HEGGIES

REPORT 10-7759-R1

Revision 4

Sydney Adventist Hospital
Acoustic Report to Support Staged Alterations and Additions
Operational Phase

PREPARED FOR

Sydney Adventist Hospital Limited
Master Planning Committee
c/- Origin Properties
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Sydney Adventist Hospital
Acoustic Report to Support Staged Alterations and Additions
Operational Phase

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1 INTRODUCTION

This section outlines the aspects of all stages of the project that will require particular attention with regard to acoustics and vibration control.

The purpose of this report is to comply with the DGRs issued by the Department of Planning, ie:

> *18. Noise and Vibration*
>
> *Provide a quantitative assessment of the potential demolition, construction, operation and traffic noise impacts of the project.*

(Noise and vibration due to construction and demolition is considered in a separate document.)

The results of environmental noise logging are presented, together with environmental (external) noise criteria for the development's emissions and relevant information to enable the report to support the Part 3A /DA submission.

1.1 Staged Development

It is proposed that the immediate and long-term development of the Hospital campus will develop in the following Stages:

Stage 1A

1. New CSB Expansion -– Surgical Precinct
2. Level 1 to Level 10
3. New Carpark
4. New Carpark
5. Refurbishment of Existing Hospital
6. Temporary Carpark
7. Site Services Upgrade
8. New Multi Level Carpark - and Adjoining Surface Carparks
9. Landscape Works

Stage 1B

1. New CSB Expansion – Cancer Precinct
2. Level 2 to Level 6
3. Road Works
4. Landscaped Area

Stage 2

1. Education Centre
   Three to four levels
2. New Access Roads
3. New Concourse
   Level 1 to Level 4

4. Refurbishment of Existing Hospital
   Introducing a Level 2 Arrival Podium

Stage 3

1. The New Shannon Wing
   Level 1 to Level 11
2. Refurbishment of Existing Hospital
3. Relocate Bethel House

2 STANDARDS AND GUIDELINES

This section identifies local government, national and /or international acoustic and vibration criteria, standards and guidelines relevant to the project.

2.1 Noise Impact to the Environment

In relation to planning, the primary acoustic concerns are of noise to the environment and, secondarily, noise from the environment impacting upon the development. Standards and guidelines relating to this aspect are listed below.

NSW DECCW Industrial Noise Policy (INP)

A framework and process for deriving noise limit conditions for consents and licences. The Policy establishes noise criteria to protect the community from excessive intrusive noise and preserve amenity for specific land uses.

This is the primary means by which to set criteria in relation to the Hospital's noise emissions and relates to fixed plant, vehicle movements (such as on access roads and in loading docks).

NSW DECCW Environmental Criteria for Road Traffic Noise (ECRTN)

Acceptable road traffic noise levels due to new traffic generated by the Hospital.

NSW DECCW Environmental Noise Control Manual (ENCM)

Chapter I51 – *Noise Control Guideline: Generators, Emergency,* in relation to noise from the Hospital's emergency generators.

2.2 Noise Impact upon the Development

In relation to planning, the secondary acoustic concerns are of noise from the environment impacting upon the development itself. Relevant Standards and guidelines relating to this aspect are listed below.

AS/NZS 2107-2000 "Acoustics - Recommended Internal Design Sound Levels and Reverberation Times for Building Interiors"

There are no Australian Standards specifically relating to design criteria for hospitals. However, this Standard includes guidance, for hospitals, in relation to acceptable internal noise levels from sources, such as continuous road traffic.

NSW DECCW Industrial Noise Policy (INP)

Recommends acceptable internal noise levels from industrial noise sources for hospital wards.

NSW DECCW Environmental Criteria for Road Traffic Noise (ECRTN)

Recommends acceptable internal noise levels from road traffic for hospital wards, and provides guidelines in terms of sleep disturbance.

2.3 Noise within the Development

The internal acoustics of the development is a matter that is separate from the Planning Application process. However the following Section covers Standards, Guidelines and criteria that relate to the internal design.

AS 2670.2-1990 : Evaluation of human exposure to whole-body vibration - Continuous and shock-induced vibration in buildings (1 to 80 Hz)

The Standard provides guidance in relation to acceptable levels of vibration for different building types and activities.

BS 6472-1:2008 : Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting

Whilst the previous (1992) version of BS 6472 contained the same criteria for human exposure to continuous vibration as AS 2670, the revised version focuses on the use of vibration dose values (VDVs) which allow an assessment of the severity of impulsive and intermittent vibration to be carried out. The VDV analysis and assessment procedure is also most relevant to the character of the vibration generated during construction works.

The Standard is consistent with the DECCW's "*Assessing Vibration: A Technical Guideline*".

NSW DECCW Assessing Vibration

"Assessing vibration: a technical guideline" is based on guidelines contained in BS 6472-1992, Evaluation of human exposure to vibration in buildings (1-80 Hz). The guideline presents preferred and maximum vibration values for use in assessing human responses to vibration and provides recommendations for measurement and evaluation techniques.

AS 2822-1985 : Acoustics – Methods of assessing and predicting speech privacy and speech intelligibility

Sets out objective methods for predicting the attainability of, and subjective methods for assessing actual attainment of, both reliable speech communication and speech privacy in a given environment. The Standard applies, inter alia, to the determination of speech privacy conditions in spaces.

AS/NZS 2107-2000 "Acoustics - Recommended Internal Design Sound Levels and Reverberation Times for Building Interiors"

This Standard includes guidance for hospitals in relation to internal noise levels (from, eg, air conditioning plant) and Reverberation Times.

Health Technical Memorandum 08-01 – Acoustics (UK).

Guidelines on acoustic criteria for healthcare premises – particularly relevant in relation to appropriate sound isolation and acoustic privacy between spaces.

3 POTENTIAL NOISE TO NEARBY SENSITIVE RECEIVERS

It is noted that these noise sources will need to be addressed in terms of impact upon the Hospital itself.

3.1 Operational Noise

Potential operational noise to the nearby environment will be:

- Fixed mechanical plant (routine and emergency)
- Service vehicles and loading docks /delivery bays
- Emergency vehicles
- Visitor /patient vehicles
- Helicopters

The criteria for noise emissions to the environment (from fixed and moveable plant and vehicular movements) are contained in **Section 4.**

3.1.1 Fixed Mechanical Plant

Following the installation of noise loggers, in and around the site, appropriate noise criteria for the control of noise to the environment has been determined – **Section 5** refers.

Given the location of the proposed development in relation to Fox Valley Road and The Comenarra Parkway, and given the existing plant has very little, if any, impact at neighbouring properties, it is likely that noise from new hospital plant will be adequately controlled through conventional means – such as attenuators, acoustic louvres, barriers, enclosures, and the careful location and orientation of air inlets /outlets and items of plant.

3.1.2 Service Vehicles and Loading Docks

Given the proposed service vehicle routes are unchanged, and given the loading dock is located to the south of the CSB Expansion, well-shielded by Hospital buildings to the nearest affected residences, noise emissions are unlikely to be problematic.

3.1.3 Emergency Vehicles

Since the route for emergency vehicles in relation to sensitive receivers is unchanged, this is unlikely to be an issue.

It is noted that emergency vehicles do not sound sirens when on site.

3.1.4 Visitor /Patient Vehicles

The route for visitor /patient vehicles in relation to sensitive receivers is unchanged. Although it now extends further around, to the north of, the Hospital, because of relatively large separation to the nearest affected residences, noise emissions are unlikely to be problematic.

3.1.5 Helicopters

We understand helicopter flights are infrequent – essentially since the Hospital is not a trauma centre and does not deal, primarily, with emergencies. As such, we understand there is unlikely to be any significant increase in flights.

In any case, helicopter operations should be conducted with due regard to the following publications.

Air Services Australia – Environmental Principles and Procedures for minimising the Impact of Aircraft Noise (2002)

> This document provides principles to be used in environmental assessments and as the basis for selecting preferred noise abatement procedures. It is for proposals for new air routes and for changes to existing arrangements, and may be used in relation to helicopter noise.

Flying Neighbourly Guide (USA)

> The Fly Neighbourly Guide is published under the auspices of HAI (Helicopter Association International) to promote helicopter noise abatement operations. It addresses general issues only. The guide is intended to assist pilots, operators, managers, and so on, to establish an effective Fly Neighbourly Program.

4 ENVIRONMENTAL NOISE SURVEY

4.1 Logger Locations

Environmental noise logging was conducted out at four locations on and around the site from Tuesday 28 April to Tuesday 5 May 2009 (**Figure 1** and **Figure 2** refers) to establish noise criteria for the control of noise to the environment.

- Location 1 205 The Comenarra Parkway – in rear garden. (ARL Type 1 Environmental Noise Logger, EL-316, Serial Number 16-004-010).
- Location 2 Jacaranda Lodge – outside, and facing tennis courts. (ARL Type 1 Environmental Noise Logger, EL-316, Serial Number 16-306-036).
- Location 3 163 Fox Valley Road – in rear garden. (ARL Type 1 Environmental Noise Logger, EL-316, Serial Number 16-306-035).
- Location 4 68 Mount Pleasant Avenue – front garden. (ARL Type 1 Environmental Noise Logger, EL-316, Serial Number 16-306-037).

All loggers were calibrated before and after measurement and the measured drift in calibration, on each logger, was less than 0.5 dB.

Figure 1 Site and Noise Logging Locations (Map)

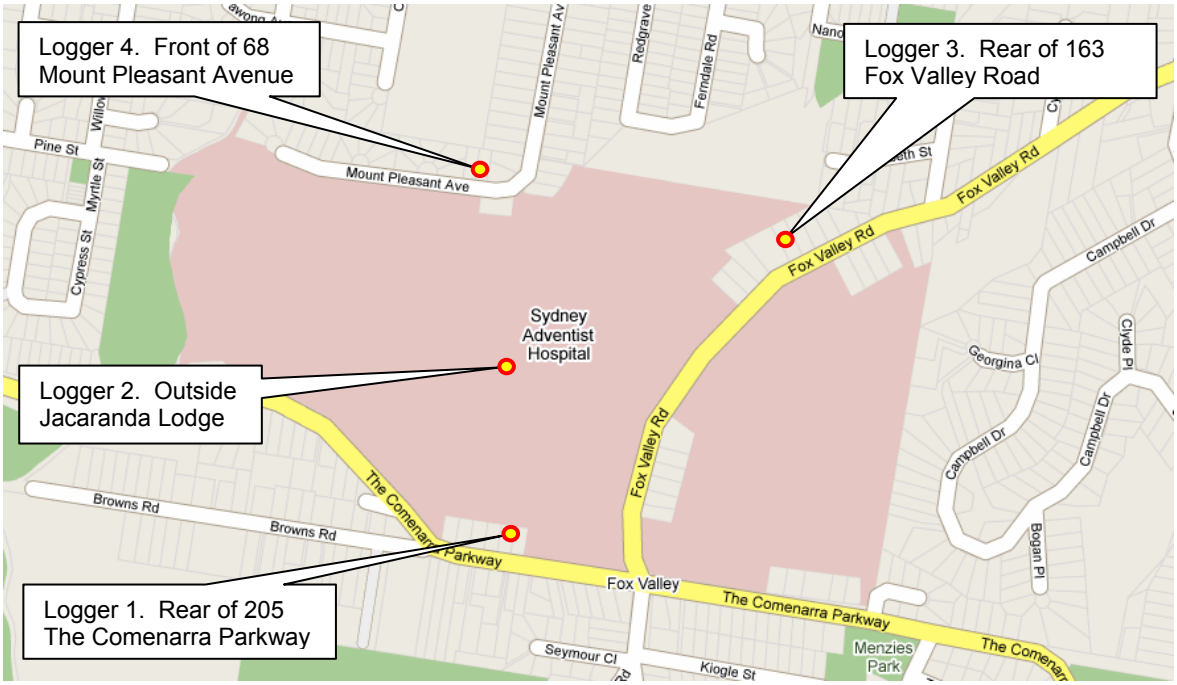
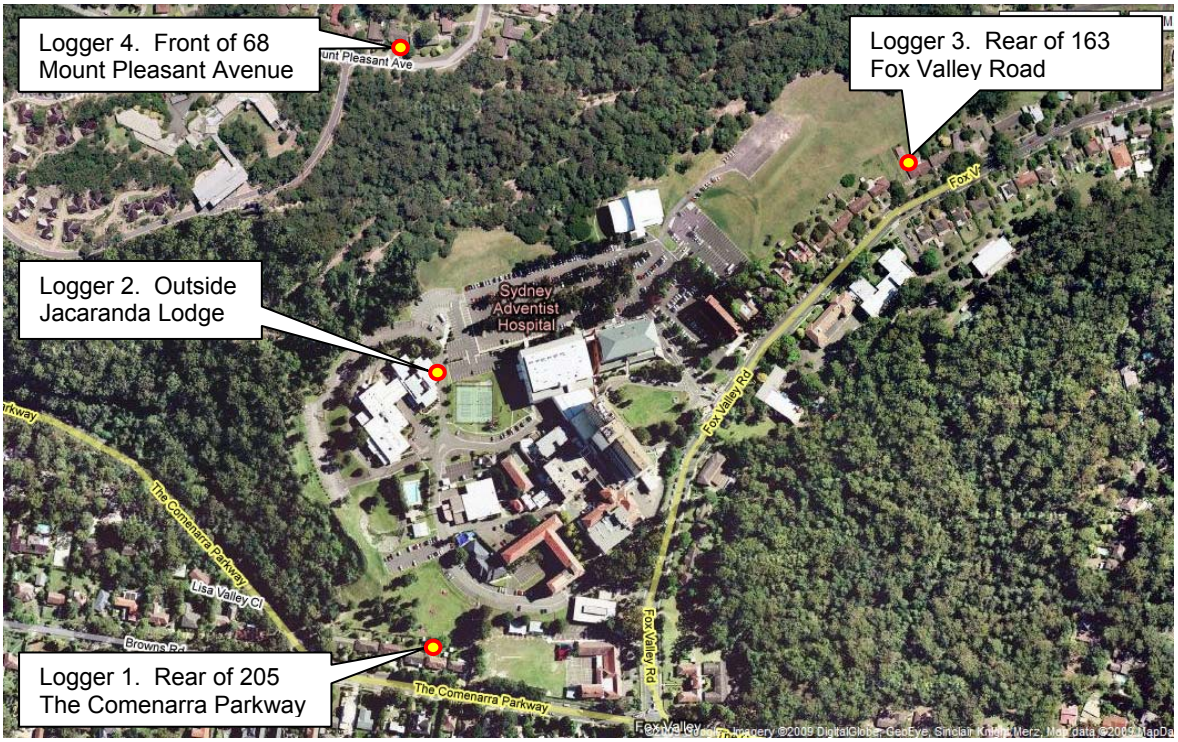


Figure 2 Site and Noise Logging Locations (Satellite)



4.2 Noise Environment

With the exception of Location 2 (Jacaranda Lodge) the noise environment at the logging locations was predominantly controlled by local (The Comenarra Parkway and Fox Valley Road) and distant (Pennant Hills Road) road traffic with very little, if any, noise from hospital plant or activities.

The noise environment at Jacaranda Lodge was predominantly controlled by nearby, and roof-top, hospital plant and local activity (people and vehicles).

4.3 Survey Results

The full, 7-day, graphical results of the survey are shown in **Appendices A to D**, and are summarised in **Figure 3**, **Figure 4, Figure 5** and **Figure 6**.

The statistical descriptors shown on the graphs are:

- **LA1** The noise level exceeded for 1% of the sample time (15 minutes) and representative of the highest noise level events (eg passing heavy vehicles, aircraft, etc).
- **LA10** The noise level exceeded for 10% of the sample time (15 minutes) and is typically described as the average maximum noise level.
- **LAeq** The L_{Aeq} is the energy-average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.
- **LA90** The L_{A90} is the level of noise exceeded for 90% of the sample time (15 minutes). The LA90 noise level is described as the average minimum background sound level or simply the "background level".

The median values of the L_{A1}, L_{A10} and L_{A90} levels are shown, together with the logarithmic average of the L_{Aeq} levels – for each 15 minute period of the entire long-term monitoring.

4.3.1 Spurious and Uncharacteristic Data

The full, 7-day, graphical results shown in **Appendices A to D** include occasional "spikes" at some of the loggers. It is clear (because the L_{A1} levels are not affected and because the events do not occur simultaneously on all the loggers) that these events are spurious and uncharacteristic – and were probably caused by very loud noises, of very short duration, very close to the logger microphone. As such, these peculiar events have been excluded from the data presented in **Figure 3**, **Figure 4, Figure 5** and **Figure 6**, and also excluded from the data used to determine the noise emission criteria.

Figure 3 Existing Background Noise Levels – Logger Location 1: Rear Garden of 205 The Comenarra Parkway

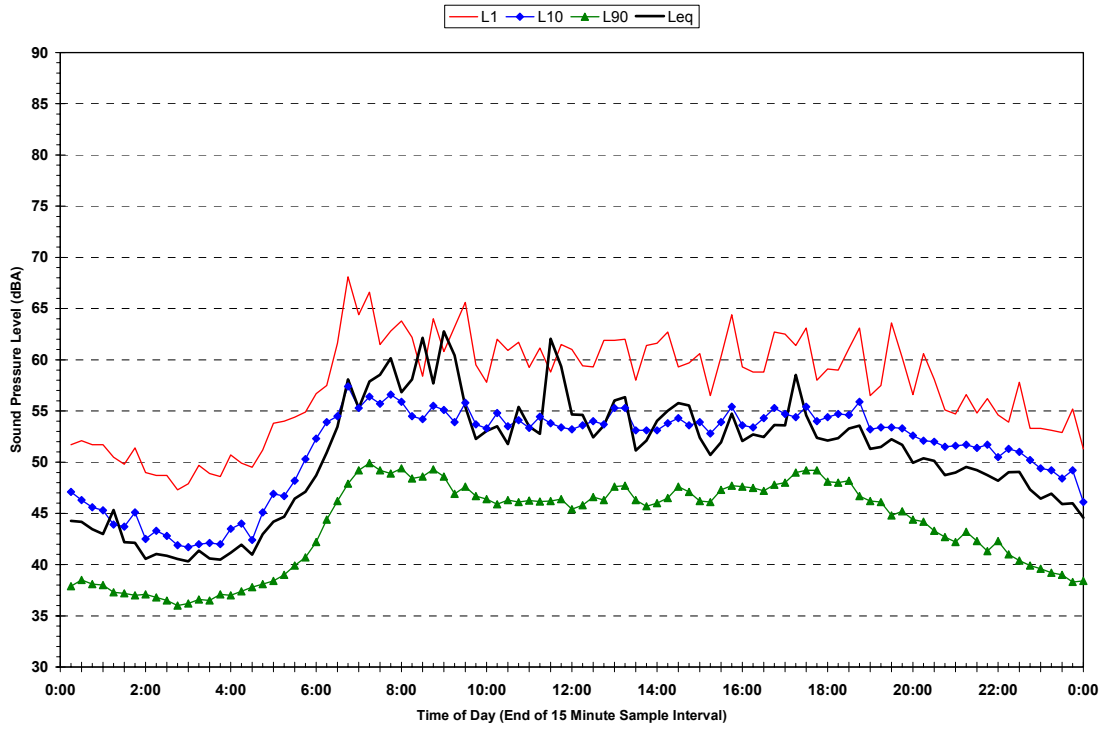


Figure 4 Existing Background Noise Levels – Logger Location 2: Jacaranda Lodge – facing tennis courts

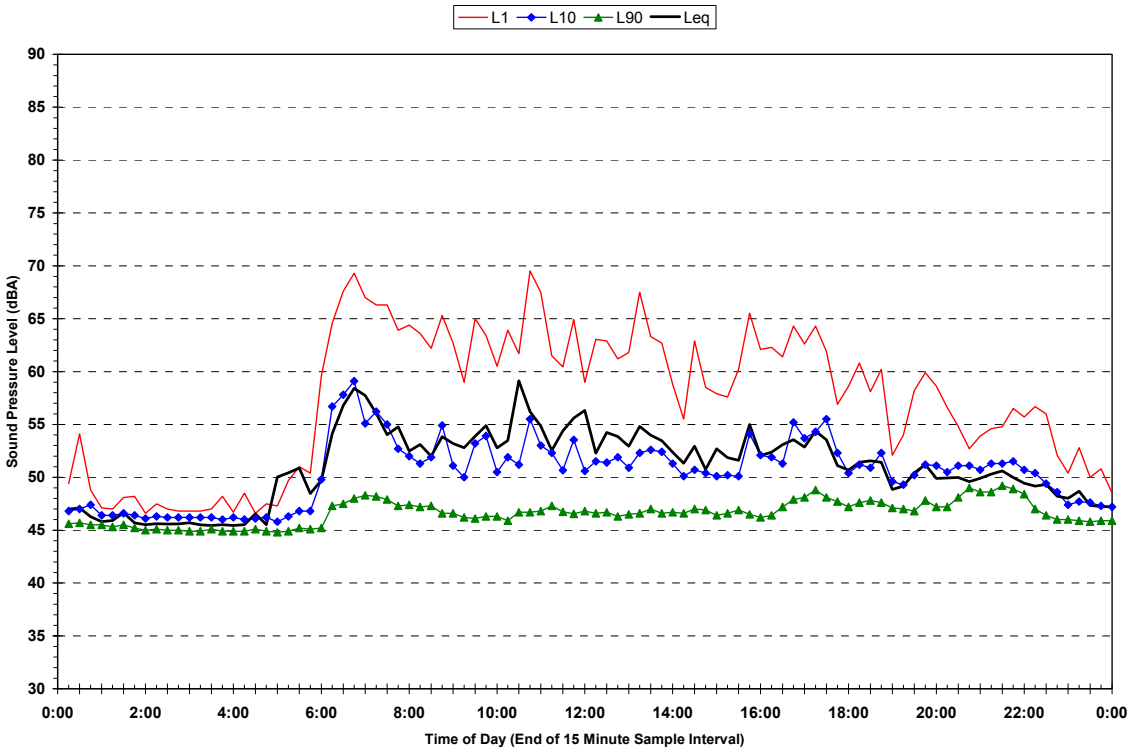


Figure 5 Existing Background Noise Levels – Logger Location 3: Rear Garden of 163 Fox Valley Road

