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WALLARAH No. 2 COAL PROJECT
NOISE IMPACT ASSESSMENT
UNDERGROUND MINE AND INFRASTRUCTURE FACILITIES

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1.0 INTRODUCTION

The Wyong Areas Joint Coal Venture *(WACJV)* propose to develop an underground coal mine with surface processing facilities and rail loop north of Wyong. The project would involve the extraction of up to five (5) million tonnes per annum of export quality coal.

Atkins Acoustics was engaged by *WACJV* to conduct a noise impact assessment of the proposal.

The proposal includes the development of three (3) greenfield sites known as the Tooheys Road *(Attachment 1),* Buttonderry and the West Shaft site. Potential noise sources associated with the proposal that have been addressed in this report include construction activities during development, operational activities train loading, road traffic and rail traffic.

Key features of the *WACJV* project include:

- an underground longwall mine;
- coal preparation plant and associated infrastructure (administration, employee facilities, car park, stockpiles) at the Tooheys Road site;
- an underground mine entrance for man and materials access at the Buttonderry site;
- a tunnel serviced with conveyors that links the Tooheys Road site to the Buttonderry site;
- upcast and downcast ventilation shafts,
- gas management facilities; and
- a rail loop with loading infrastructure at the Tooheys Road site. The rail loop would connect to the Main Northern Rail Line.

This report presents the results, findings and recommendations of site investigations, noise modelling and an assessment of the proposal. The main aims of the assessment were:

- identify nearby residential dwellings and other sensitive areas potentially exposed to noise impacts from the proposal including the Bluehaven Residential Estate;
- measure, review and comment on the pre development ambient background noise levels;
- establish noise assessment goals in accordance with the *DECCW*, Industrial Noise Policy *(INP)*, the Environmental Noise Control Manual *(ENCM)* and the Environmental Criteria for Road Traffic Noise *(ECRTN),*
- predict and evaluate noise emissions from the proposal;
- assess potential noise impacts; and
- where assessment goals are exceeded, recommend ameliorative control measures.

The information presented in this report has been prepared for the investigation described herein, and should not be used in any other context or for any other purpose without agreement and written approval from *Atkins Acoustics* and *WACJV*.

2.0 SITE DESCRIPTION AND PROPOSAL

The Wallarah 2 Coal Project (W2CP) would involve the underground extraction and processing of export quality thermal coal. The project comprises an underground mine, coal handling, processing and storage facilities, a rail loop with associated loading infrastructure, an underground drift entry, ventilation shafts, gas and water management facilities and administration buildings.

2.1 Options Discussion

Several infrastructure options were considered for the noise impact assessment. The options covered various infrastructure arrangements all of which provided advantages and disadvantages to the overall operation and noise emissions.

Option 1 – Base Case

This option involved standard noise controls as well as three active dozers, two working the project stockpile while the third operating the ROM stockpile.

Option 2 – 1 Dozer on ROM and a fully automated reclaim product stockpile

This option looked at replacing the two (2) dozers on the product stockpile with a fully automated stackout and reclaim system. This system would require additional surface conveyors and luffing stackout conveyor coupled with a bucket wheel style reclaim system. Train loading conveyor would remain relatively unchanged.

Option 3 – Dozer on ROM and a fully enclosed product stockpile with two operating dozers

This option is a modification of the base case but incorporated a concrete enclosure over the entire product stockpile. The enclosure would achieve around 15dBA reduction in noise emissions from the product stockpile dozers.

Option 4a – No dozer of ROM and fully enclosed product stockpile operating two dozers

This is a modification of Option 3 whereby the dozer operating the ROM stockpile was replaced with an automated stacking reclaim system. A dozer would therefore only be required to do undertake minor cleanup around the ROM stockpile.

Option 4a (2) – No Dozer on ROM and a fully automated product stockpile

This option represented a combination of Option 4a and Option 2 where the fully automated product stockpile system is coupled with an automated ROM stockpile system.

Option 4b – No dozer on ROM and one dozer on product stockpile

This option included the automated ROM stockpile management system but utilised only one dozer on the product stockpile. The coal handling system remained unchanged including the train loading system.

Option 4c – No dozer on ROM and two dozers on Product Stockpile

A variation of Option 4b, this option provided for two dozers on the product stockpile coupled with an automated ROM stockpile management system. All other aspects of the coal handling system would remain unchanged.

Option 5 – Fully enclosed ROM with 1 dozer and 1 dozer on the product stockpile

At this stage it was found that one of the controlling influences on noise emissions was the use of a dozer on the ROM stockpile. This option sought to refine the cost/benefit of using a dozer on the ROM stockpile compared with fully enclosing the ROM stockpile or stay with an automated system.

Option 6a – ROM Bin, 2 conveyors, 2 crushers plus 1 dozer on product stockpile

With the incorporation of a coal bin instead of a stockpile for the ROM coal, there needs to be a doubling of the coal handling system from the bin to the product stockpile to cater for peak underground coal production. All option 6 scenarios included upgrading the coal handling system at the surface to match to peak coal production from the longwall.

Option 6b – ROM Bin, 2 conveyors, 2 crushers plus 2 dozers in an enclosed product stockpile

A variation to 6a, this option allows for two dozers to work on the product stockpile within a concrete enclosure. The enclosure would be the same as previously assessed and provide 15dBA reduction.

Option 6c – ROM Bin, 2 conveyors, 2 crushers and fully automated product stockpile

This system provides the ultimate automated surface coal handling system whereby the surface system capacity meets the underground capacity and would allow direct loading of coal from the underground mine to trains.

Option 7 – 1 dozer on ROM stockpile, no dozer on product stockpile

This option looked at a further refinement to the noise model and understanding of dominant noise sources. It is not a real option as it does not allow coal to be loaded from the product stockpile. However it can be used in order to verify the potential for option 4b to be used as a real option, that is, should only one dozer be available for use can it be used on the ROM stockpile by itself when trains are not being loaded.

2.2 Assessment of Options

A detailed analysis was undertaken for each option to determine their cost and suitability to meet the needs of the mine. Several of the options assessed would meet the operating requirements and train loading times as well as handle expected peak coal production from the longwall. A comparison was then made of the expected noise emissions of each scenario. It was interesting to note, that some of the highly mechanised options provided little if any improvement in noise emissions.

2.3 Proposed Option

The preferred option from a cost and operational perspective was Option 4b. This option also provided a lower noise emission level in most cases. The proposal has been designed to minimise noise impacts on the environment, particularly impacts on the local community. During site planning consideration was given to minimising noise impacts. Design features incorporated into the proposal include the location of the sites, finished site levels, alignment of the rail line to ensure trains are loaded on an upgrade, removal of at grade rail crossing, cuttings to maximize screen effects for residential properties, cladding of structures, laminated *(soft loading)* steel chutes, low noise rated conveyor rollers, low noise rated motor gearboxes, enclosed upcast exhaust fans and noise attenuated exhaust fans.

The underground mine plan extends beneath a portion of the Hue Hue rural residential area and the Dooralong Valley before progressively extending beneath the Wyong State Forest area. The depth of cover over most of the mining area ranges from 335 m to 550 m, increasing to a maximum of 680 m below the hills separating the Yarramalong and Dooralong Valleys.

2.4 Operating Hours

The mine and infrastructure would be developed to operate twenty four (24) hours per day, seven (7) days per week. Train loading would be dependent on freight schedules and allocated time slots, and undertaken (24) hours per day, seven (7) days per week.

2.5 Construction Hours

Normal construction activities would be undertaken between 7.00am and 6.00pm Monday to Friday, and 7.00am to 1.00pm Saturday. Works outside theses hours would be considered where it could be demonstrated that noise would not impact on residential receptors. It is envisaged that the duration of construction and commissioning phases would be between one and a half (1½) and two (2) years.

2.6 Site Development and Infrastructure

The two (2) main infrastructure sites are identified as Tooheys Road and Buttonderry. The third site known as the West Shaft site would be developed to supply air to the underground workings.

2.6.1 Tooheys Road Site

The Tooheys Road site would be developed for coal processing, handling, storage and train loading *(Attachment 1)*. It is envisaged that the construction would be undertaken over a period of approximately 12 months. The site location is shown on *Figure 1* and includes the following facilities:

- Rail spur and loop;
- Conveyors, crusher and rail loading facilities;
- Office facility, inclusive of administration offices, bathrooms, training facilities;
- Car parking and site access roads;
- Mine access drift and portal;
- Coal stockpiles and material handling facilities;
- Surface workshop and compressor air installation;
- Vehicle wash down bay, incorporating water treatment plant;
- Sewage treatment facilities;
- Mine water treatment plant; and
- Gas management extraction and treatment plant.

A schedule of plant and equipment that is proposed for Tooheys Road includes:

- A four thousand (4,000) tonne per hour receival system;
- A fifty thousand (50,000) tonne raw coal surge stockpile;
- A two thousand (2,000) tonne per hour raw coal reclaim, crushing and stacking system;
- A two thousand (2,000) tonne per hour overhead tripper to stack crushed coal on the two hundred and fifty thousand (250,000) tonne product stockpile. Additional emergency stockpile capacity would be achieved using dozer push out;
- A tunnel reclaim system under the product stockpile using coal valves;
- A four thousand five hundred (4,500) tonne per hour train loading system including a loading bin of approximately two hundred and fifty (250) tonnes; and
- a rail loop that would be able to hold three (3) of the anticipated three thousand four hundred (3400) tonne capacity trains.

Figure 1 - Tooheys Road and Buttonderry Sites

2.6.1(a) Noise Sources

The main noise sources at the Tooheys Road site would be associated with infrastructure and workshops, including conveyors, crusher, train loader and mobile plant. To ameliorate noise from the site, the following strategies have been recommended and adopted for noise modelling:

- Double skin cladding of coal preparation plant;
- Low noise rated conveyors and motor drives;
- Conveyor structures with side and roof screens to provide effective directional noise amelioration;
- Design of the coal reclaim system to minimise dozer reliance for train loading;
- Selection of mobile plant with secondary noise control kits;
- Removal of surface rail crossing and requirement for trains to sound warning horns whilst on site;
- Replacement of mobile plant reversing alarms with low level alarms;
- Low noise rated gas flares;
- Where practical and feasible motor drives and gearboxes would be specified and selected to achieve a noise level of less than 85dBA measured at one (1) metre from the source.

2.6.2 Buttonderry Site

The Buttonderry site would be accessed from Hue Hue Road via a sealed private access road. It is envisaged that the construction would be undertaken over a period of approximately 24 months. The site location is shown on *Figure 1* and consists of:

- An upcast ventilation shaft;
- Enclosed fans for mine ventilation;
- Downcast ventilation shaft for mine ventilation and man-riding;
- Administration offices, training rooms and bathroom;
- Car parking and access roads; and
- Sewage treatment and compressed air facilities.

2.6.2(a) Noise Sources

The main noise sources at the Buttonderry site would be associated with infrastructure and workshops, including the mine winder (man access) and mine ventilation. The site layout was developed to maximise noise shielding from local topography.

Noise control strategies incorporated into the site development include:

- Enclosing the mine winding equipment and the mine ventilation fans;
- Inline attenuators installed on the fan discharges; and
- earth bunding along the southern alignment of the car park.

2.6.3 West Shaft Site

The west shaft site would be accessed from Little Jilliby Road. The site would be developed with a downcast shaft to provide ventilation and unmanned. It is envisaged that the construction would be undertaken over a period of approximately 15 months. The location of the site is shown on *Figure 2*.

Figure 2 - West Shaft Site

2.7 Road Traffic Generation

The likely routes taken by construction vehicles, employee traffic, delivery and service vehicles during construction and operating phases are shown in *Table 1*.

Table 1. Site Access and Travel Routes

Site	Main Access Point	Access to/from via			
		North	South	East	West
Tooheys Road	Off Motorway Link Road to Tooheys Road	F3 Freeway turn back via. Sparkes Road	F3 Freeway	Motorway Link Road	Bushells Ridge Road and Tooheys Road
Buttonderry	Off Hue Hue Road, directly north of intersection with Sparkes Road	Hue Hue Road/F3 Freeway	Hue Hue Road/F3 Freeway	Sparkes Road	Sandra Street
Western Shaft (construction only)	Off Little Jilliby Road	Jilliby Road	Jilliby Road, Hue Hue Road	Jilliby Road, Hue Hue Road	Little Jilliby Road

During the operational phase the main traffic would be associated with mine personal arriving and departing the Tooheys Road and Buttonderry sites at shift changes. Typically residential dwellings on Bushell Ridge Road and Hue Hue Road that could be exposed to additional road traffic noise are set back more than thirty (30) metres from the centre road alignment. *Table 2* presents a summary of the staff numbers likely to be rostered over three (3) daily work shifts.

Table 2. Predicted Staff Numbers (Normal Three Shift Operation)

Shift	Times	Number of Staff	
		Buttonderry Site	Tooheys Road Site
Day	7.00am to 3.00pm	120	15
Afternoon	3.00pm to 11.00pm	80	5
Night	11.00pm to 7.00am	80	3

Assuming each employee drives to the site the peak hour traffic generation at the change of site would be in the order of 200 cars movements between 6.30 and 7.30am at the Buttonderry site and 20 car movements at the Tooheys Road site.

2.8 Rail Traffic Generation

It is proposed to transport all coal removed during operation of the mine by rail. Coal produced and out loaded from Tooheys Road would be transported to the Port of Newcastle or power stations accessed from the *MNRL*. The Tooheys Road site would be developed with the rail loop serviced from the *MNRL*. The rail loop would be designed to permit continuous controlled train loading and the parking of two (2) additional trains.

Residential development along the rail corridor varies in density and offset distances. *Table 3* presents a summary of typical offset distances for the main townships along the rail line.

Table 3. Typical Residential Development Off-set distances

Residential Area	Off-set Distance metres
Wyee	50-60
Moriset	50-60
Dora Creek	50-60
Awaba	50-60
Fassifern	25-30
Boorgul	15-20
Teralba	15-25
Cockle Creek	15-25
Cardiff	15-25
Kotora	15-25
Adamstown	15-25
Broadmeadow	10-15
Waratah	15-20

North of Wyee the *MNRL* services Vales Point Colliery, Eraring Colliery, Newstan Colliery and the Tabalba Colliery. For the purpose of assessing train noise impacts from the Wallarah project the existing scheduled freight and commuter train movements between Wyee and Wyong have been adopted.

A review of the Freight Standard Timetable for the MNRL between Sydney and Newcastle (Effective from Sunday 11 October 2009) identified that the scheduled average weekday train movements between Wyee and Wyong is twenty five (25). For weekend's the average daily scheduled freight train movements is sixteen (16) movements. Commodities carried by the existing trains include general freight, coal and

grain. Train lengths vary from around 450 metres to 1500 metres. It is understood that the future *MNRL* freight train growth could increase to between fifty and eighty (50-80) movements per day. Additionally the *MNRL* services express and all station passenger commuter trains. The published commuter train timetable shows that fifty-five (55) train movements per day are scheduled north of Wyong.

The projected daily coal train movements for the Wallarah project is in the order of five (5) to seven (7). It is envisaged that the trains would normally consist of two (2) or three (3) locomotives and thirty-seven (37) to forty-eight (48) wagons.

3.0 EXISTING AMBIENT NOISE ENVIRONMENT

For the purpose of assessing the existing ambient noise, attended and unattended audits were undertaken during November 2006 and April 2007 *(Attachment 2)*. The measurement results have been evaluated in accordance with *INP* assessment procedures to confirm existing background and ambient noise levels, and establish the project specific noise assessment goals.

Initially nine (9) reference measurement locations (*Figure 3*) were selected for noise monitoring. *Table 4* presents a description of the locations and a description of the existing noise environment. Locations M8 and M9 were located on the Buttonderry site adjacent to the referenced property boundaries. Following preliminary noise modelling an additional three (3) site were selected for additional noise monitoring undertaken during April 2007.

Site attended audits confirmed that the local acoustic environments are influenced by road traffic, natural sources and localised domestic activities. No industrial noise was identified at the monitoring locations during the audits. Traffic noise exposure for each site is dependent on the location and proximity to either the F3 Freeway (Sydney to Newcastle), Hue Hue Road or Bushell Ridge Road. Two (2) locations not directly influenced by nearby road traffic noise include Bruce Crescent (M1) and Sandra Street (M9). Albeit distant road traffic noise was audible at both locations during source (road) to receiver wind conditions.

3.1 Instrumentation

The instrumentation selected for the ambient noise measurements was comprised of RTA Technology Environmental Noise Loggers. Each logger was set to A-weighting, fast response and fifteen (15) minute sampling periods. The reference level of each logger was checked in the field prior to and after the measurements with a NATA calibrated Bruel & Kjaer Sound Level Calibrator Type 4230, Serial No. 623590, with no significant drift recorded.

Figure 3. Referenced Measurement and Assessment Locations

Table 4. Reference Measurement Locations

Reference Location	Reference Property	Measurement Location	Description Ambient Noise Sources
M1	250 Bruce Crescent. Wallarah	Rear of house	Local rural amenity and distant traffic
M2	118 Bushell Ridge Road. Kira	Vacant lot west of house	Local rural amenity, passing road traffic, distance freeway traffic
M3	235 Bushell Ridge Road. Kira	Rear of house	Freeway road traffic
M4	209 Bushell Ridge Road. Kira	Rear of house	Freeway road traffic
M5	97 Bushell Ridge Road. Kira	Rear of house	Local rural amenity, passing road traffic, distance freeway traffic
M6	4 Kira Ridge Road. Jilliby	Front of house	Hue Hue Road traffic and distant freeway traffic
M7	Hue Hue Road. Jilliby	Front of house	Hue Hue Road traffic and distant freeway traffic
M8	3 Amberwood Close. Jilliby	Vacant land site boundary	Hue Hue Road traffic and distant freeway traffic
M9	Lot 2 Sandra Street. Jilliby	Vacant land site boundary	Local rural amenity and distant traffic
M10	113A Mountain Road. Wallarah	Front of house	Local rural amenity and distant traffic
M11	20 Bushell Ridge Road	Front of house	Local rural amenity, freeway traffic, passing road traffic
M12	Bushell Ridge Road	Vacant land opposite house	Local rural amenity, passing road traffic, distance freeway traffic

The ambient noise levels were measured and assessed as percentile A-weighted sound levels. The parameters regarded as being the most important amongst these for environment noise assessment purposes, are the "L_{A90}", the level exceeded for 90% of the sample period and referenced as the "background or average minimum noise level", and the "L_{Aeq}", which is the A-weighted energy equivalent continuous (constant) sound level.

3.2 Results

From *INP* assessment procedures the Rating Background Level *(RBL)* and ambient $L_{Aeq, (Period)}$ levels were established. The *RBL* is the median of the tenth percentile background levels for each assessment period. The $L_{Aeq, (Period)}$ level represents the measured energy averaged noise level for each assessment period. *Table 5* presents a summary of the existing ambient $L_{Aeq, (Period)}$ levels for the daytime, evening and night-time assessment periods, and the calculated RBL's.

3.3 Meteorological Conditions

Meteorological conditions recorded during the noise monitoring were typified by generally low wind speeds (<3m/s). Air temperatures ranged from 12°C at night to 34°C during the day. The meteorological conditions logged during the measurement periods were considered to be acceptable for outdoor noise measurement. *Attachment 3* presents a summary of the meteorological conditions recorded during the survey period.

3.4 Road Traffic Noise

Residential dwellings on Bushell Ridge Road and Hue Hue Road could be exposed to road traffic noise associated with the proposal. Dwellings on the eastern end of Bushell Ridge Road are exposed to traffic noise from the F3 Freeway. At the eastern end of Bushell Ridge Road (M3) the measured $L_{Aeq\ 15\ hour}$ and $L_{Aeq\ 9\ hour}$ noise levels were 61dBA and 58dBA, respectively. At the western end of Bushell Ridge Road (M2) the measured $L_{Aeq\ 15\ hour}$ and $L_{Aeq\ 9\ hour}$ noise levels were 51dBA and 48dBA, respectively. For Hue Hue Road (M7) the measured $L_{Aeq\ 15\ hour}$ and $L_{Aeq\ 9\ hour}$ noise levels were 56dBA and 54dBA, respectively

Table 5. Assessment RBL's and L_{Aeq} Noise Levels

Date	Assessment Background Level RBL			Equivalent Continuous Level $L_{Aeq, (Period)}$		
	Day	Evening	Night	Day	Evening	Night
Location M1: 250 Bruce Crescent						
RBL	36.2	41.4	37.2			
Ambient L_{Aeq}				50.3	48.2	47.3
RBL	37.4	41.8	38.3			
Ambient L_{Aeq}				49.1	47.3	46.3
Location M2: 118 Bushell Ridge Road						
RBL	37.8	39.8	33.2			
Ambient L_{Aeq}				51.1	49.7	47.8
Location M3: 235 Bushell Ridge Road						
RBL	52.1	52.1	44.3			
Ambient L_{Aeq}				61.3	60.0	58.4
RBL	52.9	52.1	43.0			
Ambient L_{Aeq}				69.3	63.0	58.2
Location M4: 209 Bushell Ridge Road						
RBL	58.1	56.7	46.6			
Ambient L_{Aeq}				64.4	63.4	63.0
RBL	57.7	56.5	45.6			
Ambient L_{Aeq}				64.2	63.5	61.9
Location M5: 97 Bushell Ridge Road						
RBL	37.4	43.1	36.1			
Ambient L_{Aeq}				48.0	58.8	48.5
RBL	44.1	49.2	41.9			
Ambient L_{Aeq}				56.0	56.1	55.9
Location M6: 4 Kira Road						
RBL	41.2	39.6	38.6			
Ambient L_{Aeq}				52.4	50.6	49.2
Location M7: Hue Hue Road						
RBL	42.7	46.3	42.9			
Ambient L_{Aeq}				56.8	53.6	54.9
Location M8: Amberwood Close						
RBL	40.8	45.6	41.0			
Ambient L_{Aeq}				50.3	50.9	50.3
Location M9: Sandra Road						
RBL	32.7	35.8	33.5			
Ambient L_{Aeq}				43.8	42.1	42.1
Location M10: 113A Mountain Road						
RBL	39.2	41.3	39.4			
Ambient L_{Aeq}				48.6	48.4	48.7
Location M11: 20 Bushell Ridge Road						
RBL	43.7	43.9	41.6			
Ambient L_{Aeq}				63.7	58.3	54.3
Location M12: Bushell Ridge Road						
RBL	44.1	49.2	41.9			
Ambient L_{Aeq}				56.0	56.1	55.9

1. Daytime: 7.00am to 6.00pm, Monday to Saturday and 8.00am to 6.00pm Sundays and Public Holidays.
2. Evening: 6.00pm to 10.00pm, Monday to Sunday and Public Holidays
3. Night: 10.00pm to 7.00am Monday to Saturday and 10.00pm to 8.00am Sundays and Public Holidays.

3.5 Rail Traffic Noise

The measurement of noise from existing commuter and freight rail traffic on the *MNRL* was undertaken north of Wyong during December 2009. For assessment purposes three (3) reference off-set distances were selected. Unmanned measurements were conducted at the three (3) locations together with site attended measurements to assess the existing L_{Amax} and $L_{Aeq,\ 24\ hour}$ levels. The results are summarised in *Table 6.*

Table 6. Measured Existing Rail Traffic Noise Levels

Off-set Distance (metres)	Measured Sound Pressure Levels dBA		
	LAeq, 24 hr	LAmax	LAmax (95%)
25	59.2	80-88	86
50	-	75-81	79
100	53.2	64-75	73

4.0 PROJECT NOISE ASSESSMENT GOALS

The *DECCW* published guidelines and policies for assessing environmental noise impacts from industrial activities and transport infrastructure. The guidelines and policies were prepared to promote uniform procedures for assessing noise impacts are documented in the Industrial Noise Policy *(INP),* Environmental Noise Control Manual *(ENCM)*, and, Environmental Criteria for Road Traffic Noise *(ECRTN).*

4.1 Operational Noise

Procedures for establishing operational noise assessment goals from industrial sources are documented in the *INP.* The assessment procedures have two components and developed for the purpose of:

(1) controlling intrusive noise; and
(2) maintaining noise level amenity for particular lands used for residences and other uses.

The intrusiveness of a noise is considered to be acceptable if the $L_{Aeq,\ 15\ minute}$ level from the source does not exceed the rating background level (RBL) by more than 5dBA. In order to assess noise amenity, the source $L_{Aeq,\ Period}$ levels should not normally exceed the recommended acceptable noise levels (*Table 7*).

When assessing the noise impact of industrial sources for residential receivers, both the intrusive and amenity limits are taken into account. In most situations the lowest level becomes the limiting criterion and used to determine project-specific noise goals for the industrial source.

The *DECCW* recognise (*INP* Section 1.4.1) that in setting noise goals the levels established in accordance with the *INP* assessment procedures are best regarded as planning tools and not mandatory. The *DECCW* recognise that an application for a noise producing development is not determined purely on the basis of compliance or otherwise of noise goals. Other factors taken into account include economic consequences, other environmental effects, and the social benefit of the proposal.

For preservation of acoustic amenity, the *INP* requires industrial noise in residential areas be within acceptable levels recommended for the locality and land-use. Referenced to the *INP* the existing land uses in the vicinity of the Tooheys Road and Buttonderry sites would be defined as *Rural, Suburban or Urban*. *Table 7* presents a summary of the *INP* amenity noise goals for residential development and different land uses.

Table 7. INP Noise Policy Amenity Goals

Receiver Description	Indicative Noise Amenity Area	Time of Day	Recommended $L_{Aeq.\ Periofd}$ Noise Level	
			Acceptable	Recommended Maximum
Residence	Rural	Day	50	55
		Evening	45	50
		Night	40	45
	Suburban (1)	Day	55	60
		Evening	45	50
		Night	40	45
	Urban (2)	Day	60	65
		Evening	50	55
		Night	45	50

NOTES: Daytime: (7.00am to 6.00pm)
Evening: (6.00pm to 10.00pm)
Nighttime: (10.00pm to 7.00am)

(1) Rural
- an agricultural area, except those used for intensive agricultural activities
- a rural recreational area such as resort areas
- a wilderness area or national park
- an area generally characterised by low background noise levels (except in the immediate vicinity of industrial noise sources

This area may be located in either a rural, rural-residential, environment protection zone or scenic protection zone as defined on a council LEP or other planning instrument

(2) 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.

This area may be located in either a rural, rural-residential or residential zone, as defined on an LEP or other planning instrument.

(3) Urban
- an area with an acoustical environment that:
- is dominated by 'urban hum' or industrial source noise
- has through traffic with 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.

This area may be located in either a rural, rural-residential or residential zone, as defined on an LEP or other planning instrument, and also includes mixed land-use zones such as mixed commercial and residential uses.

Considering the measured noise levels *(Table 5)* and the *INP* procedures, *Table 8* presents a summary of the assessment *RBL's,* the ambient $L_{Aeq,\ Period}$ levels and noise goals for the monitoring locations. When determining noise goals for industrial sources the *INP* recommends that the intrusive night-time noise goal should be set no higher than the

intrusive noise goals for day or evening, and the evening be no higher than the intrusive daytime goal.

In accordance with *INP* guidelines operational noise is assessed at the most affected point on or within the residential property boundary or if this is more than 30m from the residence, at the most affected point within 30m of the residence (INP Section 2.2.1).

Table 8. Noise Goals for Measurement Locations
dBA re: 20 x 10^{-6} Pa

Period	Recommended Noise Level $L_{Aeq,\ Period}$	Existing RBL	Existing $L_{Aeq,\ Period}$	Noise Goals for Measurement Locations	
				Intrusive $L_{Aeq,\ 15\ min}$	Amenity $L_{Aeq,\ Period}$
Location M1: 250 Bruce Crescent (*)					
Day	50	36	49	41	50
Evening	45	41	47	41(7)	45
Night	40	37	47	41(7)	40
Location M2: 118 Bushell Ridge Road (**)					
Day	55	38	51	43	55
Evening	45	40	50	43(7)	45
Night	40	33	48	38	40
Location M3: 235 Bushell Ridge Road (***)					
Day	60	52	61	57	60
Evening	50	52	60	57	50
Night	45	43	58	48	48(6)
Location M4: 209 Bushell Ridge Road (***)					
Day	60	58	64	63	60
Evening	50	57	63	62	53(6)
Night	45	46	62	51	52(6)
Location M5: 97 Bushell Ridge Road (**)					
Day	55	37	48	42	55
Evening	45	43	50(5)	42(7)	45
Night	40	36	48	41	40

1. DECCW. INP Land Zoning (*) Rural (**) Suburban (***) Urban
2. Daytime: 7.00am to 6.00pm, Monday to Saturday and 8.00am to 6.00pm Sundays and Public Holidays.
3. Evening: 6.00pm to 10.00pm, Monday to Sunday and Public Holidays
4. Night 10.00pm to 7.00am Monday to Saturday and 10.00pm to 8.00am Sundays and Public Holidays.
5. Adjusted to account for localised noise sources.
6. Adjusted to account for existing traffic noise as per INP (Section 2.2.3)
7. Adjusted in accordance with DECCW Application Notes

Table 8. Noise Goals for Measurement Locations. Cont'd.
dBA re: 20 x 10^{-6} Pa

Period	Recommended Noise Level $L_{Aeq, Period}$	Existing RBL	Existing $L_{Aeq, Period}$	Noise Goals for Measurement Locations	
				Intrusive $L_{Aeq, 15\ min}$	Amenity $L_{Aeq, Period}$
Location M6: 4 Kira Road (**)					
Day	55	41	52	46	55
Evening	45	40	51	45	45
Night	40	39	49	44	40
Location M7: Hue Hue Road (**)					
Day	55	43	57	48	55
Evening	45	46	54	48(7)	45
Night	40	43	55	48	45(6)
Location M8: Amberwood Close (**)					
Day	55	41	50	46	55
Evening	45	46	51	46(7)	45
Night	40	41	50	46	40
Location M9: Sandra Road (*)					
Day	50	33	44	38	50
Evening	45	36	42	38(7)	45
Night	40	33	42	38	40
Location M10: 113A Mountain Road (*)					
Day	50	39	49	44	50
Evening	45	41	48	44(7)	45
Night	40	39	49	44	40
Location M11: 20 Bushell Ridge Road (**)					
Day	55	44	64	49	55
Evening	45	44	57	49	47(6)
Night	40	42	54	47	44(6)
Location M12: Bushell Ridge Road (**)					
Day	55	44	56	49	55
Evening	45	49	56	49(7)	46(6)
Night	40	42	56	47	46(6)

1. DECCW. INP Land Zoning (*) Rural (**) Suburban (***) Urban
2. Daytime: 7.00am to 6.00pm, Monday to Saturday and 8.00am to 6.00pm Sundays and Public Holidays.
3. Evening: 6.00pm to 10.00pm, Monday to Sunday and Public Holidays
4. Night 10.00pm to 7.00am Monday to Saturday and 10.00pm to 8.00am Sundays and Public Holidays.
5. Adjusted to account for localised noise sources.
6. Adjusted to account for existing traffic noise as per INP (Section 2.2.3)
7. Adjusted in accordance with DECCW Application Notes

4.2 Sleep Disturbance

Procedures for assessing sleep disturbance from short-term noise events are referenced in the *ENCM (Section 19.3).* From the *ENCM* the $L_{A1, 1min}$ level measured over a one (1) minute period outside a residential bedroom window should not exceed the repeated L_{A90} background level by more than 15dBA. Based on the night-time (10.00pm to 7.00am) RBL's *(Table 5) Table 9* presents the sleep disturbance assessment goals.

Table 9. Sleep Disturbance Goals for Measurement Locations

Assessment Period	Existing RBL	Sleep Disturbance Assessment Goals L_{A1}
Location M1: 250 Bruce Crescent		
Night	36(1)	51
Location M2: 118 Bushell Ridge Road		
Night	33	48
Location M3: 235 Bushell Ridge Road		
Night	43	58
Location M4: 209 Bushell Ridge Road		
Night	46	61
Location M5: 97 Bushell Ridge Road		
Night	36	51
Location M6: 4 Kira Road		
Night	39	54
Location M7: Hue Hue Road		
Night	43	58
Location M8: Amberwood Close		
Night	41	56
Location M9: Sandra Road		
Night	33	48
Location M10: 113A Mountain Road		
Night	39	54
Location M11: 20 Bushell Ridge Road		
Night	42	57
Location M12: Bushell Ridge Road		
Night	42	57

(1) Adjusted in accordance with DECCW Application Notes

4.3 Project Noise Goals for Noise Assessment Locations

For assessment purposes residential receptor locations with similar acoustic environments have been grouped together. *Table 10* presents a summary of the referenced measurement and grouped assessment locations with similar noise environments.