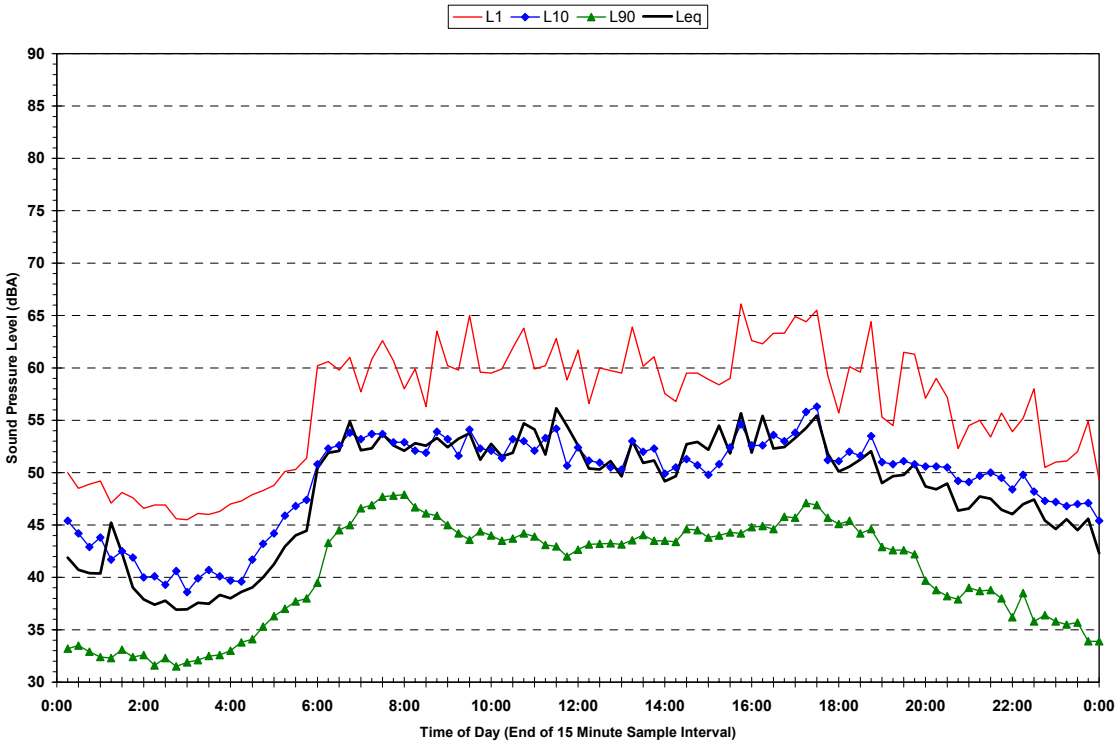
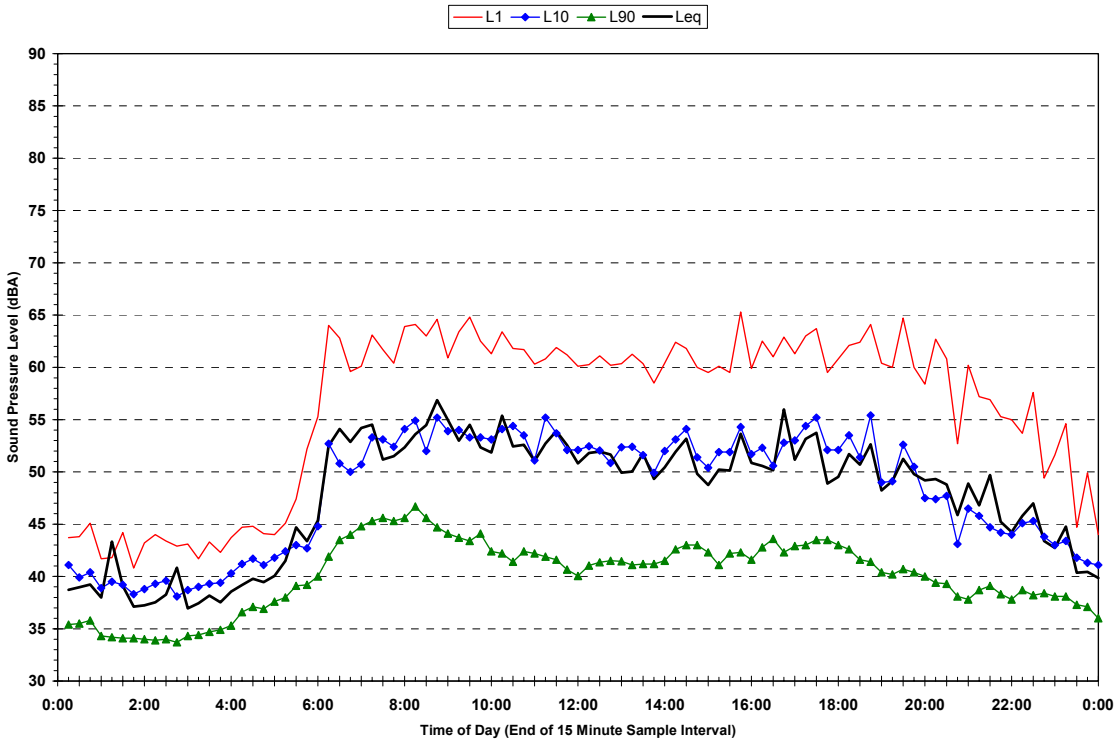


Figure 6 Existing Background Noise Levels – Logger Location 4: Front Garden of 68 Mount Pleasant Avenue



4.3.2 Summary of Existing Noise Levels

The data obtained from the noise monitoring has been processed in accordance with the procedures set out in the NSW DECCW Industrial Noise Policy (INP) and are presented in **Table 1**.

To assess the impact of industrial noise from the proposed development, data obtained from Logger 1 has also been processed in accordance with the time periods given in the NSW DECCW Industrial Noise Policy (INP). The results of this analysis are presented in **Table 1**.

Table 1 Measured Ambient Noise Levels Corresponding to Defined INP Periods

Location	Measurement Descriptor	Measured Noise Level - dBA re 20 µPa		
		Daytime 7.00 am - 6.00 pm	Evening 6.00 pm - 10.00 pm	Night-time 10.00 pm - 7.00 am
Logger 1	L_{Aeq}	57	51	48
205 Comenarra Parkway	RBL (Background)	45	42	36
Logger 2	L_{Aeq}	58	50	51
Jacaranda Lodge	RBL (Background)	46	47	45
Logger 3	L_{Aeq}	53	49	46
163 Fox Valley Road	RBL (Background)	43	37	32
Logger 4	L_{Aeq}	53	49	46
68 Mount Pleasant Avenue	RBL (Background)	42	38	34

5 ROAD TRAFFIC NOISE

5.1 Environmental Criteria for Road Traffic Noise (ECRTN)

The NSW DECCW's *"Environmental Criteria for Road Traffic Noise"* (ECRTN, May 1999) sets noise goals for road traffic noise. The policy document provides road traffic noise criteria for proposed road or commercial land use developments as well as noise goals for other sensitive land uses. The relevant criteria relating to land use developments with potential to create additional traffic on "*existing collector roads"* roads is summarised in **Table 2**.

Table 2 ECRTN Guidelines for Road Traffic Noise at Residences

Type of Development	**Criteria**		
	Day (7am to 10pm)	**Night (10pm to 7am)**	**Where Criteria are Already Exceeded**
Land use developments with potential to create additional traffic on existing collector roads	$L_{Aeq(1hr)}$ 60 dBA	$L_{Aeq(1hr)}$ 55 dBA	Where feasible, existing noise levels should be mitigated to meet the noise criteria. Examples of applicable strategies include appropriate location of private access roads; regulating times of use; using clustering; using 'quiet' vehicles; and using barriers and acoustic treatments. In all cases, traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB.

Definitions: Land use development with potential to create additional traffic on existing roads implies increases to the magnitude of the traffic flow and/or changes to the traffic mix brought about by new land use developments or significant alterations to existing land use developments, which may not involve any construction to the road. This category does not cover minor changes that are not subject to either development consent or amendment to an EPA licence.

The more onerous of these criteria requires that traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB.

5.2 Predicted Traffic Noise Impact

Section 5.2 of Transport Traffic and Planning's report (Reference 0934) dated July 2010 provides "a worst case sensitivity assessment the projected future traffic movements generated by the staged hospital development" as given in **Table 3** and **Table 4** for the am and pm periods, respectively.

These traffic movements are movements in to and out of the Hospital (only) and do not include other traffic on the roads. As such, the predicted increases in noise levels (as given in **Table 3** and **Table 4**) represent the worst possible impact due to the change in traffic flows.

Table 3 Change in Traffic Noise for AM Traffic Flows

	Incoming			**Outgoing**		
	Future Traffic	**Increase on Existing Flow**	**Increase in Noise Level**	**Future Traffic**	**Increase on Existing Flow**	**Increase in Noise Level**
Stage 1A	645	94	**0.7 dB**	133	17	**0.6 dB**
Stage 1B	709	158	**1.1 dB**	142	26	**0.9 dB**
Stage 3	810	259	**1.7 dB**	279	56	**1.6 dB**

Table 4 Change in Traffic Noise for PM Traffic Flows

	Incoming			**Outgoing**		
	Future Traffic	**Increase on Existing Flow**	**Increase in Noise Level**	**Future Traffic**	**Increase on Existing Flow**	**Increase in Noise Level**
Stage 1A	214	34	**0.8 dB**	316	44	**0.7 dB**
Stage 1B	230	50	**1.1 dB**	366	94	**1.3 dB**
Stage 3	251	271	**1.4 dB**	411	139	**1.8 dB**

It is seen that traffic arising from the development should not lead to an increase in existing noise levels of more than 2 dB LAeq(1hour).

6 OPERATIONAL NOISE CRITERIA

6.1 Site Activity Noise

"Industrial" noise emissions from on-site activities associated with the proposed development (such as on-site vehicle movements, air-conditioning equipment, exhaust fans and other mechanical plant) must be controlled to avoid impacting upon the acoustic amenity of nearby premises which, in this case, are predominantly residential.

Responsibility for the control of noise emission in New South Wales is vested in Local Government and the Department of Environment, Climate Change and Water (DECCW).

The DECCW oversees the Industrial Noise Policy (INP) which provides a framework and process for deriving noise criteria designed to:

- Control the *intrusive* noise impacts for residents and other sensitive receivers in the short term; and
- Maintain noise level *amenity* for particular land uses for residents and sensitive receivers in other land uses

6.2 Assessing Intrusiveness

The intrusiveness criterion essentially requires that the equivalent continuous noise level (L_{Aeq}) of the source should be no more than 5 dBA above the background noise over any 15 minute period.

In instances where "industrial noise" from a site occurs in short bursts followed by much longer periods of relative quiet (which is unlikely to be the case here) the impact of the industrial noise must be assessed on the basis of the level of that noise against the background noise during the period that the activity occurs. (The alternative approach – of determining the (LAeq) level of the industrial noise "averaged" over the whole day, evening or night period – would potentially under-estimate the impact of the activity.)

For steady-state noise sources (ie where the industrial noise is fairly uniform, over the whole day, evening or night period – as is the case here) the intrusiveness criterion requires that the equivalent continuous noise level (L_{Aeq}) of the source should be no more than 5 dBA above the Rated Background Level (RBL). The RBL is established through environmental monitoring **Section 4.3.2** refers.

6.3 Assessing Amenity

The amenity criterion is based on land use and associated activities (and their sensitivity to noise emission). The cumulative effect of noise from industrial sources needs to be considered in assessing the impact. The criterion relates only to other industrial-type noise sources and does not include road, rail or community noise.

The existing noise level from industry is measured. If it approaches the criterion value, then noise levels from new industrial-type noise sources (including air-conditioning mechanical plant and vehicle movement) need to be controlled so that the cumulative effect does not significantly exceed the criterion. If, on the other hand, the existing level of industrial noise is below the criterion value, then noise levels from new industrial-type are controlled so that the cumulative effect approaches the criterion.

(For areas of high road traffic, there are further considerations that influence the selection of the noise criterion – but that is not the case here.)

6.4 Area Classification

We have deemed this area to fall under the "Suburban Area" classification. The INP characterises a suburban area as, inter alia, "*an area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry*".

6.5 Project Specific Noise Levels

Having defined the area type, the processed results of the unattended noise monitoring have been used to generate project-specific noise criteria.

In this case (since the noise from hospital equipment and activity is, and will be, fairly steady) the project-specific noise levels, which are shown in bold in **Table 5** below, are the lower of the intrusive and amenity criteria.

Where the noise source contains annoying characteristics (such as prominent tonal components, impulsiveness, intermittency, irregularity and dominant low-frequency content) adjustments are applied to the level of noise that is received at the assessment point before comparison with the criteria.

Table 5 Criteria for Noise Emissions to Nearby Sensitive Receivers

Time of Day	Noise Level dBA re 20 µPa				
	ANL[1] (Period)	Measured RBL $L_{A90(Period)}$[2]	Measured $L_{Aeq(Period)}$	INP Criteria	
				Intrusive	Amenity
				$L_{Aeq(15minute)}$ Criterion for New Sources	$L_{Aeq(Period)}$ Criterion for New Sources[3]
Location 1, 205 Comenarra Parkway					
Day 7.00 am - 6.00 pm	55	45	57	50	**47**
Evening 6.00 pm - 10.00 pm	45	42	51	47	**41**
Night 10.00 pm - 7.00 am	40	36	48	41	**38**
Location 2, Jacaranda Lodge					
Day 7.00 am - 6.00 pm	55	46	58	51	**48**
Evening 6.00 pm - 10.00 pm	45	47	50	52	**40**
Night 10.00 pm - 7.00 am	40	45	51	46	**41**
Location 3, 163 Fox Valley Road					
Day 7.00 am - 6.00 pm	55	43	53	**48**	51
Evening 6.00 pm - 10.00 pm	45	37	49	42	**39**
Night 10.00 pm - 7.00 am	40	32	46	37	**36**
Location 4, 68 Mount Pleasant Avenue					
Day 7.00 am - 6.00 pm	55	42	49	**47**	54
Evening 6.00 pm - 10.00 pm	45	38	49	43	**39**
Night 10.00 pm - 7.00 am	40	34	46	39	**36**

Note 1: ANL: Acceptable Noise Level for a "Suburban" area
Note 2: RBL: Rating Background Level
Note 3: Assuming existing noise levels are unlikely to decrease
Note 4: Project Specific Criteria are shown in bold
Note 5: The Amenity criteria given assume the measured noise (LAeq) is comprised entirely of industrial noise, so as to result in conservative (ie more stringent) levels.

6.6 Summarised Criteria

Since the criteria at the off-site residential receivers (Locations 1, 3 and 4) are very similar, for simplicity, the following criteria (based on the more stringent of those determined above) are proposed for the closest off-site receivers:

- Day 47 dBA
- Evening 39 dBA
- Night 36 dBA

6.7 Discussion

In nearly all cases, the project-specific criteria (**Section 6.6**) are approximately equal to, or less than the measured background noise. The exception to this is that, at Locations 3 and 4, the daytime criteria is based upon the measured RBLs, permitting new noise sources to exceed the existing background noise at these places.

However, given that the majority of the plant will operate continuously, it is likely that controlling noise to the night-time criterion will be the governing factor in terms of noise control treatment and that compliance will also ensure compliance with the daytime and evening criteria.

Complying with the above criteria (**Section 6.6**) at the nearest affected residences will likely mean that the noise to Mount Pleasant Avenue (which is about twice the distance and experiences a similar noise climate to residences on Fox Valley Road) will be controlled to about, or below, the existing background noise.

It is also likely that complying with the above criteria will result in noise levels at Jacaranda Lodge (which are, currently, slightly higher than at the other locations) not being increased. However, this potential impact should be checked during the design process, as equipment details become available.

It is also noted that compliance with the above criteria will result in compliance with the following requirements for the nearby school:

- Inside classrooms, during the noisiest 1-hour period when the school is in use: 35 L_{Aeq}
- School playground when the school is in use: 55 L_{Aeq}

7 CONTROLLING MECHANICAL PLANT

Potential acoustic concerns, in relation to controlling mechanical plant, together with conceptual design solutions, are discussed below.

7.1 Noisy Equipment

Typical AHUs (on Level 6) serving the Operating Theatres on Level 5 may require large attenuators to provide adequate insertion losses to the Theatres. Sufficient space should also be allowed for adequate cross-section areas, so as to minimise the pressure drop that will arise.

Typical AHUs (on Level 6) are unlikely to be problematic to the Wards on Level 7. However, noisier plant (such as chillers) would likely require special measures such as: adopting quiet(er) chillers; and /or a heavy, resiliently-hung ceiling to the Level 6 plantroom. A very high degree of mechanical isolation, both for the plant and the associated pipework, may also be required.

Special attention will be required to ensure the noise from the existing CSB plantroom (Level 6) is adequately controlled to the Wards on the new Level 7 building. Noise control measures may include (depending upon the noise levels encountered): remedial treatment to the existing plant; and /or special glazing to the Level 7 Wards.

Emergency Generators located over sensitive areas may require “floating” concrete floors, as well as large-section, long attenuators.

8 CONCLUSION

Works that will require particular attention with regard to acoustics and vibration control are outlined.

Issues that are likely to impact upon the cost of the project are indentified and conceptual measures to deal with these are proposed.

The results of environmental noise logging are presented, together with environmental (external) noise criteria for the development's emissions.

Noise control measures will be developed during the design stages to ensure noise from new mechanical equipment will meet the noise criteria.

It is likely that noise from fixed plant will be adequately controlled through conventional measures.

Any increase in noise due to increased activity from fixed mechanical plant, service vehicles /loading docks, emergency and visitor /patient vehicles Is unlikely to go unnoticed at nearby residential receivers.

Traffic arising from the development should not exceed the relevant criteria (ie should not give rise to an increase in noise of more than 2 dB).

Since helicopter flights are infrequent (and unlikely to significantly increase) the proposed scheme poses no significant risk of adverse noise impact.

In essence, the acoustic impacts arising from the operational phase will not result in any unacceptable impacts on hospital patients or the surrounding residents.

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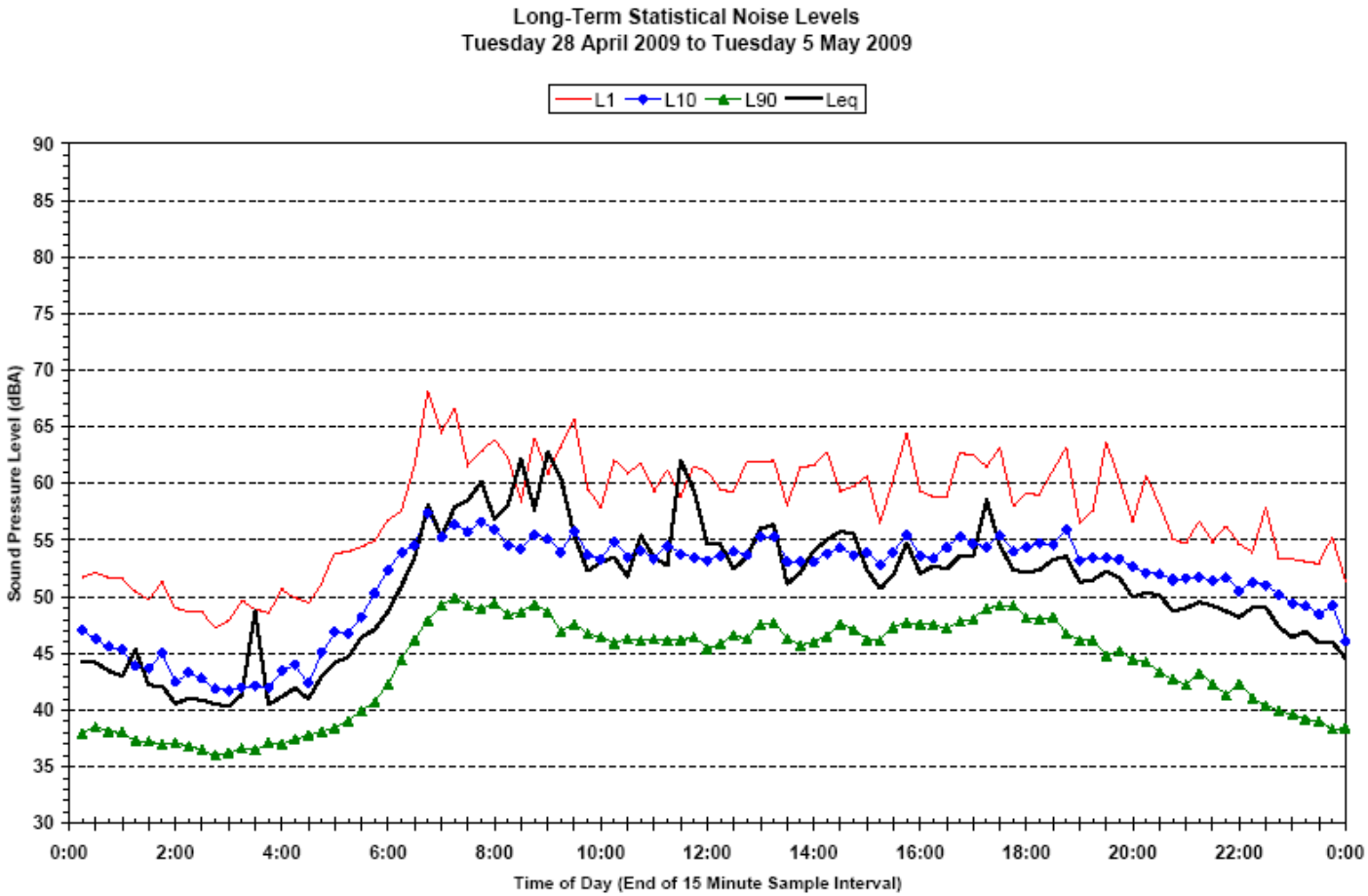
Existing Background Noise Levels –
Logger Location 1: Rear Garden of 205 The Comenarra Parkway



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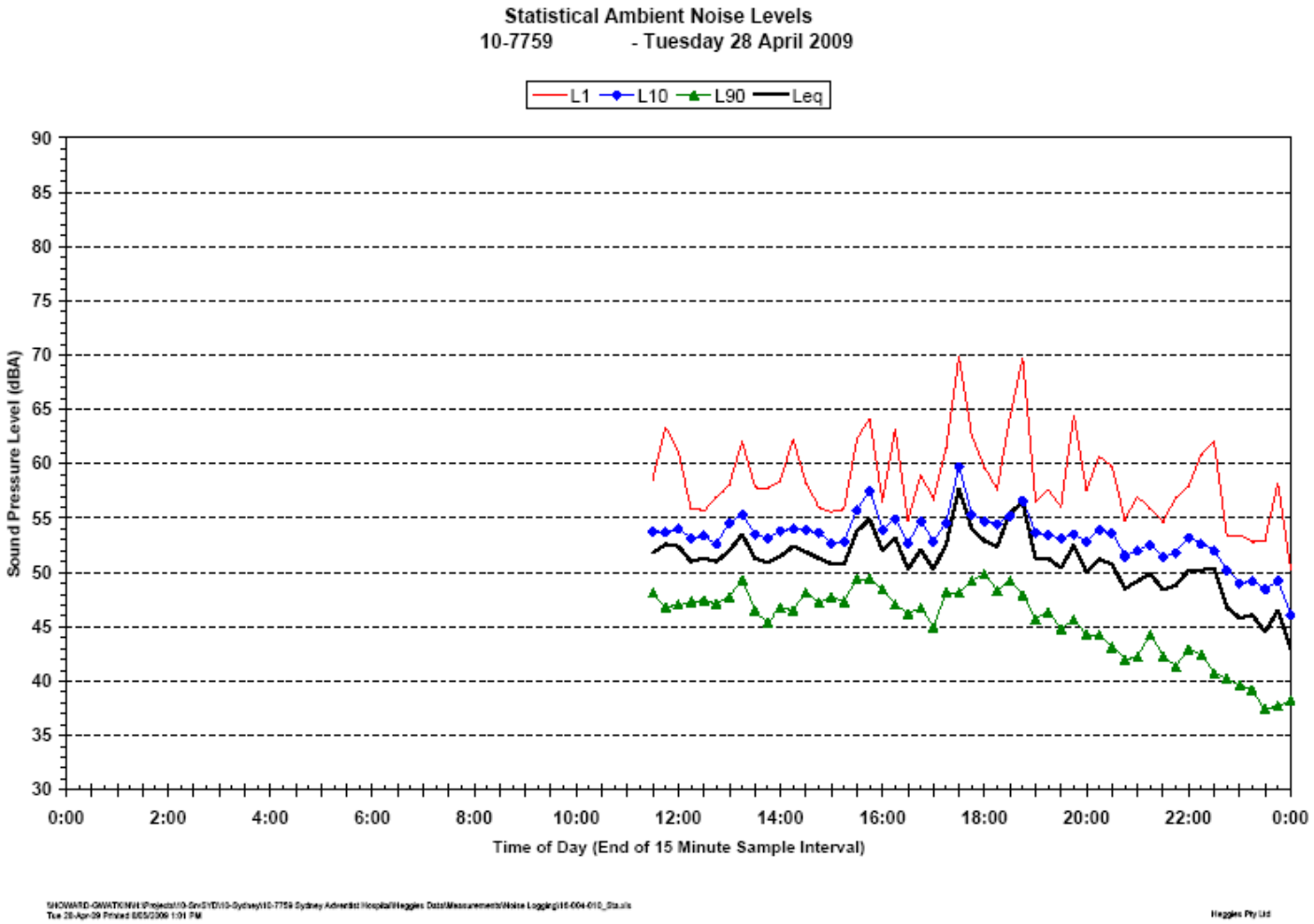
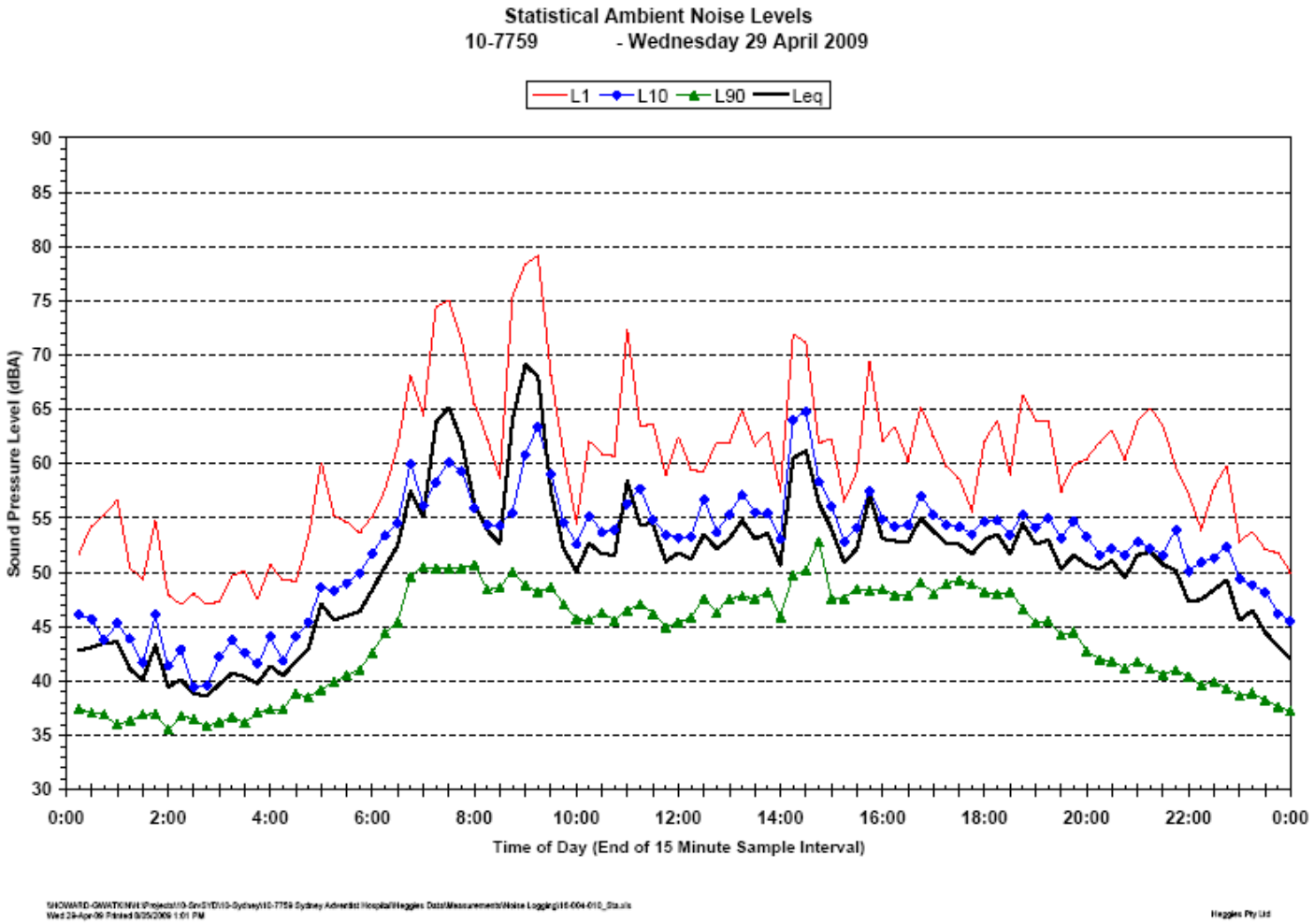
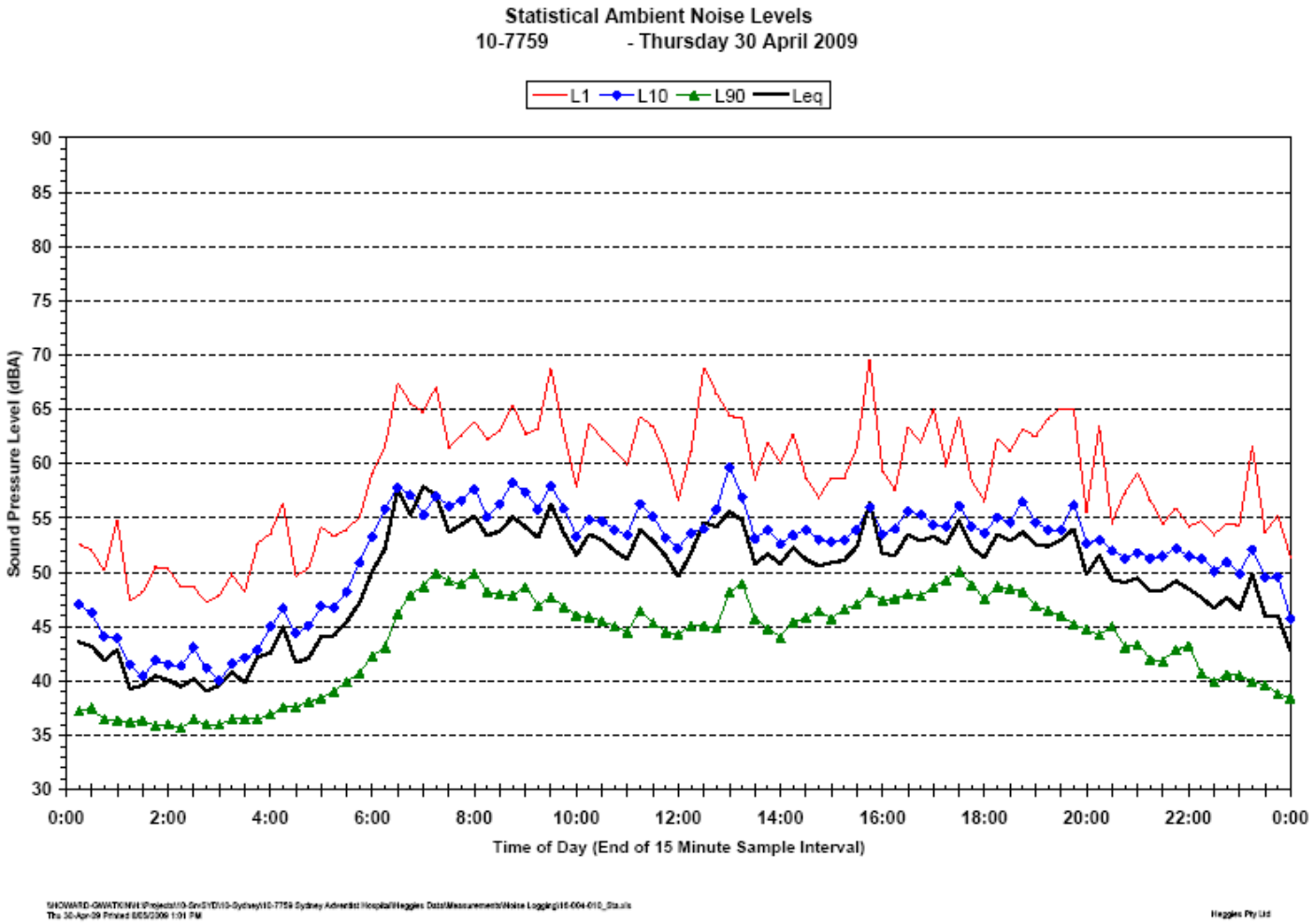


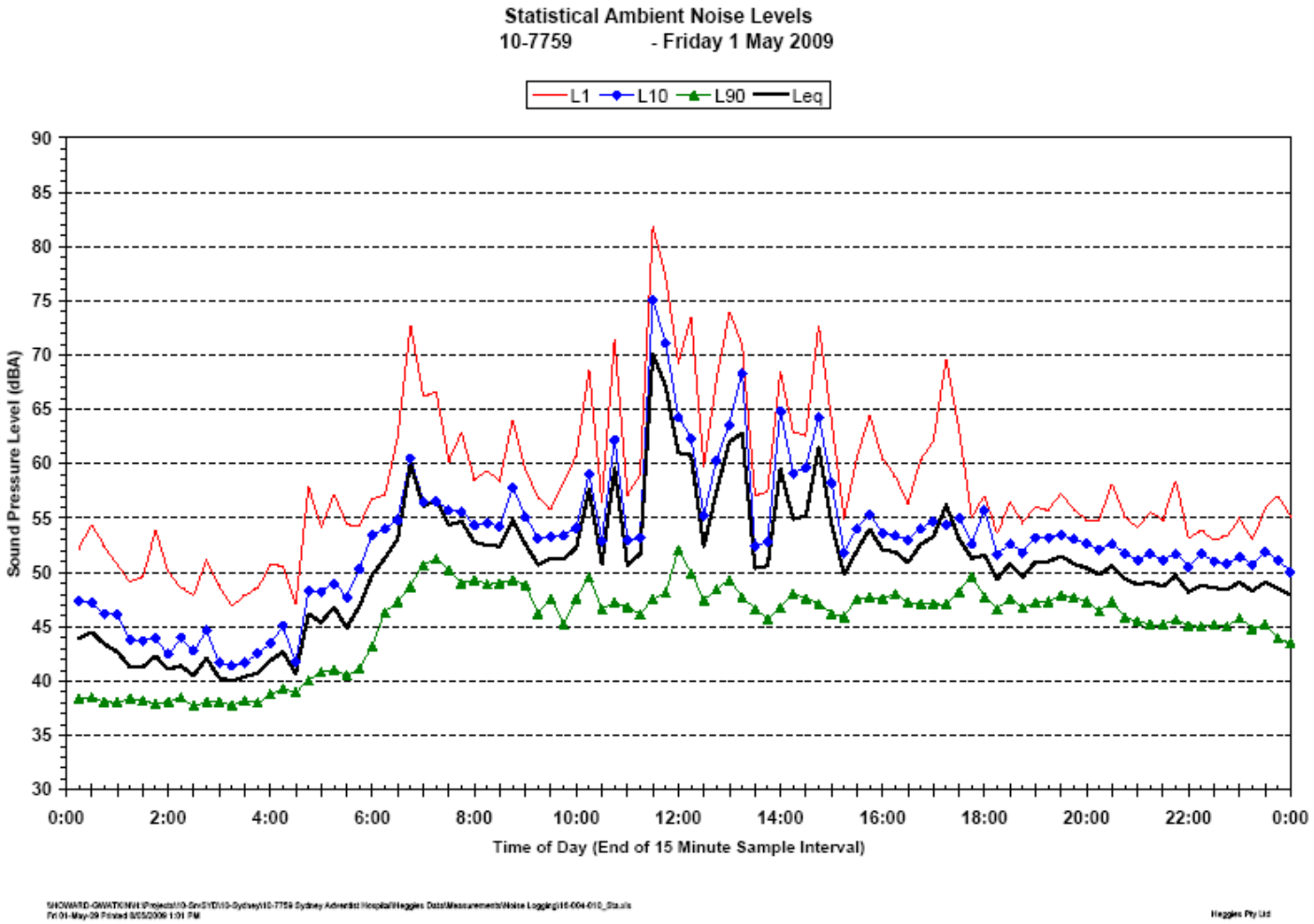
Existing Background Noise Levels –
Logger Location 1: Rear Garden of 205 The Comenarra Parkway



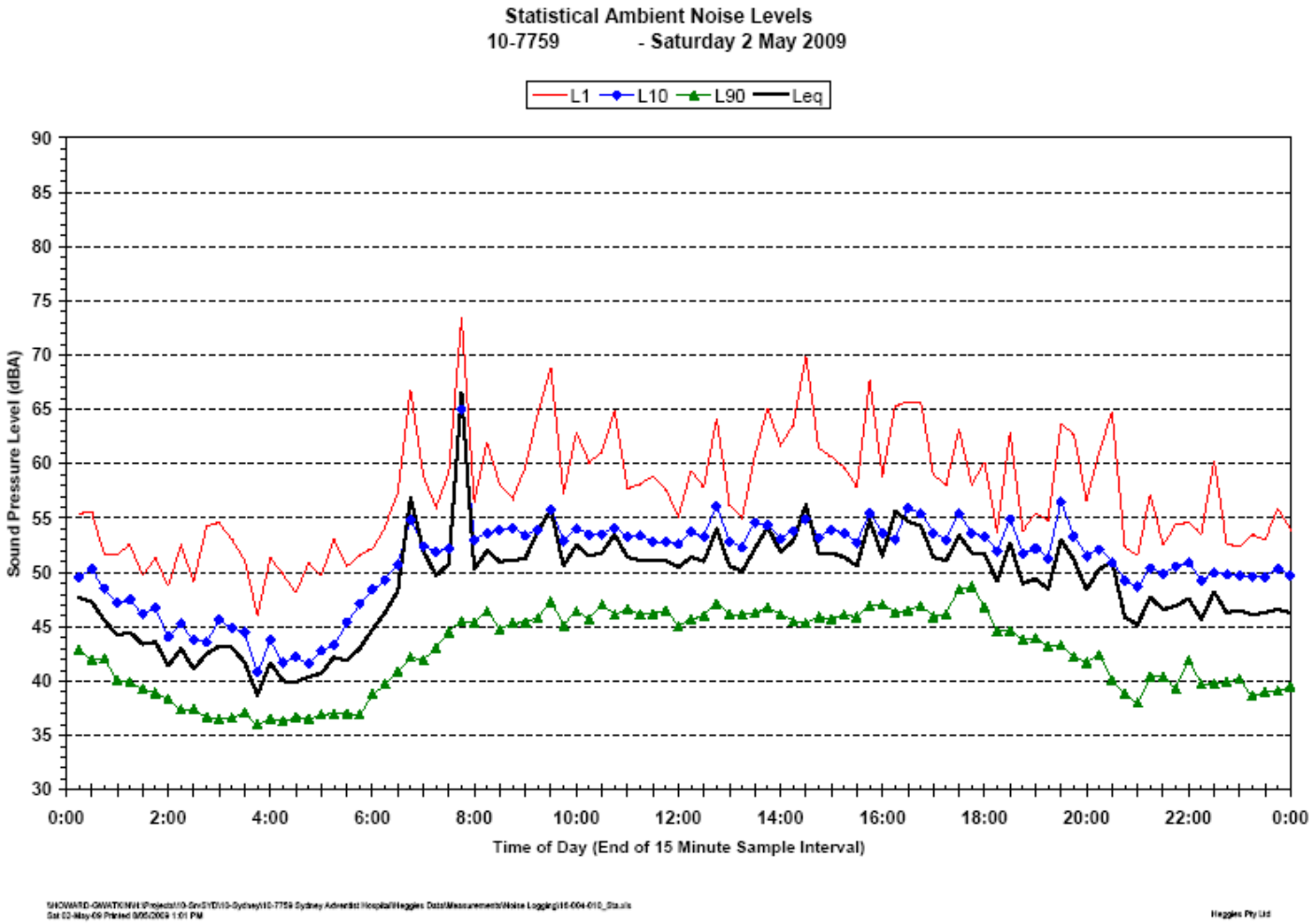
Existing Background Noise Levels –
Logger Location 1: Rear Garden of 205 The Comenarra Parkway



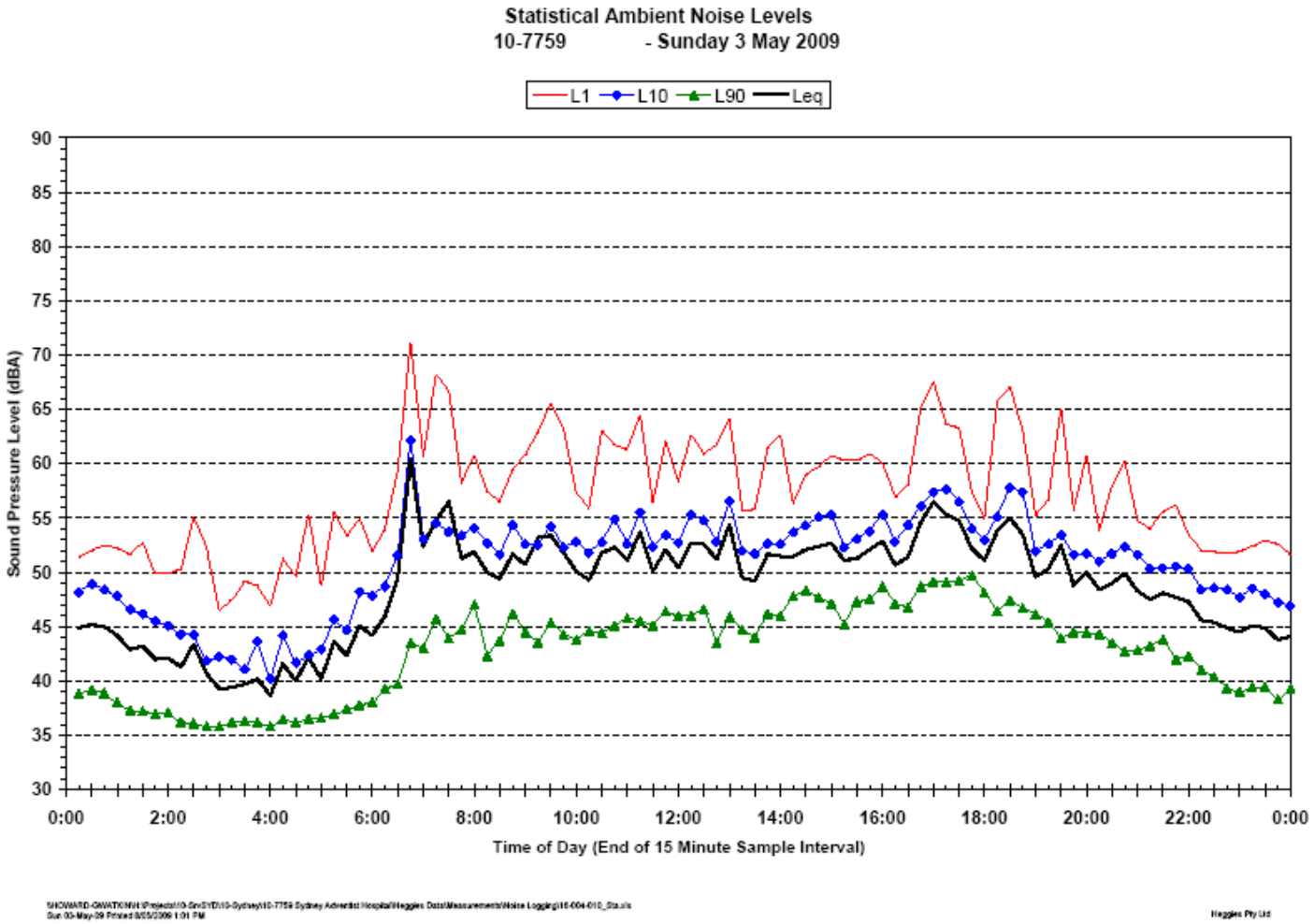
Existing Background Noise Levels –
Logger Location 1: Rear Garden of 205 The Comenarra Parkway