Table 10. Summary of Measurement and Assessment Locations

Reference Measurement Locations	Reference Assessment Locations	INP Indicative Noise Amenity
M1	P1, P2, P3	Rural
M2	P6	Suburban
M3	P10	Urban
M4	-	Urban
M5	P7	Suburban
M6	P5	Suburban
M7	-	Suburban
M8	-	Suburban
M9	-	Rural
M10	P4	Rural
M11	P9	Suburban
M12	P8	Suburban

4.3.1 Operational Project Specific Noise Goals

Considering the above intrusive and amenity noise goals for the measurement locations *(Tables 8 and 9)* and the referenced residential locations selected for assessing noise from the project, *Table 11* provides a summary of the project-specific noise goals. Where the amenity criterion is less than the intrusive criterion, the lower amenity criterion was adopted and assessed as an $L_{Aeq,\ 15\ min}$ level.

Table 11. Project-Specific Noise Goals.

Period	Recommended Noise Level $L_{Aeq,\ Period}$	Existing RBL	Existing $L_{Aeq,\ Period}$	Project- Specific Noise Goals	
				Assessment Noise Goal $L_{Aeq,\ 15\ min}$	Sleep Arousal $L_{A1,\ 1\ min}$
Assessment Location P1					
Day	50	36	49	41	-
Evening	45	41	47	45	-
Night	40	37	47	40	52
Assessment Location P2					
Day	50	36	49	41	-
Evening	45	41	47	45	-
Night	40	37	47	40	52
Assessment Location P3					
Day	50	36	49	41	-
Evening	45	41	47	45	-
Night	40	37	47	40	52

Table 11. Project-Specific Noise Goals. Cont'd.

Period	Recommended Noise Level $L_{Aeq, Period}$	Existing RBL	Existing $L_{Aeq, Period}$	Project- Specific Noise Goals	
				Assessment Noise Goal $L_{Aeq, 15\ min}$	Sleep Arousal $L_{A1, 1\ min}$
Assessment Location P4					
Day	50	39	49	44	-
Evening	45	41	48	45	-
Night	40	39	49	40	54
Assessment Location P5					
Day	55	41	52	46	-
Evening	45	40	51	45	-
Night	40	39	49	40	54
Assessment Location P6					
Day	55	38	51	43	-
Evening	45	40	50	45	-
Night	40	33	48	38	48
Assessment Location P7					
Day	55	37	48	42	-
Evening	45	43	50(5)	45	-
Night	40	36	48	40	55
Assessment Location P8					
Day	55	44	56	49	-
Evening	45	49	56	46	-
Night	40	42	564	46	57
Assessment Location P9					
Day	55	44	64	49	-
Evening	45	44	57	47	-
Night	40	42	54	44	57
Assessment Location P10					
Day	60	52	61	57	-
Evening	50	52	60	50	-
Night	45	43	58	48	58

4.4 Discussion

The *DECCW* recognise that it does not always follow that all people exposed to noise levels that exceed the *INP* project specific noise goals would find the noise unacceptable. Subjectively an increase in noise of less than 1dBA would not be noticeable and generally classified as negligible; increases of 1 to 2dBA would not be noticeable by most people and classified as marginal; increases of 3 to 5dBA would be moderate and noticeable by some people; while increases greater than 5dBA would be classified as noticeable.

For situations were the *INP* project noise goals are not achieved the following management and affectation criteria have been considered.

4.4.1(a) Noise Management Zone

For areas where the predicted noise levels exceed the project specific assessment goals by up to 5dBA, the affectation could be described as negligible to moderate. For these situations and where it is not feasible to reduce the site noise, it is recommended that consideration is given to acoustic treatments to exposed receptors or discussions with identified property owners with respect to negotiated agreements. For properties identified in the *noise management zone*, agreements would be finalised with the property owners after commission and compliance noise audits confirm that the project noise assessment goals are not satisfied.

4.4.1(b) Noise Affected Zone

For areas where the predicted noise levels exceed the project specific assessment goals by more than 5dBA the affectation could be described as unacceptable. For these situations and where it is not feasible to reduce the site noise emissions, it is recommended that consideration be given to offering acoustic treatments to exposed receptors or discussions undertaken with property owner with respect to negotiated agreements.

4.5 Road Traffic Noise

Procedures for assessing road traffic noise from new land use developments are documented in the *DECCW, Environment Criteria for Road Traffic Noise (ECRTN)*. *Table 12* presents a summary of the traffic noise assessment goals recommended *(ECRTN)* for new land use developments.

Table 12. Road Traffic Noise Goals

Land Use Development	Traffic Noise Criteria		Where Criteria is already Exceeded
	Daytime (7.00am to 10.00pm)	Nighttime (10.00pm to 7.00am)	
Land use developments with potential to create additional traffic on local roads	$L_{Aeq,\ 1\ hour}$ 55	$L_{Aeq,\ 1\ hour}$ 50	In all cases, the redevelopment should not increase existing noise levels by more than 2dBA. Where feasible and reasonable noise Levels from existing roads should be reduced to meet the noise criteria. In many instances this may be achievable only through long-term strategies.
Land use developments with potential to create additional traffic on collector roads	$L_{Aeq,\ 1\ hour}$ 60	$L_{Aeq,\ 1\ hour}$ 55	

4.6 Rail Traffic Noise

Rail traffic noise is regulated by licences issued by the *DECCW*. As part of licence conditions the *DECCW* is progressively incorporating requirements for implementation of Pollution Reduction Programs *(PRP)*. The noise levels recommended by the *DECCW* for the assessment of rail noise exposure is that the cumulative levels (ie. the existing plus proposed) should not exceed $L_{Aeq,\ 24\ hour}$ 60dBA and $L_{Amax\ (95th\ percentile)}$ 85dBA assessed at residential building facades.

5.0 METEOROLOGICAL EFFECTS

Research in the Hunter Valley identified that areas are subject to temperature inversions and seasonal winds. The effects of meteorological conditions can enhance or reduce noise propagation and noise perceived at distant receptors. In the near field wind has minimal influence on measured down wind sound levels. Wind effects become more important as distances increase. Downwind effects depending on wind speed and distance can increase noise by a few dB (1-5dB). Depending on wind speed and distance from a noise source, upwind noise measurement levels can drop by 5-10dB. Temperature gradients create similar enhancement effects to wind, except that the effects are generally uniform in all directions.

Meteorological information for the study area *(Attachment 4)* has been supplied by Holmes Air Sciences. The data provided annual and seasonal data on wind speed, wind direction and stability classes for meteorological stations at Charmhaven and Buttonderry (*Tables 13 and 14)*.

A review of the data for the purpose of noise modelling identified predominant wind directions and percentage occurrence of winds for Charmhaven. The data shows that the percentage occurrence of winds with speeds of less than 3m/s is predominantly from the easterly direction, ie, south to north-east, during daytime and evening hours, and from west to south-west during night time hours. The meteorological data also identifies that F Stability Class conditions during nighttime hours occur for more than 30% of the time.

At the Buttonderry site dominant winds with speeds of less than 3m/s are from a westerly direction, ie., south-west to north west, during all three assessment periods (day, evening and night). The meteorological data for the nighttime hours identifies that F Stability Class conditions occur for more than 30% of the time.

Considering the above and the *INP* assessment procedures noise modelling has been undertaken to assess the effects of meteorological conditions.

Table 13. Predominant Wind Direction and Percentage Occurrence

Reference: Holmes Air Sciences

Meteorological Station	Time Period	Wind Direction ± 45°	Percentage Occurrence (%)		
			Day	Evening	Night
Charmhaven	Summer	N	13	23	9
		NE	37	47	11
		E	54	64	16
		SE	49	40	16
		S	31	31	37
		SW	22	17	53
		W	14	7	47
		NW	9	5	14
	Autumn	N	15	15	10
		NE	21	19	8
		E	32	16	7
		SE	31	12	7
		S	32	27	30
		SW	37	43	63
		W	32	40	58
		NW	15	21	16
	Winter	N	19	20	7
		NE	18	13	4
		E	14	9	4
		SE	14	9	3
		S	21	27	19
		SW	32	47	57
		W	31	46	62
		NW	18	29	22
	Spring	N	22	28	20
		NE	28	32	11
		E	29	28	10
		SE	25	18	10
		S	19	25	27
		SW	19	29	51
		W	18	25	57
		NW	15	20	26

Table 13. Predominant Wind Direction and Percentage Occurrence. Cont'd.

Reference: Holmes Air Sciences

Meteorological Station	Time Period	Wind Direction ± 45°	Percentage Occurrence (%)		
			Day	Evening	Night
Buttonderry	Summer	N	10	5	0
		NE	19	16	12
		E	18	16	13
		SE	1	0	14
		S	0	7	51
		SW	35	43	71
		W	45	56	63
		NW	47	42	13
	Autumn	N	10	3	0
		NE	14	8	0
		E	16	10	0
		SE	14	7	2
		S	25	37	61
		SW	41	73	79
		W	39	69	60
		NW	29	20	4
	Winter	N	0	0	0
		NE	6	6	0
		E	10	11	1
		SE	12	11	4
		S	22	25	42
		SW	34	55	73
		W	36	55	63
		NW	20	14	9
	Spring	N	20	26	9
		NE	6	0	0
		E	14	12	1
		SE	16	12	1
		S	9	7	45
		SW	13	22	45
		W	19	55	73
		NW	23	59	60

Table 14. Stability Classes and Percentage Occurrence

Reference: Holmes Air Sciences

Stability Class	Percentage Frequency
Charmhaven, 1998-1999 Winter (Night 10pm-7am):	
A	0.0
B	0.0
C	0.0
D	36.3
E	18.7
F	45.1
Charmhaven, 1998-1999 Winter (Night 6pm-7am):	
A	0.0
B	0.0
C	0.0
D	36.3
E	17.2
F	46.5
Buttonderry, 1998-1999 Winter (Night 10pm-7am):	
A	0.0
B	0.0
C	0.0
D	40.1
E	27.7
F	32.2
Buttonderry, 1998-1999 Winter (Night 6pm-7am):	
A	0.0
B	0.0
C	0.0
D	36.9
E	27.7
F	35.5

6.0 SCHEDULE OF SITE PLANT AND NOISE AUDITS

6.1 Operational Noise Sources

Operational noise modelling for Tooheys Road and Buttonderry has considered noise from fixed plant, mobile plant and train loading. A summary of the sound power levels adopted for the modelling is presented in *Table15.* The data developed from site audits represents the L_{Aeq} levels and octave band SWL for each item.

Table 15: Plant and Equipment Sound Power Levels
dB re: 10^{-12} Watts

Plant Description	Sound Power Level dB re: 10^{-12} Watts									
	dBA	32	63	125	250	500	1k	2k	4k	8k
Tooheys Road										
Drift Conveyor	91	88	95	97	93	89	86	80	73	58
Drift Conveyor Drive	97	93	92	91	93	92	95	88	78	67
ROM Stockpile Conveyor	100	97	104	106	102	98	95	89	82	67
ROM Stockpile Conveyor Drive	97	93	92	91	93	92	95	88	78	67
ROM Coal Stockpile	103	102	109	106	102	97	96	96	95	86
Stockpile Dozer D11	111	106	108	117	107	108	107	102	96	86
ROM –Crusher Conveyor	96	93	100	102	98	94	91	85	78	63
ROM –Crusher Conveyor Drive	97	93	92	91	93	92	95	88	78	67
Crusher Building	105	107	106	108	110	105	96	87	79	65
Crusher- Transfer Bl'd. Conveyor	103	100	107	109	105	101	98	92	85	70
Crusher- Transfer Bl'd. Conveyor Drive	97	93	92	91	93	92	95	88	78	67
Transfer Building	102	101	102	101	103	104	87	77	63	54
Incline Stockpile Conveyor	96	93	100	102	98	94	91	85	78	63
Incline Stockpile Conveyor Drive	97	93	92	91	93	92	95	88	78	67
Stockpile Conveyor	101	98	105	107	103	99	96	90	83	68
Stockpile Conveyor Drive	97	93	92	91	93	92	95	88	78	67
Coal Stockpile	103	102	109	106	102	97	96	96	95	86
Rail Bin Transfer Conveyor	96	93	100	102	98	94	91	85	78	63
Rail Bin Transfer Conveyor Drive	87	83	92	81	83	82	85	78	68	57
Coal Train per 30 metres	97	99	108	99	90	93	92	89	84	82
Rail Loading	87	93	86	86	84	81	81	80	78	73
Gas Flare Module	86	89	87	85	82	79	78	80	68	59
Buttonderry										
Fan Discharge No. 1	85	108	98	91	85	79	76	78	76	77
Fan Discharge No.2	85	108	98	91	85	79	76	78	76	77
Fan House	72	100	91	78	77	68	54	49	37	27
Winder Building	73	84	87	85	82	81	79	73	65	54

6.2 Off-site Road Traffic Noise

The projected daily traffic generation for each site during construction and operation is summaried in *Tables 16 and 17.* Construction at the Tooheys Road and Buttonderry sites would be undertaken at the same time, the western shaft site is not expected to be under construction until around year 10 of mining.

Table 16. Project Operational Traffic Volumes (Three Shift Operation)

Shift	Times	Vehicle Trips	
		Buttonderry Site	Tooheys Road Site
Day	7.00am to 3.00pm	120	15
Afternoon	3.00pm to 11.00pm	80	5
Night	11.00pm to 7.00am	80	3

Assuming each employee during the operational phase drives to the site, the peak hour traffic generation at the change of site would be in the order of 200 car movements between 6.30 and 7.30am at the Buttonderry site and 20 car movements at the Tooheys Road site.

Table 17: Projected Construction Traffic Volumes

Site	Vehicle Type	Number per day	Vehicle Trips per day
Tooheys Road	Light (employees)	150	300
	Light(deliveries)	60	120
	Rigid Truck	20	40
	Articulated Truck	20	40
	Total		**500**
Buttonderry	Light (employees)	75	150
	Light(deliveries)	40	80
	Rigid Truck	10	20
	Articulated Truck	20	40
	Total		**290**
Western Shaft	Light (employees)	25	50
	Light(deliveries)	10	20
	Rigid Truck	5	10
	Articulated Truck	5	10
	Total		**90**

6.3 Rail Traffic Noise

Passenger train schedule information available for the *MNRL* north of Wyong shows that the average daily usage is comprised of V-set (50 per day), XPT (6 per day) and Explore (4 per day) commuter trains. Effective from Sunday 11 October 2009, the scheduled

freight train passby's is in the order of twenty five (25) for weekdays and sixteen (16) for weekends. The Wallarah project is projected to generate five to seven (5-7) addition coal train movements per day. *Table 18* presents a summary of the existing and projected train movements.

Table 18: Existing and Projected Train Movements

Description	Total
V-Set Commuter	50
XPT	6
Explorer	4
Existing Freight	25/16
Wallarah 2 Coal	5-7

Passby noise measurements for freight trains show that the level of noise exposure is dependent on the rolling stock, train length, train speed, track design and off-set distance from the tracks. The main noise sources identified include locomotive engine/exhaust, wheel/rail noise and wagon radiated noise.

For modelling and assessment noise from train passbys has been normalised to 15 metres and 75/80 kilometers per hour. *Table 19* presents a summary of typical rolling stock free field noise levels adopted for modelling.

Table 19. Rolling Stock Noise Levels
dB re: $20x10^{-6}$ Pa

Description	Sound Pressure Levels @ 15m dBA	
	SEL	LAmax
NR Class Locomotive	96	91
81 Class Locomotive	95	90
Passenger (XPT)	94	90
Explorer	93	88
V-Set	92	86
Freight Wagons	98	90
Coal Wagons	98	89

7.0 NOISE MODELLING PROCEDURE AND ASSESSMENT

Noise for each site was modelled with the *EPA* approved Environmental Noise Model *(ENM)* computer model. The computer *model* is based on digital topographical data for the sites and surrounding areas, and calculates attenuation factors including distance, shielding from structures, ground vegetation, atmospheric absorption and topographical features.

7.1 Tooheys Road

The *INP* *(Section 5.3.1)* guidelines recommend that wind effects be assessed when wind speeds of 3m/s or below occur for 30 percent of the time or more in any assessment period or season. Considering the meteorological and seasonal wind data *(Section 5.0, Tables 13 and 14)* modelling was undertaken for a number of wind scenarios and with a temperature inversion. The meteorological scenarios modelled are outlined below:

- Calm: relative humidity of 60%, and air temperature of 15°C;
- Wind: 3m/sec, relative humidity of 60%, and air temperature of 15°C; and
- Temperature Inversion: temperature gradient of 3°C/100m elevation, relative humidity of 60%, and air temperature of 10°C.

The noise modelling assumed that the fixed and mobile plant (one (1) stockpile dozer) were operating simultaneously together with train loading. *Tables 20 and 21* present a summary of the predicted noise levels to the reference assessment locations *(Figure 3)*.

Table 20. Predicted Noise Levels for Day/Evening Site Operating Conditions

L_{Aeq} dBA re: 20 x 10^{-6} Pa

Assessment Location	Predicted Noise Level L_{Aeq} dBA							
	Meteorological Conditions							
	Goals	Calm	NE	E	SE	S	SW	W
Assessment Location P1	41/41	22	29	18	16	17	20	32
Assessment Location P2	41/41	31	35	30	27	26	28	33
Assessment Location P3	41/41	34	40	36	29	28	30	34
Assessment Location P4	44/44	19	31	27	20	16	15	16
Assessment Location P5	46/45	14	27	31	22	14	14	14
Assessment Location P6	43/43	32	34	38	39	37	30	30
Assessment Location P7	42/42	35	37	41	42	40	36	36
Assessment Location P8	49/46	34	34	42	45	43	37	37
Assessment Location P9	49/47	31	27	32	39	42	39	39
Assessment Location P10	57/50	27	22	25	32	37	36	36

Table 21. Predicted Noise Levels for Night Site Operating Conditions

L_{Aeq} dBA re: 20 x 10^{-6} Pa

Assessment Location	Predicted Noise Level L_{Aeq} dBA					
	Meteorological Conditions					
	Goals	Calm	TI	S	SW	W
Assessment Location P1	40	22	31	17	20	32
Assessment Location P2	40	31	34	26	28	33
Assessment Location P3	40	34	38	28	30	34
Assessment Location P4	40	19	23	16	15	16
Assessment Location P5	40	14	19	14	14	14
Assessment Location P6	38	32	36	37	30	30
Assessment Location P7	40	35	39	40	36	36
Assessment Location P8	46	34	39	43	37	37
Assessment Location P9	44	31	35	42	39	39
Assessment Location P10	48	27	32	37	36	36

The results summarised in *Tables 20 and 21* show that the project-specific noise assessment goals *(Table 9)* are marginally satisfied during adverse weather conditions. Operational noise levels at the Bluehaven Estate are predicted to be less than 35dBA under adverse westerly wind and temperature inversion conditions.

For descriptive purposes noise contours produced from the ENM modelling are presented in *Attachments 5 to 12.* The noise plots are presented for descriptive and visual purposes, compliance with the recommended noise *INP* goals should be confirmed against the predicted levels in *Tables 20 and 21.*

7.2 Buttonderry Site

For assessment purposes noise contour plots produced from *ENM* modelling for the Buttonderry site are presented in *Attachment 13*. The findings show that the project-specific noise assessment goals *(Table 11)* are satisfied.

7.3 Road Traffic

Table 22 presents a summary of the predicted peak hour traffic noise levels assuming a 50% split in traffic from the Buttonderry site and an average pass-by traffic speed of 60kph.

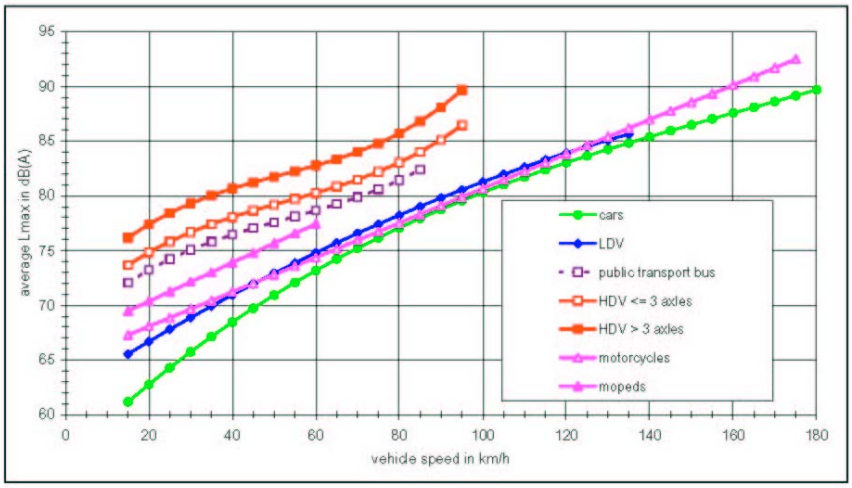
Table 22. Predicted Operational Traffic Noise Levels

Shift	Times	Predicted Traffic Noise Levels LAeq, 1 hour			
		10m	30m	50m	100m
Buttonderry Site (Hue Hue Road)					
Day	6.30am to 7.30am	59.1	55.1	53.1	50.2
Afternoon	2.30pm to 3.30pm	59.1	55.1	53.1	50.2
Night	10.30pm to 11.00pm	58.1	54.1	52.1	49.2
Tooheys Road Site (Bushell Ridge Road)					
Day	6.30am to 7.30am	51.6	47.7	45.6	42.8
Afternoon	2.30pm to 3.30pm	52.1	48.1	46.1	43.2
Night	10.30pm to 11.00pm	48.1	44.1	42.1	39.2

The predicted $L_{Aeq\ 1\ hour}$ traffic noise levels for Hue Hue Road at thirty (30) metres satisfy the daytime 60dBA and nighttime 55dBA target noise assessment goals for collector roads. Passby L_{Amax} noise levels *(Figure 4)* from cars at thirty (30) metres are predicted to be in the order 64-65dBA. For Bushell Ridge Road the predicted traffic noise levels satisfy the target noise assessment goals at ten (10) from the road.

Figure 4. LAmax Passby Traffic Noise Levels @ 10 metres

(Reference: Steven, 2005)



7.4 Rail Traffic

Modelling for the existing and projected rail traffic noise has been undertaken assuming no allowance for noise attenuation from shielding provided by cuttings, buildings, etc . *Tables 23* presents a summary of predicted existing levels for comparison with measured levels for modelling validation.

Table 23. Predicted Existing Rail Traffic Noise Levels

Sound Pressure Levels 25 metres					
Train Type	**LAmax**	**SEL**	**No. of Train Movements**	**Predicted Rail SPL's**	
				LAeq,24hr	**LA,max**
XPT	90	94	6	48.0	85.6
Explorer	88	93	4	45.2	83.6
V set	86	92	50	55.2	81.6
Freight Loco's	91	96	16	58.4	88.8
Freight Waggons	90	98	16	58.2	85.6
			Total	**62.5**	**88.8**

* Free field conditions without facade correction (+2.5dBA)

The predicted noise levels in *Table 23* show that the overall $L_{Aeq,\ 24\ hour}$ and $L_{Amax\ (95\%)}$ levels are within 3dBA of the measured levels *(Table 6)* and considered acceptable for noise prediction.

7.4.1 Predicted Existing and Future Rail Traffic Noise Levels

For assessment purposes *Table 24* presents a summary of the predicted existing and predicted future trains noise levels at off-set distances referenced to fifteen (15), twenty fifty (25), fifty (50) and one hundred (100) metres with a building facade correction of 2.5dBA. The modelling is based on the assumptions that there is a direct line of sight between the trains and receptor, a train speed of 75/80kph and no acoustic shielding.

Table 24. Predicted Existing and Future Rail Traffic Noise Levels

Predicted Existing and Future Rail Traffic SPL's							
Weekdays				Weekends			
Existing		Projected		Existing		Projected	
LAeq,24hr	LA,max	LAeq,24hr	LA,max	LAeq,24hr	LA,max	LAeq,24hr	LA,max
Off-set 15 metres							
68.7	93.5	69.5	93.5	67.4	93.5	68.4	96.5
Off-set 25 metres							
65.0	91.3	65.8	91.3	63.6	91.3	64.7	91.3
Off-set 50 metres							
60.4	88.3	61.3	88.3	58.9	88.3	60.1	88.3
Off-set 100 metres							
56.3	85.3	57.3	85.3	54.6	85.3	56.0	85.3

The predicted levels summarised in *Table 24* show that the additional coal trains would not increase the existing LAmax levels along the *MNRL* and the existing LAeq, 24 hour levels would increase by 1.4dBA and the *DECCW* $L_{Aeq\ 24\ hour}$ 60dBA goal is satisfied at approximately sixty (60) metres from the rail line. The L_{Amax} 85dBA level is predicted to be satisfied at a distance of approximately one hundred (100) metres.

To minimise noise level creep from the trains along the *MNRL* and where feasible and practical it is recommended that locomotives approved to operate on the New South Wales rail network in accordance with the noise limits L6.1 to L6.4 in RailCorp and ARTC Environmental Licences or a Pollution Control Approval be selected; and, train movements be limited during more sensitive nighttime hours.

8.0 CONSTRUCTION METHODS AND ACTIVITIES

For the purpose of noise assessment, an indicative construction plan and works method is outlined in this report for the civil works associated with the surface infrastructure at the three sites.

Detailed construction staging plans and works methods would be determined by the selected contractor prior to commencement. The actual construction method and staging may vary from the description presented in this report, as a result of detailed design changes and community consultations and submissions.

8.1 Construction Sites.

The three (3) main construction sites include Tooheys Road, Buttonderry and the West Shaft Site.

8.1.1 Tooheys Road

Civil and construction activities at Tooheys Road would include site establishment, infrastructure development and commissions. For modelling and assessment purposes four (4) phases of constructions were considered:

- Decline
- Civil infrastructure
- Rail loop and spur
- Administration buildings and facilities

8.1.1(a) Decline Construction Plant and Equipment

The major plant and equipment that is likely to be used during this phase includes excavators with hydraulic hammers, dozers, road headers, concrete trucks and concrete pumps, trucks and cranes.

8.1.1(b) Civil Infrastructure

The envisaged duration for the civil works is approximately twenty (20) months.
The works would commence with the clearing and grubbing of the site followed by the topsoil strip and stockpile. Excess topsoil would be spread on site in other areas of work. Bulk earthworks for the proposed stockpile pads, internal access roads and rail loop would commence soon after.

The plant and equipment that is likely to be used during these works would include excavators, rock breakers, dozers, scrappers, tippers, trucks, graders, vibratory rollers, compactor, asphalt pavers and water carts.

8.1.1(c) Rail Loop and Spur

Construction of the rail loop and spur would be carried out in three (3) main phases. Preparatory phase to isolate the construction zone from the operating RailCorp rail tracks, and to relocate or protect existing services and utilities. The major civil construction, when the earthworks, culverts and bridges would be constructed. Followed by the track construction and installation of signalling and communications facilities.

The plant and equipment that is likely to be used during these works would include excavators, rock breakers, dozers, scrappers, tippers, trucks, graders, vibratory rollers, compactor and water carts.

8.1.2 Buttonderry Site

During the construction phase of the Buttonderry site the main site activities would be associated with the site establishment, civil works including internal roads, drainage, erection of buildings, installation of equipment, the establishment of underground drifts and the ventilation shaft.

The plant and equipment that is likely to be used during these works would include excavators, shaft boring machine, rock breakers, dozers, scrappers, tippers, trucks, graders, vibratory rollers, compactor, asphalt pavers and water carts.

8.1.3 West Shaft Site

During the West Shaft construction phase the main site activities would be associated with the site establishment, civil works including internal roads, drainage, and the establishment of the ventilation shaft.

The plant and equipment that is likely to be used during these works would include excavators, shaft boring machine, rock breakers, dozers, scrappers, tippers, trucks, graders, vibratory rollers, compactor, asphalt pavers and water carts.

9.0 CONSTRUCTION NOISE AND VIBRATION GOALS

For major construction projects undertaken in New South Wales the *DECCW* recommend procedures for assessing noise and vibration impacts. Publications released and referred to by the *DECCW* with reference to the assessment of construction noise and vibration impacts includes the *Environmental Noise Control Manual (Chapter 171) (ENCM)* and the *Interim Construction Noise Guideline (2009) (ICNG)* and *Assessing Vibration: a technical guideline.* The *ICNG* recommends that construction noise associated with mining be assessed under the *NSW Industrial Noise Policy (EPA 2000) (INP).*

Albeit not directly related to construction noise from mining proposals the *ENCM* and *the ICNG* were developed in response to concerns raised with respect to construction noise impacts. The primary objective of the *ICNG* is aimed at managing noise from construction works regulated by the *DECCW.* The guideline deals with procedures to:

- promote a clear understanding of ways to identify and minimise noise from construction works;
- focus on applying all 'feasible and reasonable' work practices to minimise construction noise impacts;
- encourage construction to be undertaken during recommended hours;
- streamline the assessment and approval stages;
- reduce time spent dealing with complaints at the project implementation stage; and
- provide flexibility in selecting site-specific feasible and reasonable work practices in order to minimise noise impacts.

The *DECCW* recognise that feasible work practices are practical to implement, while reasonable work practices take into account the balance of costs and benefits and community views. Work practices recommended by the *DECCW* can include notifying the community of expected noise impacts and when they are expected to occur.

It is recognised that the procedures and recommendations published in the *ICNG* for

assessing noise from construction activities are best regarded as planning tools. They are not mandatory, and their application for assessing construction noise is not determined purely on the basis of compliance or otherwise with numerical noise levels.

For the purpose of assessing and managing construction noise impacts the *ICNG* refers to the proposed construction hours and the duration of the works. For construction works extending more than three (3) weeks a 'quantitative assessment method' is recommended. For construction works that are unlikely to affect an individual or sensitive land use for more than three (3) weeks in total, the *ICNG* refers to a 'qualitative assessment method'.

9.1 Standard Construction Hours

The recommended standard hours for construction are summarised in *Table 25.* Albeit the *DECCW* recognise that the recommended hours are not mandatory and that there would be situations, where construction works are undertaken outside of these hours.

Table 25. Recommended Standard Construction Hours

Work Type	Recommended Standard Hours of Work*
Normal Construction	Monday to Friday 7.00am to 6.00pm Saturday 8.00am to 1.00pm No works on Sundays or public holidays
Blasting	Monday to Friday 9.00am to 5.00pm Saturday 9.00am to 1.00pm No blasting on Sundays or public holidays

* The relevant authority (consent, determination or regulatory) may impose more or less stringent construction hours

9.2 Quantitative Noise Assessment Method

The *ICNG* *(Chapter 4)* refers to quantitative assessment methods involving predicted noise levels and comparing them with levels developed from Chapter 4 of the Guideline. For assessment purposes the Rating Background Level *(RBL)* is used when determining the management assessment level. *Table 26* sets out noise management levels at residences and how they are applied. Restrictions to construction hours may apply to activities that generate noise at residences above the 'highly noise affected ' noise management level.

Table 26. Noise at Residences (Quantitative Assessment)

Time of Day	Management Level LAeq (15 min)	How to Apply
Recommended standard hours: Monday to Friday 7.00am to 6.00pm Saturday 8.00am to 1.00pm No works on Sundays or public holidays	Noise affected RBL+10dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured LAeq 15min is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details
	Highly noise affected 75	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. 2. If the community is prepared to accept longer period of construction in exchange for restrictions on construction times
Outside recommended standard hours	Noise affected RBL+5	• A strong justification would typically be required for works outside the recommended standard hours • The proponent should apply all feasible and reasonable work practices to meet the noise affected level • Where feasible and reasonable practices have been applied and noise is more than 5 above the noise affected level, the proponent should negotiate with the community

* Noise levels apply at the residential property boundary that is most exposed to construction noise. If the property boundary is more than 30m from the residence the location for measuring or predicting noise levels is at the most noise-affected point within 30m of the residence.

For other noise sensitive land uses, such as schools, hospitals, etc *Table 27* presents management levels based on the principle that the characteristic activity for each of these land uses should not be unduly disturbed. Internal levels referenced in *Table 27* are assessed at the centre of the occupied room. External levels are assessed at the most affected point within 50m of the area boundary. Where internal noise levels cannot be measured adjusted external levels are recommended.