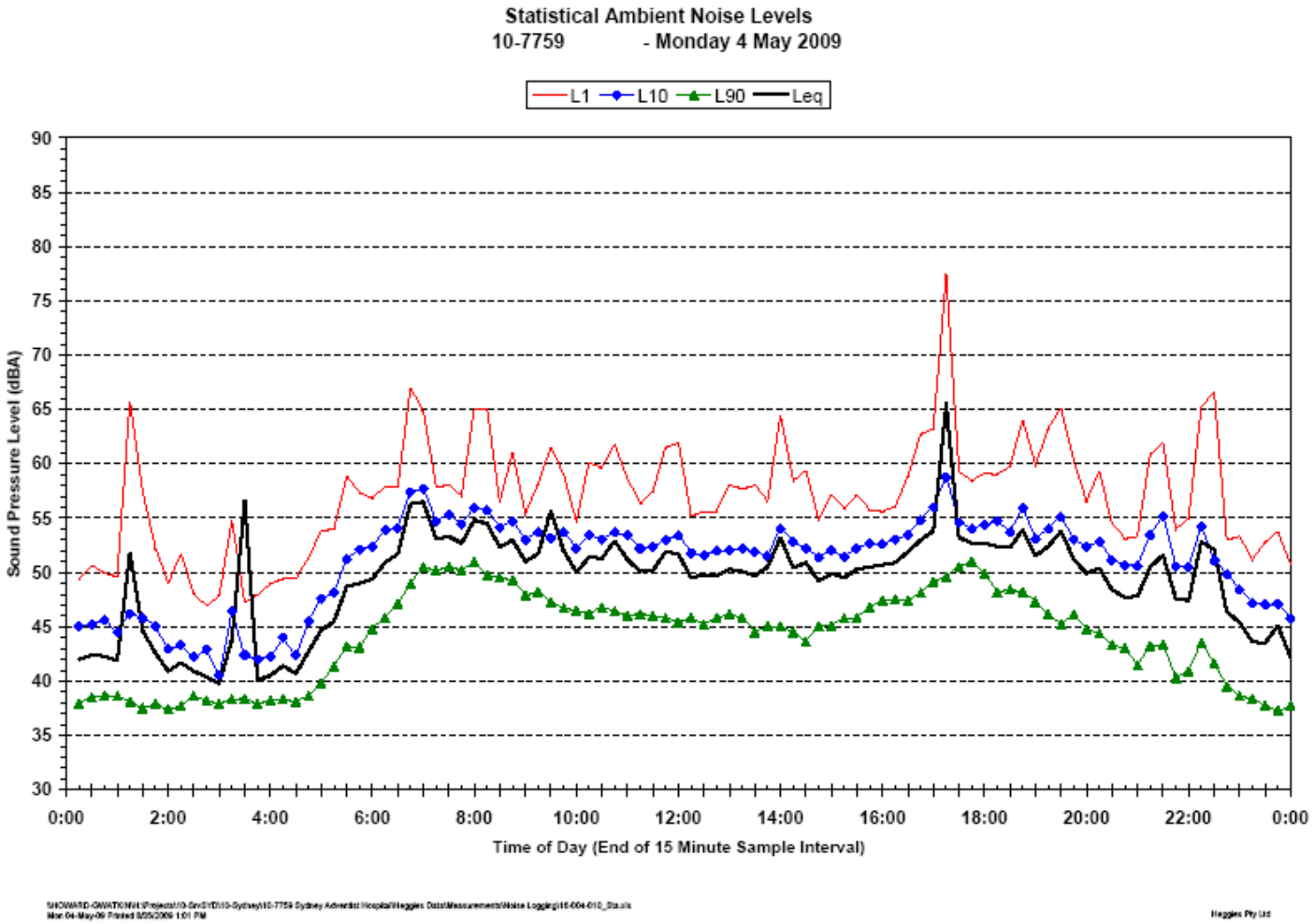
Existing Background Noise Levels –
Logger Location 1: Rear Garden of 205 The Comenarra Parkway



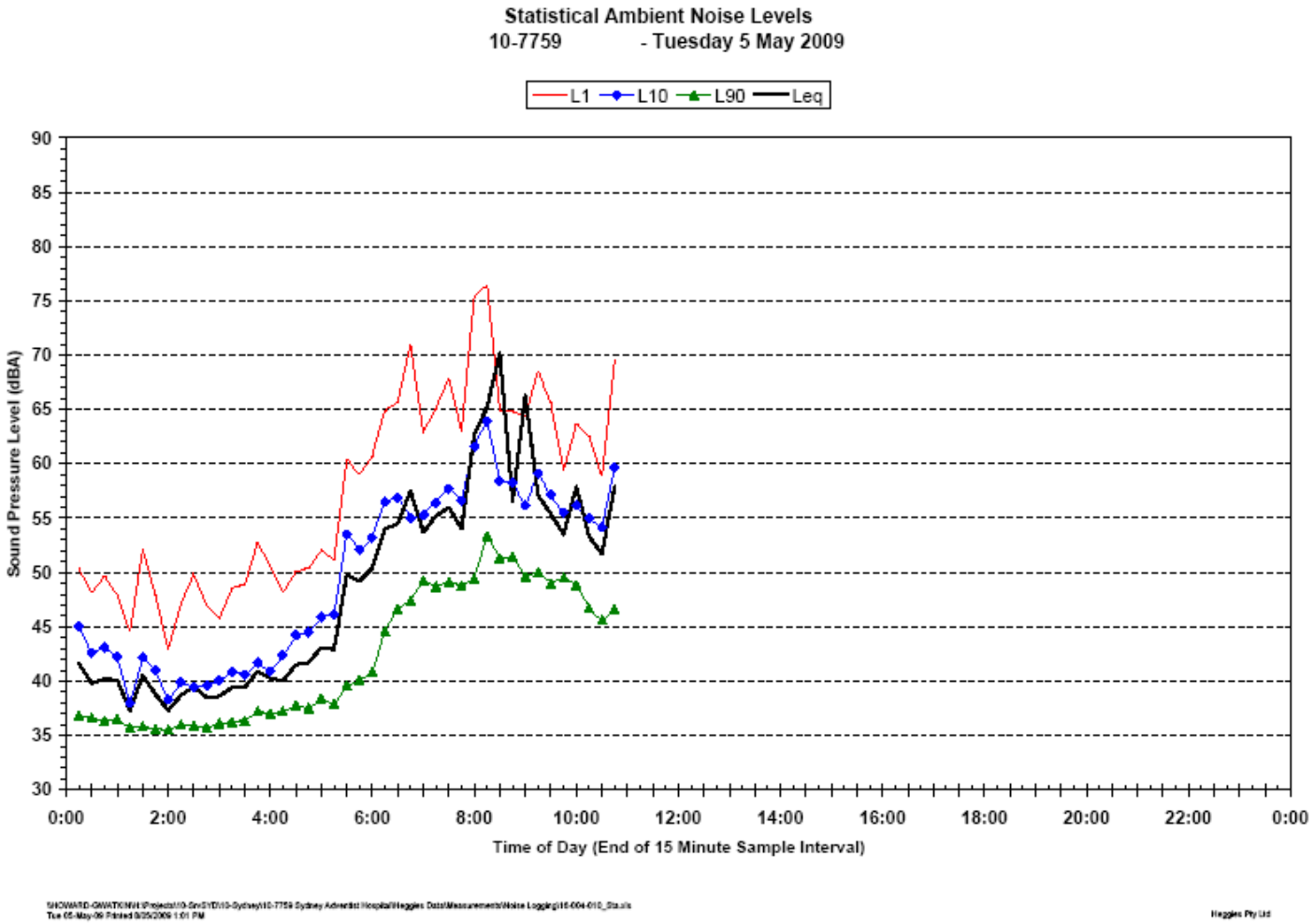
Existing Background Noise Levels –
Logger Location 1: Rear Garden of 205 The Comenarra Parkway



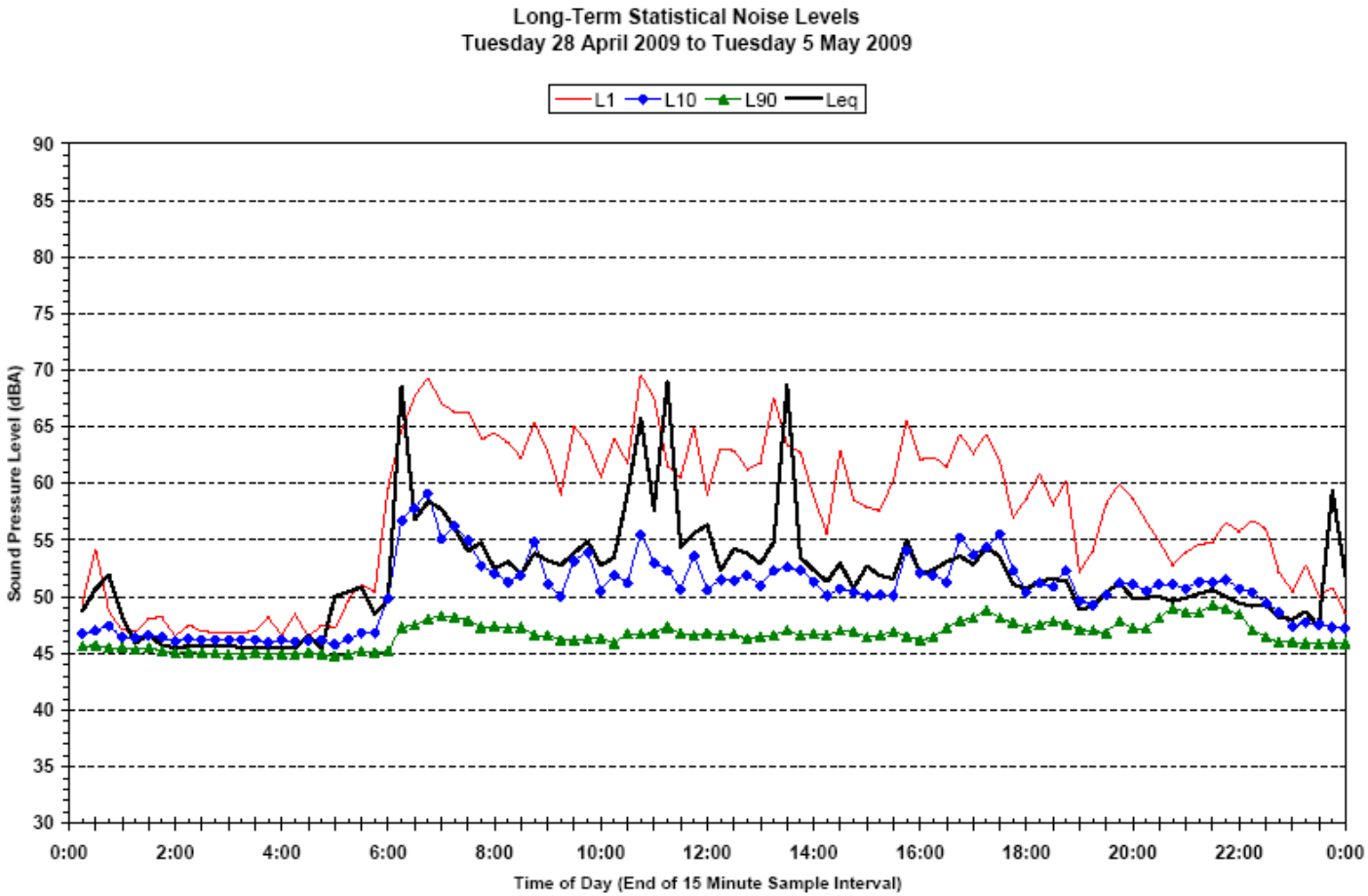
Existing Background Noise Levels –
Logger Location 1: Rear Garden of 205 The Comenarra Parkway



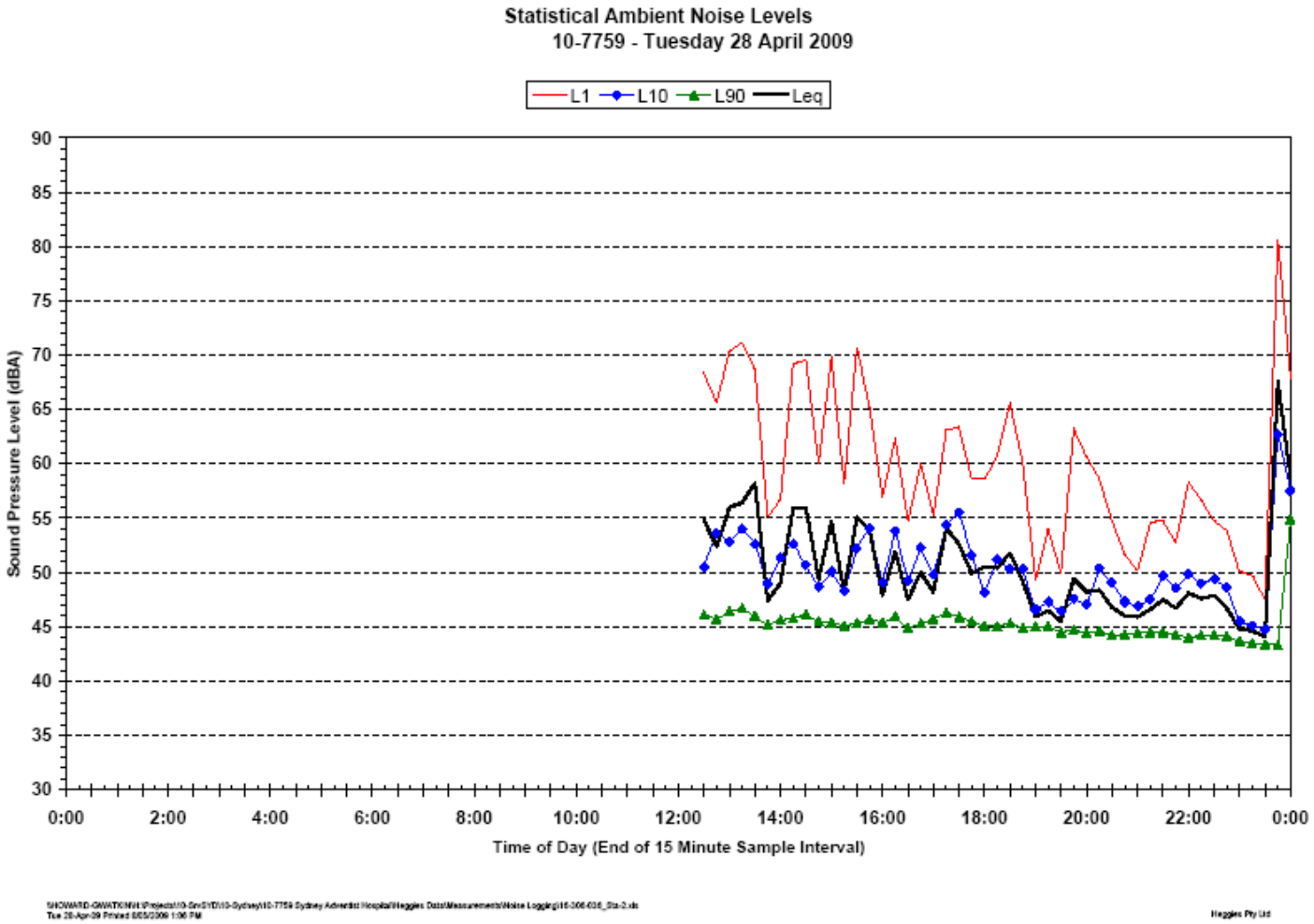
Existing Background Noise Levels –
Logger Location 1: Rear Garden of 205 The Comenarra Parkway



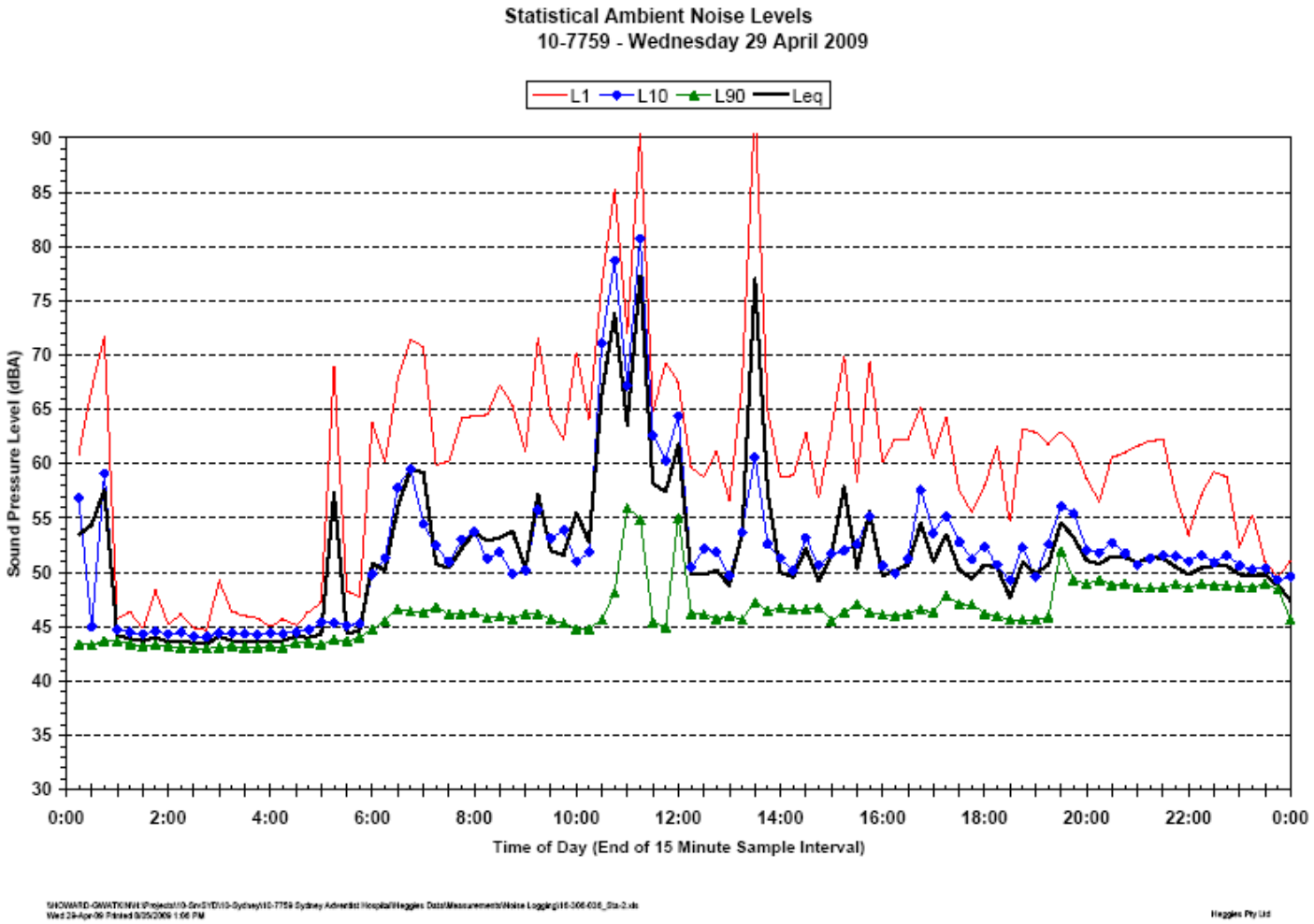
Existing Background Noise Levels –
Logger Location 2: Jacaranda Lodge – facing tennis courts