Table 27. Noise at Other Sensitive Receptors (Quantitative Assessment)

Land Use	Management Level LAeq (15 min)	
	Internal	External
Classrooms at schools and other educational institutes	45	55
Hospital wards and operating theatres	45	55
Places of worship	45	55
Active recreation areas	-	65
Passive recreation areas	-	60
Industrial premises	-	75
Office, retail outlets		70
Community centres	Refer to AS2107**	

* External levels measured within 50m of property boundary.
** Refer to recommended 'maximum' internal levels in AS2107 for specific uses.

9.3 Sleep Disturbance at Residences

Where construction works are planned to extend over more than two consecutive nights, and a quantitative assessment method is used, the *ICNG* recommends that the analysis include the assessment of maximum noise levels, and the extent and number of times that the maximum noise level are likely to exceed the *RBL.*

9.4 Qualitative Noise Assessment Method

The qualitative method for assessing noise is used for construction sites that are not likely to affect an individual or sensitive land use for more than three (3) weeks. Where residences may be affected by noise, work practice methods should be considered and a community notification program implemented together with a Noise Management Plan.

9.5 Project Construction Noise Goals

Considering the recommendations of the *ICNG,* the *INP* and the measured *RBL's,* the target assessment goals recommended for evaluating construction noise are summarised in *Table 28*.

For assessment purposes construction noise is assessed at a height of 1.5m above ground level at a residential property boundary or thirty (30) metres from a residential dwelling, if the boundary is more than thirty (30) metres from the dwelling.

Table 28. Construction Noise Target Goals
dBA 20 × 10^{-6} Pa

Period	Existing RBL	Existing L_{Aeq}	Project Noise Assessment Goals L_{Aeq}
Location M1: 250 Bruce Crescent			
Day	36	49	41
Location M2: 118 Bushell Ridge Road			
Day	38	51	43
Location M3: 235 Bushell Ridge Road			
Day	52	61	57
Location M4: 209 Bushell Ridge Road			
Day	58	64	63
Location M5: 97 Bushell Ridge Road			
Day	37	48	42
Location M6: 4 Kira Road			
Day	41	52	46
Location M7: Hue Hue Road			
Day	43	57	48
Location M8: Amberwood Close			
Day	41	50	46
Location M9: Sandra Road			
Day	33	44	38
Location M10: 113A Mountain Road			
Day	39	49	44
Location M11: 20 Bushell Ridge Road			
Day	44	64	49
Location M12: Bushell Ridge Road			
Day	44	56	49

Notes: Day: 7.00am to 6.00pm Monday to Saturday, 8.00am to 6.00pm Sunday and Public Holidays.

9.6 Ground Vibration

As part of the site preparation rock may be encountered and accordingly rock hammers and or small explosive charges may be required. The effect of vibration on humans and structures is normally considered and evaluated in terms of annoyance and structural damage.

9.6.1 Annoyance

The *DECCW*, *Assessing Vibration: a technical guideline* recommends goals for assessing human response and potential disturbance to the occupants of buildings. *Table 29* presents a summary of velocity levels (rms) referenced to specific frequency bands adjusted by multiplying factors for residential receptors referenced to human response *(BS 6472-1992. Figure B1.4).*

Table 29. Vibration Levels for Assessment of Human Comfort

Frequency (Hz)	Vibration Level (mm/s)			
	Continuous Vibration		Intermittent Vibration	
	Day (2)	Night (1.4)	Day (60)	Night (90)
1	3.2	2.2	95	31
1.25	2.3	1.6	68	22
1.6	1.6	1.1	47	15
2	1.1	0.8	33	11
2.5	0.8	0.6	24	8.0
3.15	0.6	0.4	17	5.8
4	0.4	0.3	19	4.0
5	0.3	0.2	9.5	3.2
6.3	0.3	0.2	7.6	2.5
8	0.2	0.1	6.0	2.0
10	0.2	0.1	6.0	2.0
12.5	0.2	0.1	6.0	2.0
16	0.2	0.1	6.0	2.0
20	0.2	0.1	6.0	2.0
25	0.2	0.1	6.0	2.0
31.5	0.2	0.1	5.4	1.8
40	0.2	0.1	6.0	2.0
50	0.2	0.1	6.0	2.0
63	0.2	0.1	6.0	2.0
80	0.2	0.1	6.0	2.0

9.6.2 Perception

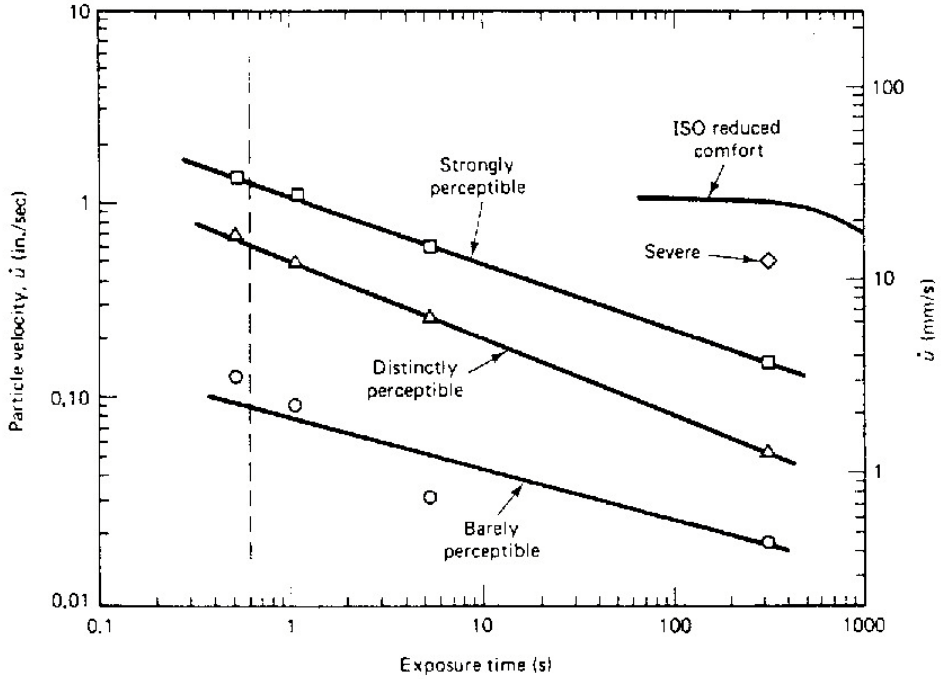
For comparison of vibration in terms of human response, *Table 30* presents a summary of levels referenced to likely perception.

Table 30. Human Perception of Vibration
Ref: German Standard DIN 4150 (1986)

Vibration Levels mm/sec	Likely Perception
0.15	Perception Threshold
0.35	Barely Noticeable
1.0	Noticeable
2.2	Easily Noticeable
6.0	Strongly Noticeable
14.0	Very Strongly Noticeable

Figure 5 compares human response to vibration levels and exposure. The data in *Figure 5* demonstrates that short duration vibration exposure levels are less perceptible than longer continuous levels.

Figure 5: Human Response to Vibration



9.6.3 Structural Damage

German Standard DIN4150 Part 3 (1986) provides guidelines for evaluating the effects of vibration on structures. The values recommended in the standard are summarised in *Table 31*. The values are the maximum levels measured in any direction at the building foundation.

Table 31. Safety Limits for Structural Damage

Type of Structure	Vibration Level (mm/s)		
	< 10Hz	10Hz to 50Hz	50Hz to 100Hz
Commercial/industrial buildings or buildings with similar design	20	20 to 40	40 to 50
Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20
Structures of great intrinsic value (eg. buildings under preservation)	3	3 to 8	8 to 10

Ref: German Standard DIN4150

9.7 Plant and Equipment

The construction plant schedule and sound power levels summarised in *Table 32* were adopted for the purpose of predicting noise from each site. The sound power levels were established from Table D2 of Australian Standard 2436 1981 *"Guide to Noise Control on Construction Maintenance and Demolition Sites",* site attended audit measurements and manufacturers data.

Table 32. Construction Plant Sound Power Levels
dBA re: 10^{-12} Watts

Plant Description	Sound Power Level dBA	
	Range	Average Level
Dozers	104-111	108
Water Cart	104-106	105
Front End Loaders	105-112	107
Haul Trucks	102-113	110
Scrapers	110-115	113
Track Excavators	105-115	110
Graders	105-110	107
Excavator with Hydraulic Breaker	112-122	120
Rollers	100-113	106
Backhoe	100-108	104
Concrete Truck	108-110	109
Concrete Pump	100-110	105
Truck Mounted Crane	100-106	102

9.7.1 Construction Traffic Generation

The projected daily traffic generation for each site during construction and operation is summaried in *Table 13.* It should be noted that construction at the Tooheys Road and Buttonderry sites would be undertaken at the same time, the western shaft site is not expected to be under construction until around year 10 of mining.

9.7.2 Construction Equipment Vibration Emission Levels

During the excavation and construction activities associated with access tracks and preparation of trenches, it may be necessary to use plant and equipment that would generate ground vibration. To evaluate the likely effects of the construction activities, the following vibration levels (*Table 33*) have been considered.

Table 33: Typical Plant Vibration Levels
mm/sec

Plant Description	Vibration Levels mm/sec		
	@ 5m	**@ 20m**	**@ 40m**
Rock-breaker (large)	5	0.5	0.3
Rock breaker (light)	1	0.3	0.1
Dozer	2	0.2	0.02
Truck	1	0.05	0.02

9.8 Modelling and Assessment of Construction Noise

Noise from construction activities was modelled with the EPA approved Environmental Noise Model (ENM) computer model. The model considers attenuation factors such as distance, shielding from working faces, ground vegetation, atmospheric absorption, topographical features of the areas. *Attachments 13 and 14* present noise contour plots for Tooheys Road and Buttonderry and the envisaged worst case scenario with all earth works operating simultaneously.

The predicted results show that construction noise impacts have the potential to exceed the noise target assessment objectives. Considering the transient nature of the construction works the short-term impacts would normally be considered to be acceptable.

9.9 Off-site Construction Traffic Noise

Table 34 presents a summary of the predicted peak hour traffic noise levels assuming a 50% split in traffic from the Buttonderry site and an average pass-by traffic speed of 60kph.

Table 34. Predicted Construction Traffic Noise Levels

Site	Vehicle Type	Trip Numbers	Predicted Facade Sound Pressure Levels $L_{Aeq\ 1\ hour}$			
			10m	**30m**	**50m**	**100m**
Tooheys Road site	Light (employees)	150	60.8	56.9	54.8	52.0
	Trucks	13	59.9	55.9	53.9	51.0
Total			**63.4**	**59.4**	**57.4**	**59.4**
Buttonderry site	Light (employees)	75	54.8	50.9	48.8	46.0
	Trucks	9	55.3	51.3	49.3	46.4
Total			**61.1**	**57.1**	**55.1**	**52.2**

The predicted $L_{Aeq\ 1\ hour}$ traffic noise levels at thirty (30) metres satisfy the daytime 60dBA target noise assessment goals for collector roads. Passby L_{Amax} noise levels *(Figure 4)* from cars and trucks at thirty (30) metres are predicted to range between 64-76 dBA. Typically residential dwellings on Bushell Ridge Road and Hue Hue Road are set back more than thirty (30) metres from the centre road alignment.

9.10 Vibration Levels from Construction Activities

The main source of ground vibration that has been identified and assessed is associated with rock hammers. Ground vibration level predicted from rock hammers could range up to 0.5mm/sec at a distance of twenty (20) metres, and are below 0.3mm/sec at forty (40) metres. Vibration levels at these distances satisfy the structural damage assessment goals *(Table 31*) and expected to be acceptable from a human disturbance point of view.

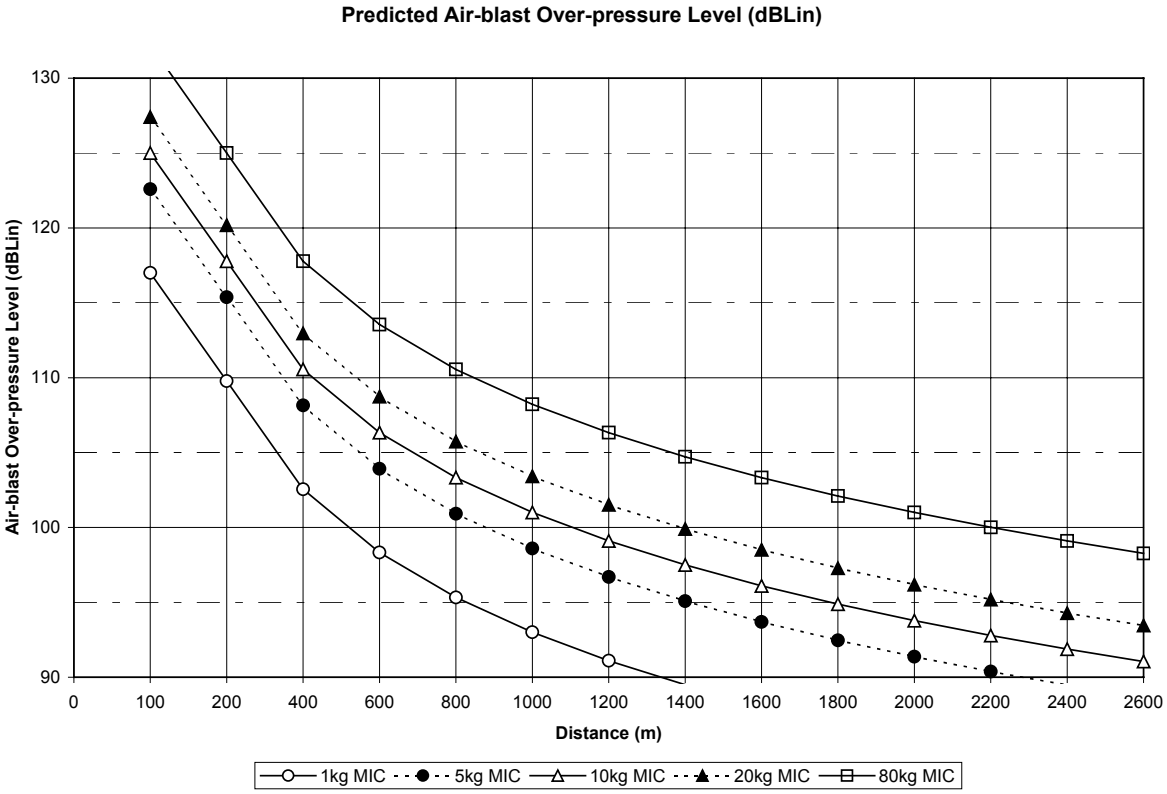
9.11 Blast Assessment

Confined blasting may be required to remove rock outcrops. Blast holes would be drilled and filled with an explosive charge and detonated with the aid of primers and detonators. Impacts associated with blasting normally relate to air blast overpressure and ground vibration.

9.11.1 Air-blast Overpressure Prediction Model

Air-blast overpressure is a function of maximum instantaneous explosive charge and the distance between the receiver and blast location. *Figure 6* presents a summary of the maximum instantaneous charge *(MIC)* blast design data used to predict air-blast overpressure.

Figure 6: Air-blast Overpressure v Distance

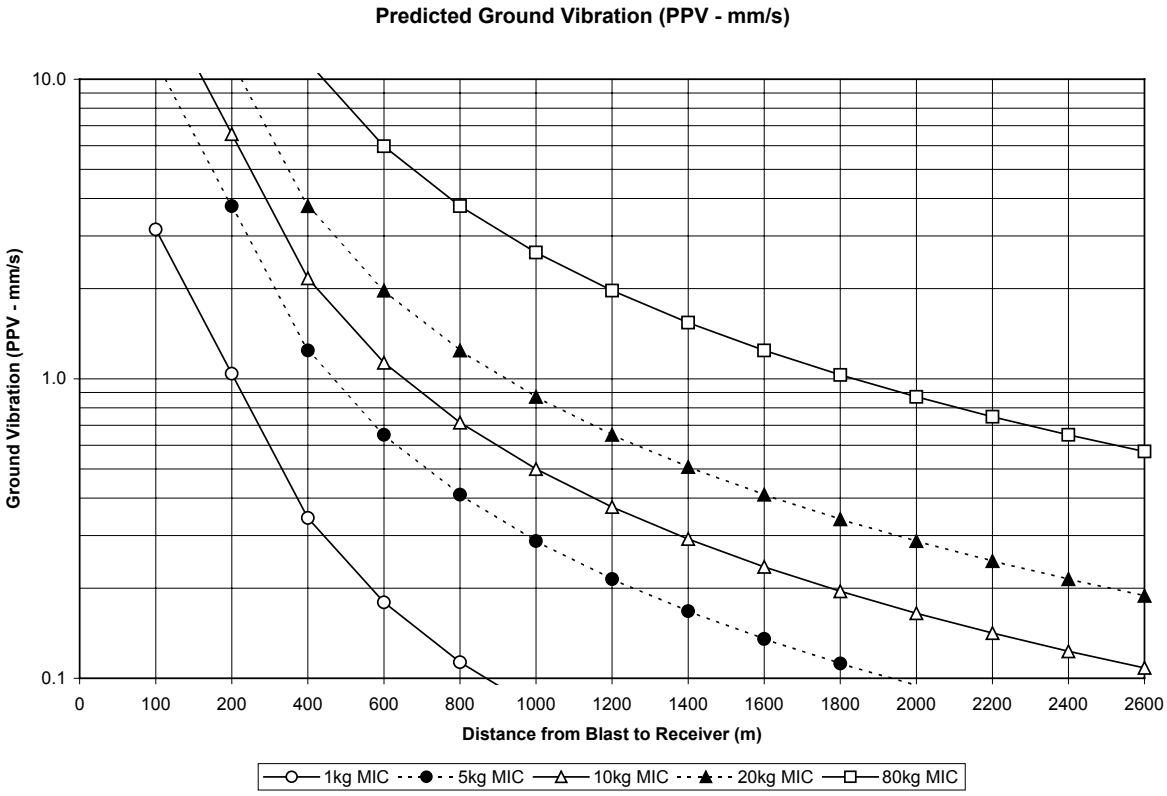


The results in *Figure 6* show that the *DECCW/ANZECC* air-blast overpressure goal (115dBLin) can be satisfied with the employment of controlled MIC's (1-3kg) at a distance of two hundred (200) metres.

9.11.2 Ground Vibration Prediction Model

Ground vibration is a function of maximum instantaneous charge, the distance between receiver and blast location and ground condition. The predictive formula adopted for peak particle velocity (PPV) assessment is based on the site law data provided in Australian Standard AS2187: Part 2 (1993). *Figure 7* provides the predicted PPV v distance vibration levels for confined blast conditions.

Figure 7: Ground Vibration v Distance



The results summarised in *Figure 7* show that the *DECCW/ANZECC* ground vibration goal (5mm/sec) is satisfied with the employment of controlled MIC's (1-3kg) at a distance of two hundred (200) metres.

9.12 Recommendations

Considering the predicted noise exceedances for the construction site as part of the contractor's contractual requirements for the project, noise control and management practices will form part of the contract to minimise potential impacts. In accordance with recognised practices the following items would form part of any pending construction contract:

- an undertaking to control and minimise noise impacts during the construction phase of the project;

- the adoption of Best Management Practice *(BMP)* and Best Available Technology Economical Achievable *(BATEA)* practices;
- all plant to be selected after consideration to noise emissions from the items of plant;
- the development of a site induction program for all contractors. The program to include noise reduction techniques and ongoing maintenance of noise controls throughout the duration of the construction works;
- information to be provided to affected property owners prior to commencing noisy works. The information provided to include hours of works and the duration of the works; and
- contact details for affected property owners to contact site environmental staff for complaints to be received in relation to noise and recorded.

As part of the Environmental Management Plan *(EMP)* a Noise Management Plan *(NMP)* would be developed. The *NMP* would be prepared by the construction contractor prior to commencing site works. The plan would include a monitoring program, identify and address noise impacts for potentially affected properties, noise mitigation measures and noise management practices.

10.0 CONCLUSION

The Wyong Areas Coal Joint Venture (WACJV) propose to develop an underground coal mine with surface processing facilities with a rail loop north of Wyong. The project would involve the extraction of up to five (5) million tonnes per annum of export quality coal.

Site attended audits confirmed that the local acoustic environments at residential properties in the vicinity of the development sites are controlled by road traffic noise, natural elements and localised domestic activities. Traffic noise exposure for each site is dependent on location and exposure to the F3 Freeway (Sydney to Newcastle), Hue Hue Road or Bushell Ridge Road. Two (2) locations not directly influenced by nearby road traffic noise are Bruce Crescent (M1) and Sandra Street (M9). Albeit, distant road traffic noise was audible at both locations during source (road) to receiver breeze conditions.

The main noise sources at the Tooheys Road site would be associated with infrastructure and workshops, including conveyors, crusher, train loading and mobile plant. Plant at the Buttonderry site would include ventilation fans and the mine winding building. It is not proposed to install any fixed plant at the West Shaft site that would impact on the existing noise environment.

From the measured ambient noise levels *(Table 2)* and the *INP* procedures, *Table 11* presents a summary of the assessment RBL's, the L_{Aeq} noise levels and project-specific noise assessment goals. The *DECCW* recognise that it does not always follow that all people exposed to noise levels that exceed the *INP* project specific noise goals would find the noise unacceptable. For situations were the *INP* project noise goals are not achieved the following management and affectation criteria is normally considered.

For areas where the predicted noise levels exceed the project specific assessment goals by up to 5dBA, the affectation could be described as negligible to moderate. For these situations and where it is not feasible to reduce the site noise, it is recommended that consideration is given to acoustic treatments to exposed receptors or discussions with identified property owners with respect to negotiated agreements. For the properties

identified in the *noise management zone*, agreements would be finalised with the property owners after commission and compliance noise audits confirm that the project noise assessment goals are not satisfied. For areas where the predicted noise levels exceed the project specific assessment goals by more than 5dBA the affectation could be described as unacceptable. For these situations and where it is not feasible to reduce the site noise emissions, it is recommended that consideration be given to offering acoustic treatments to exposed receptors or discussions undertaken with property owner with respect to negotiated agreements.

Noise modelling for the project assumed that the fixed and mobile plant was operating simultaneously together with train loading. *Tables 18 and 19* present a summary of the predicted noise levels at the reference assessment locations (*Figure 3*) for each meteorological scenario. The results summarised in *Tables 18 and 19* show that the project noise assessment goals *(Table 9)* are satisfied during calm and adverse weather conditions. For descriptive purposes noise contours for the Tooheys Road site are presented in *Attachments 5 to 12.*

For assessment purposes noise contour plots for the Buttonderry site are presented in *Attachment 13*. The results predicted for Buttonderry show that the project specific assessment noise goals *are* satisfied.

A review of the operational noise source rankings identified that there is minimal potential to further reduce noise from the Tooheys Road site. Where operational noise exceedances are identified it is recommended, the proponent *WACJV* approach the affected property owners to discuss in detail the proposed activities and potential noise levels at their properties. Potential noise mitigation strategies should be discussed with the property owners including purchased and executed if the owner believes he or she is adversely affected by noise from the proposal; and noise level measurements confirm the recommended goals are exceeded.

The predicted $L_{Aeq\ 1\ hour}$ road traffic noise levels for the Tooheys Road (Bushell Ridge Road) and Buttonderry sites (Hue Hue Road) during the operational phase satisfy the

daytime 60dBA and nighttime 55dBA target noise assessment goals at off-set distances of ten (10) metres and thirty (30) metres respectively. Passby L_{Amax} noise levels from cars at thirty (30) metres are predicted to be in the order 64-65dBA.

Noise modelling for peak annual production output of 5,000,000 tonne per year show that the additional rail traffic would marginally increase (1-2dBA) the existing $L_{Aeq, 24\ hour}$ rail traffic noise levels on the Main Northern Rail Line. With respect to the LAmax noise levels the project is not expected to increase the existing levels.

For the purpose of noise assessment, an indicative construction plan and method is outlined in this report for the civil works associated with the surface infrastructure. Detailed construction staging plans and methods would be determined by the selected contractor prior to the commencement of construction. The actual construction method and staging may vary from the description presented in this report, as a result of detailed design changes and community consultations and submissions.

Noise from envisaged construction activities was modelled with the EPA approved Environmental Noise Model (ENM) computer model. *Attachments 14 and 15* present noise contour plots for Tooheys Road and Buttonderry and the envisaged worst case scenario with all earth works operating simultaneously.

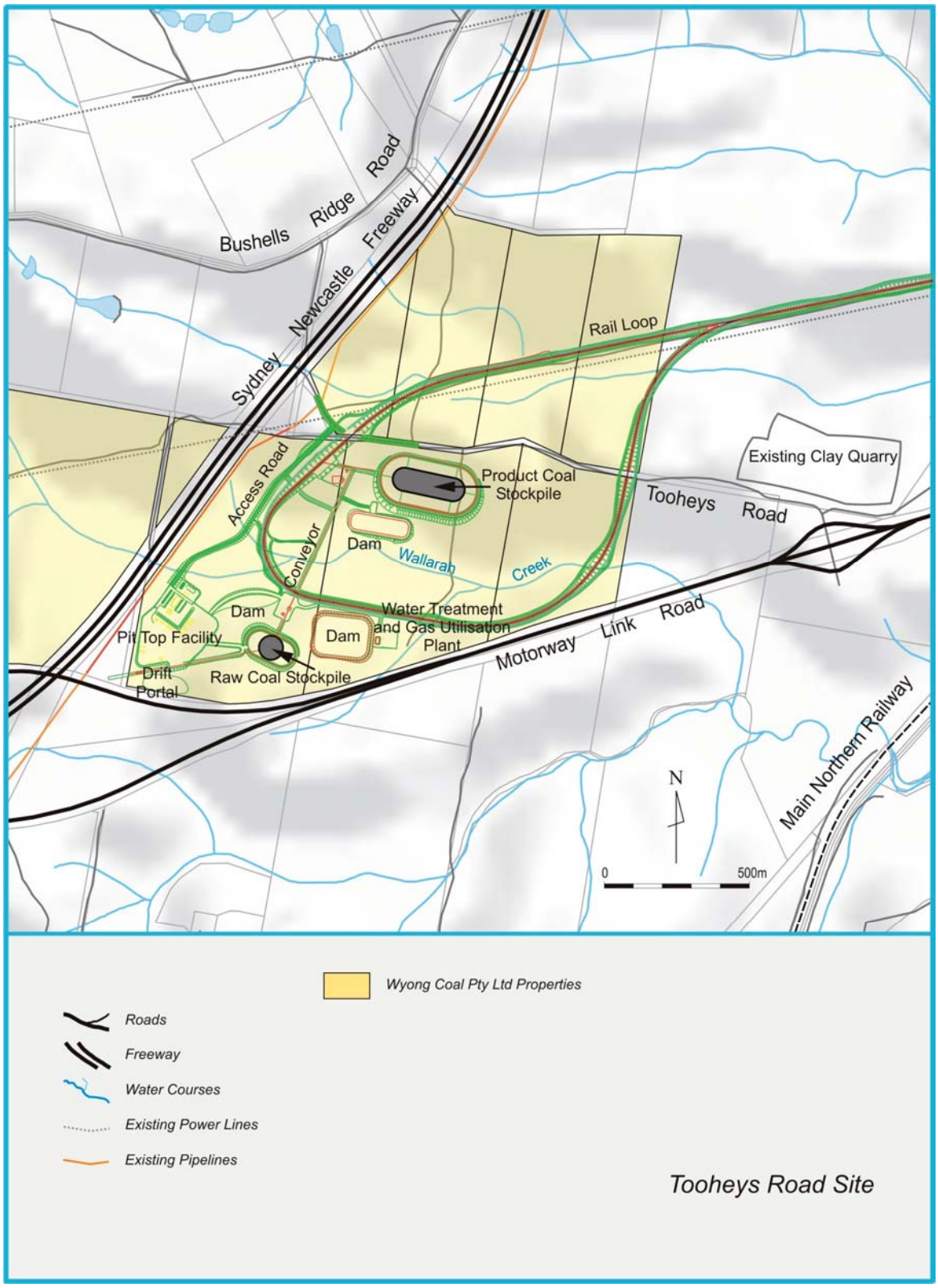
The predicted results show that construction noise impacts have the potential to exceed the noise assessment objectives. Notwithstanding the predicted exceedances considering the transient nature of the construction works the short-term impacts would normally be considered to be acceptable.

The main source of ground vibration that has been identified and assessed is associated with rock hammers. Ground vibration level predicted from rock hammers could range up to 0.5mm/sec at a distance of twenty (20) metres, and are below 0.3mm/sec at forty (40) metres. Vibration levels at these distances satisfy the structural damage assessment goals *(Table 31*) and expected to be acceptable from a human disturbance point of view.

If blasting is required the assessment has shown that the ground vibration goal and air blast over pressure can be satisfied with the employment of controlled MIC's.

Considering the findings of the noise modelling and the predicted noise and vibration levels it is recommended as part of the contractor's contractual requirements, noise and vibration control and management practices form part of the contract to minimise potential impacts during the construction phase of the project.