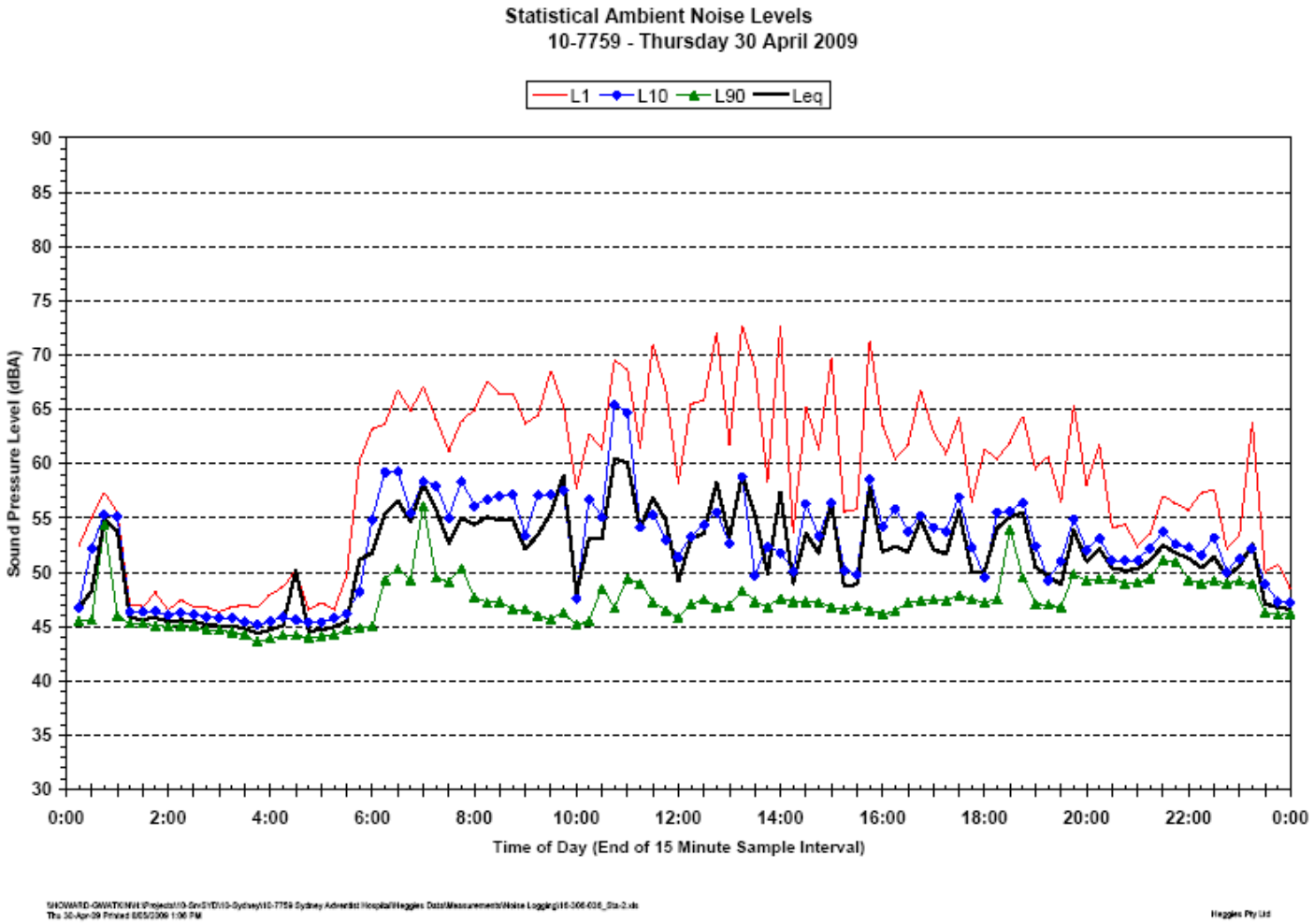
Existing Background Noise Levels –
Logger Location 2: Jacaranda Lodge – facing tennis courts



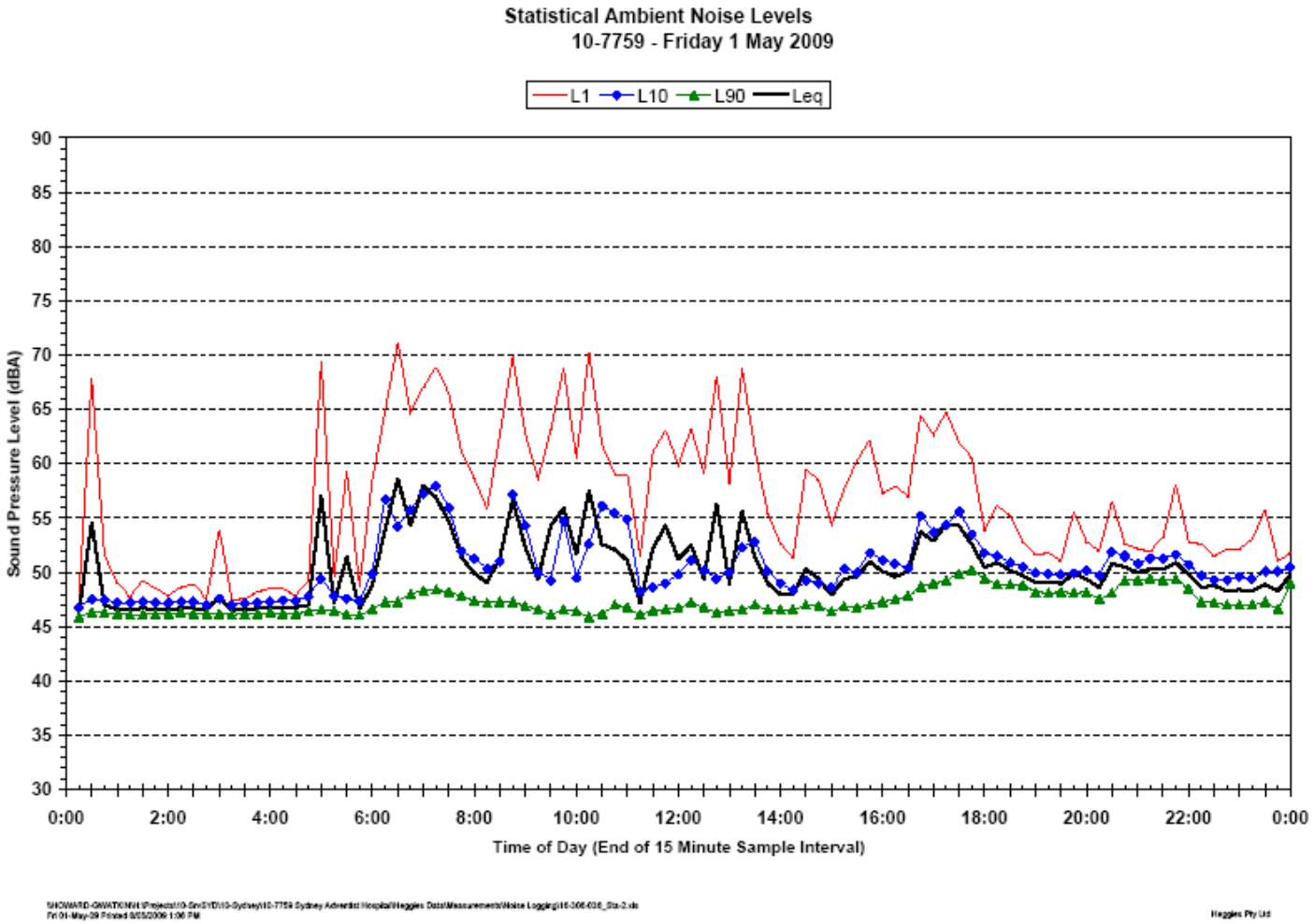
Existing Background Noise Levels –
Logger Location 2: Jacaranda Lodge – facing tennis courts



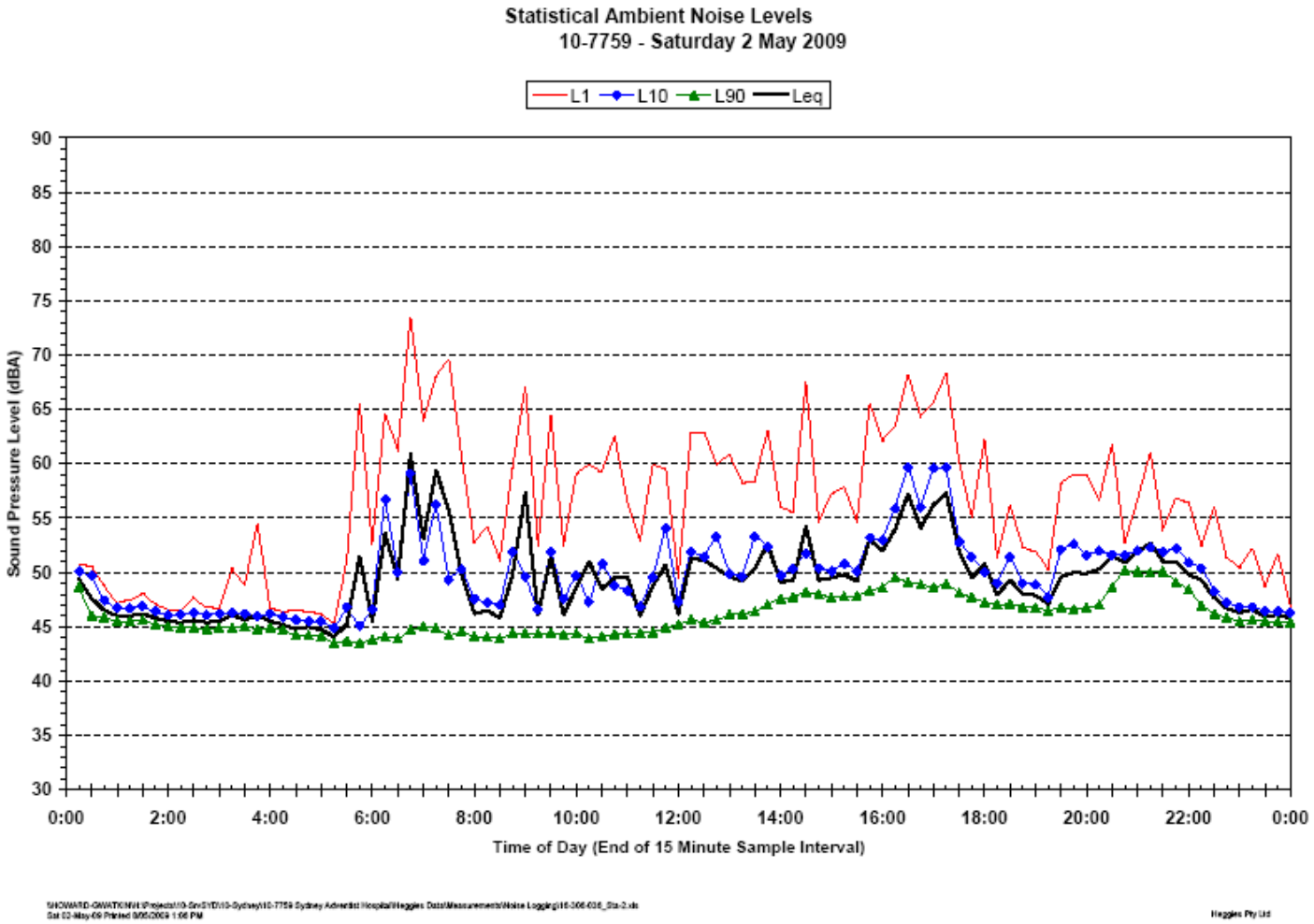
Existing Background Noise Levels –
Logger Location 2: Jacaranda Lodge – facing tennis courts



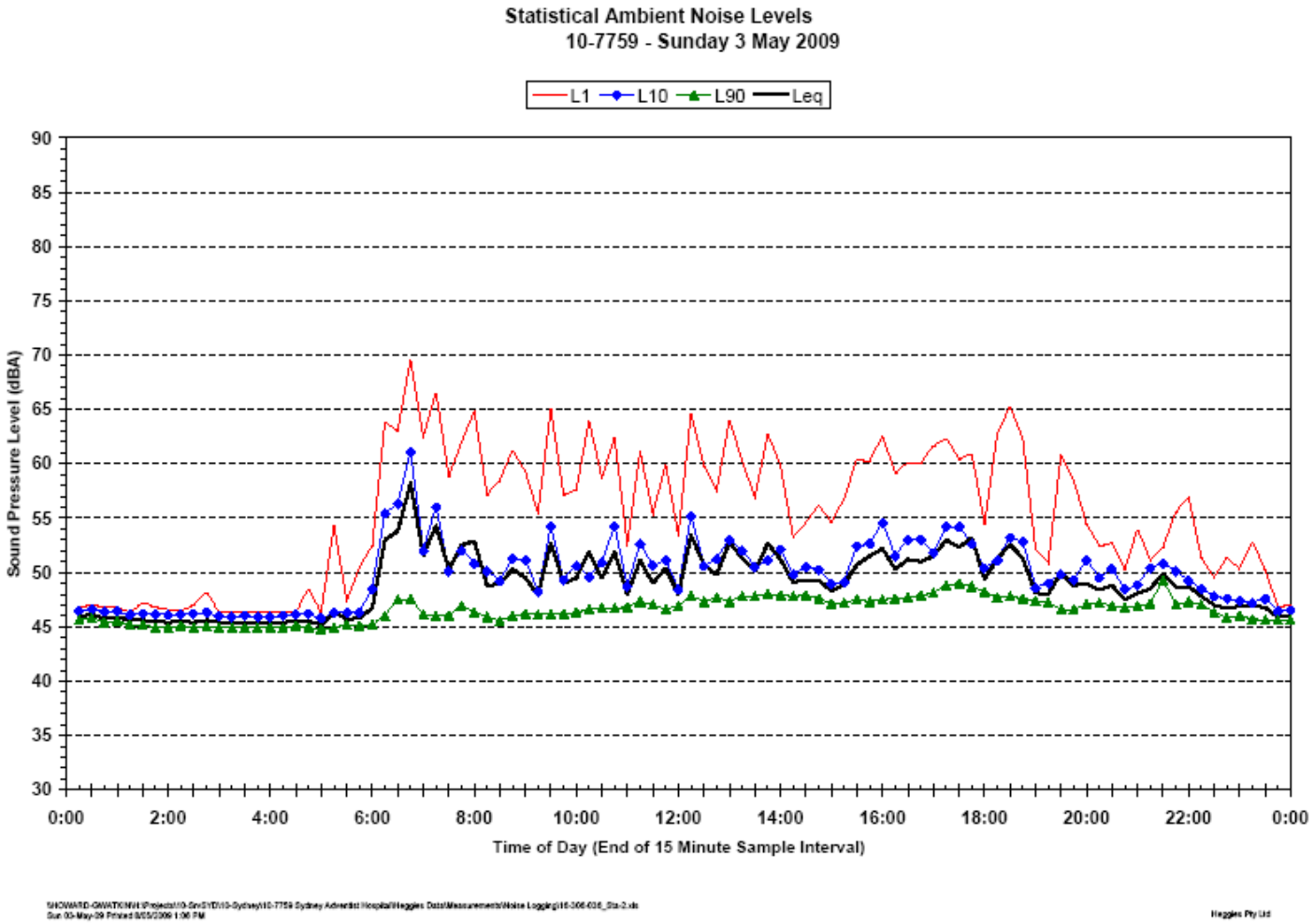
Existing Background Noise Levels –
Logger Location 2: Jacaranda Lodge – facing tennis courts



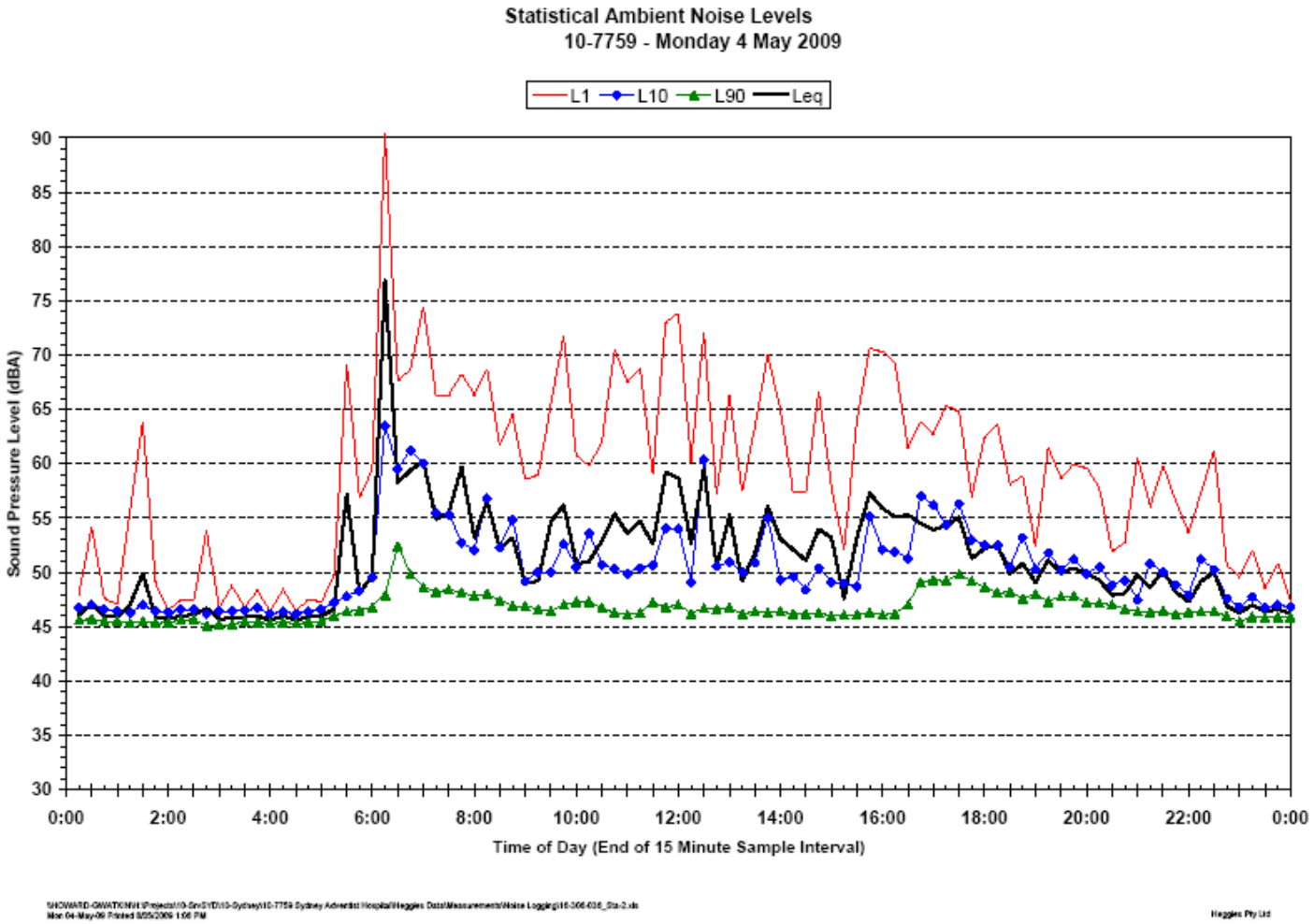
Existing Background Noise Levels –
Logger Location 2: Jacaranda Lodge – facing tennis courts



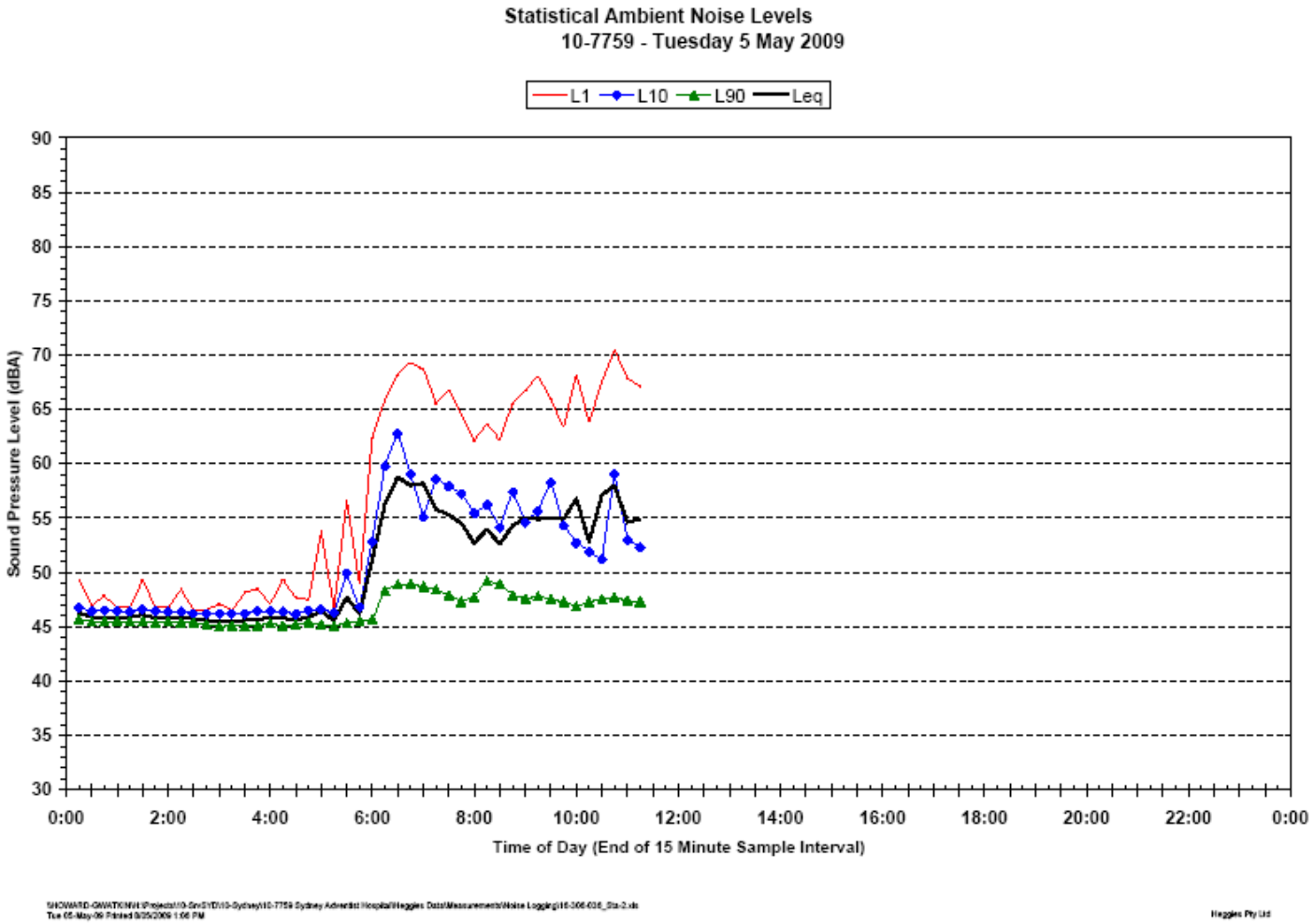
Existing Background Noise Levels –
Logger Location 2: Jacaranda Lodge – facing tennis courts