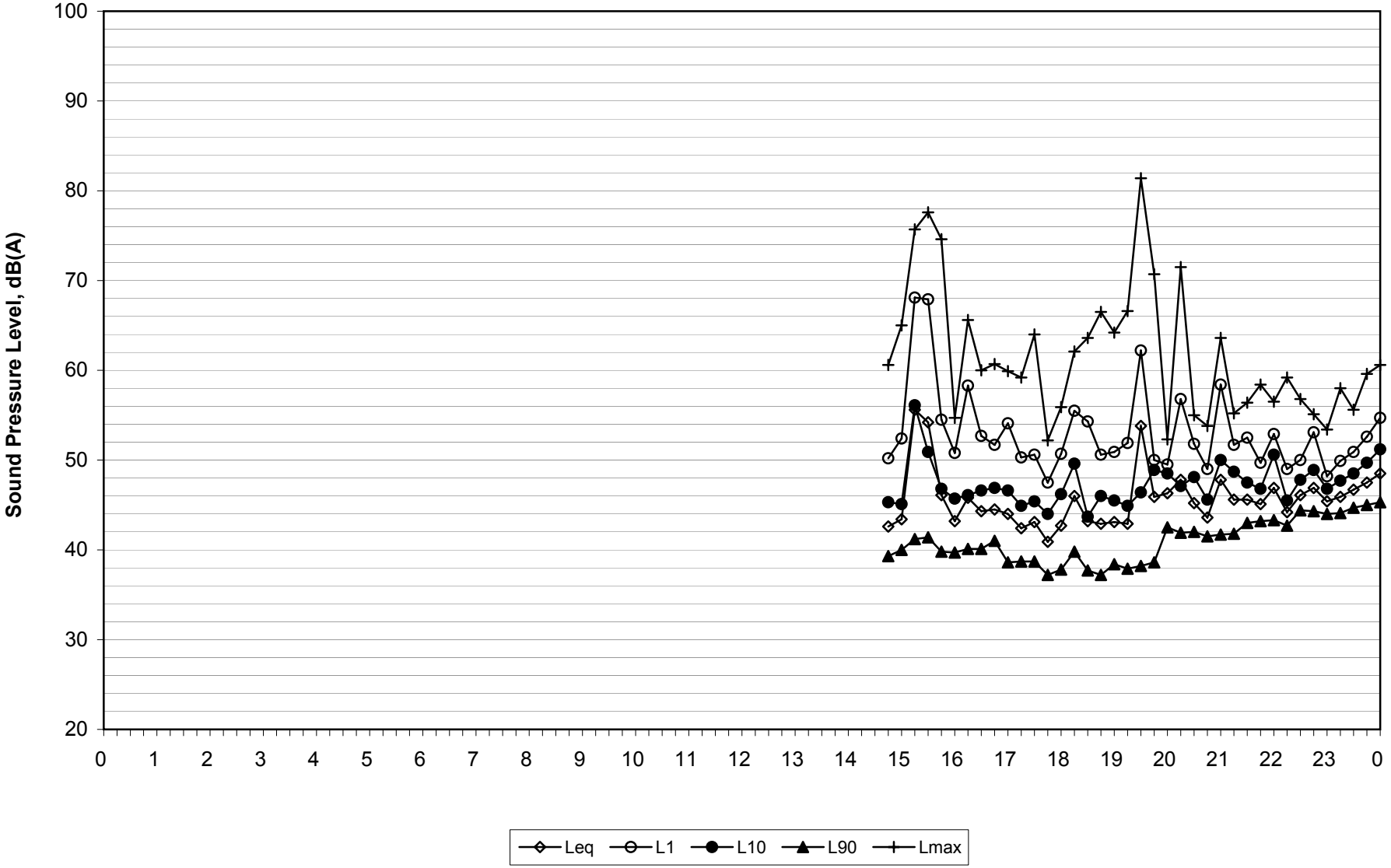
ATTACHMENT 1: TOOHEYS ROAD SITE LAYOUT



ATTACHMENT 2: AMBIENT SOUND PRESSURE LEVELS

Ambient Sound Pressure Levels

Thursday 09 November 2006

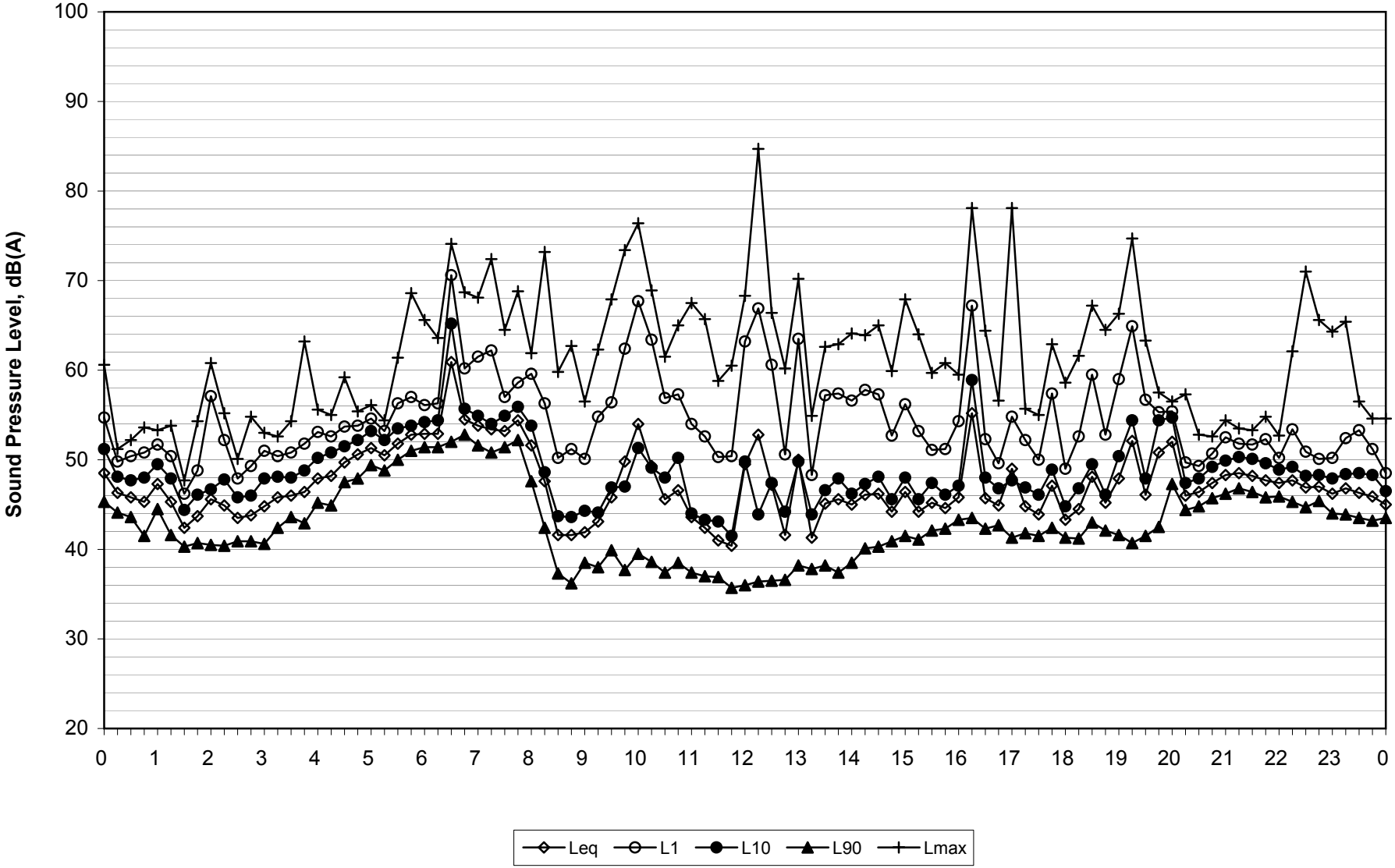


Reference Location M1
250 Bruce Crescent

5987R1.xls

Ambient Sound Pressure Levels

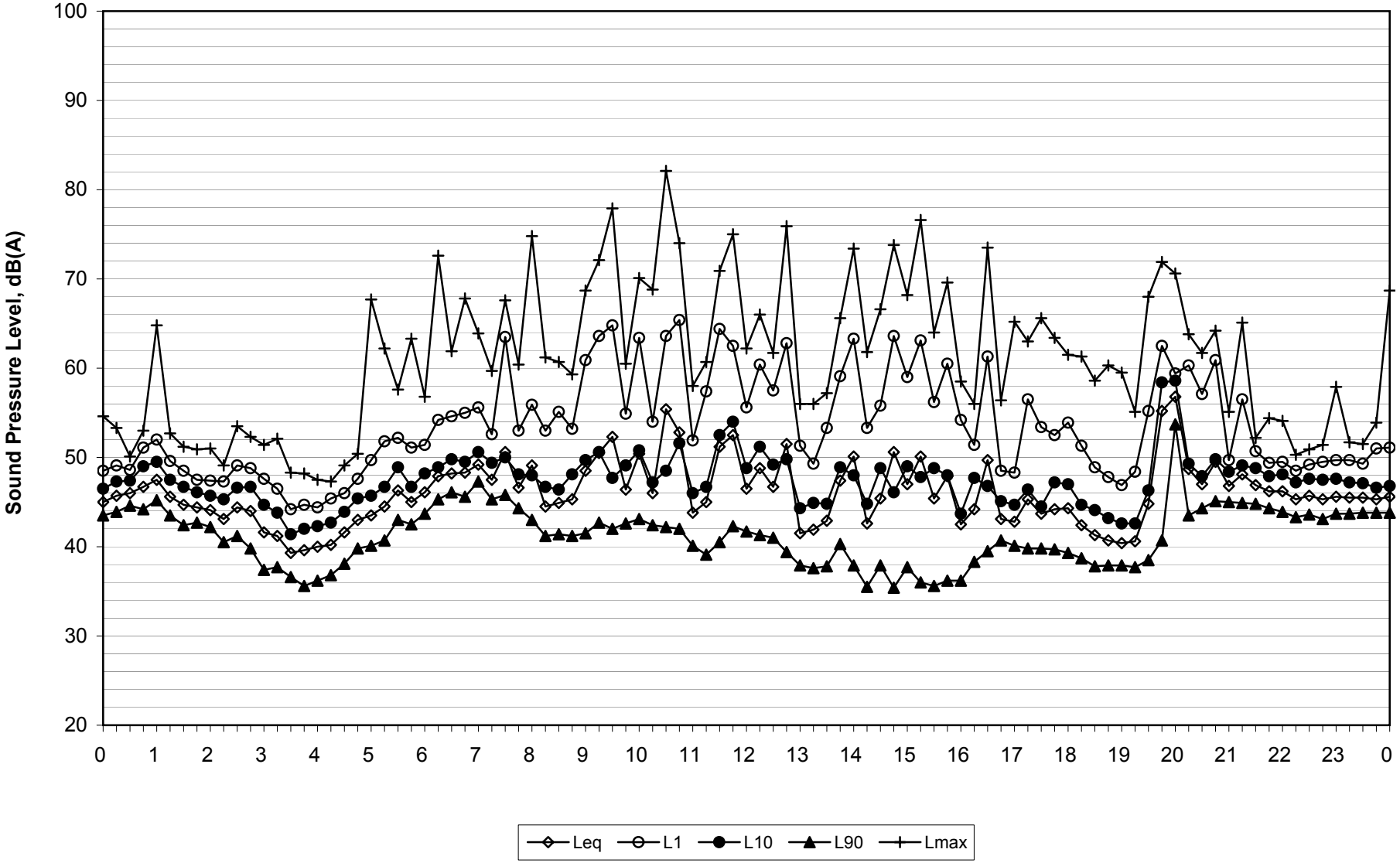
Friday 10 November 2006



Reference Location M1
250 Bruce Crescent

Ambient Sound Pressure Levels

Saturday 11 November 2006

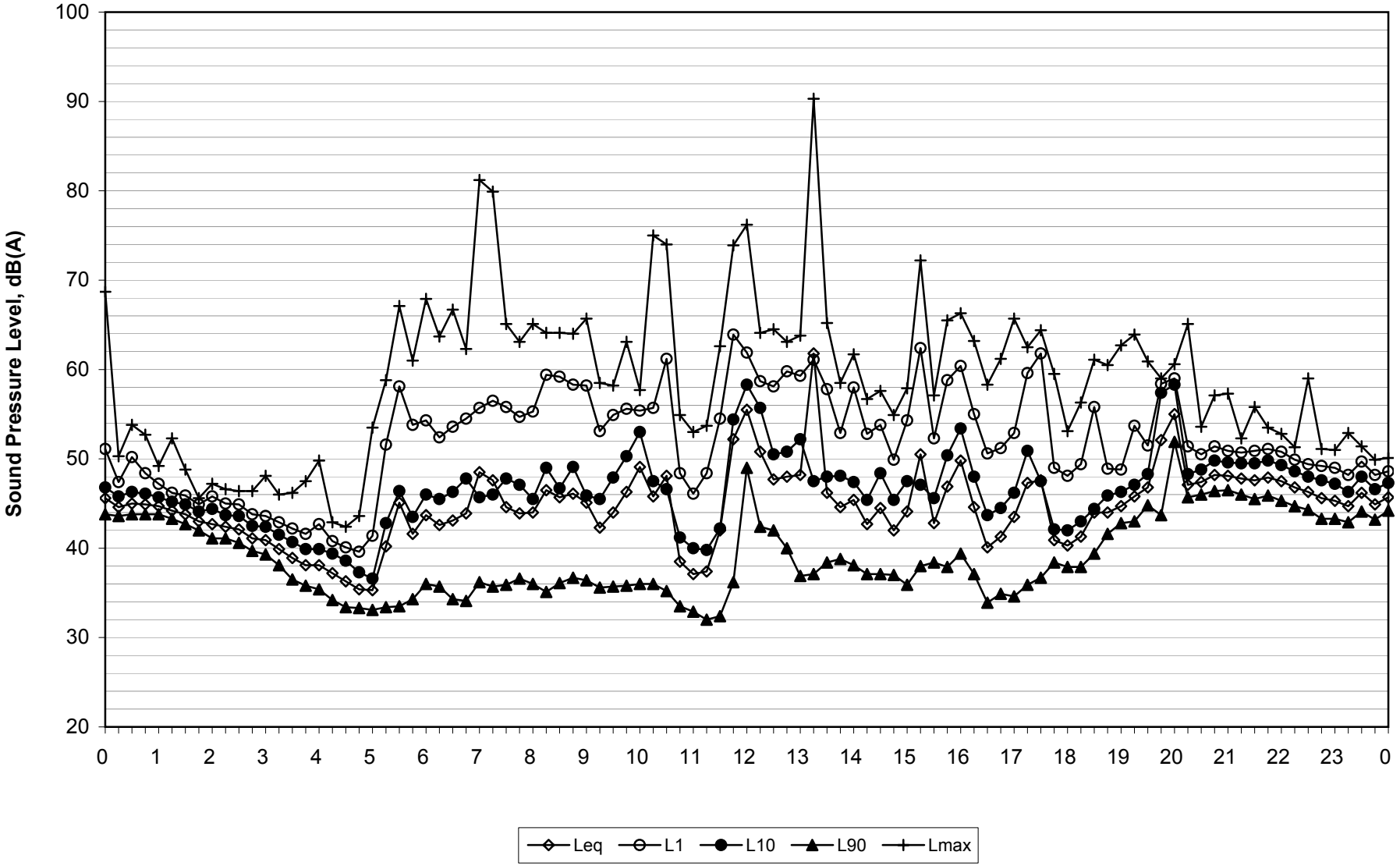


Reference Location M1
250 Bruce Crescent

5987R1.xls

Ambient Sound Pressure Levels

Sunday 12 November 2006

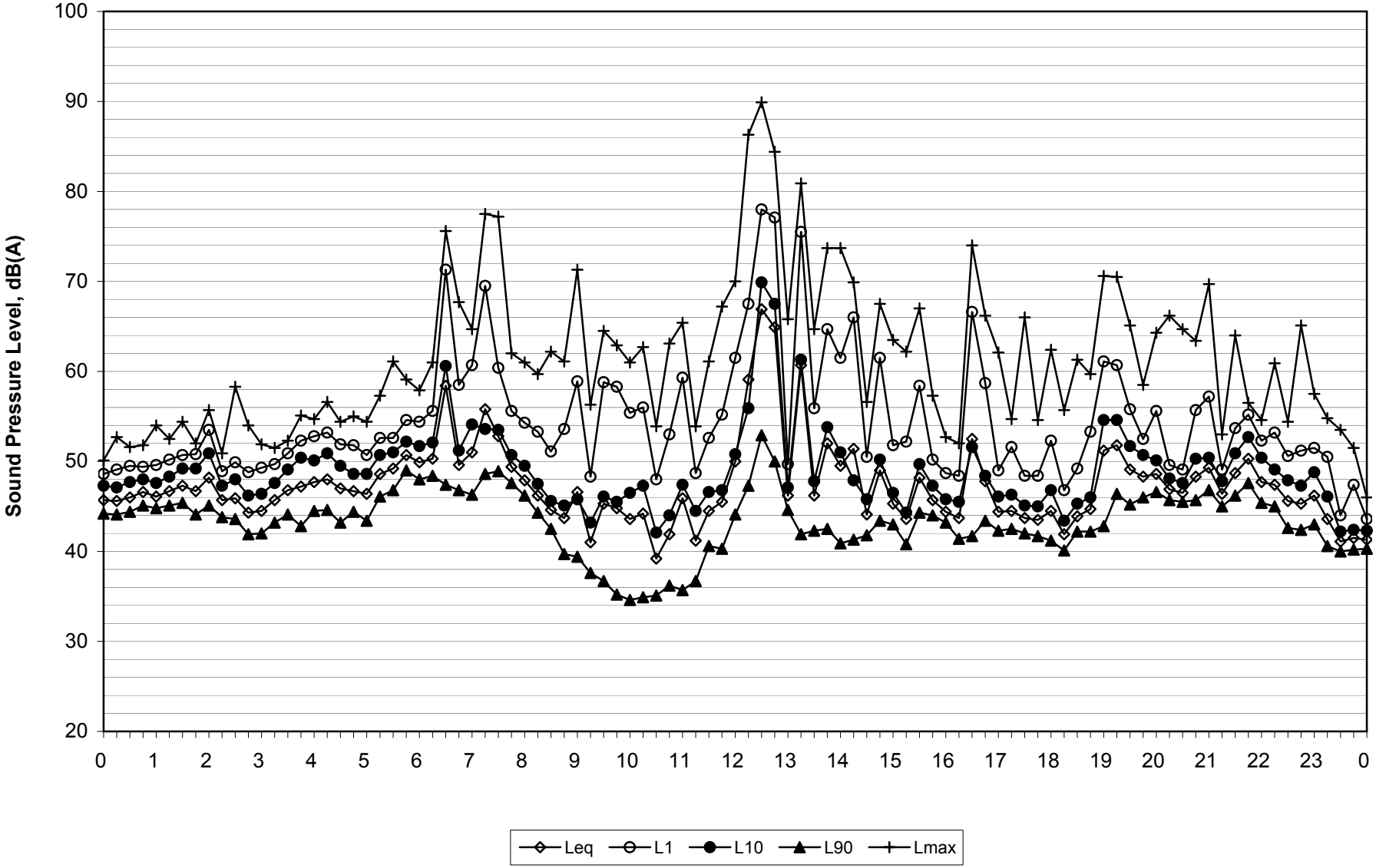


Reference Location M1
250 Bruce Crescent

5987R1.xls

Ambient Sound Pressure Levels

Monday 13 November 2006

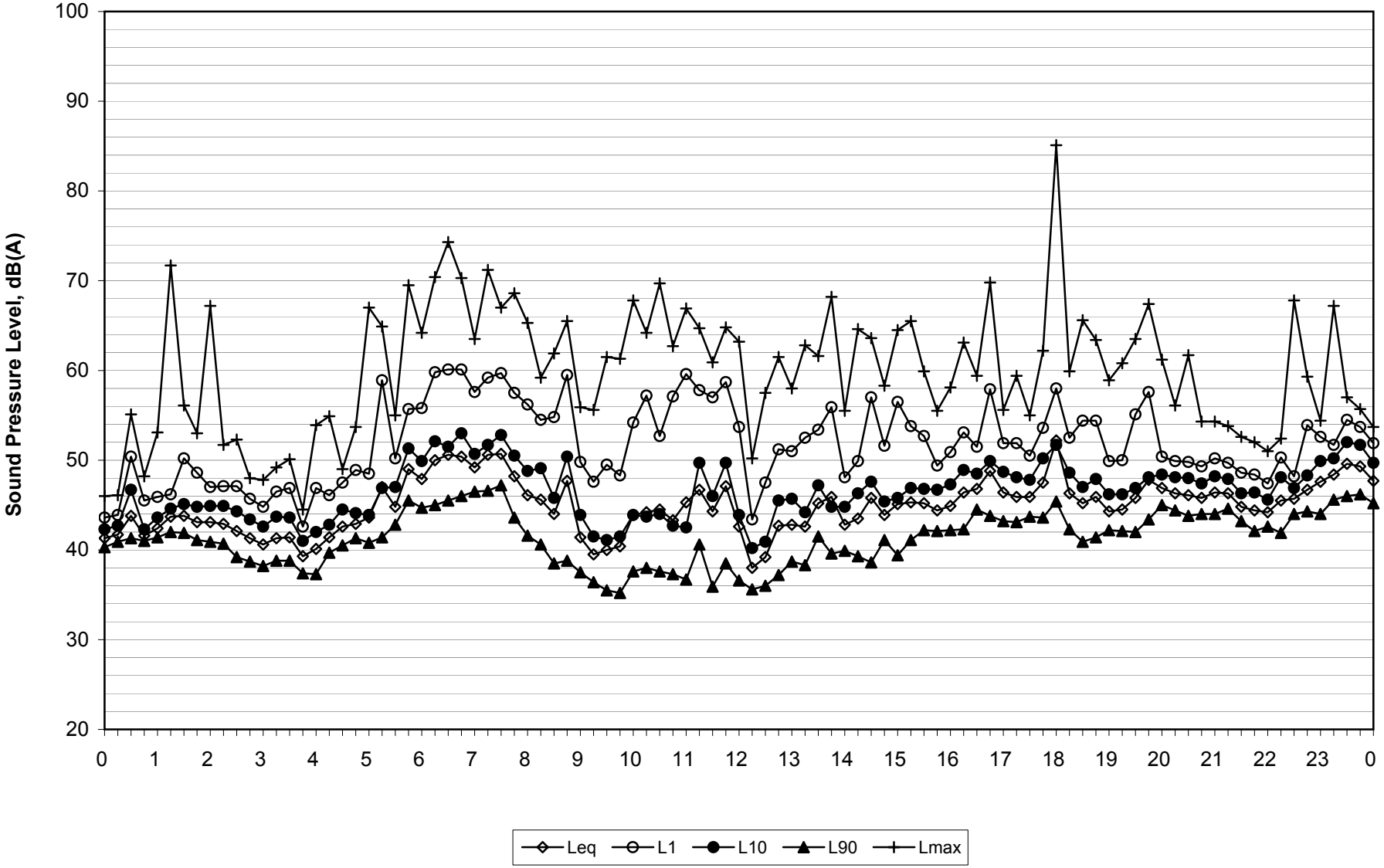


Reference Location M1
250 Bruce Crescent

5987R1.xls

Ambient Sound Pressure Levels

Tuesday 14 November 2006

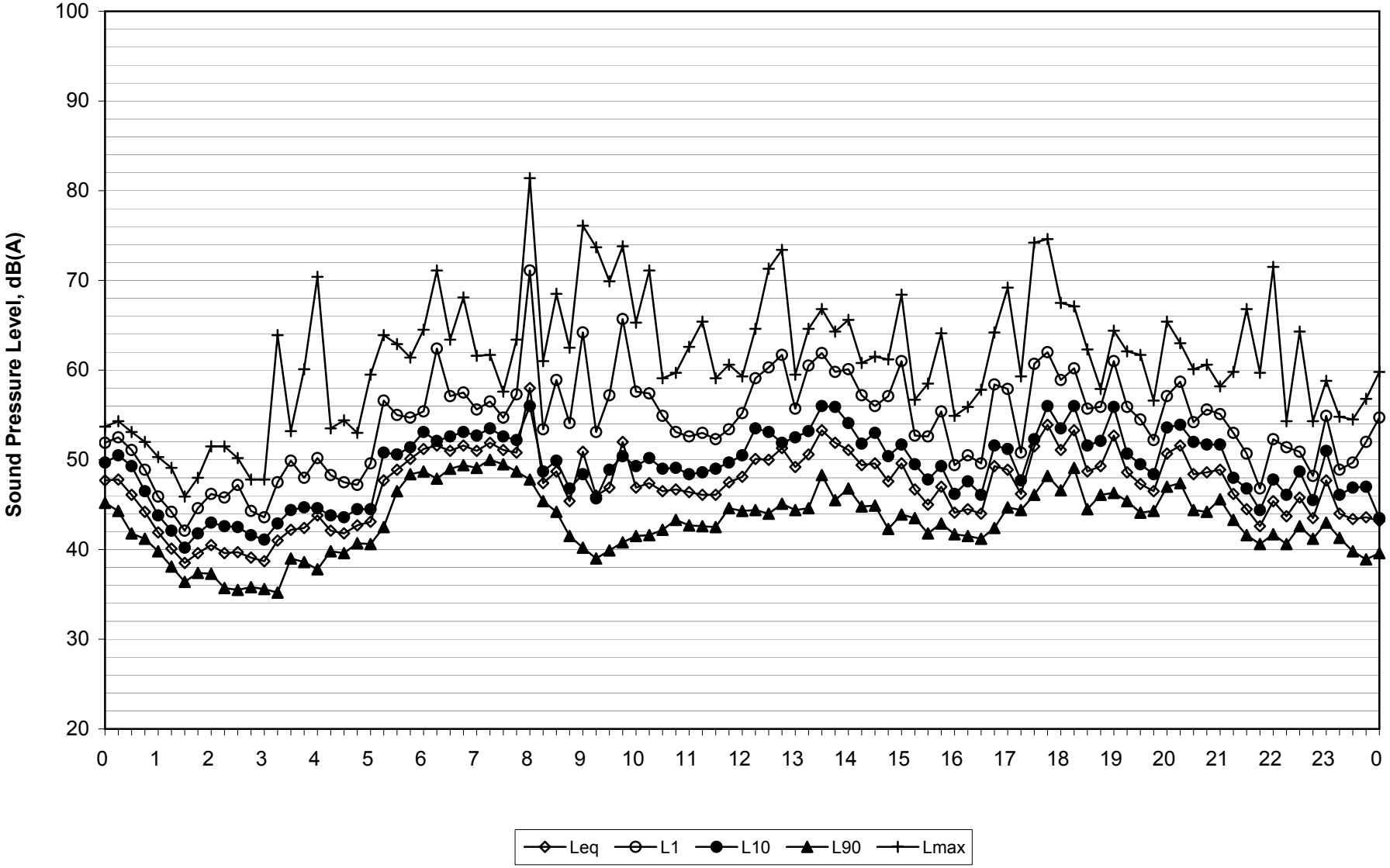


Reference Location M1
250 Bruce Crescent

5987R1.xls

Ambient Sound Pressure Levels

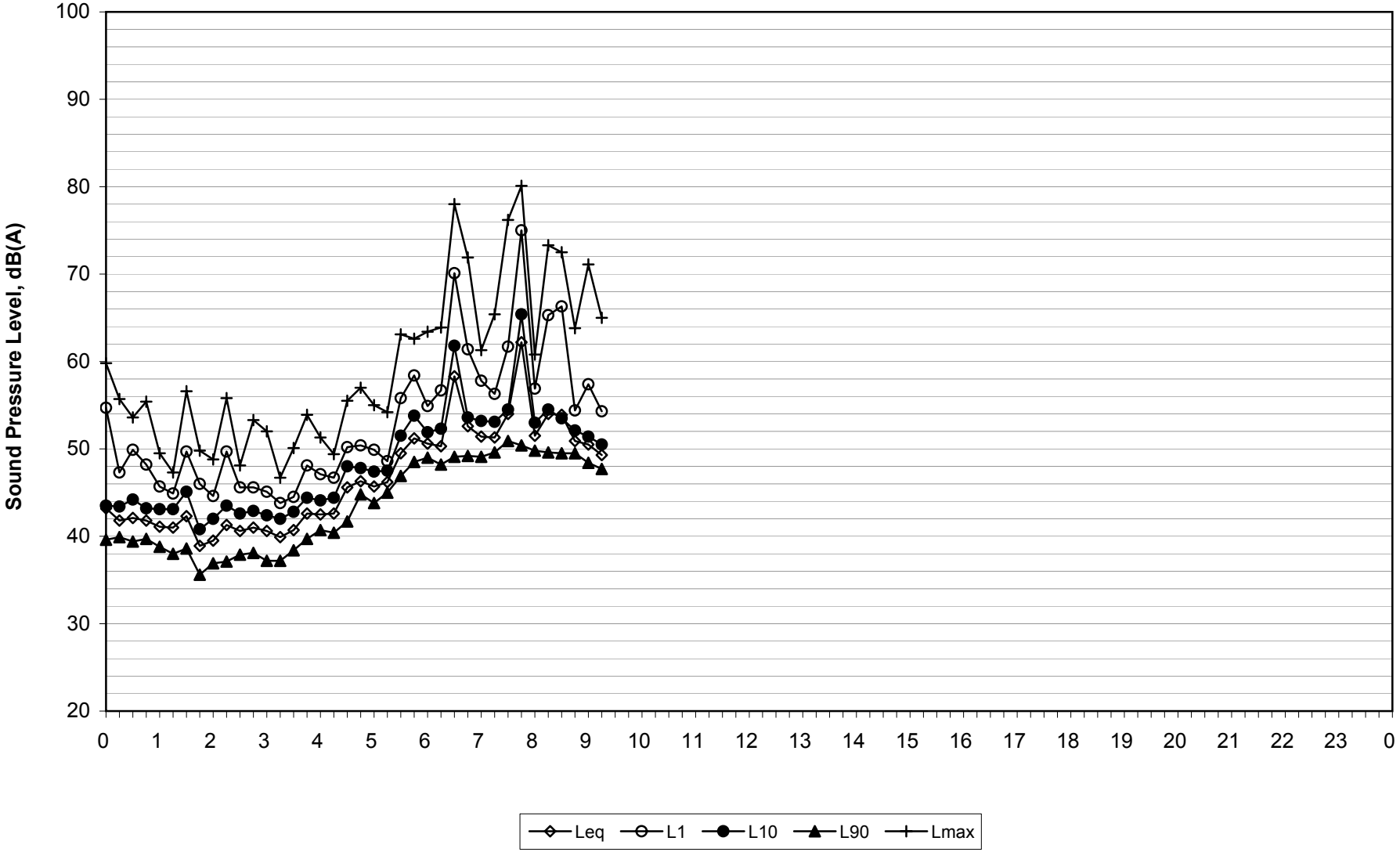
Wednesday 15 November 2006



Reference Location M1
250 Bruce Crescent

Ambient Sound Pressure Levels