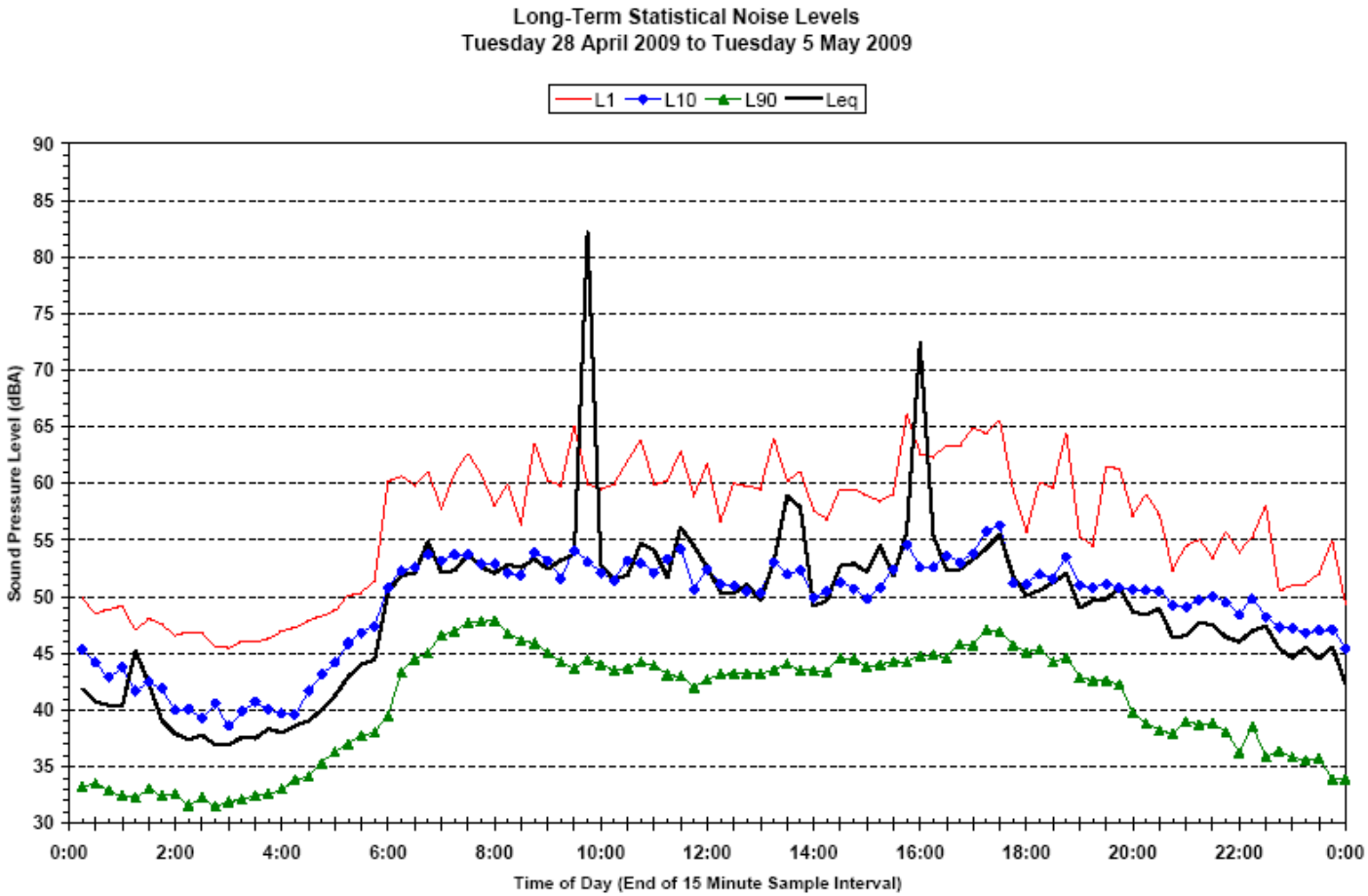
Existing Background Noise Levels –
Logger Location 2: Jacaranda Lodge – facing tennis courts



Existing Background Noise Levels –
Logger Location 2: Jacaranda Lodge – facing tennis courts



Existing Background Noise Levels –
Logger Location 3: Rear Garden of 163 Fox Valley Road



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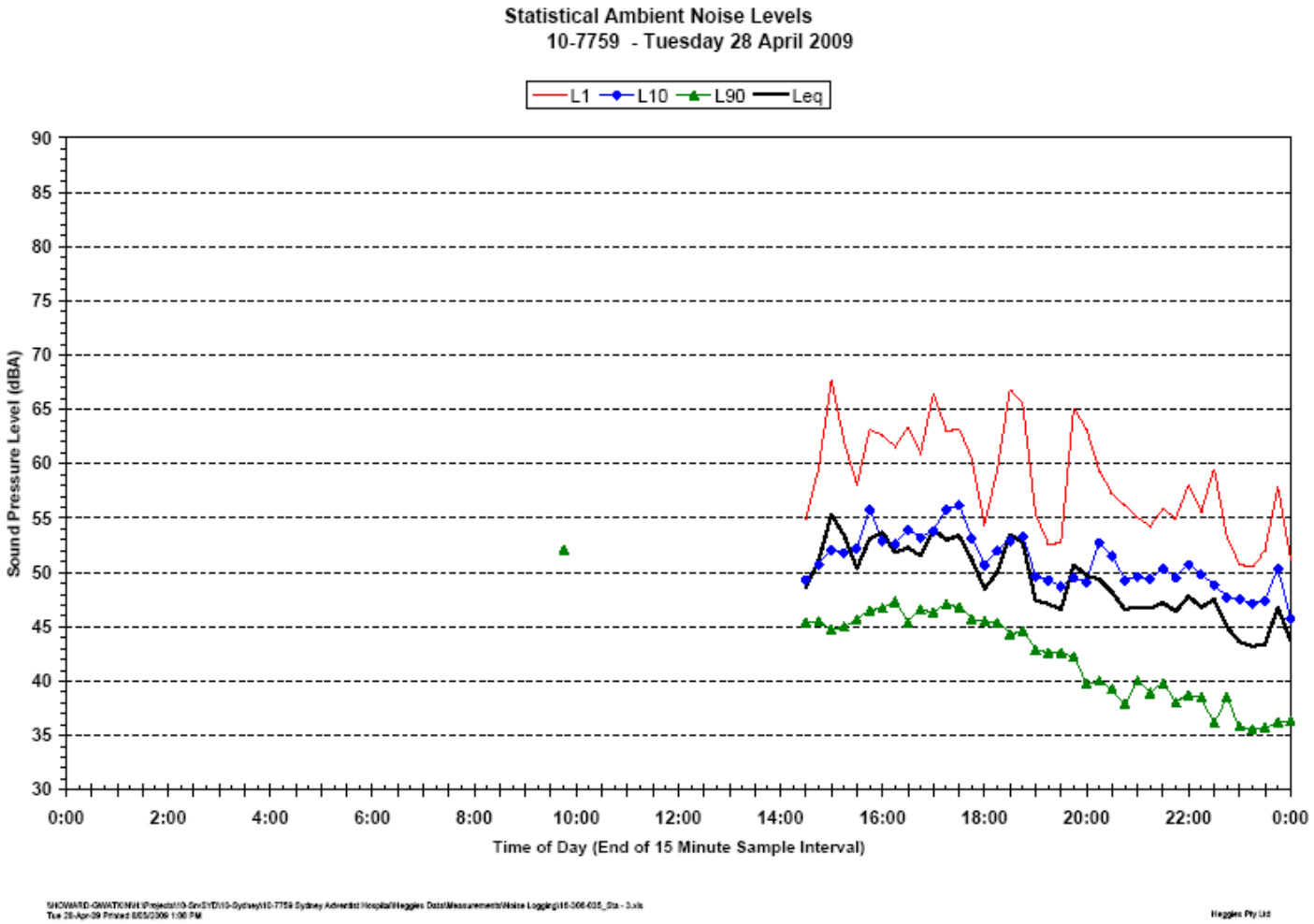
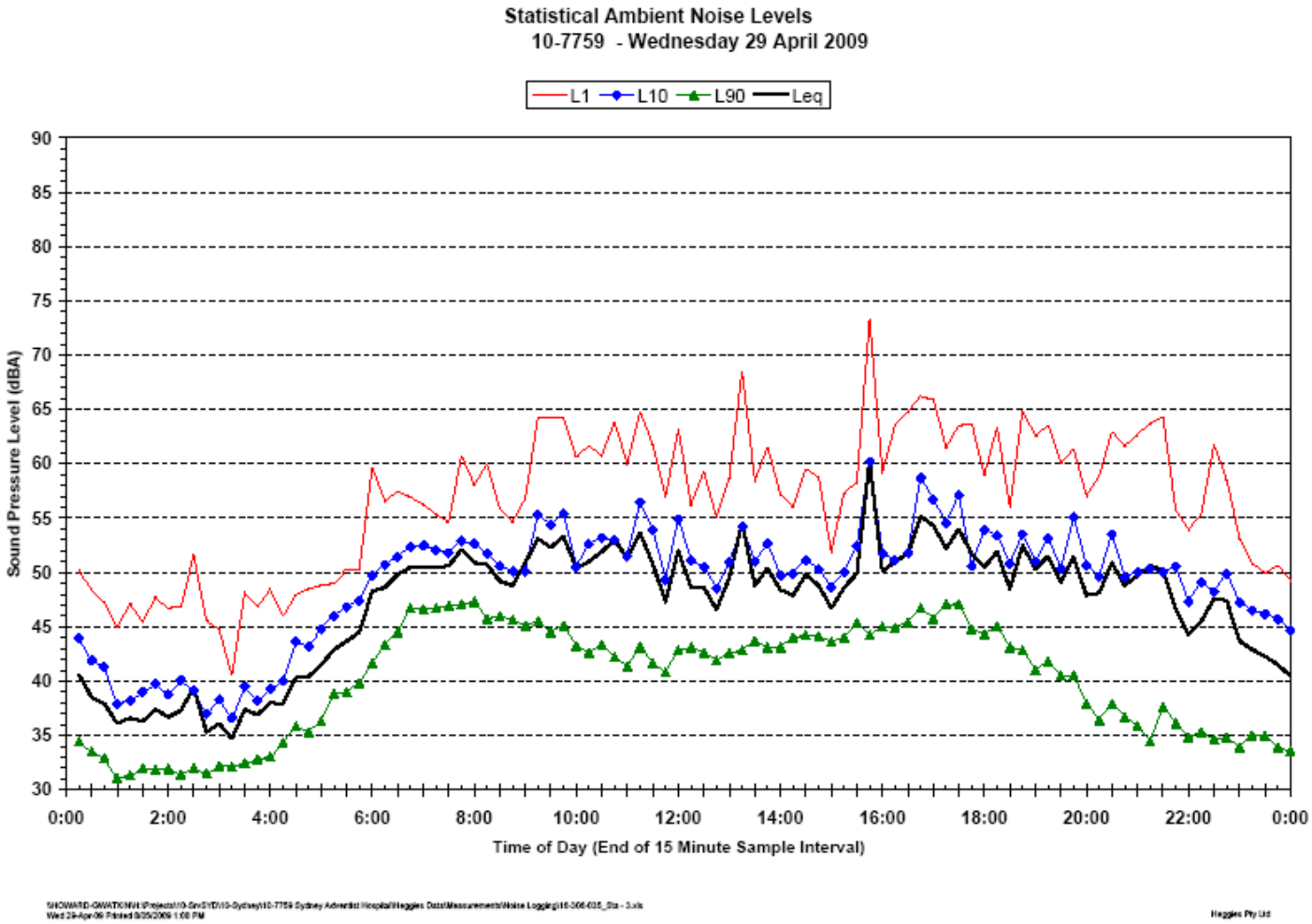
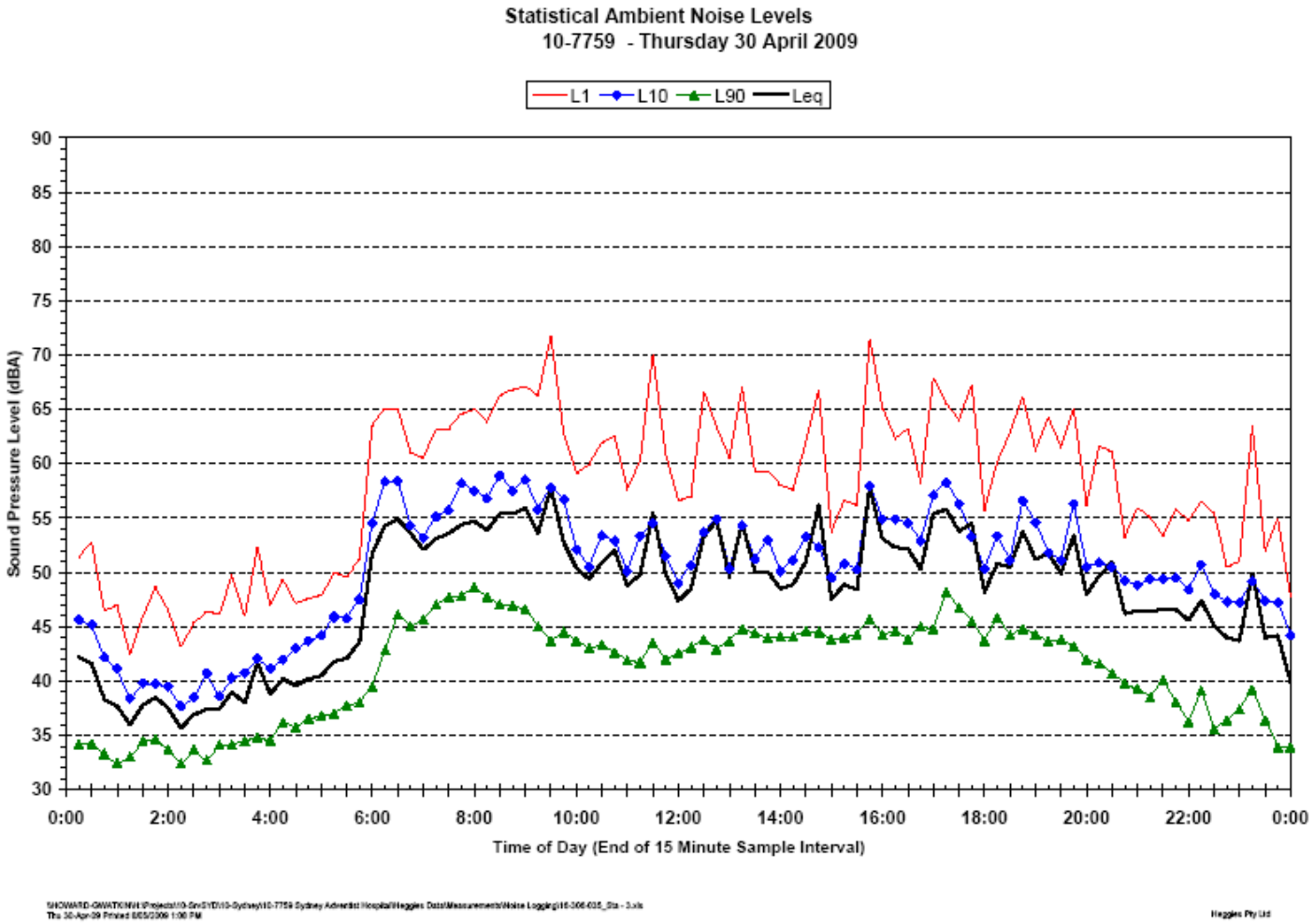
Existing Background Noise Levels –
Logger Location 3: Rear Garden of 163 Fox Valley Road



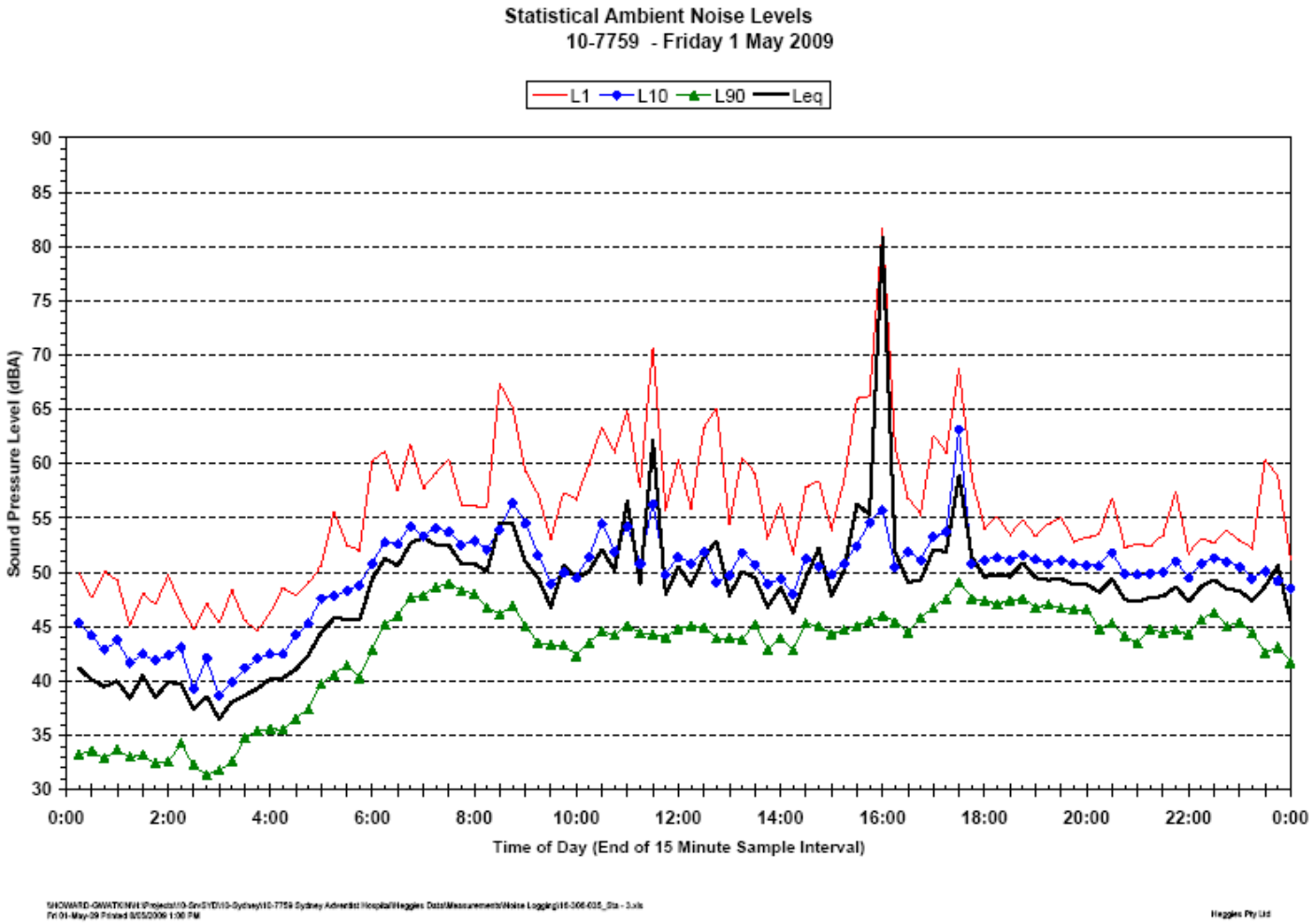
Existing Background Noise Levels –
Logger Location 3: Rear Garden of 163 Fox Valley Road



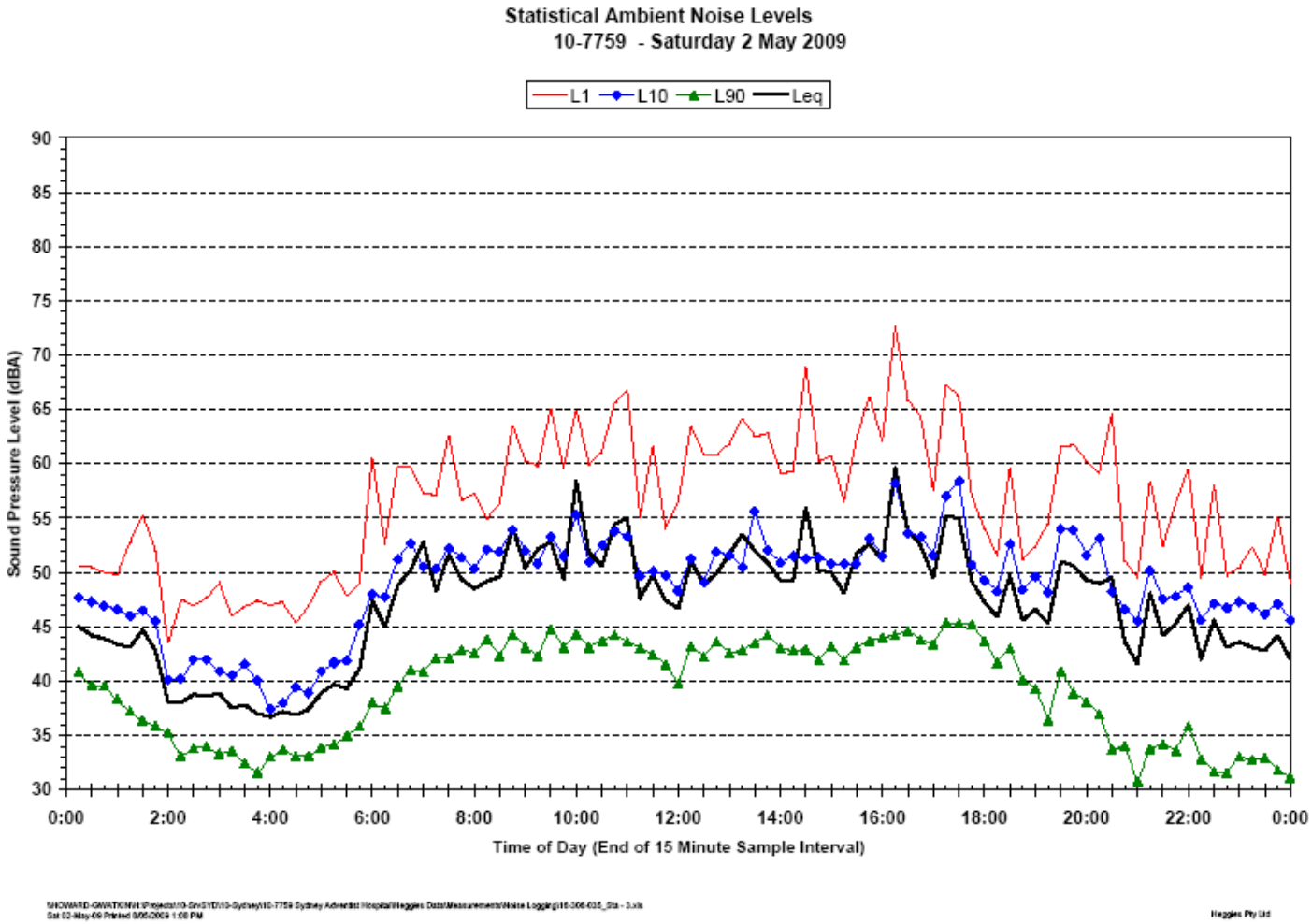
Existing Background Noise Levels –
Logger Location 3: Rear Garden of 163 Fox Valley Road