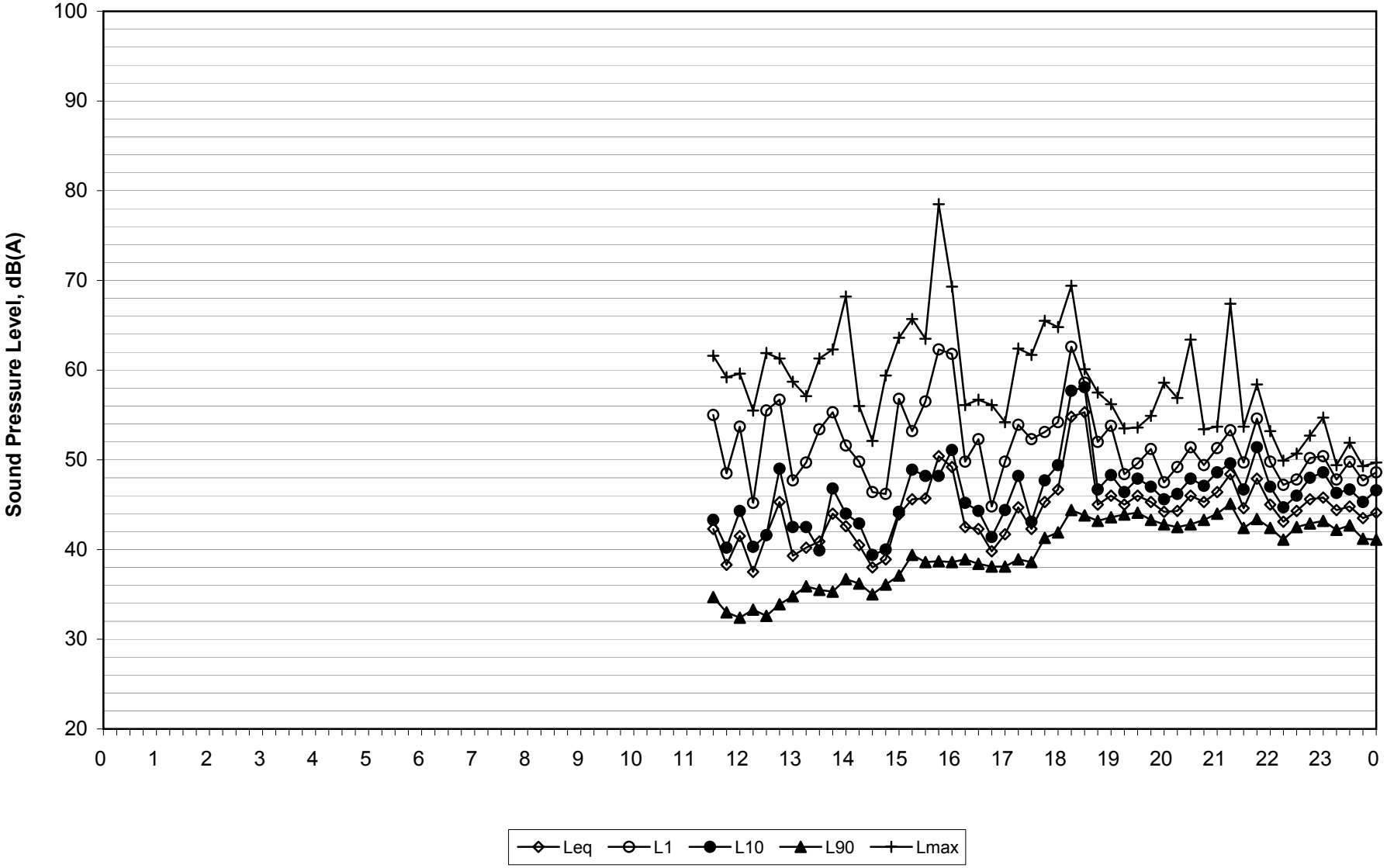
Thursday 16 November 2006



Reference Location M1
250 Bruce Crescent

Ambient Sound Pressure Levels

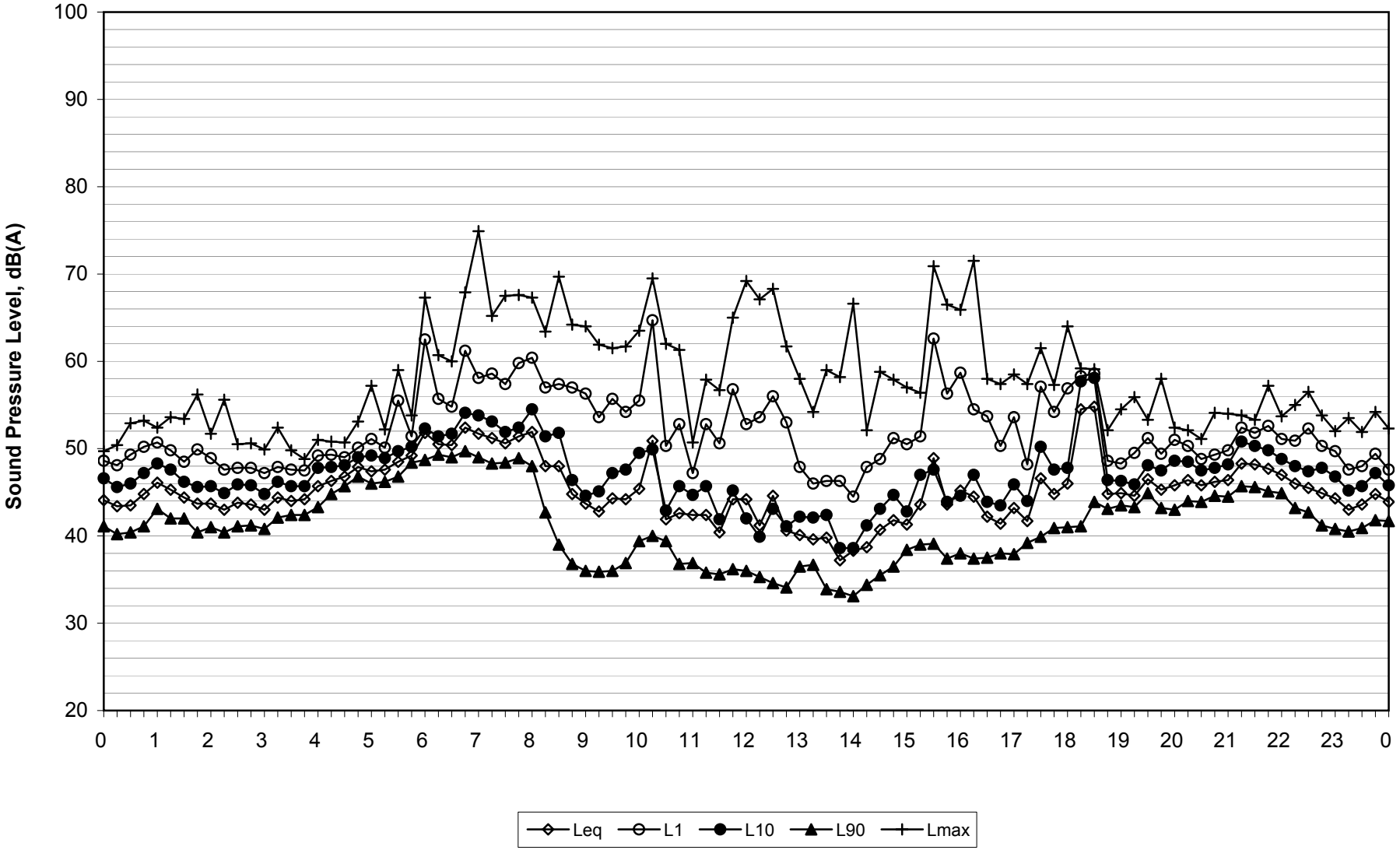
Tuesday 27 March 2007



Reference Location M1
250 Bruce Crescent

Ambient Sound Pressure Levels

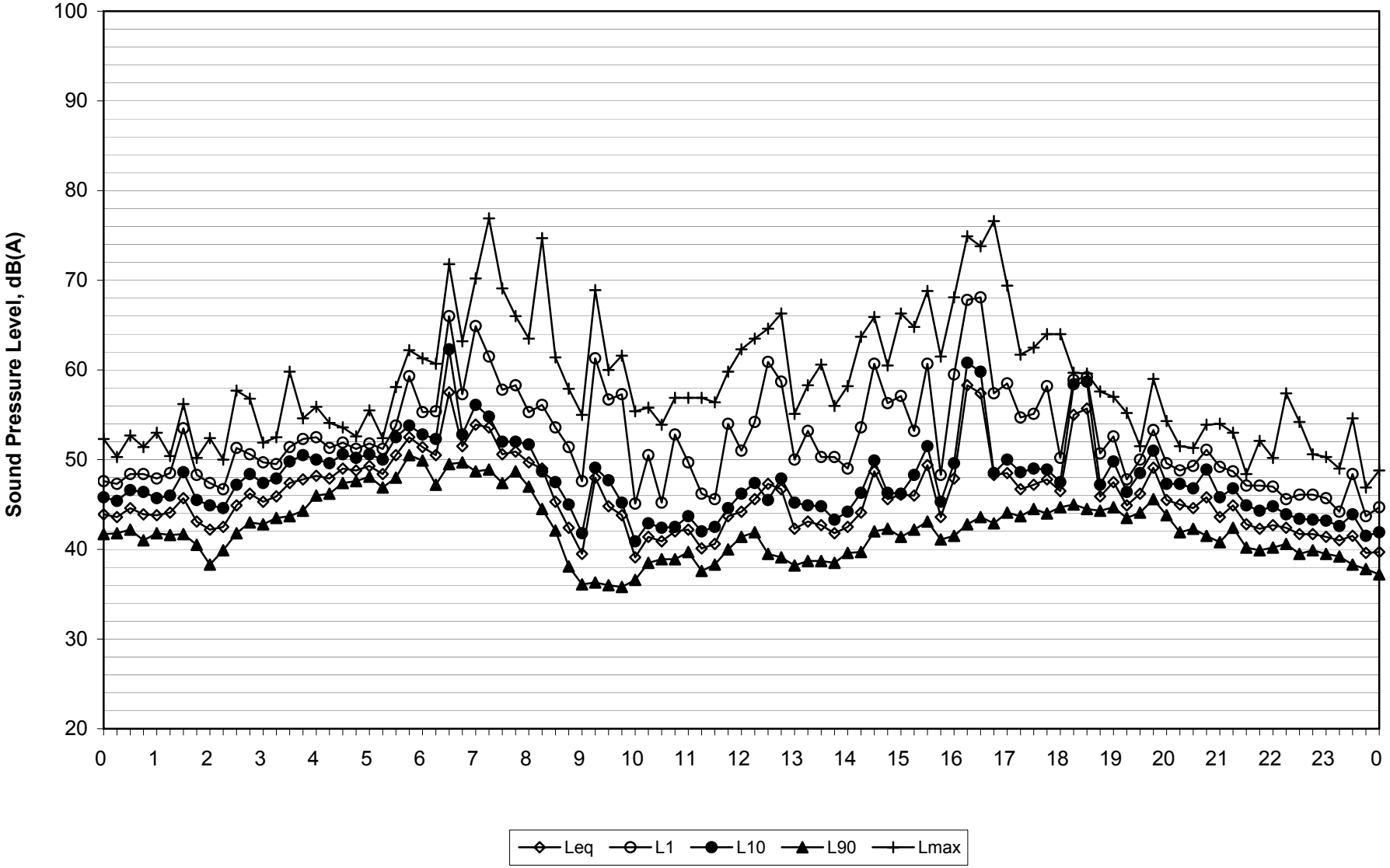
Wednesday 28 March 2007



Reference Location M1
250 Bruce Crescent

Ambient Sound Pressure Levels

Thursday 29 March 2007

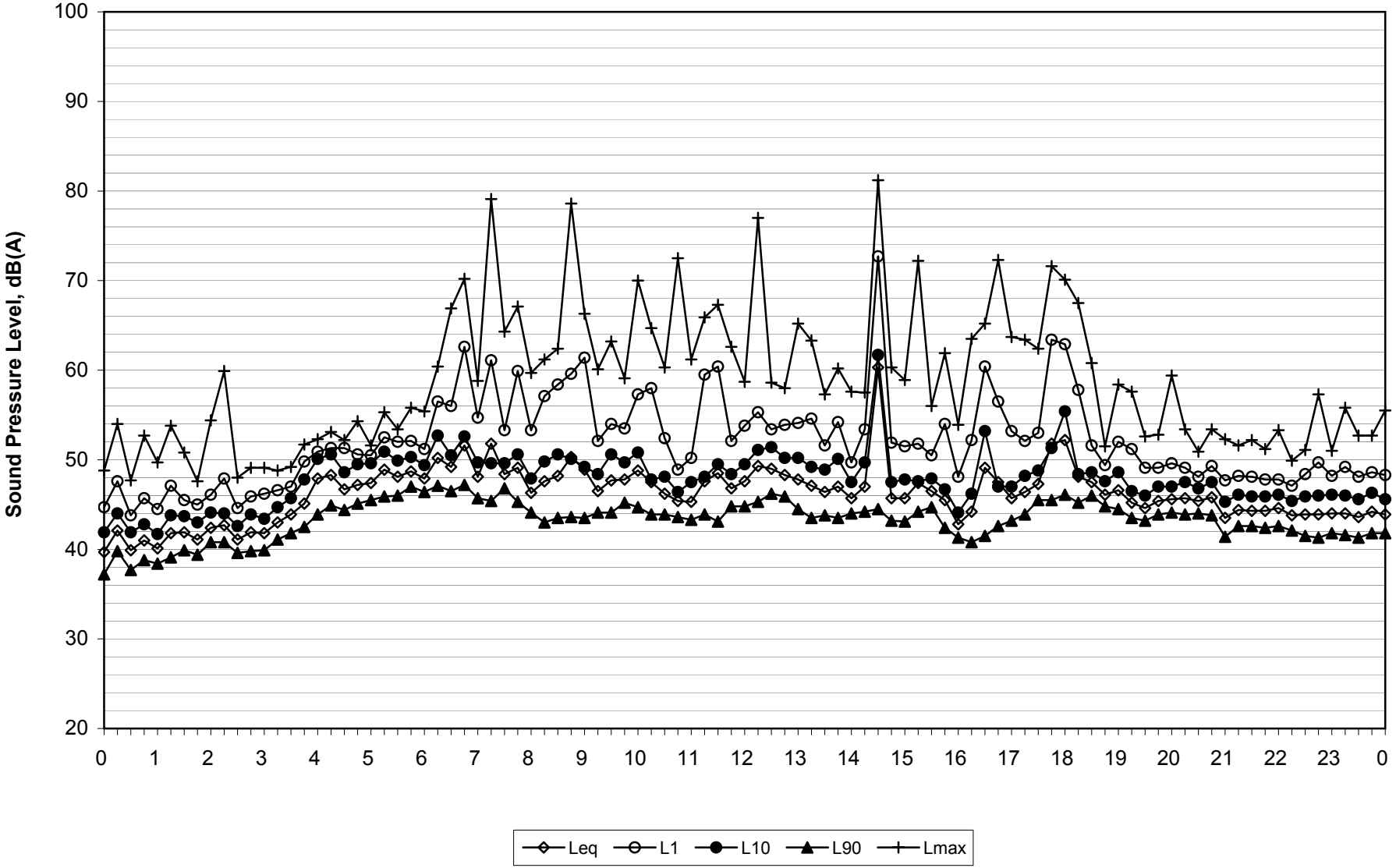


Reference Location M1
250 Bruce Crescent

5987R1_b.xls

Ambient Sound Pressure Levels

Friday 30 March 2007

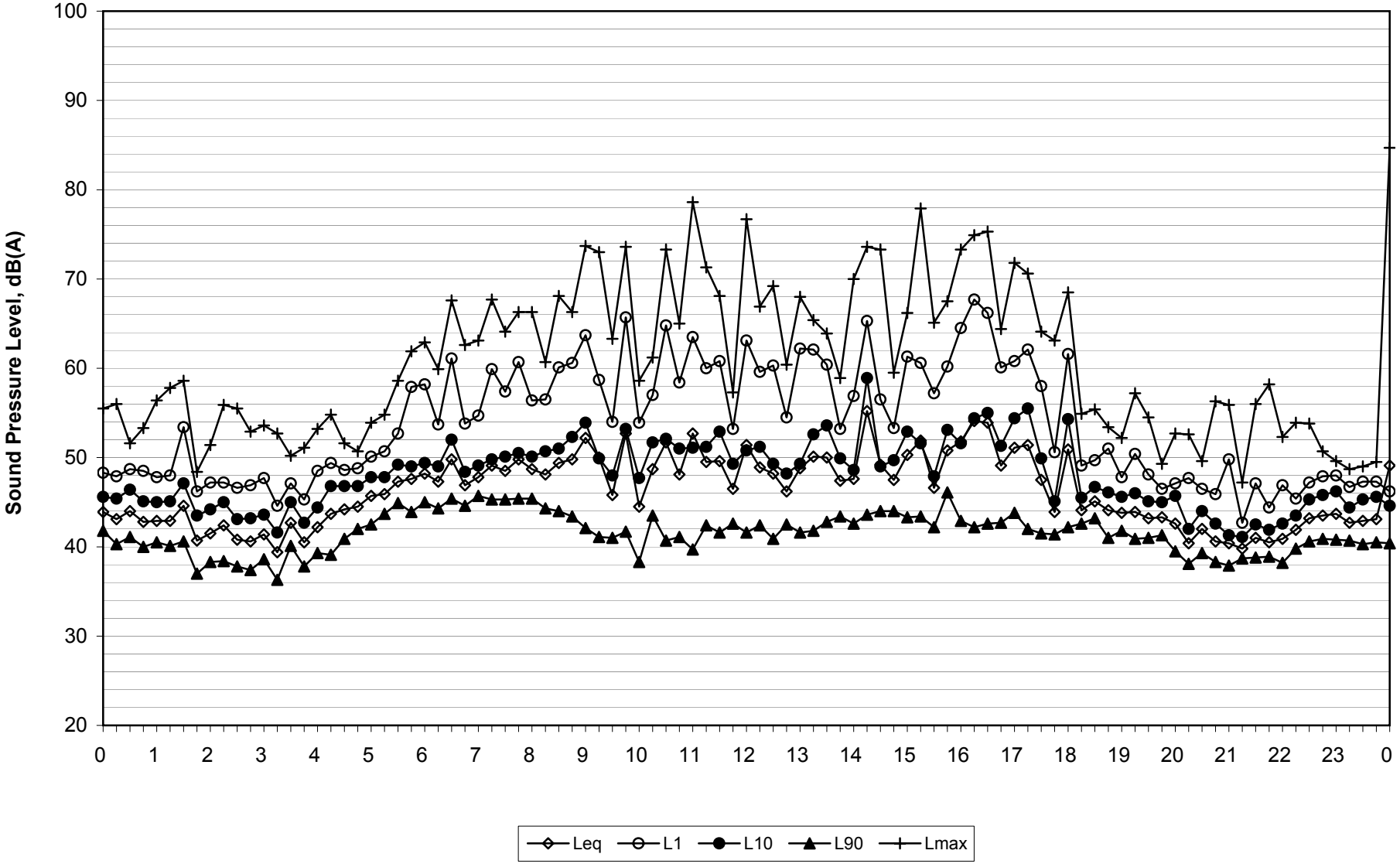


Reference Location M1
250 Bruce Crescent

5987R1_b.xls

Ambient Sound Pressure Levels

Saturday 31 March 2007

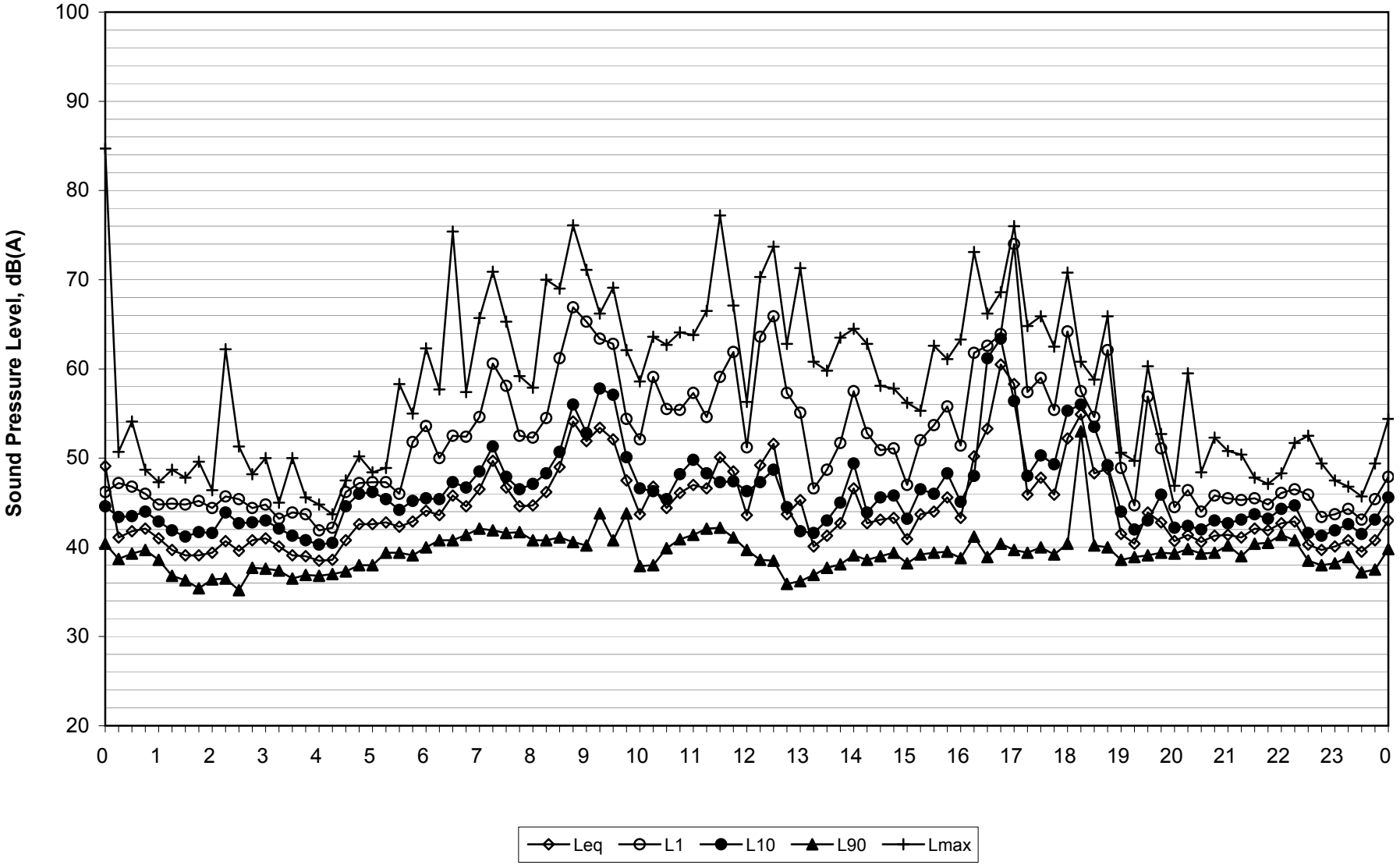


Reference Location M1
250 Bruce Crescent

5987R1_b.xls

Ambient Sound Pressure Levels

Sunday 01 April 2007

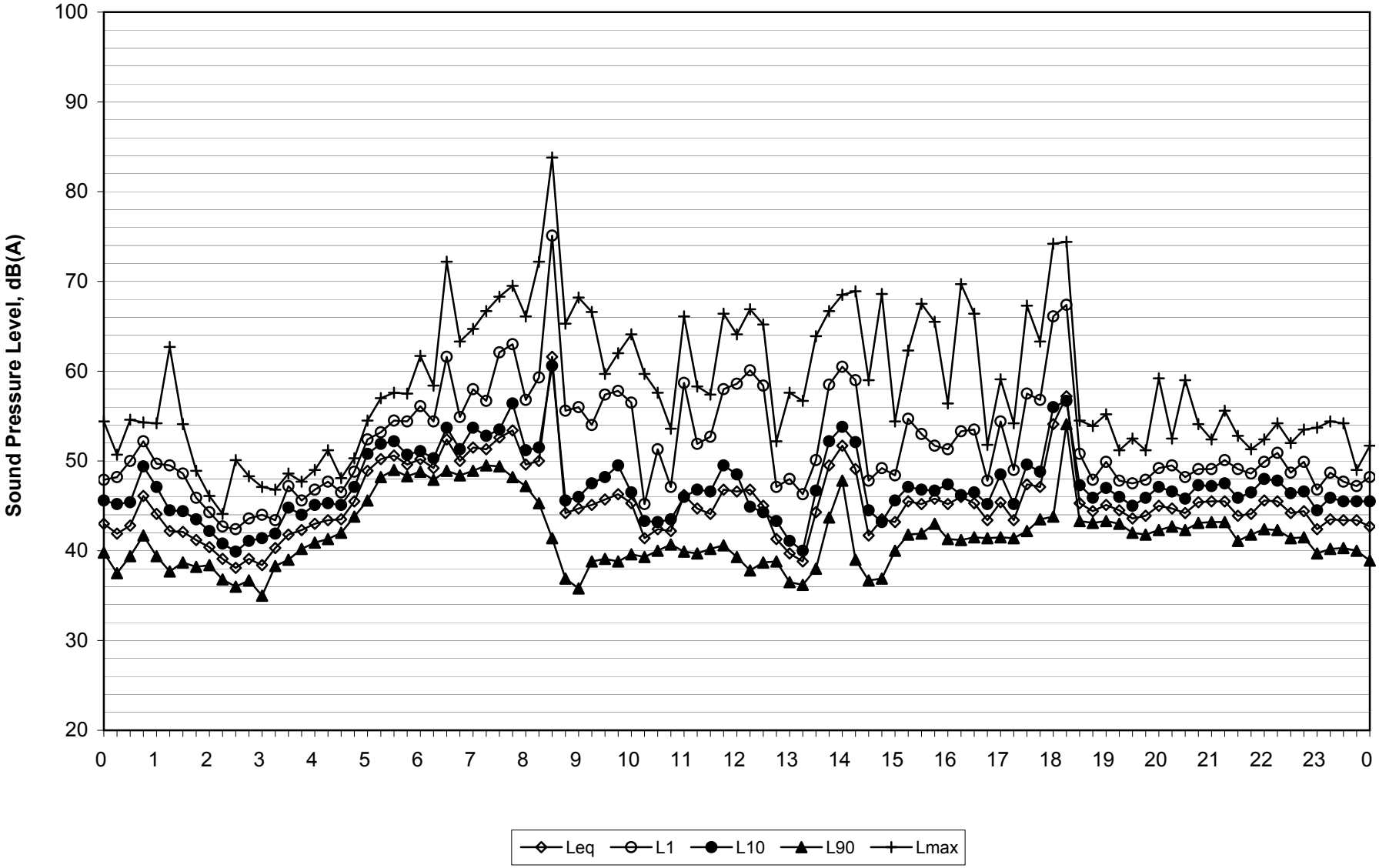


Reference Location M1
250 Bruce Crescent

5987R1_b.xls

Ambient Sound Pressure Levels

Monday 02 April 2007

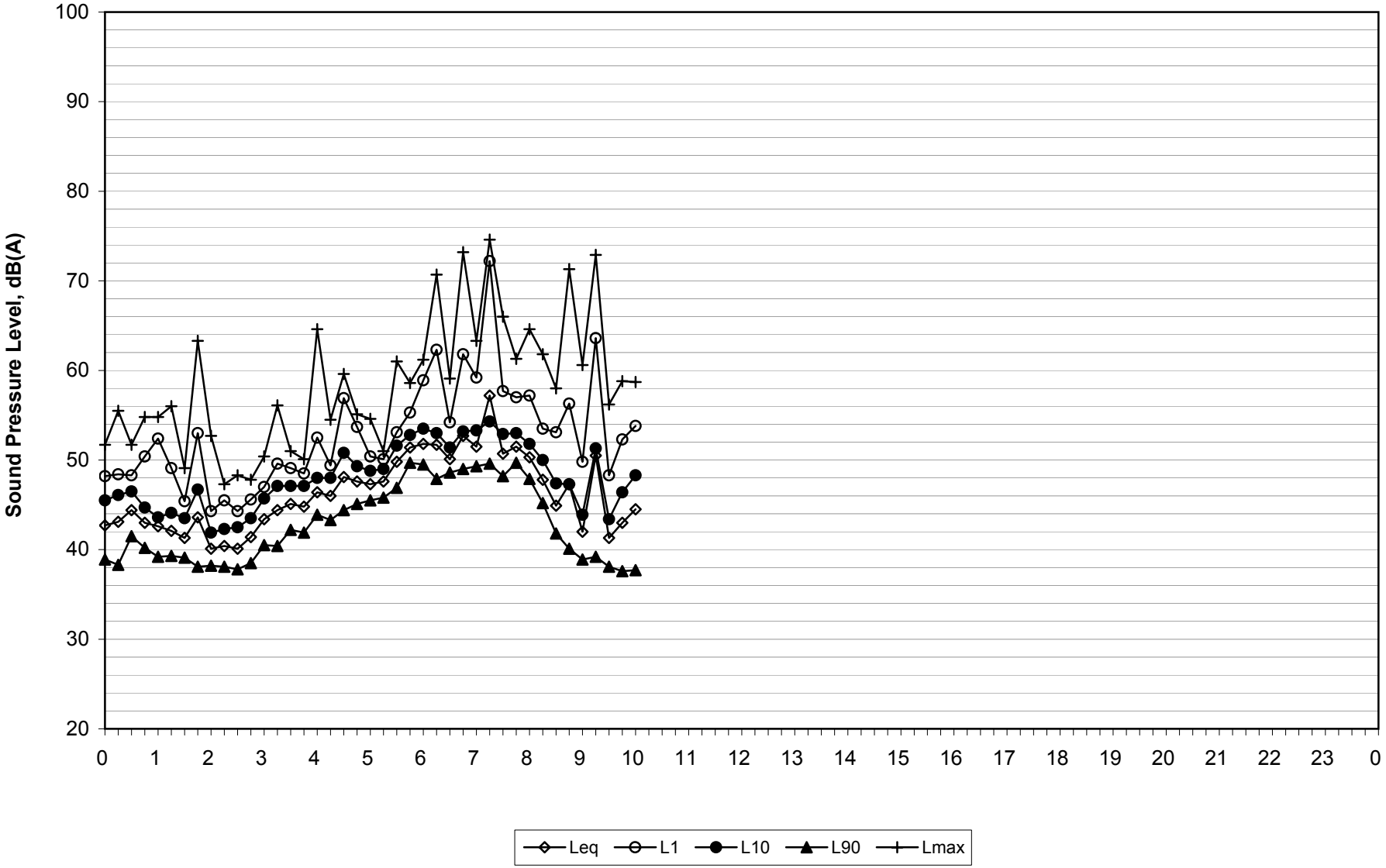


Reference Location M1
250 Bruce Crescent

5987R1_b.xls

Ambient Sound Pressure Levels

Tuesday 03 April 2007