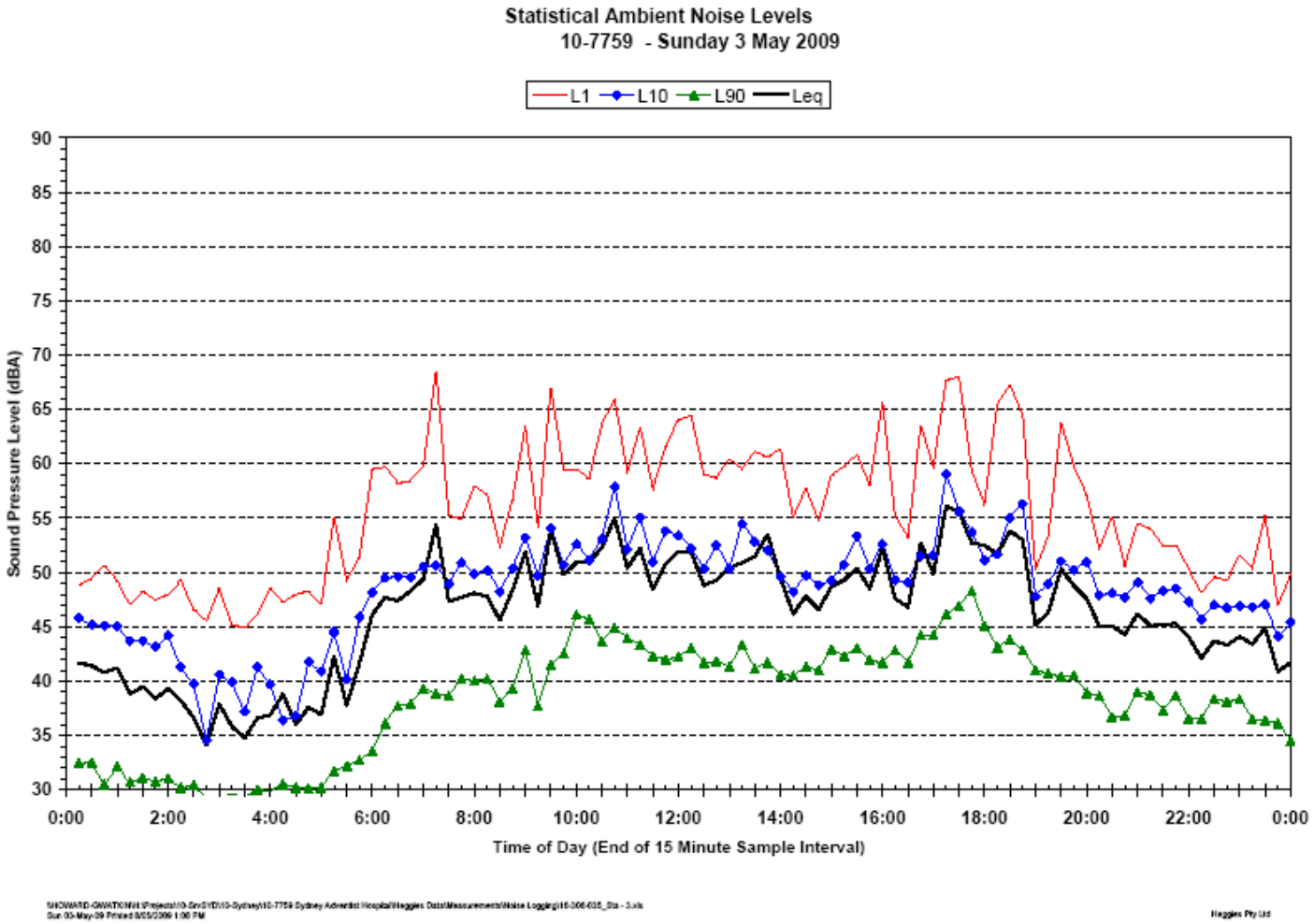
Existing Background Noise Levels –
Logger Location 3: Rear Garden of 163 Fox Valley Road



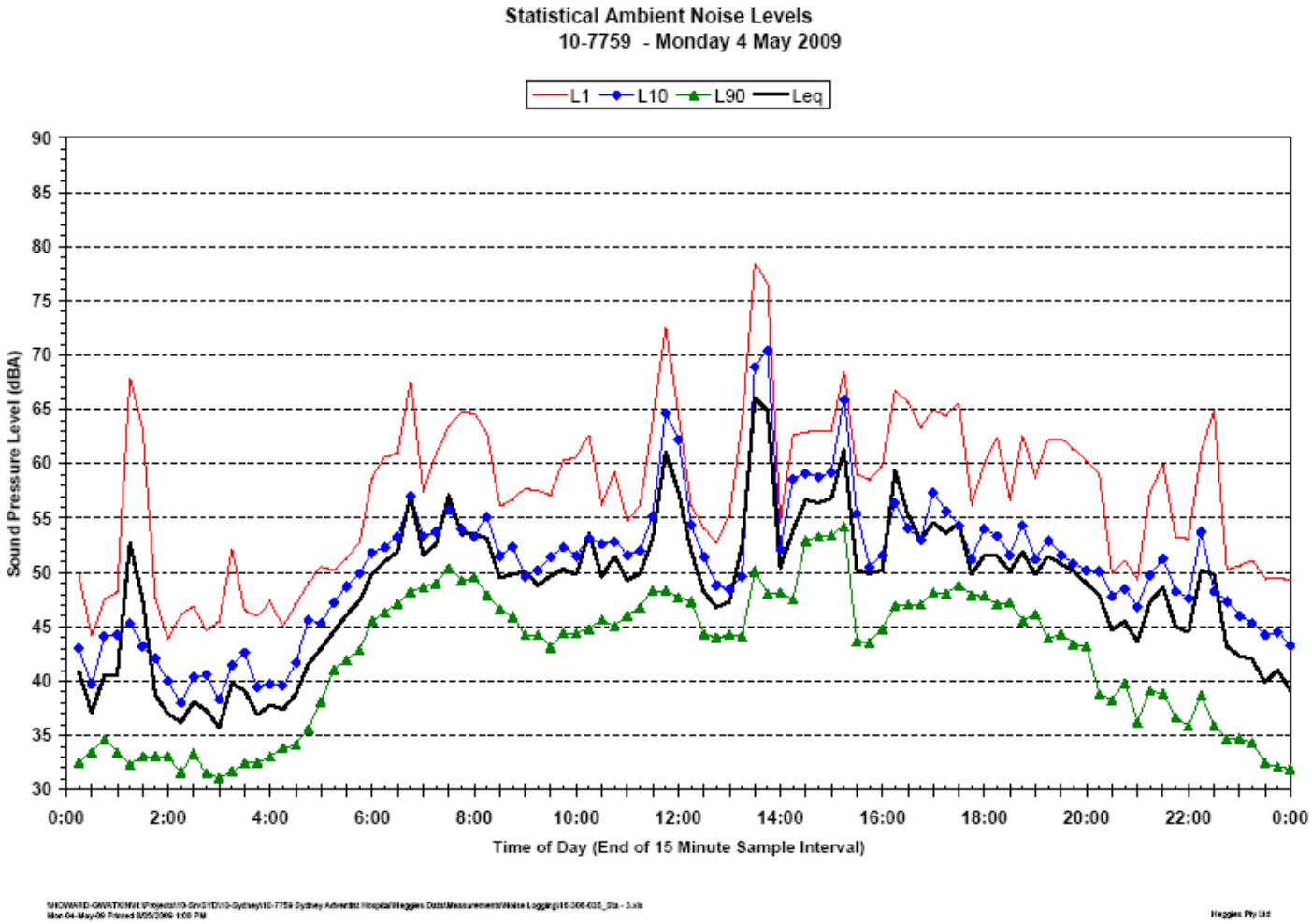
Existing Background Noise Levels –
Logger Location 3: Rear Garden of 163 Fox Valley Road



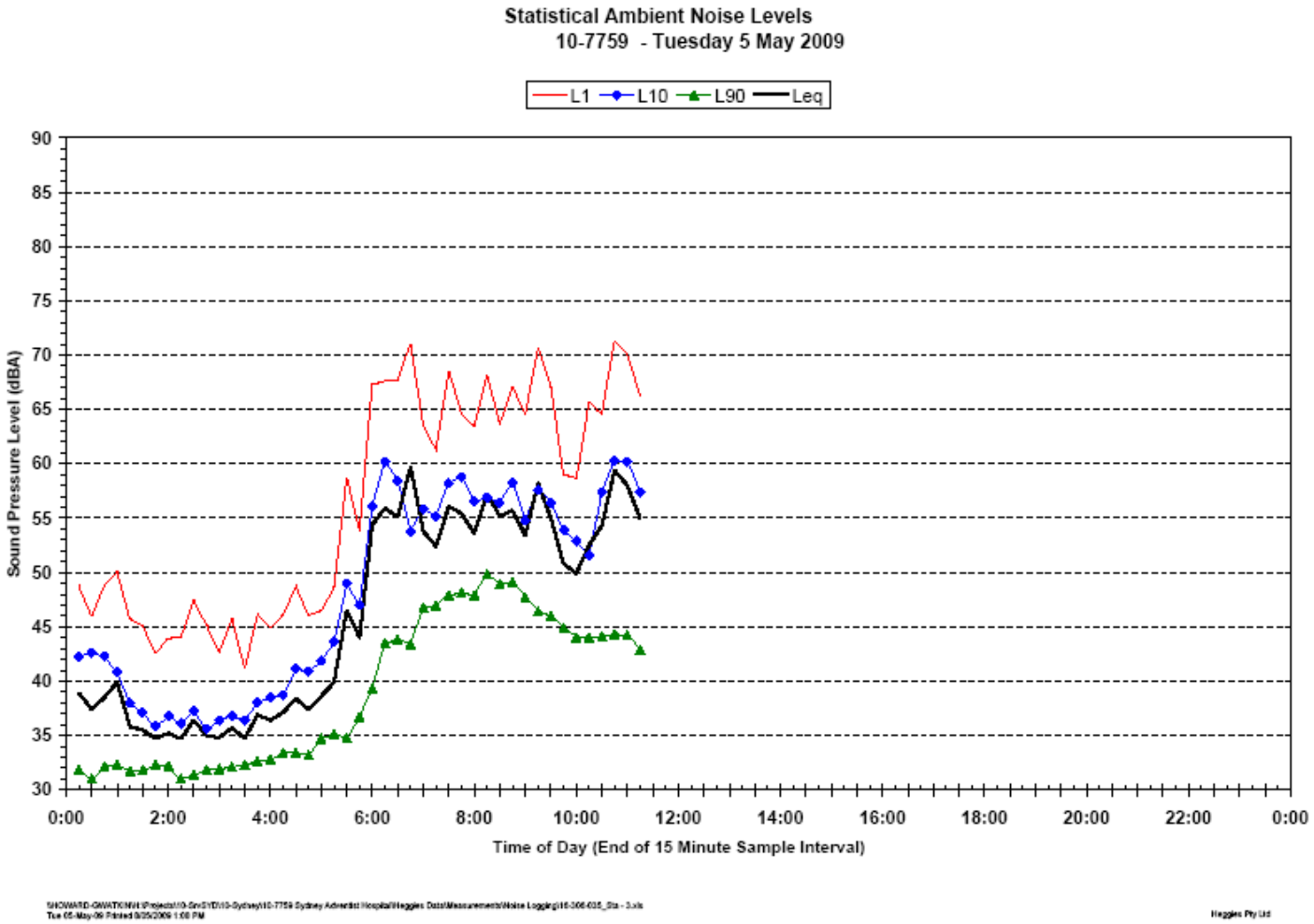
Existing Background Noise Levels –
Logger Location 3: Rear Garden of 163 Fox Valley Road



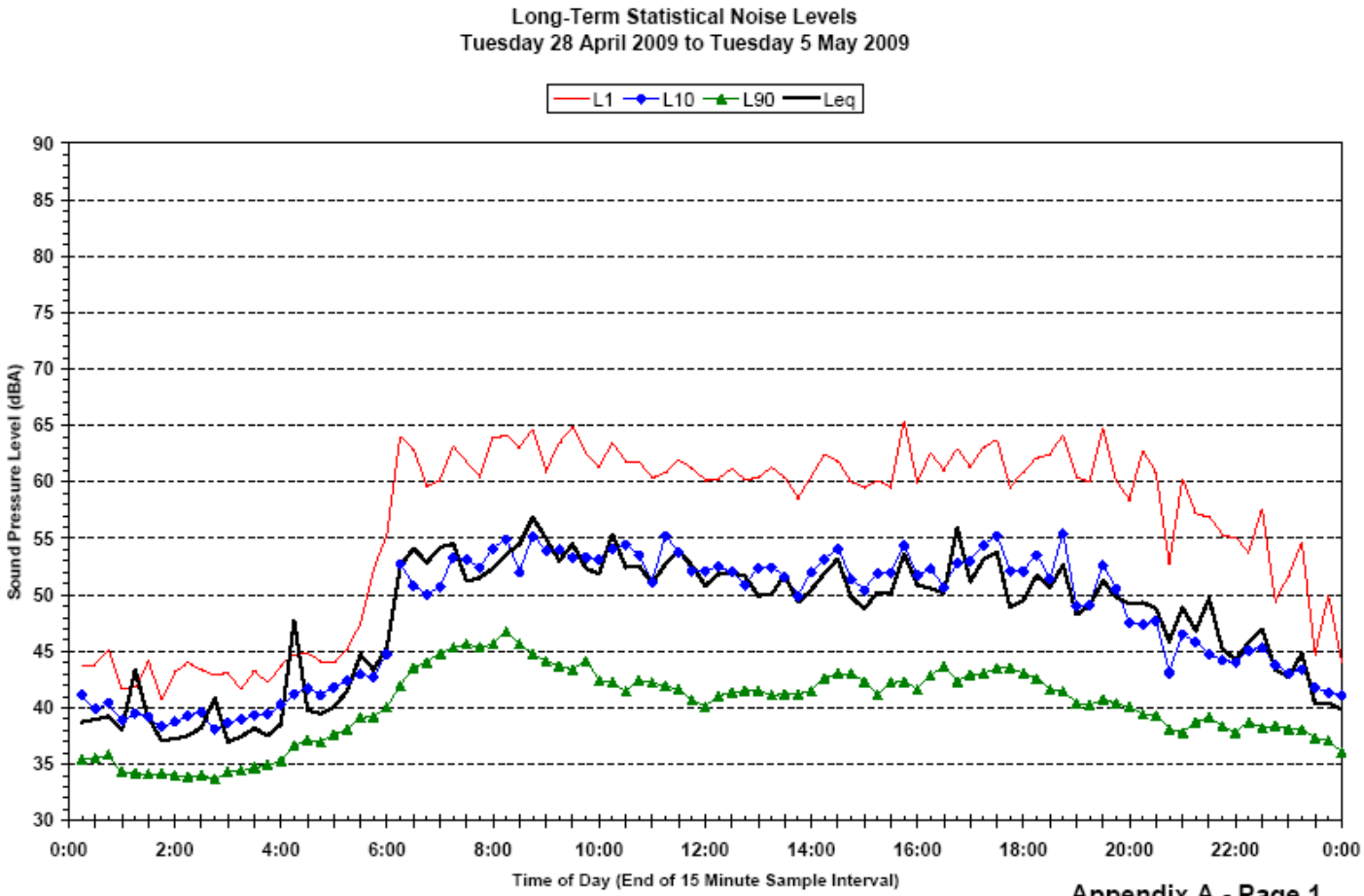
Existing Background Noise Levels –
Logger Location 3: Rear Garden of 163 Fox Valley Road



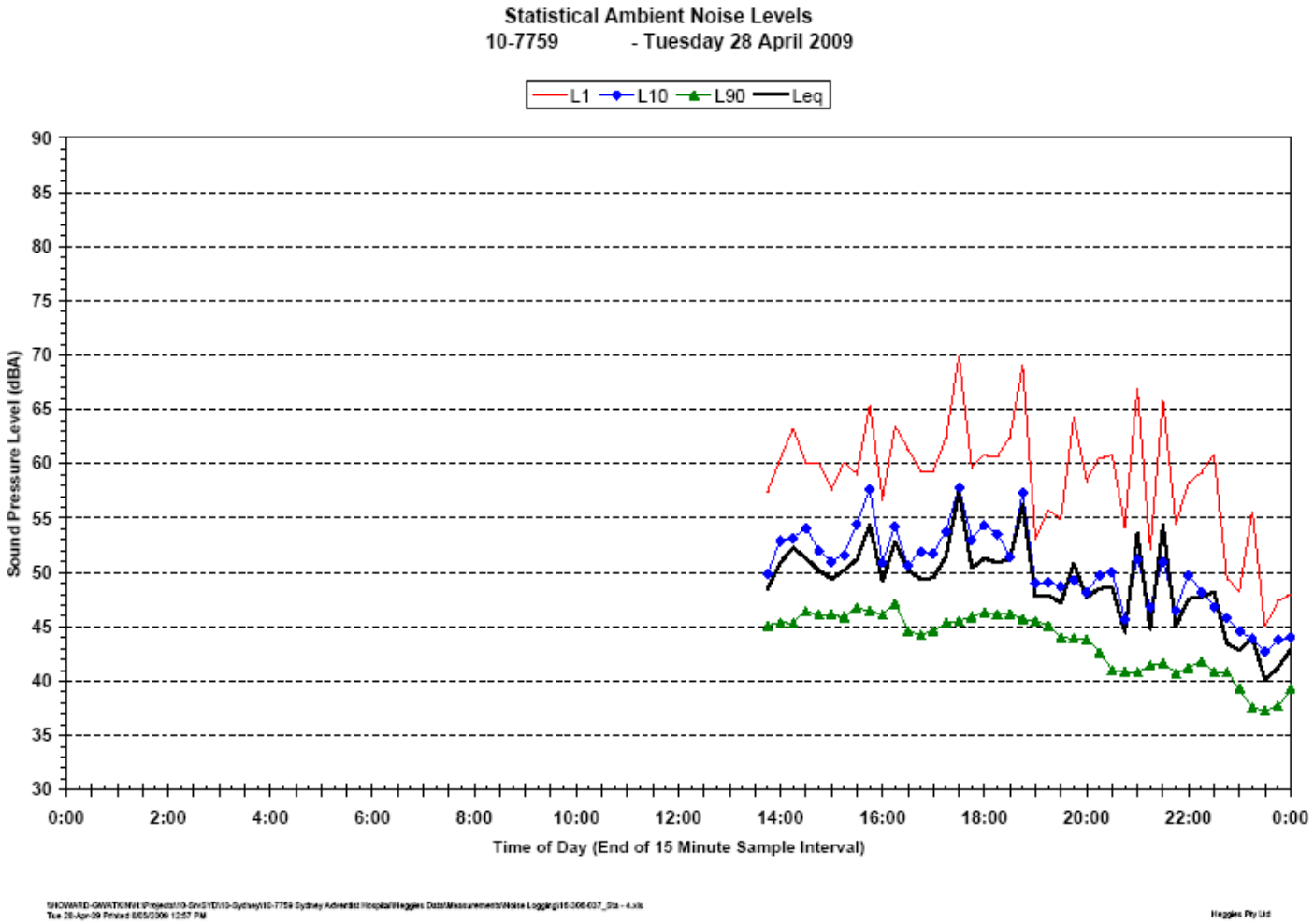
Existing Background Noise Levels –
Logger Location 3: Rear Garden of 163 Fox Valley Road