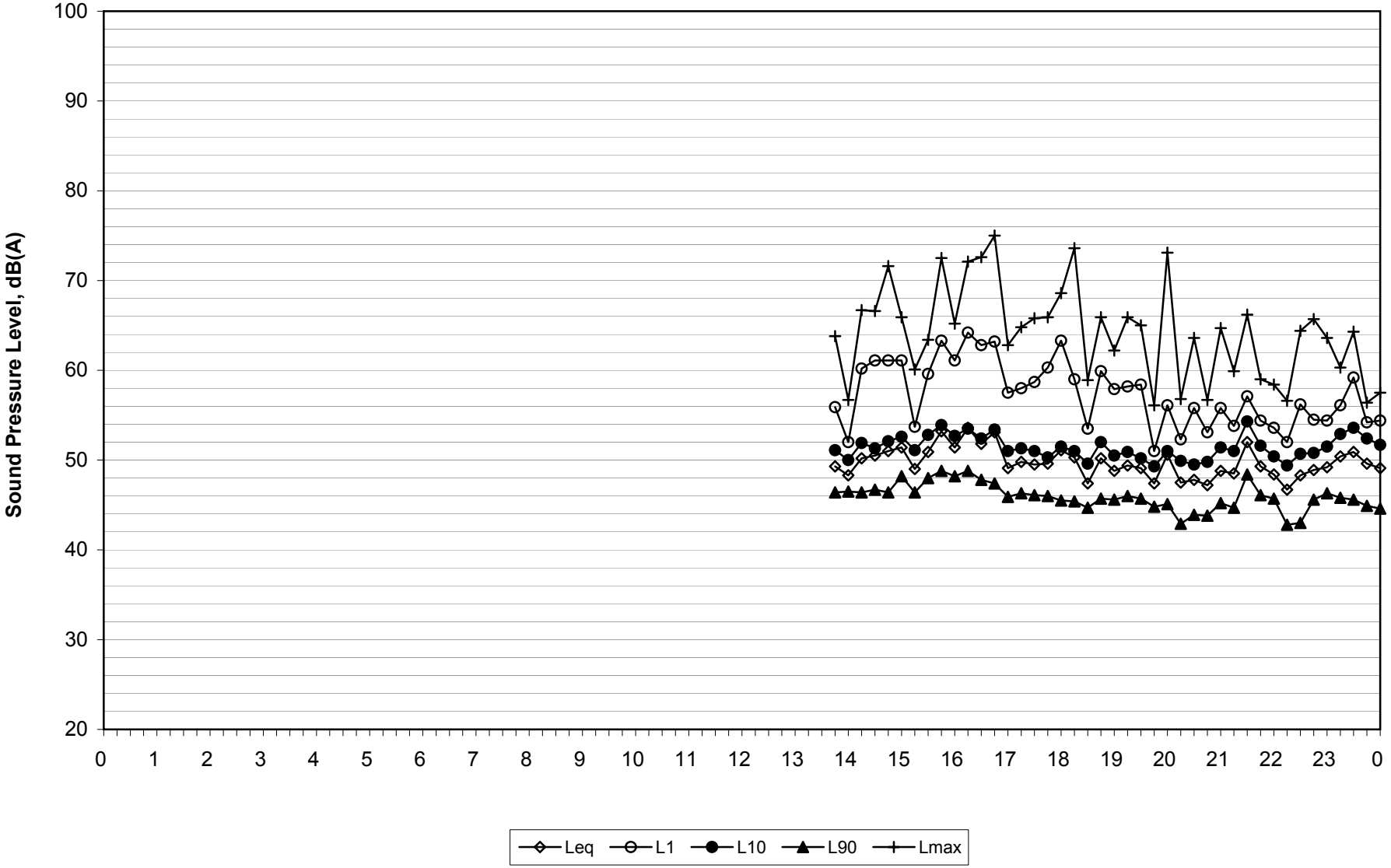


Reference Location M1
250 Bruce Crescent

5987R1_b.xls

Ambient Sound Pressure Levels

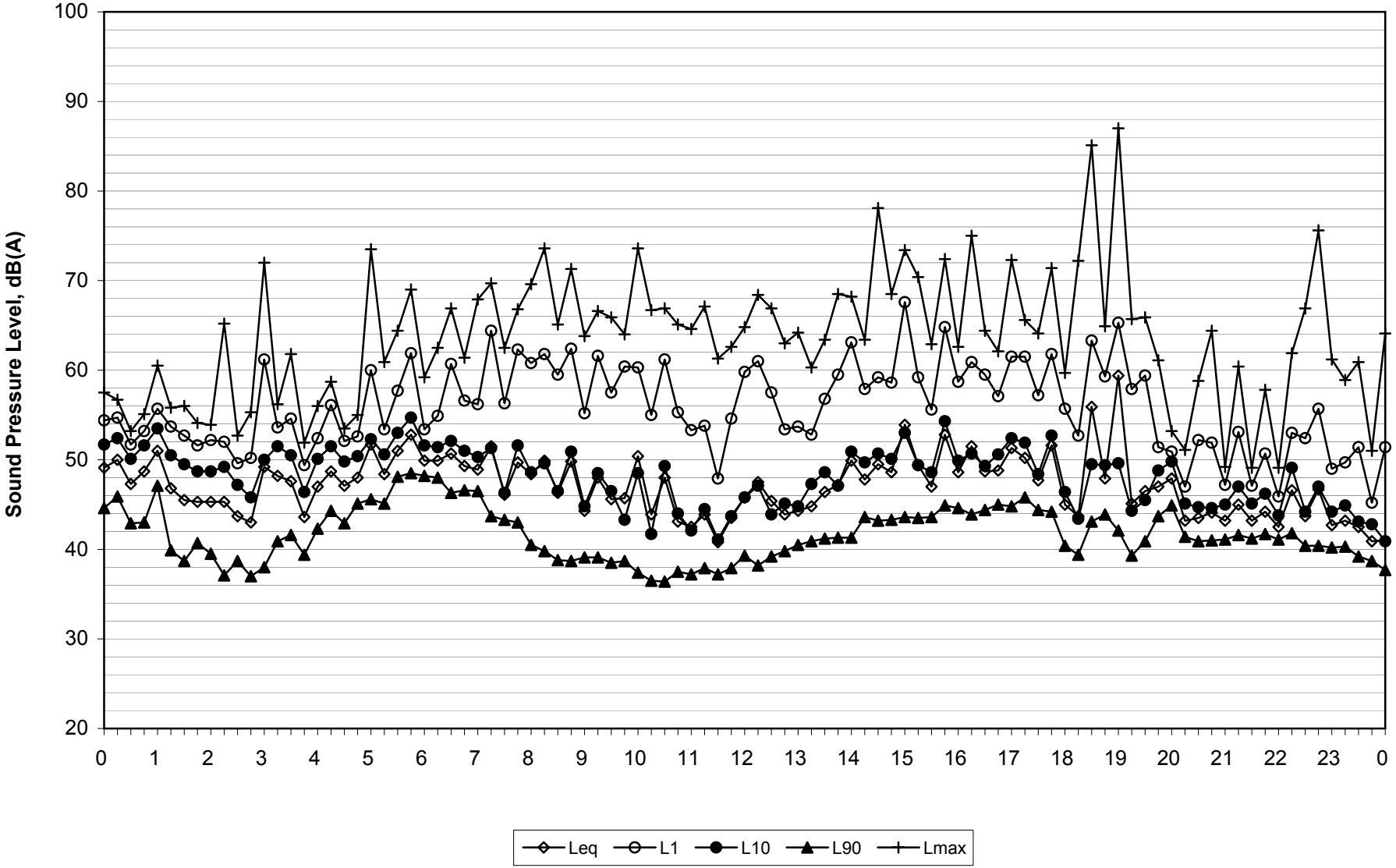
Thursday 09 November 2006



Reference Location M2
118 Bushells Ridge Road

Ambient Sound Pressure Levels

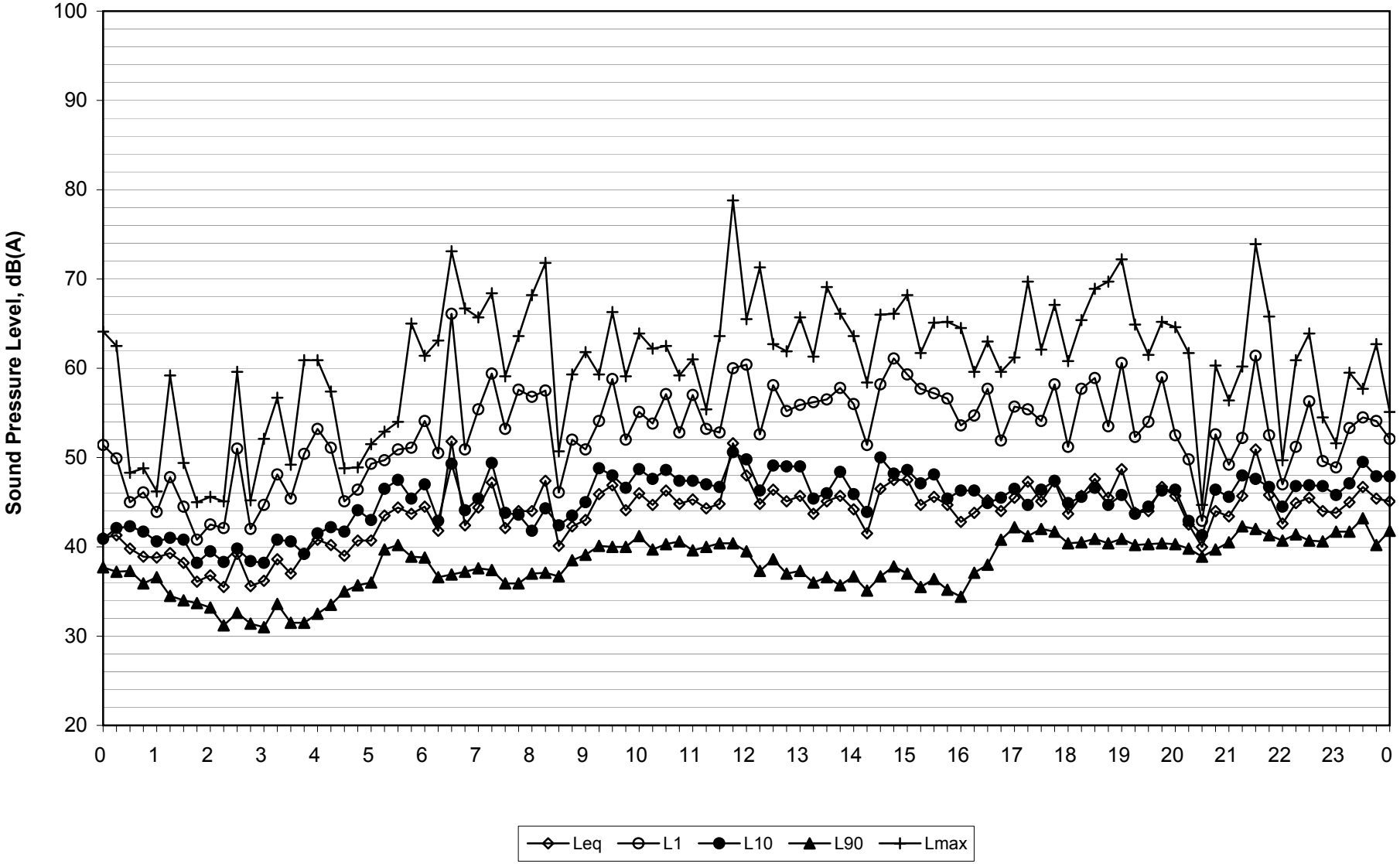
Friday 10 November 2006



Reference Location M2
118 Bushells Ridge Road

Ambient Sound Pressure Levels

Saturday 11 November 2006

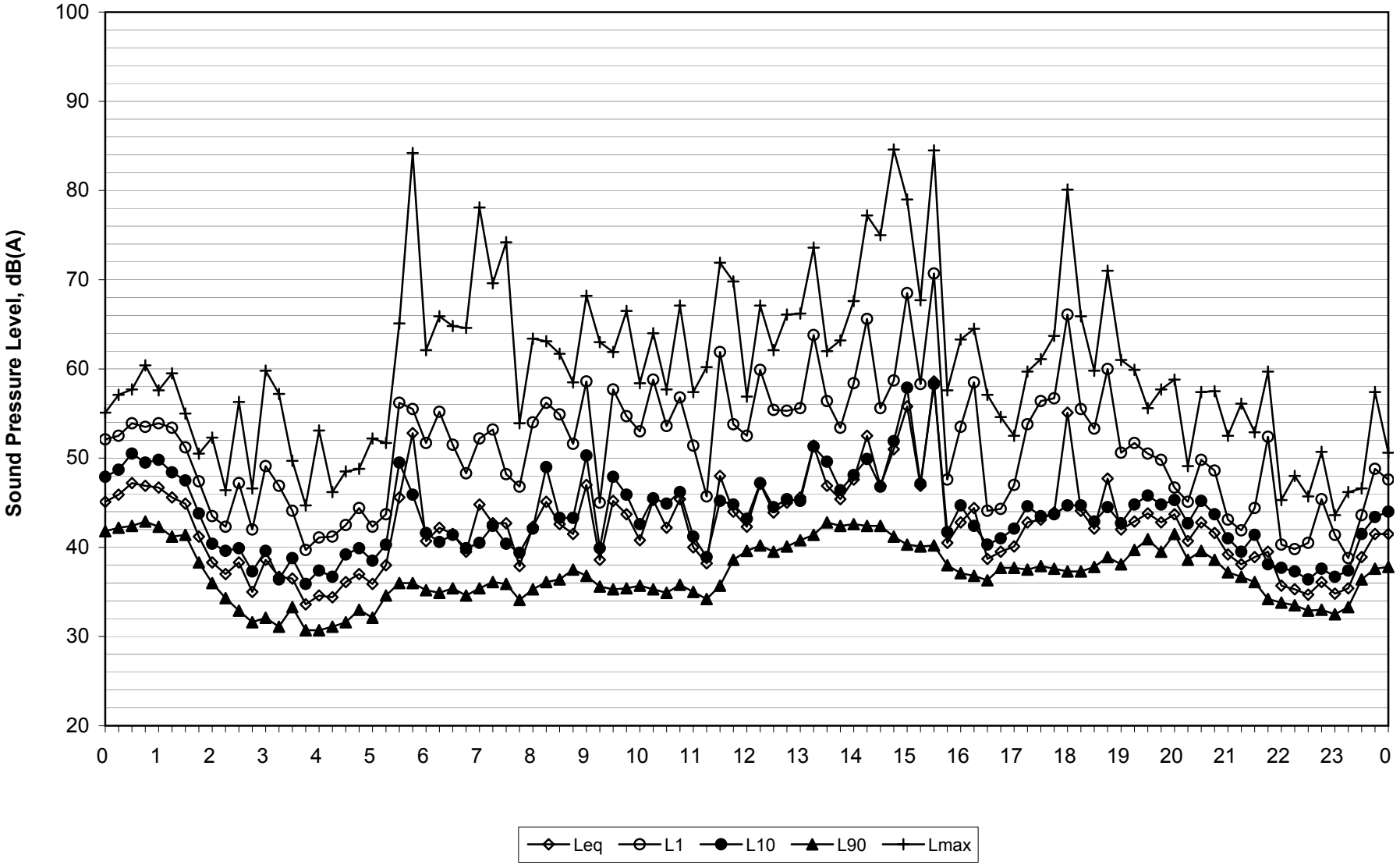


Reference Location M2
118 Bushells Ridge Road

5987R2.xls

Ambient Sound Pressure Levels

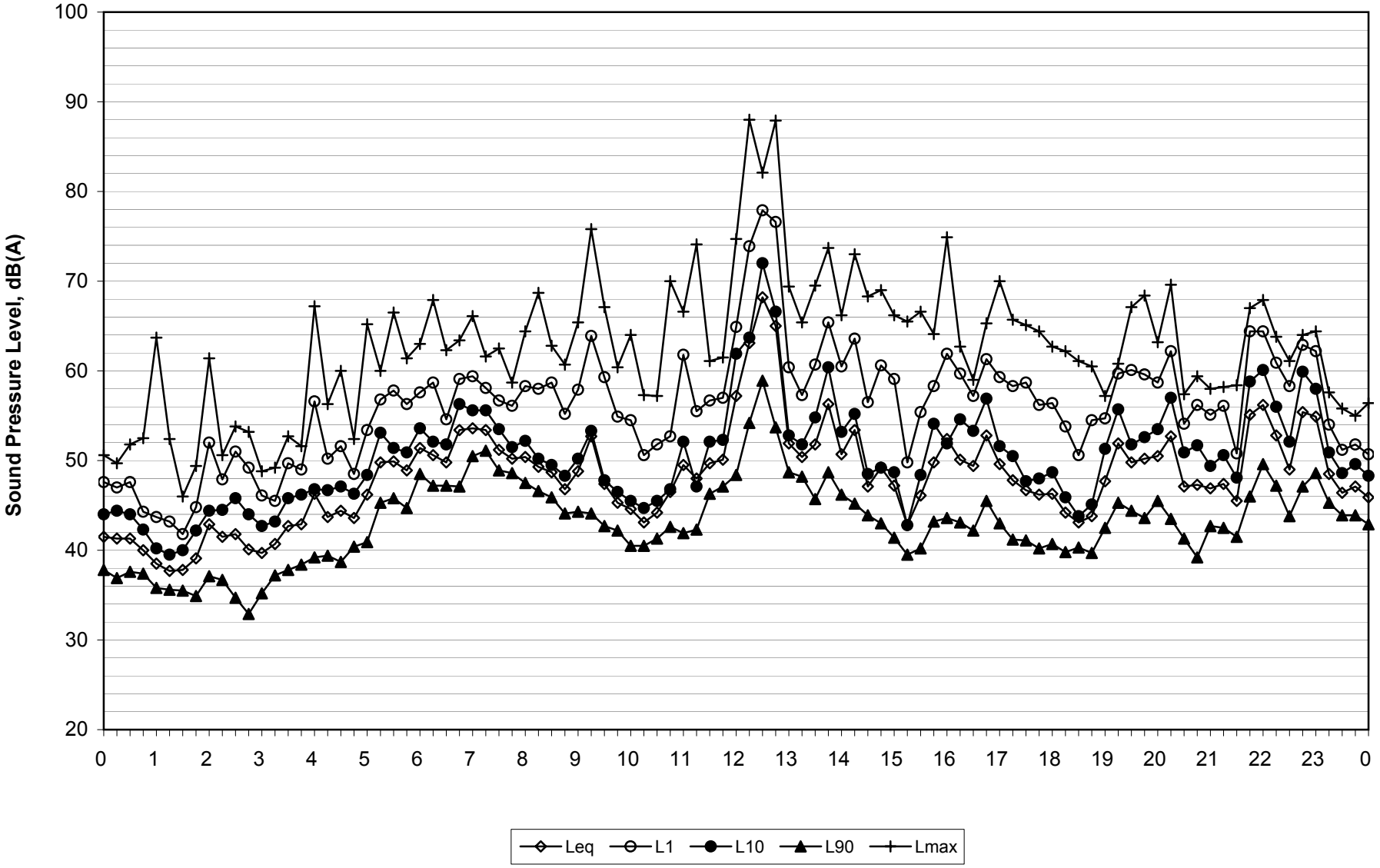
Sunday 12 November 2006



Reference Location M2
118 Bushells Ridge Road

Ambient Sound Pressure Levels

Monday 13 November 2006

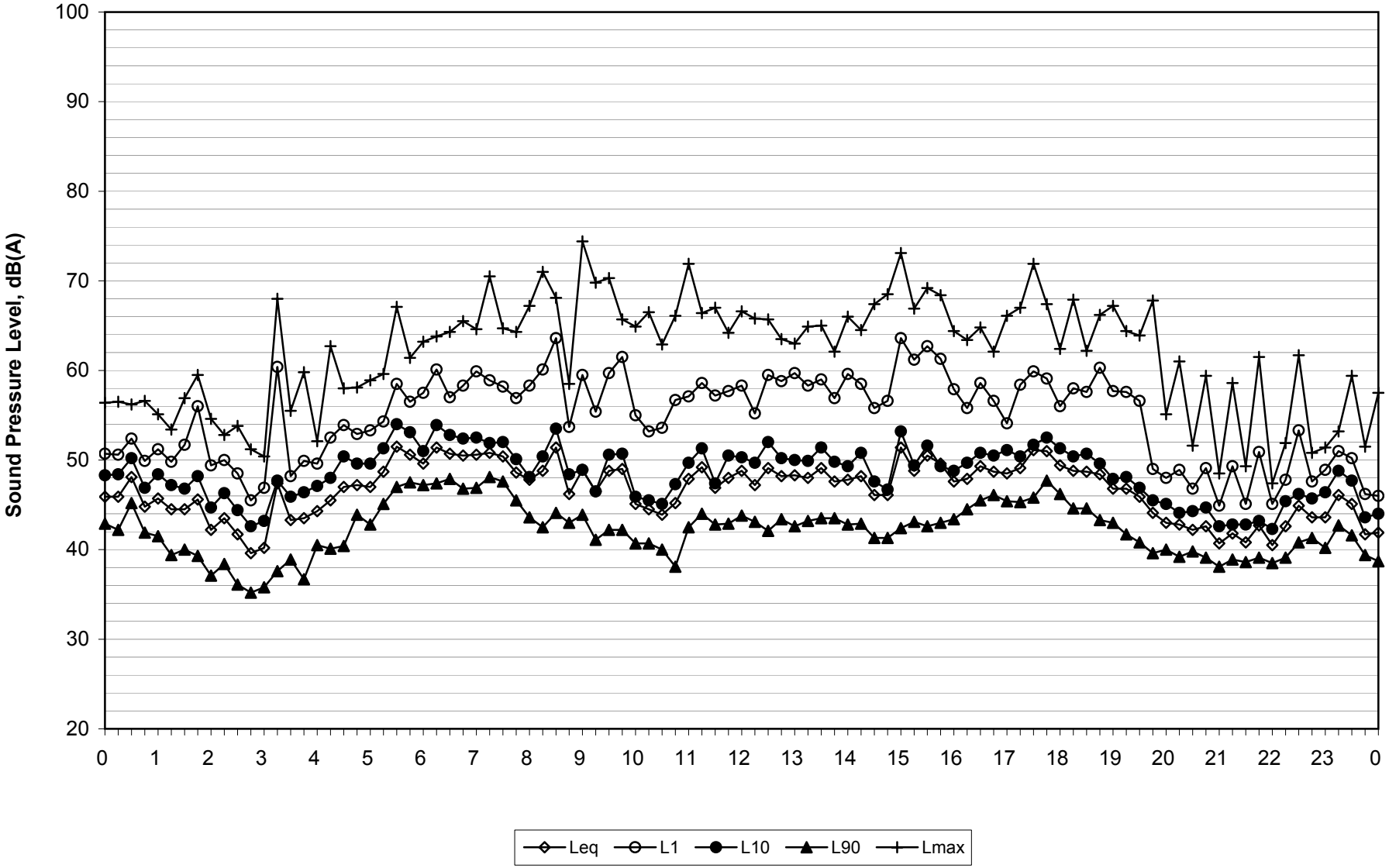


Reference Location M2
118 Bushells Ridge Road

5987R2.xls

Ambient Sound Pressure Levels

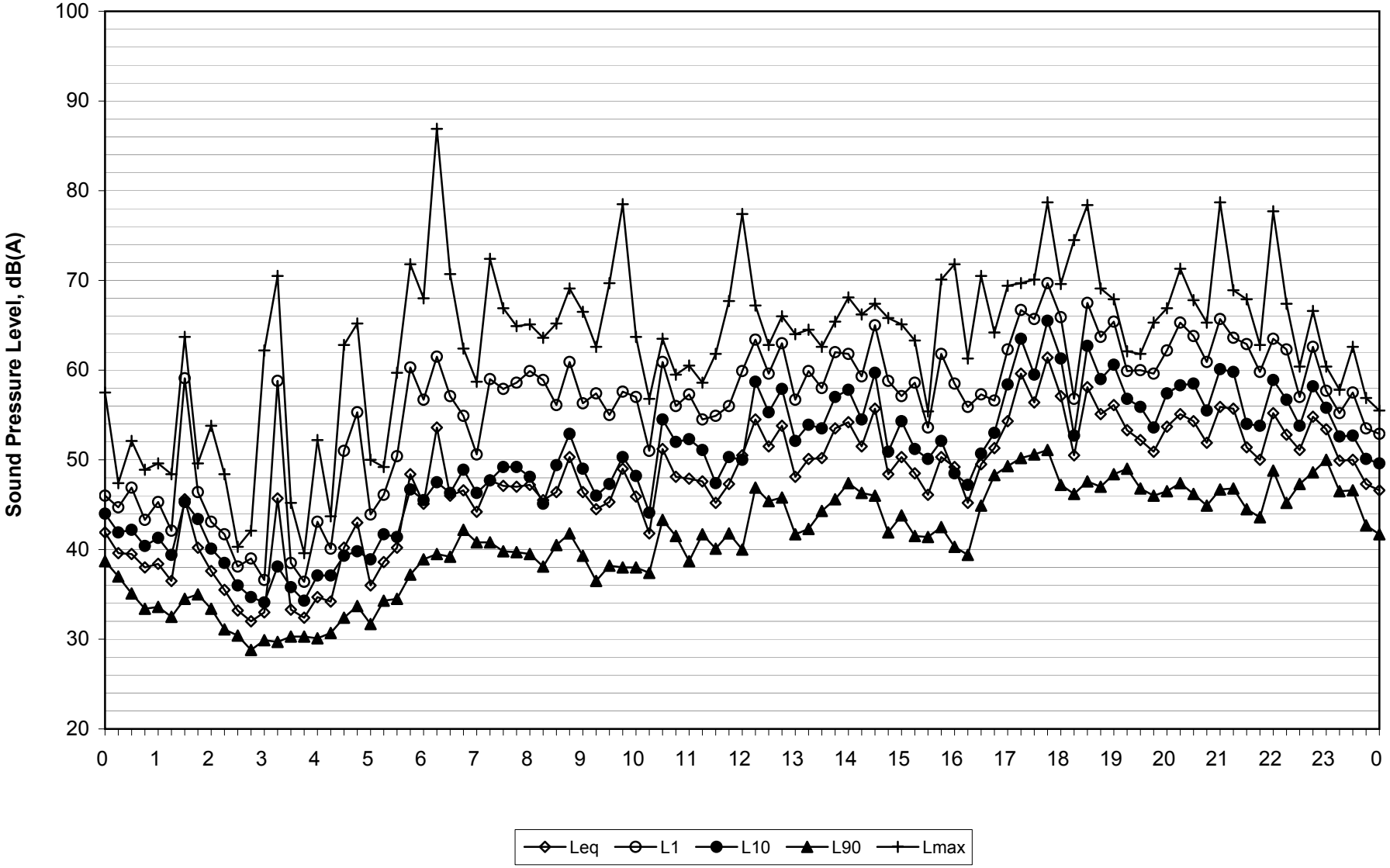
Tuesday 14 November 2006



Reference Location M2
118 Bushells Ridge Road

Ambient Sound Pressure Levels

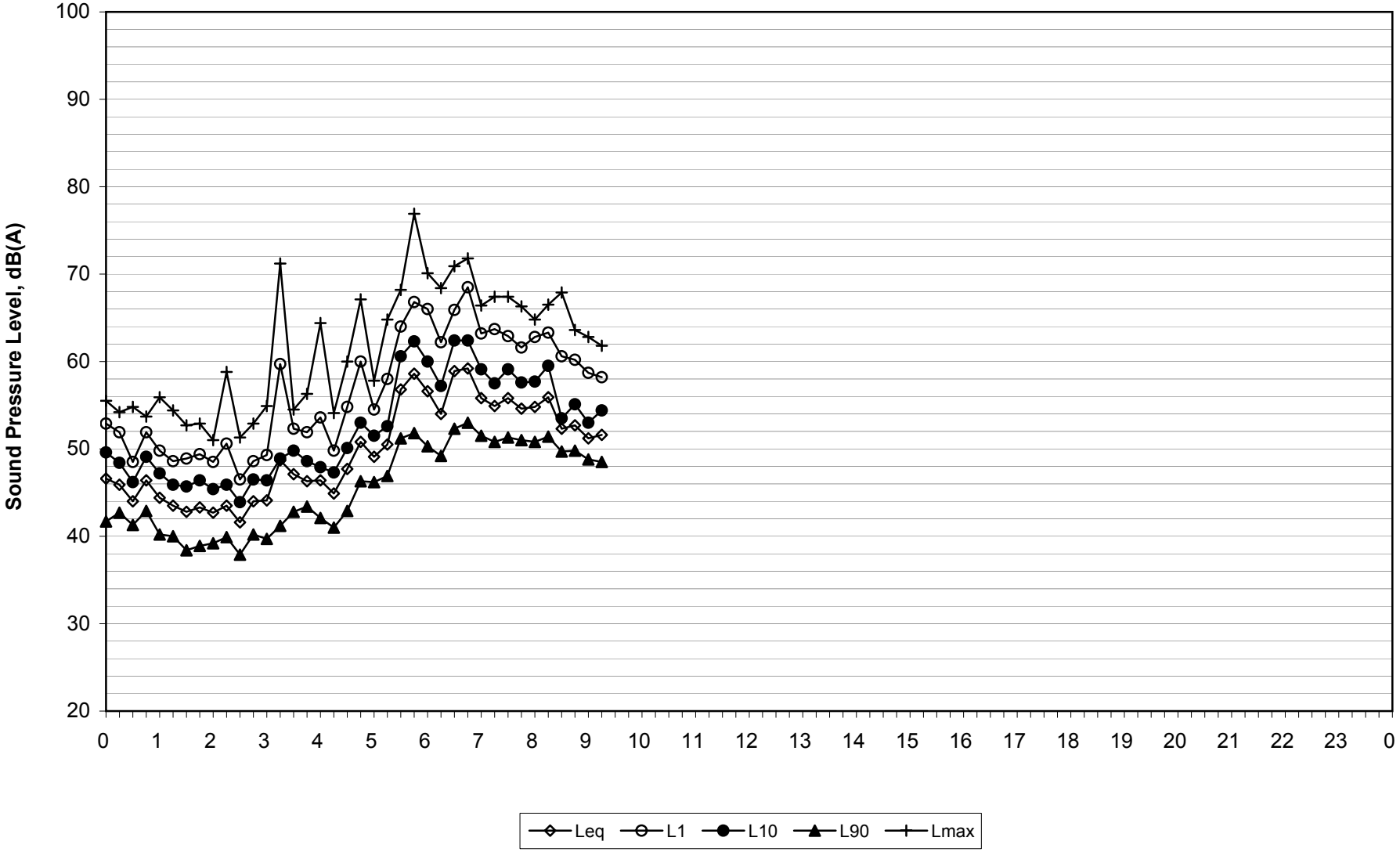
Wednesday 15 November 2006



Reference Location M2
118 Bushells Ridge Road

Ambient Sound Pressure Levels

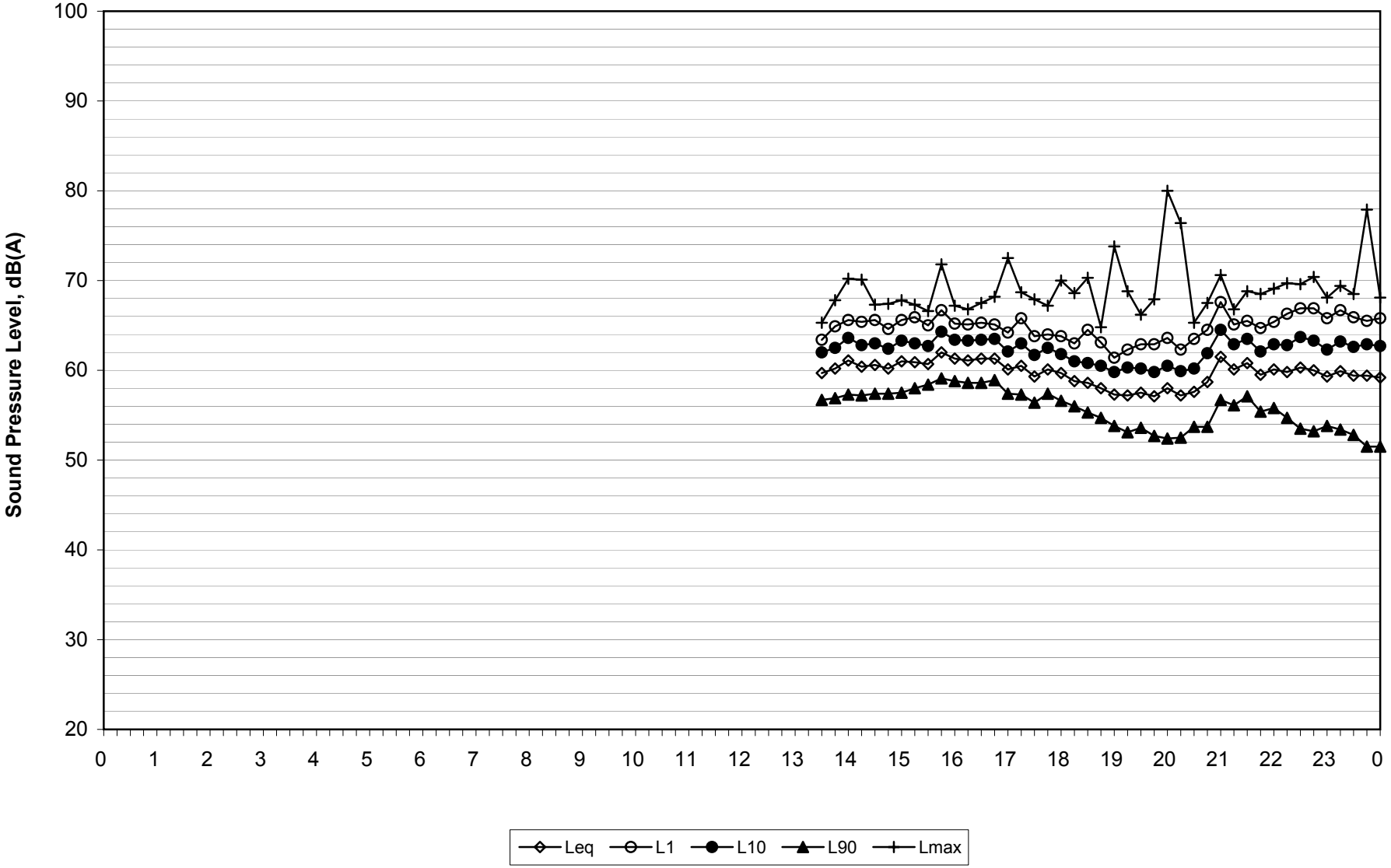
Thursday 16 November 2006