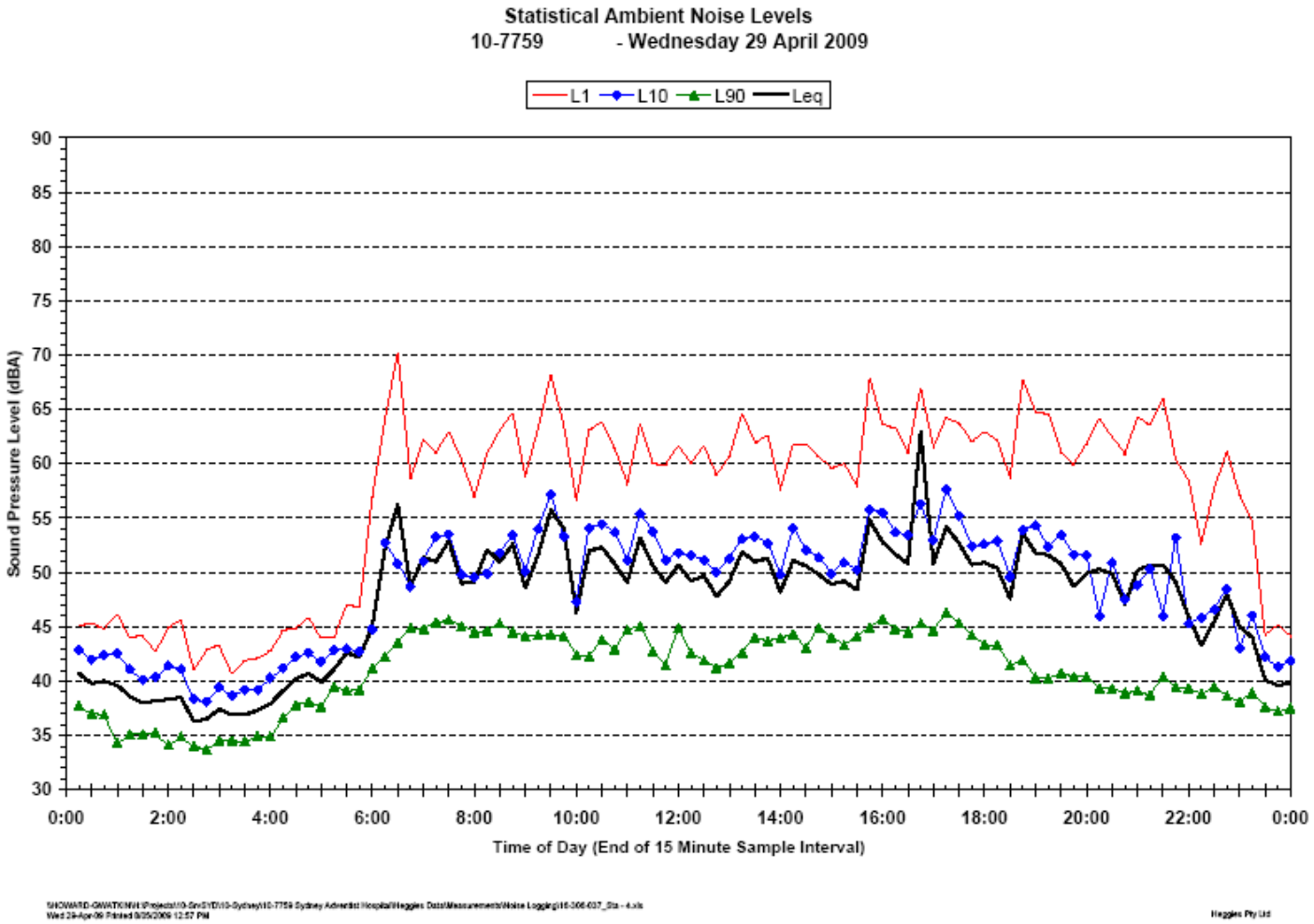
Existing Background Noise Levels –
Logger Location 4: Front Garden of 68 Mount Pleasant Avenue



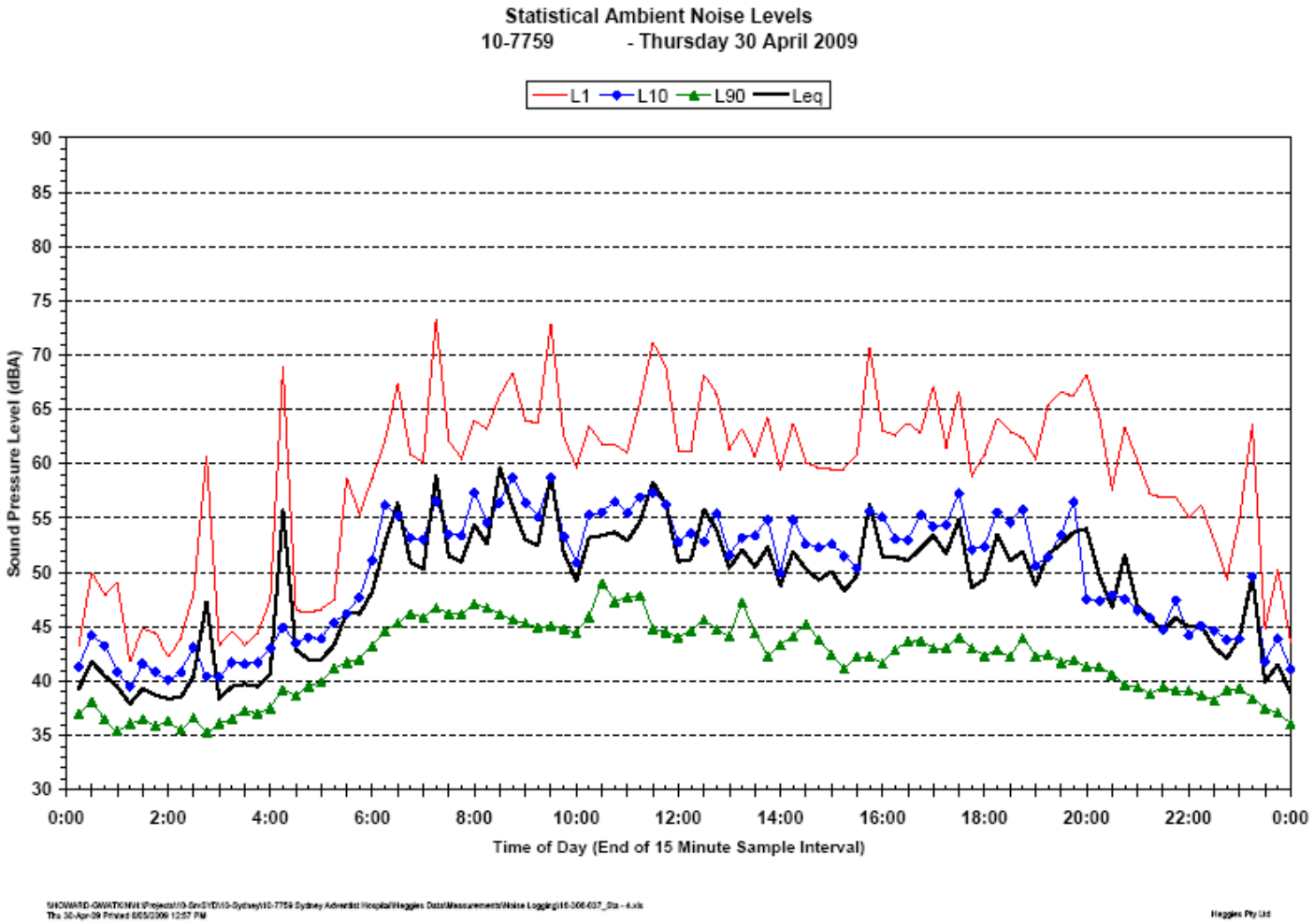
Existing Background Noise Levels –
Logger Location 4: Front Garden of 68 Mount Pleasant Avenue



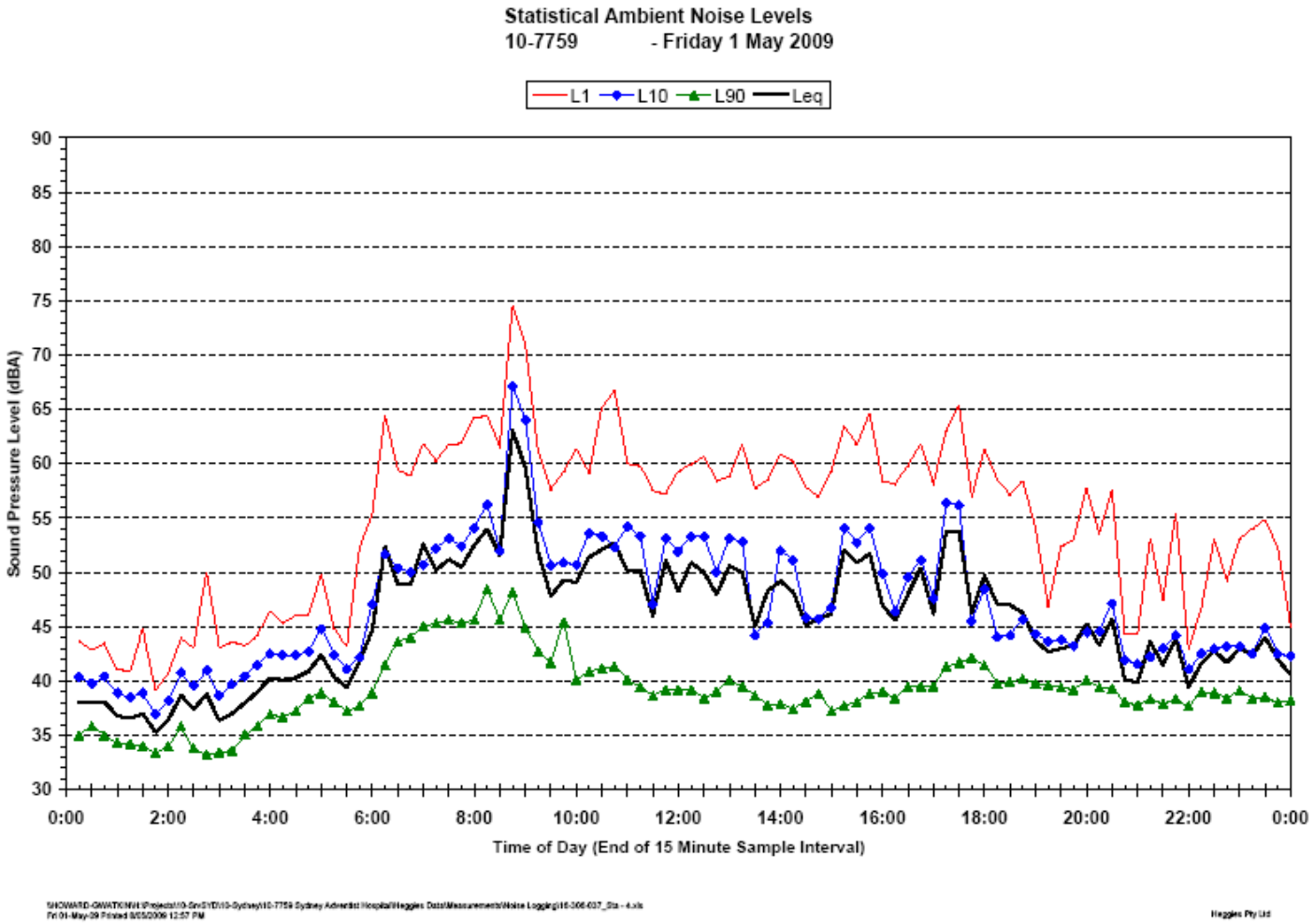
Existing Background Noise Levels –
Logger Location 4: Front Garden of 68 Mount Pleasant Avenue



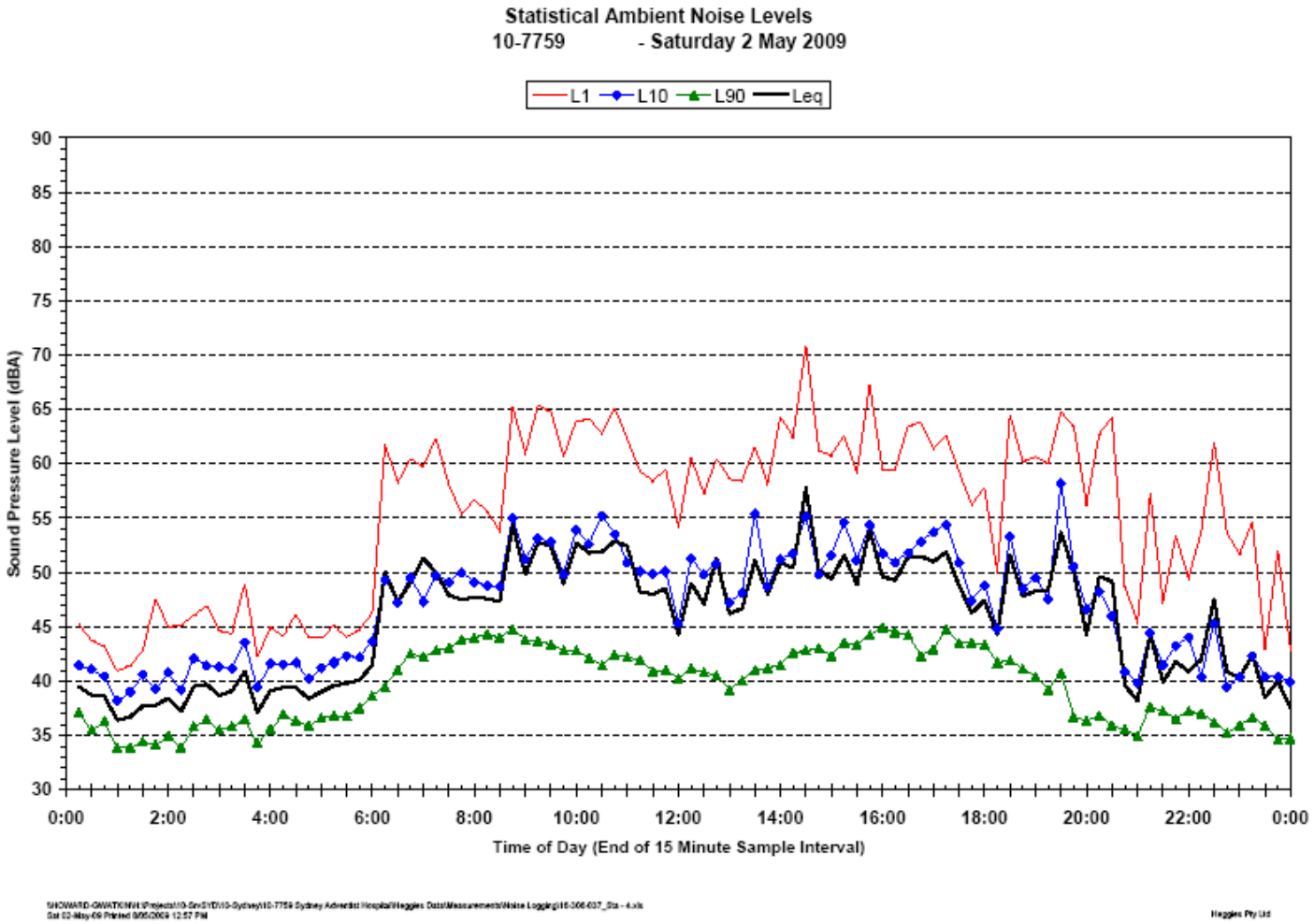
Existing Background Noise Levels –
Logger Location 4: Front Garden of 68 Mount Pleasant Avenue



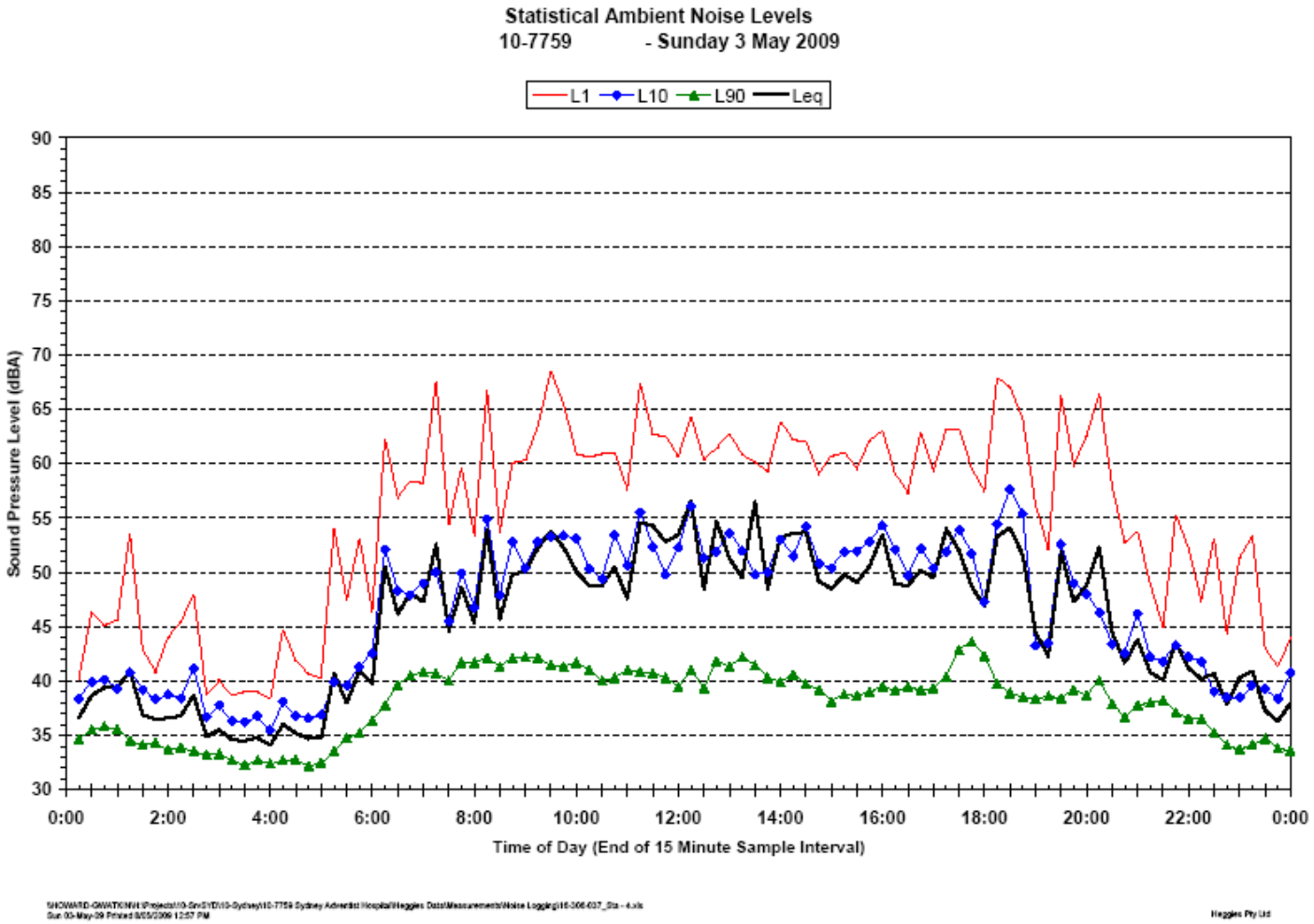
Existing Background Noise Levels –
Logger Location 4: Front Garden of 68 Mount Pleasant Avenue



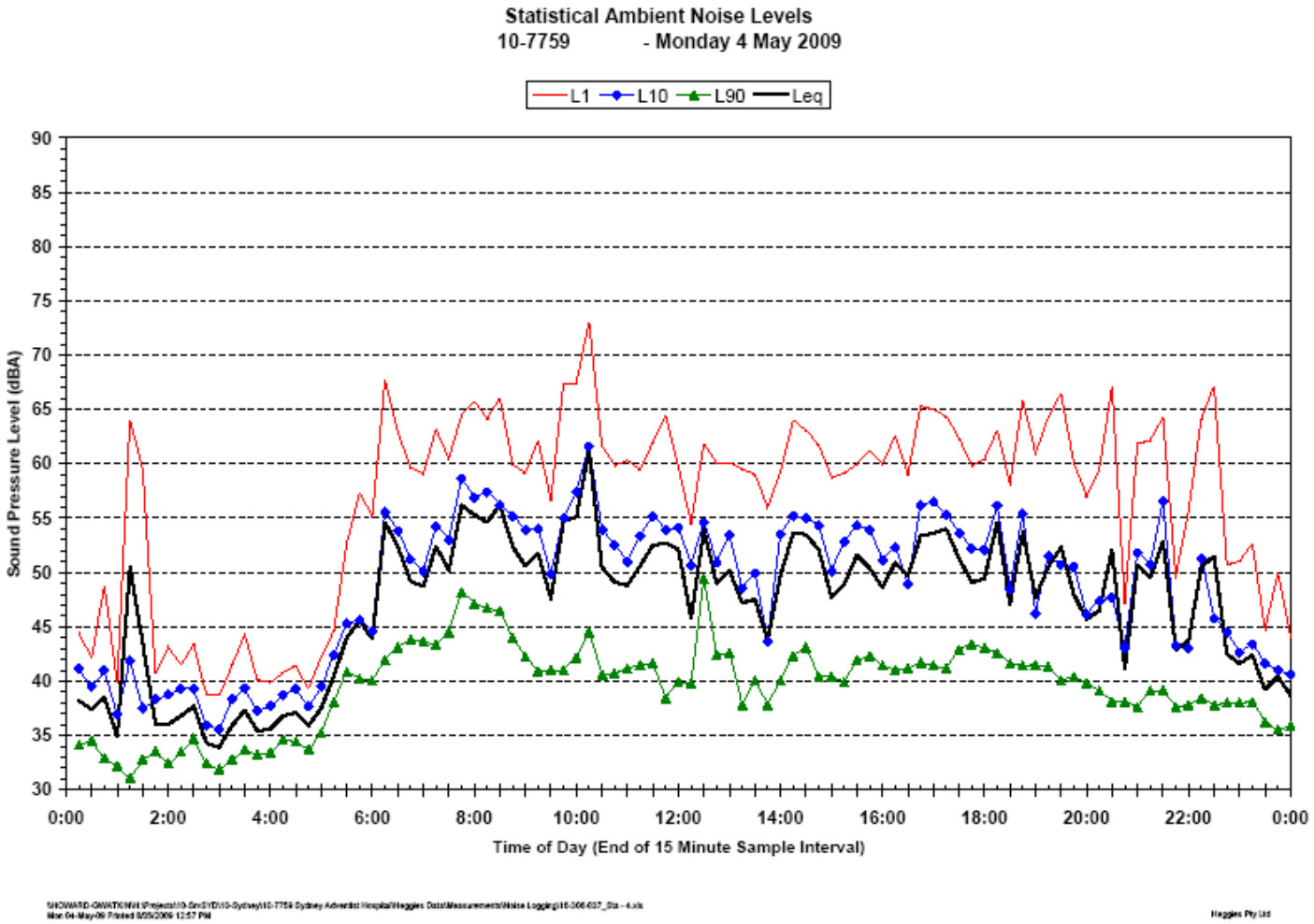
Existing Background Noise Levels –
Logger Location 4: Front Garden of 68 Mount Pleasant Avenue



Existing Background Noise Levels –
Logger Location 4: Front Garden of 68 Mount Pleasant Avenue



Existing Background Noise Levels –
Logger Location 4: Front Garden of 68 Mount Pleasant Avenue



Existing Background Noise Levels –
Logger Location 4: Front Garden of 68 Mount Pleasant Avenue