Reference Location M2
118 Bushells Ridge Road

Ambient Sound Pressure Levels

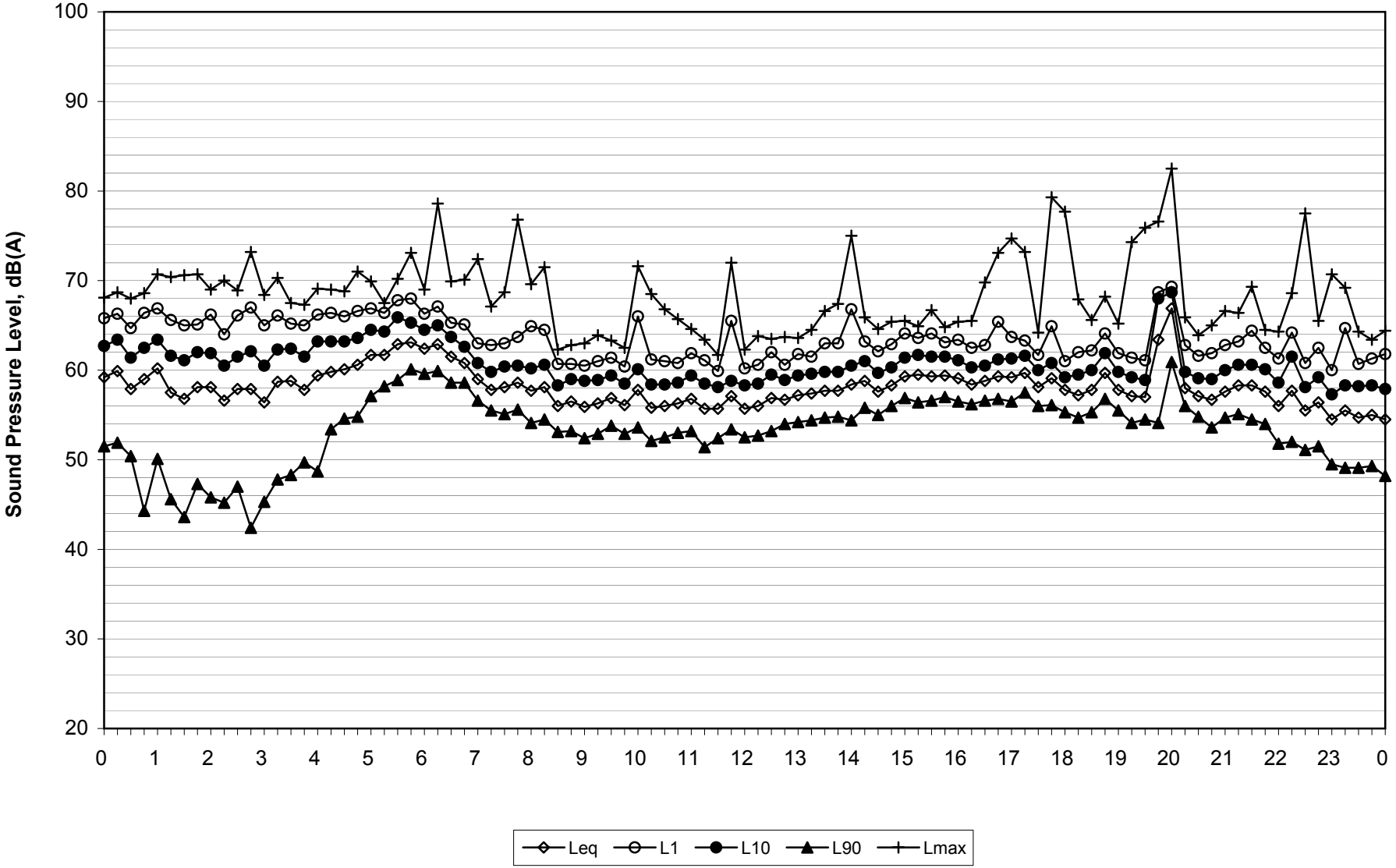
Thursday 09 November 2006



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

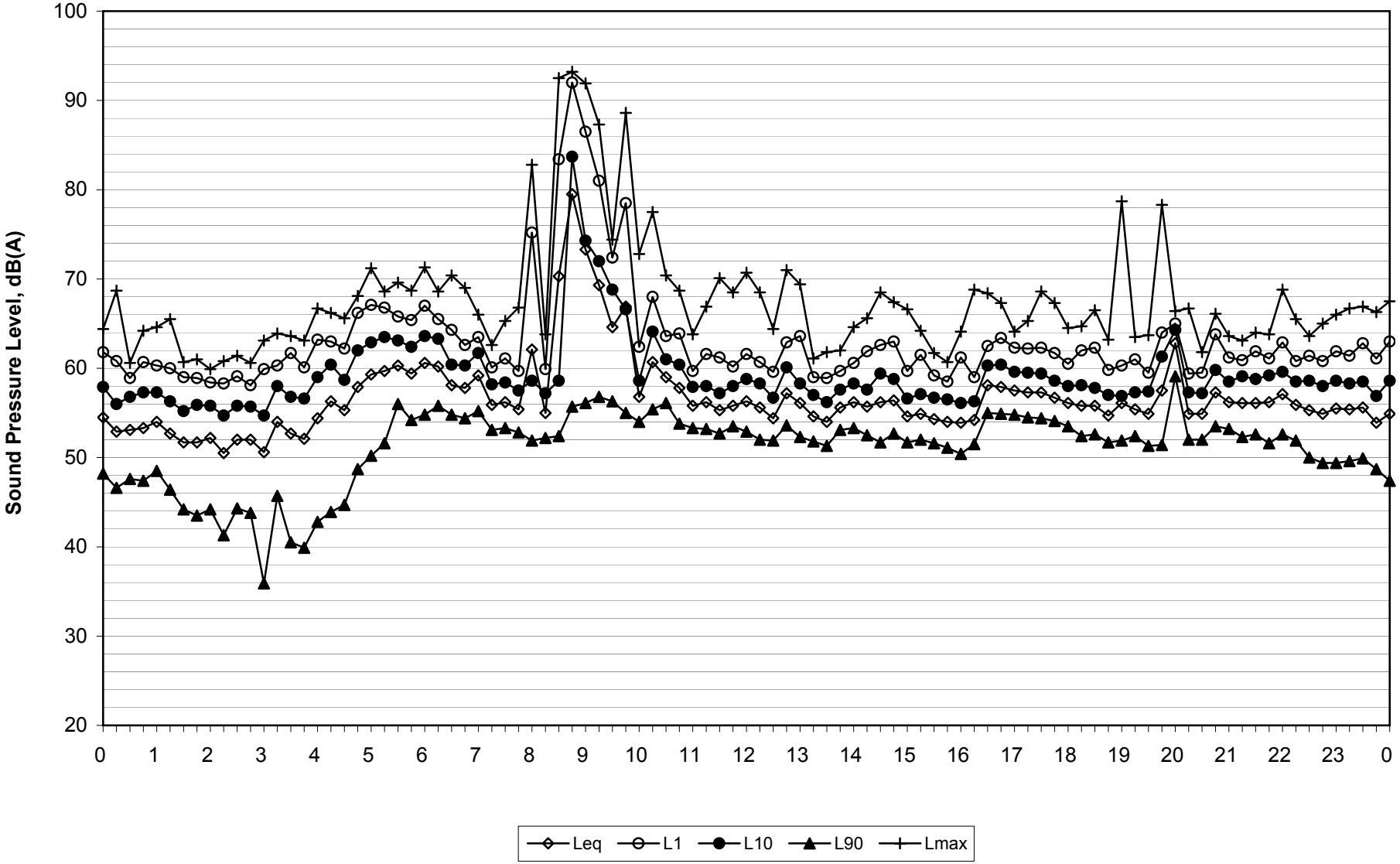
Friday 10 November 2006



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

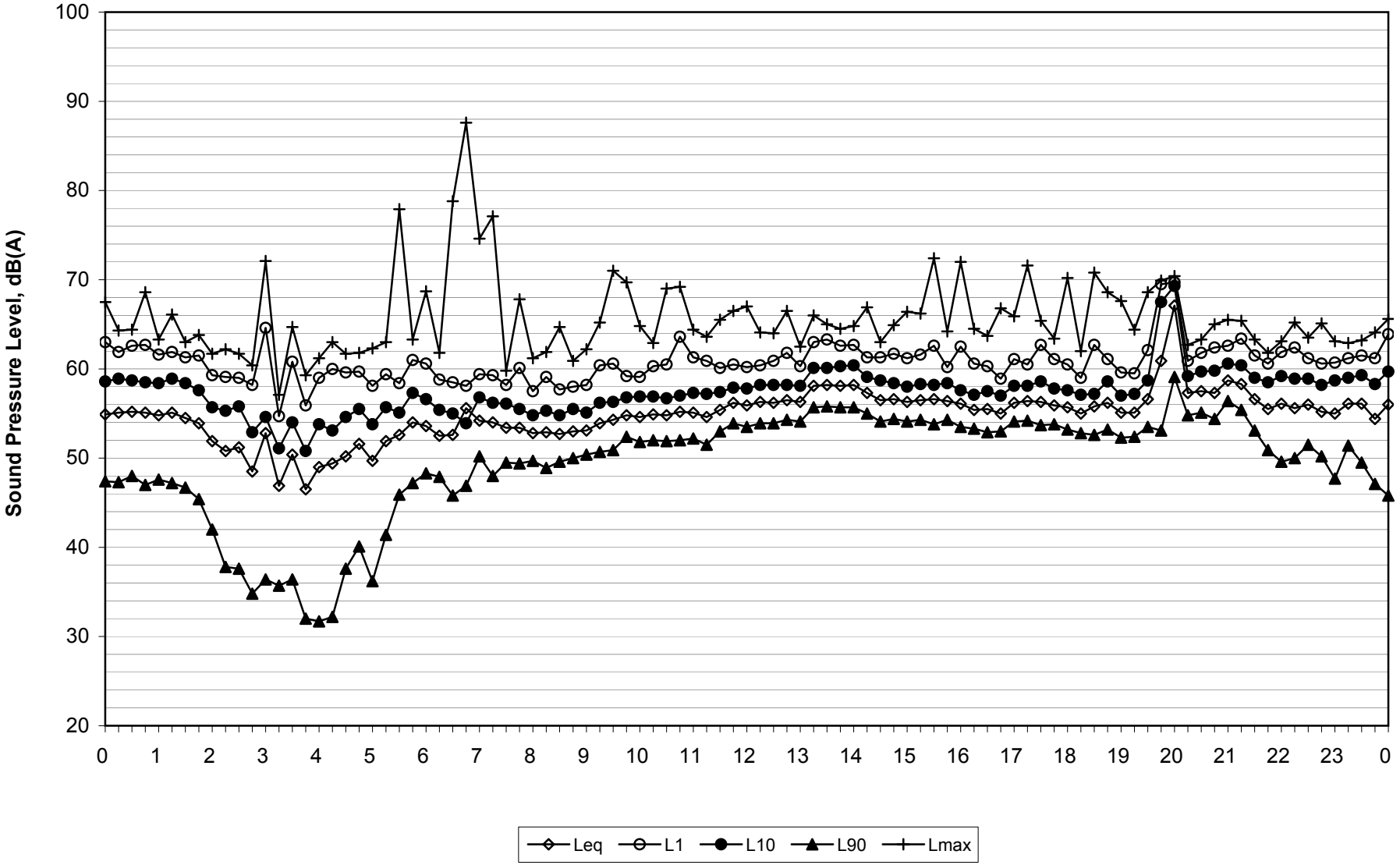
Saturday 11 November 2006



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

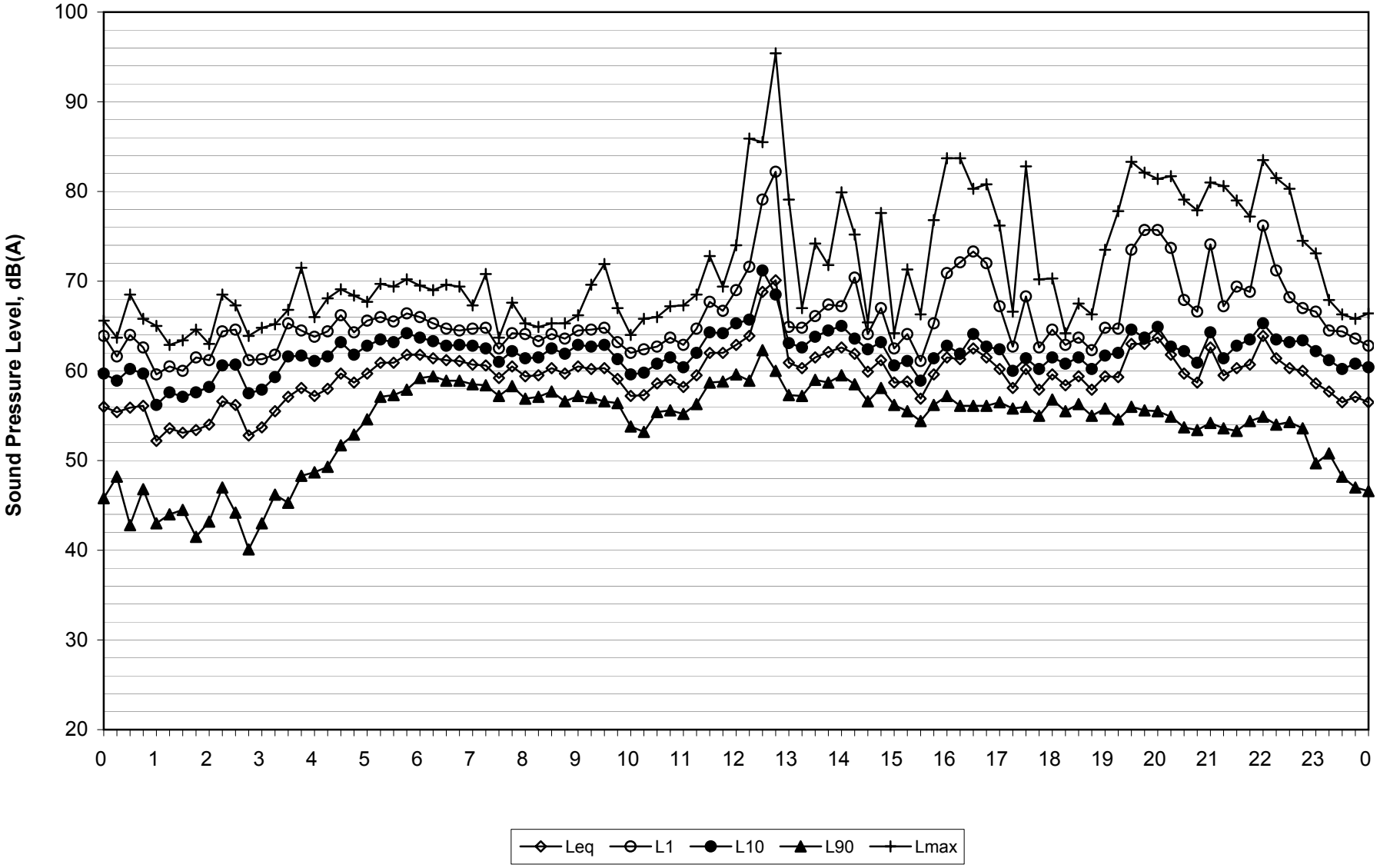
Sunday 12 November 2006



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

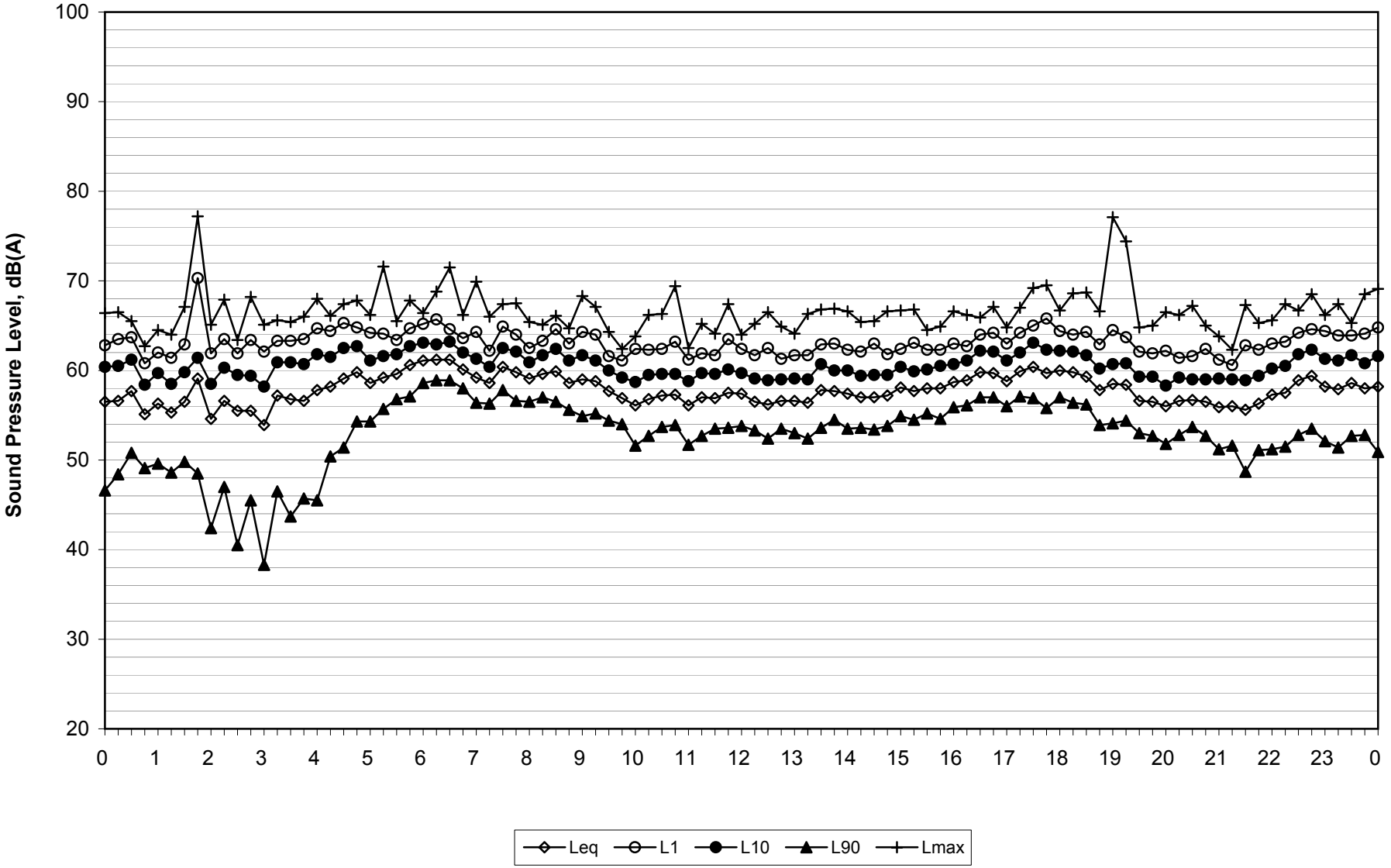
Monday 13 November 2006



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

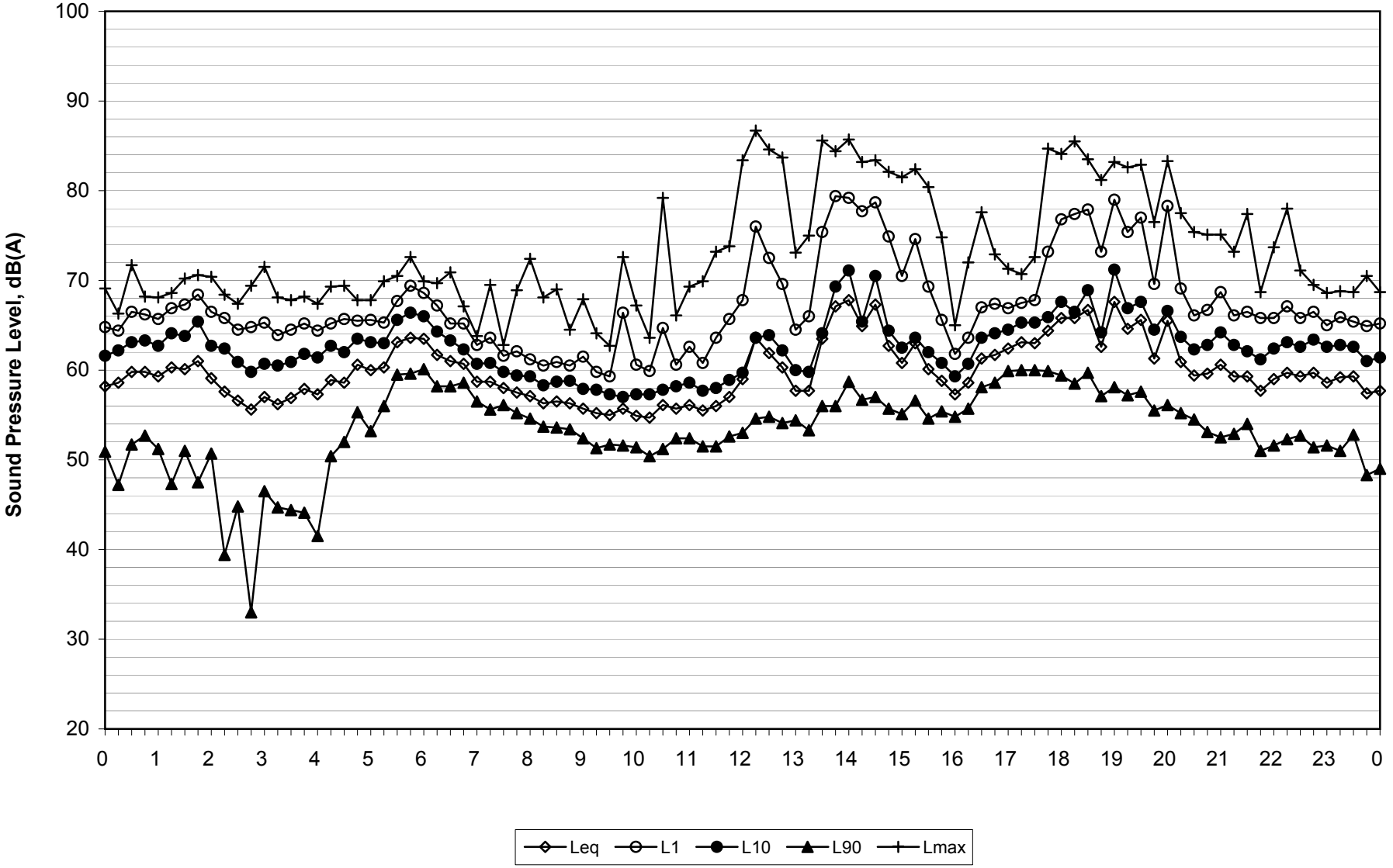
Tuesday 14 November 2006



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

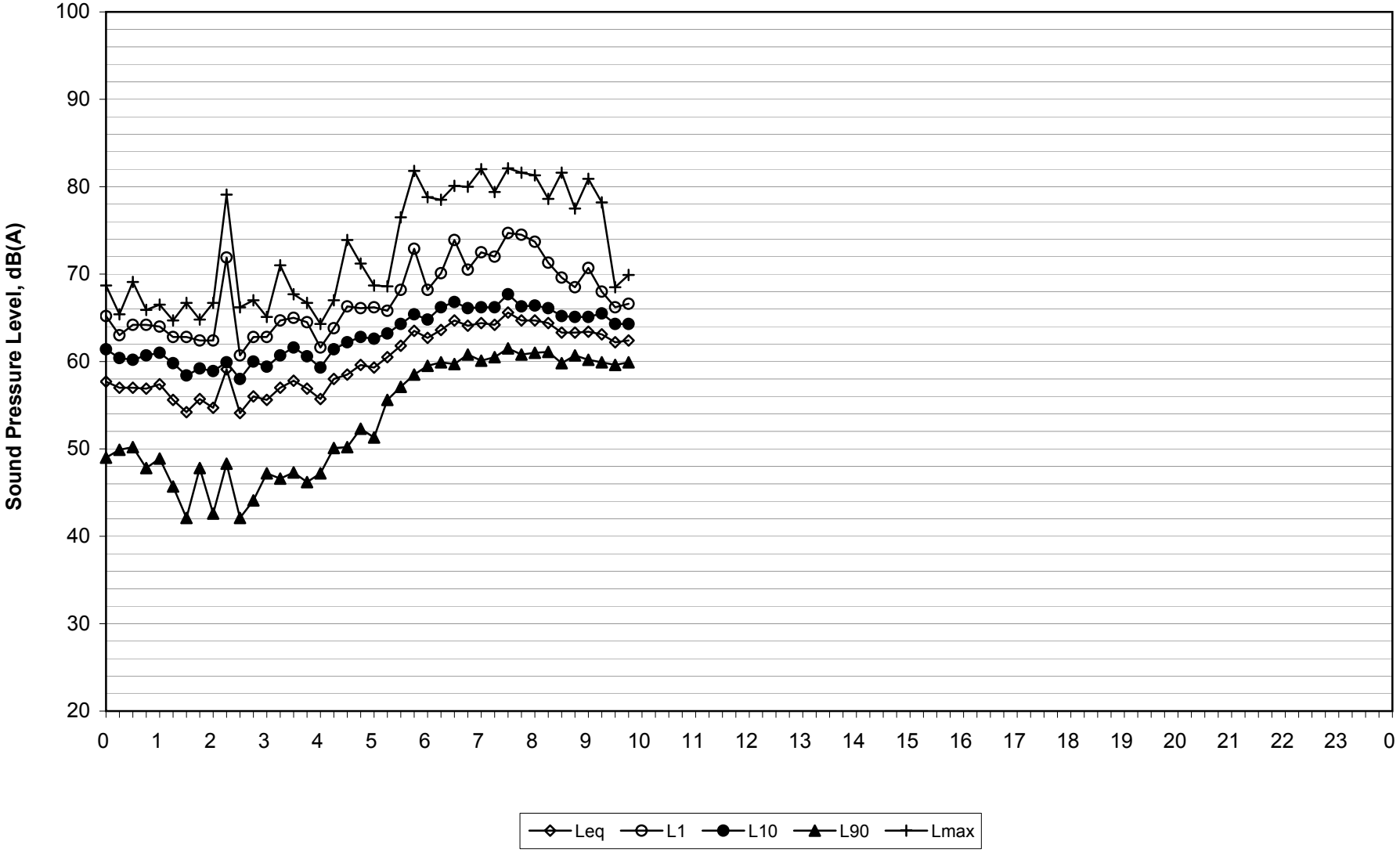
Wednesday 15 November 2006



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

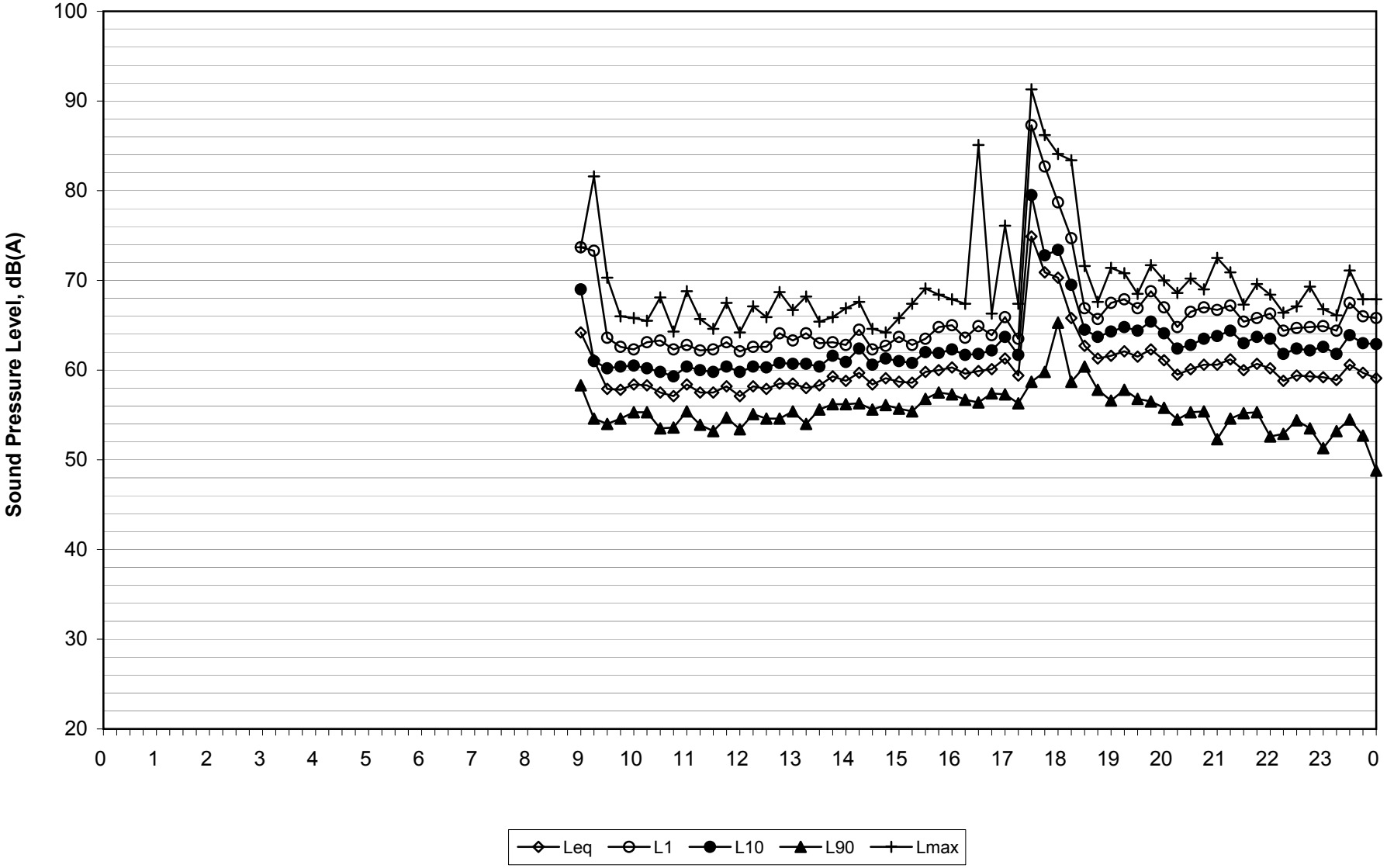
Thursday 16 November 2006



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

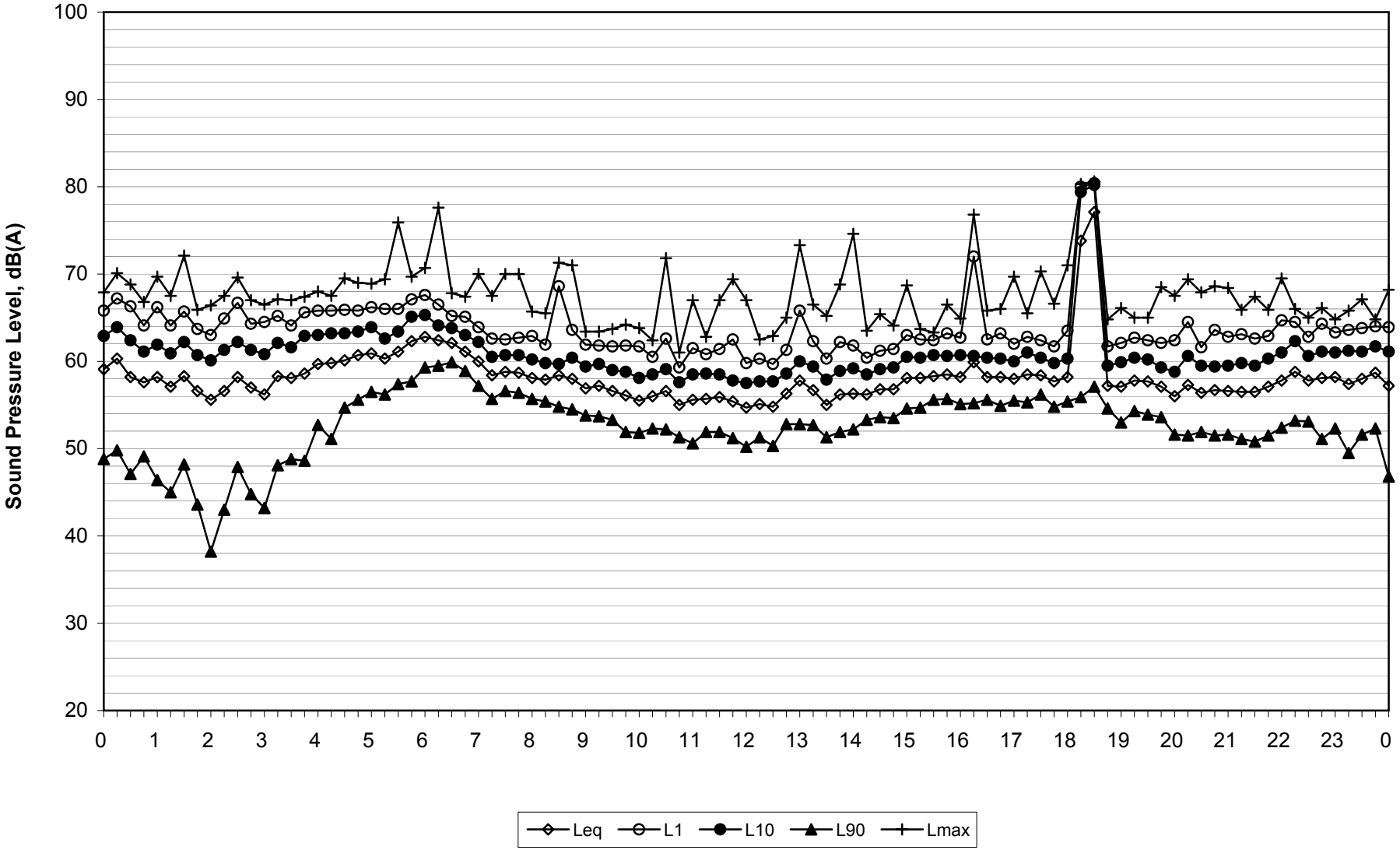
Tuesday 27 March 2007



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

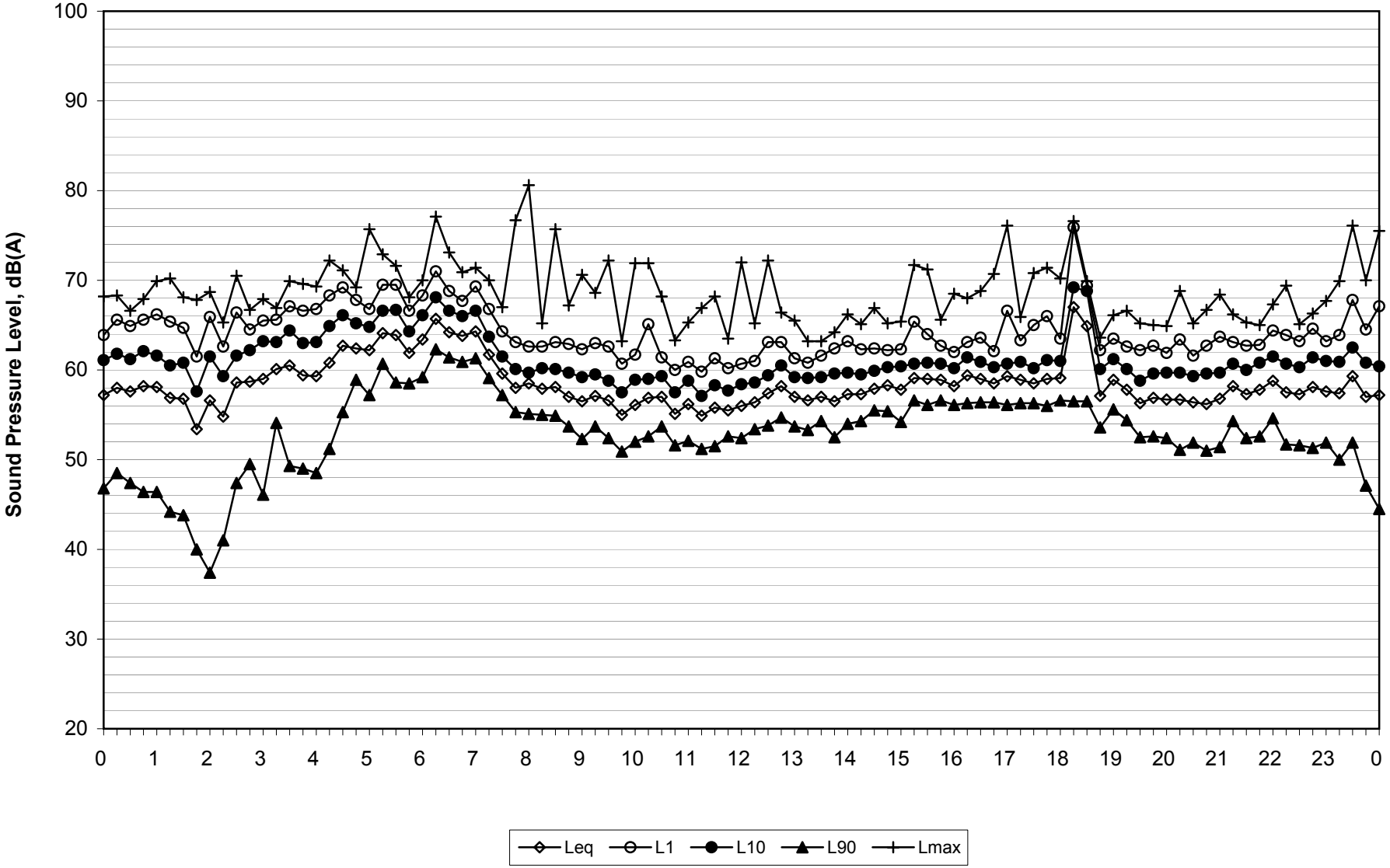
Wednesday 28 March 2007



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

Thursday 29 March 2007

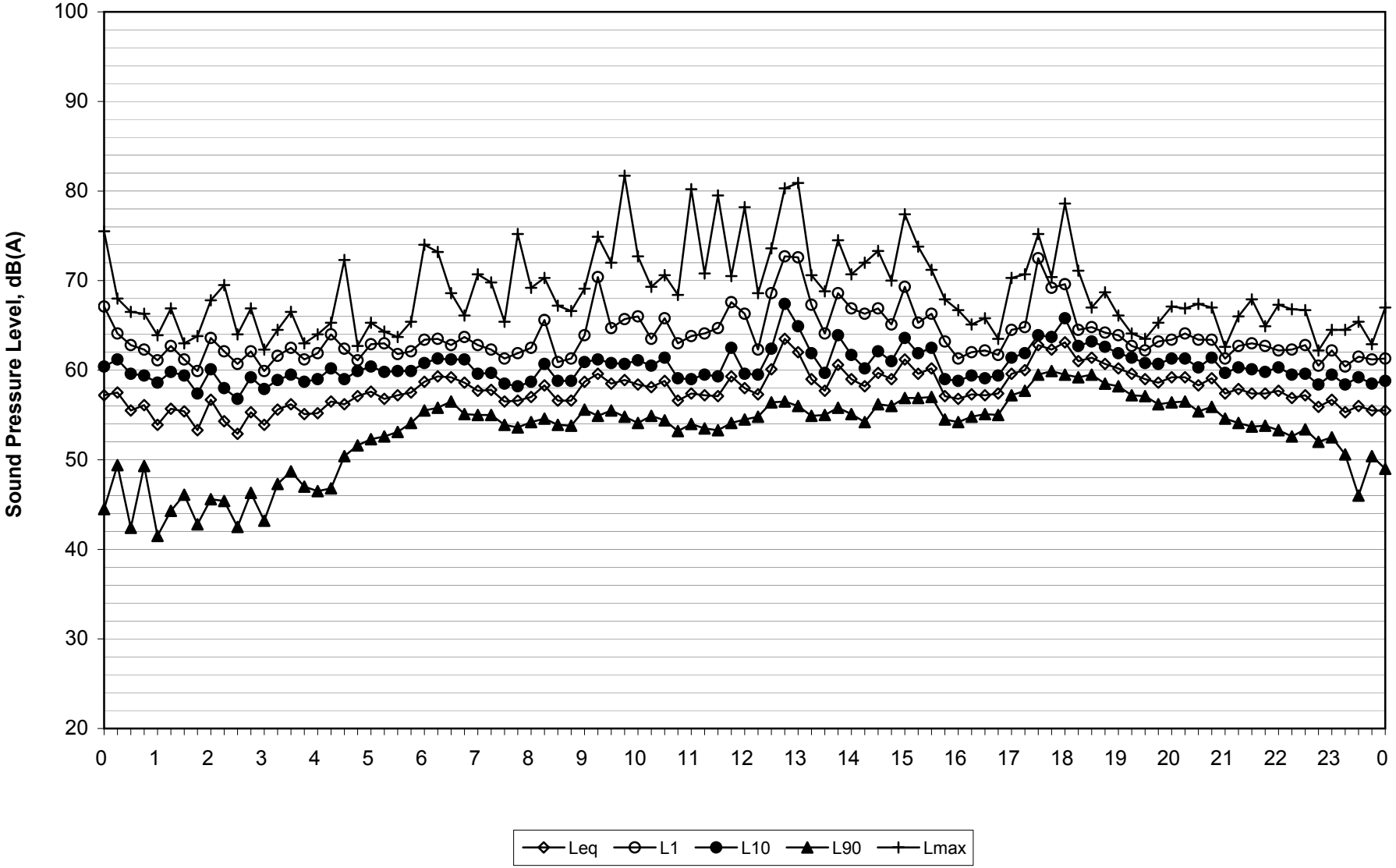


Reference Location M3
235 Bushells Ridge Road

5987R3_b.xls

Ambient Sound Pressure Levels

Friday 30 March 2007

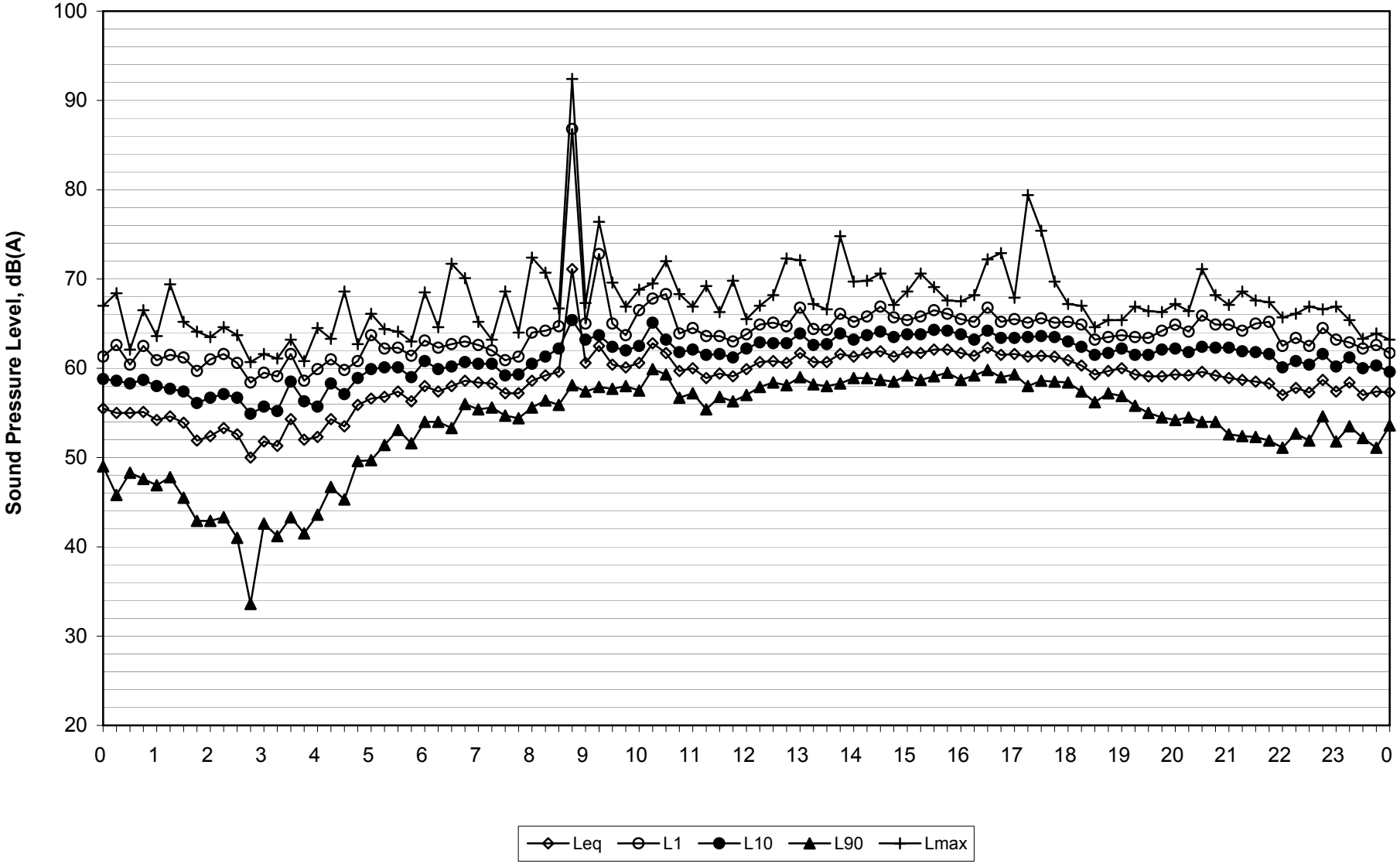


Reference Location M3
235 Bushells Ridge Road

5987R3_b.xls

Ambient Sound Pressure Levels

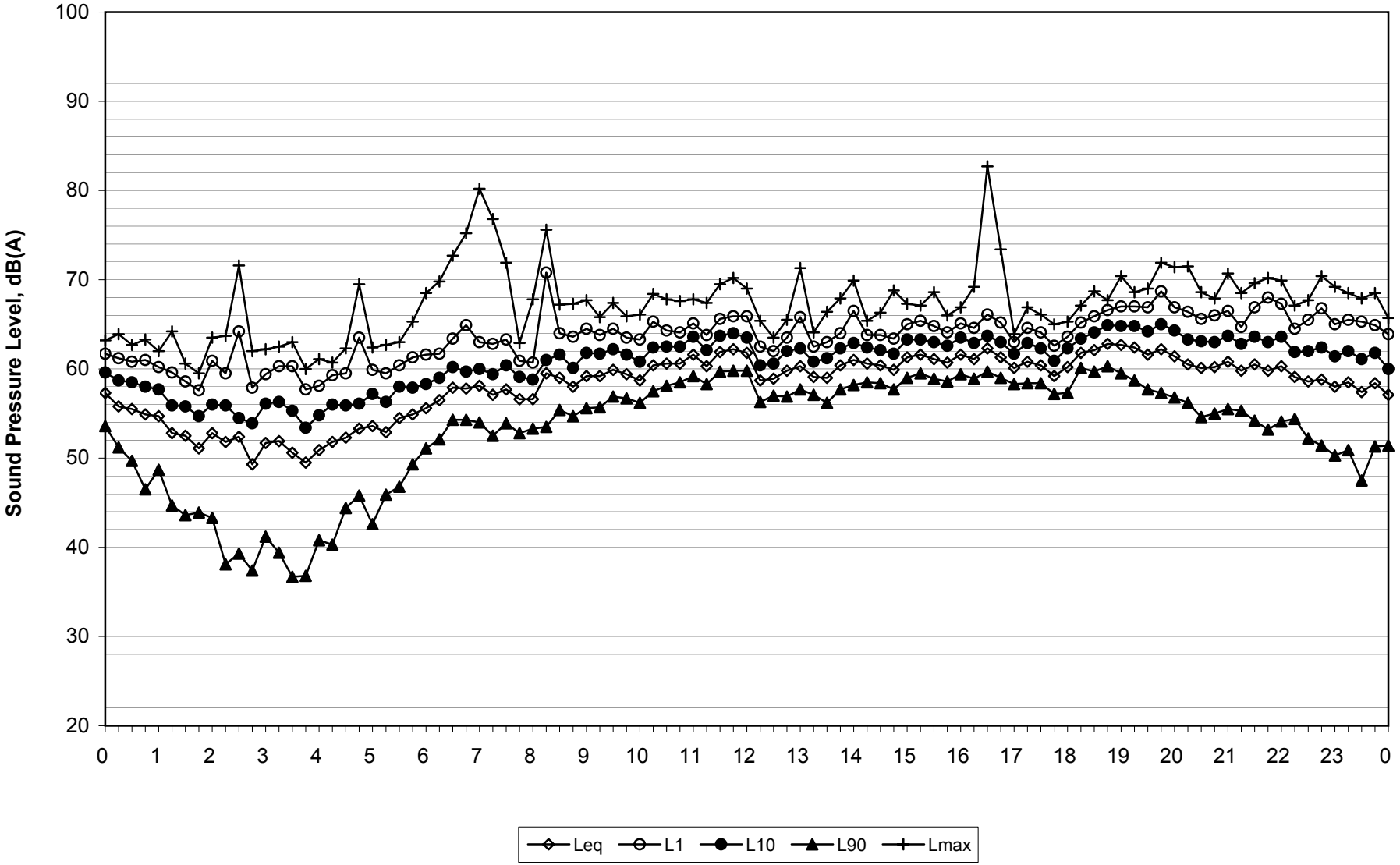
Saturday 31 March 2007



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

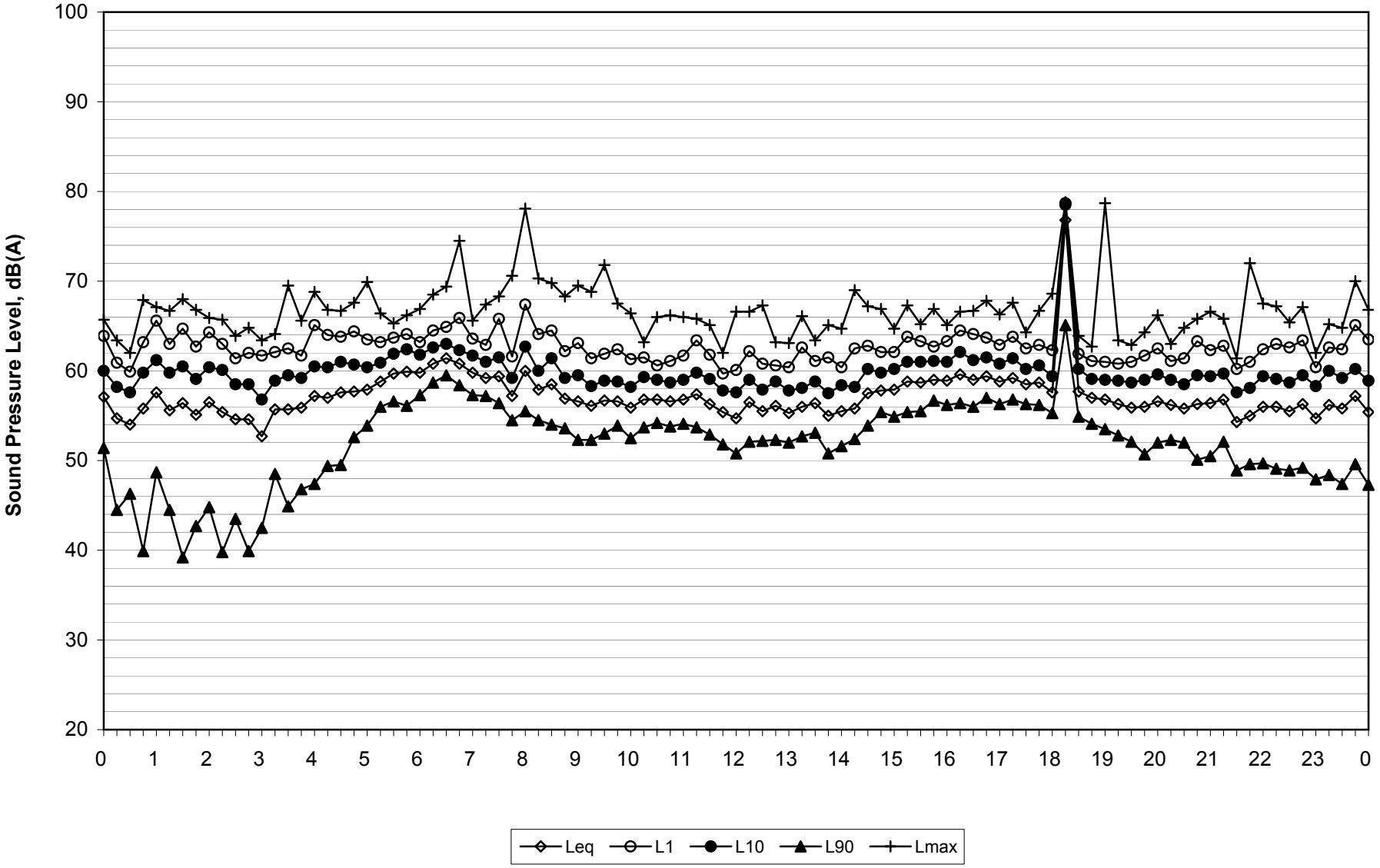
Sunday 01 April 2007



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

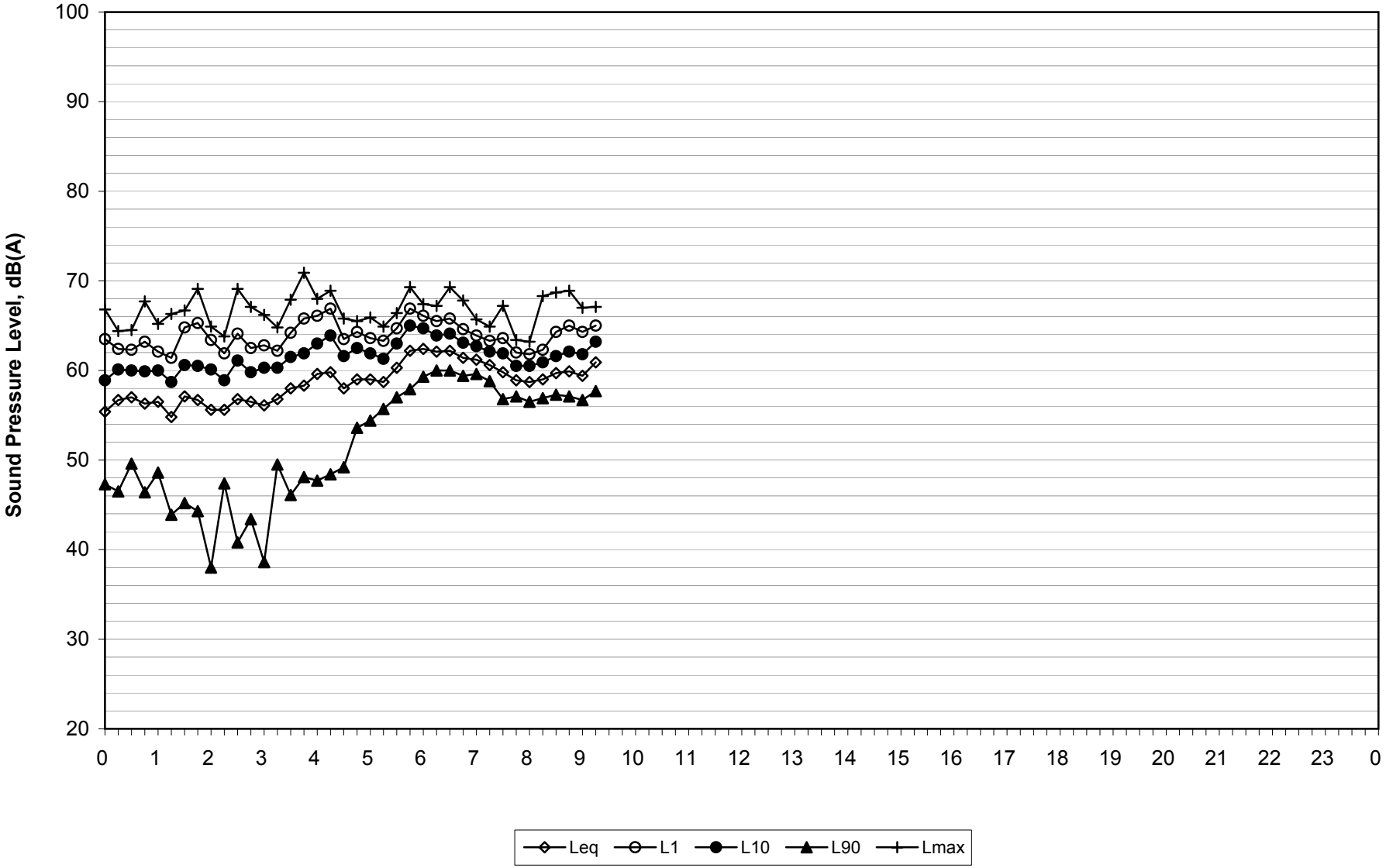
Monday 02 April 2007



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

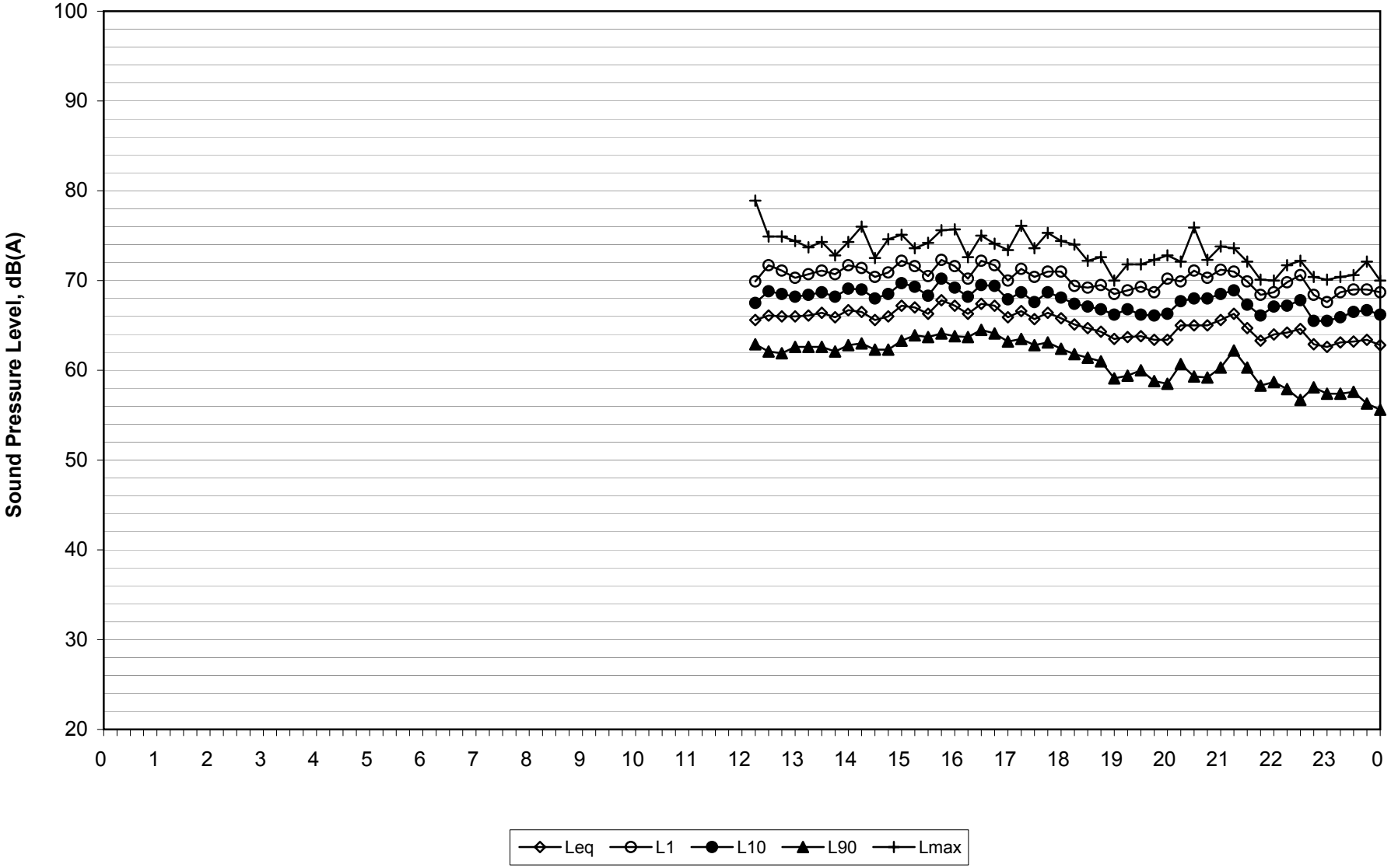
Tuesday 03 April 2007



Reference Location M3
235 Bushells Ridge Road

Ambient Sound Pressure Levels

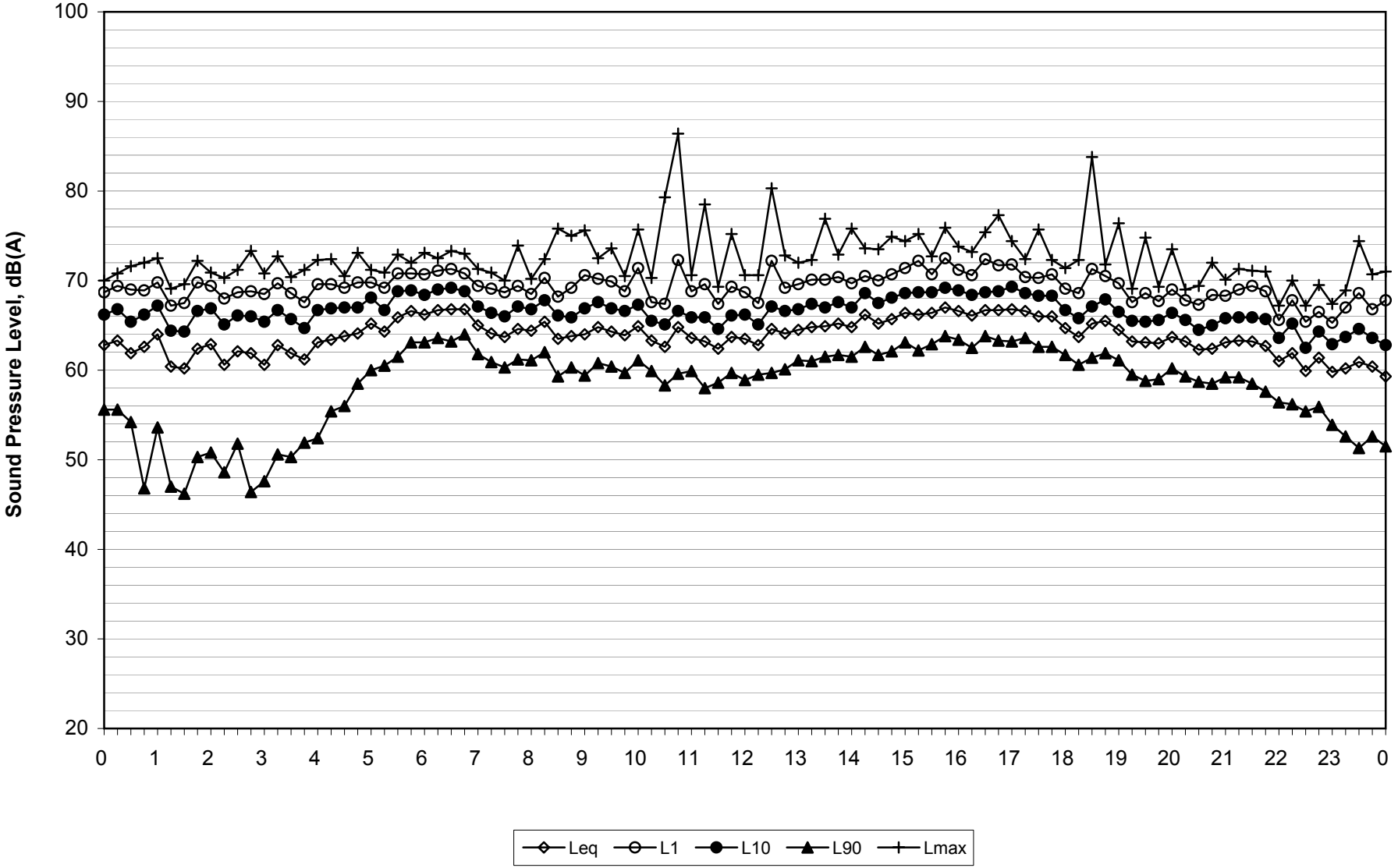
Thursday 09 November 2006



Reference Location M4
209 Bushells Ridge Road

Ambient Sound Pressure Levels

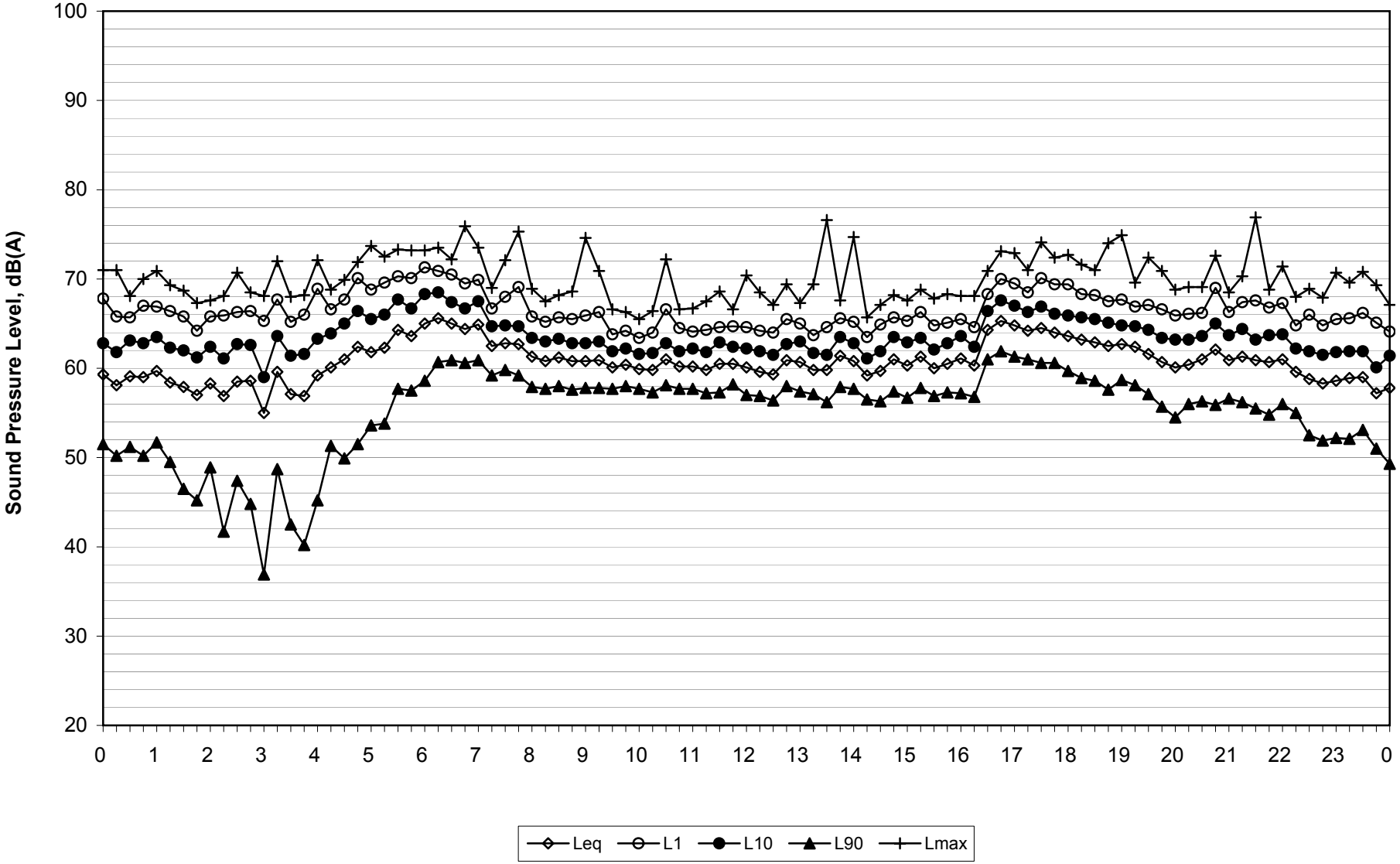
Friday 10 November 2006



Reference Location M4
209 Bushells Ridge Road

Ambient Sound Pressure Levels

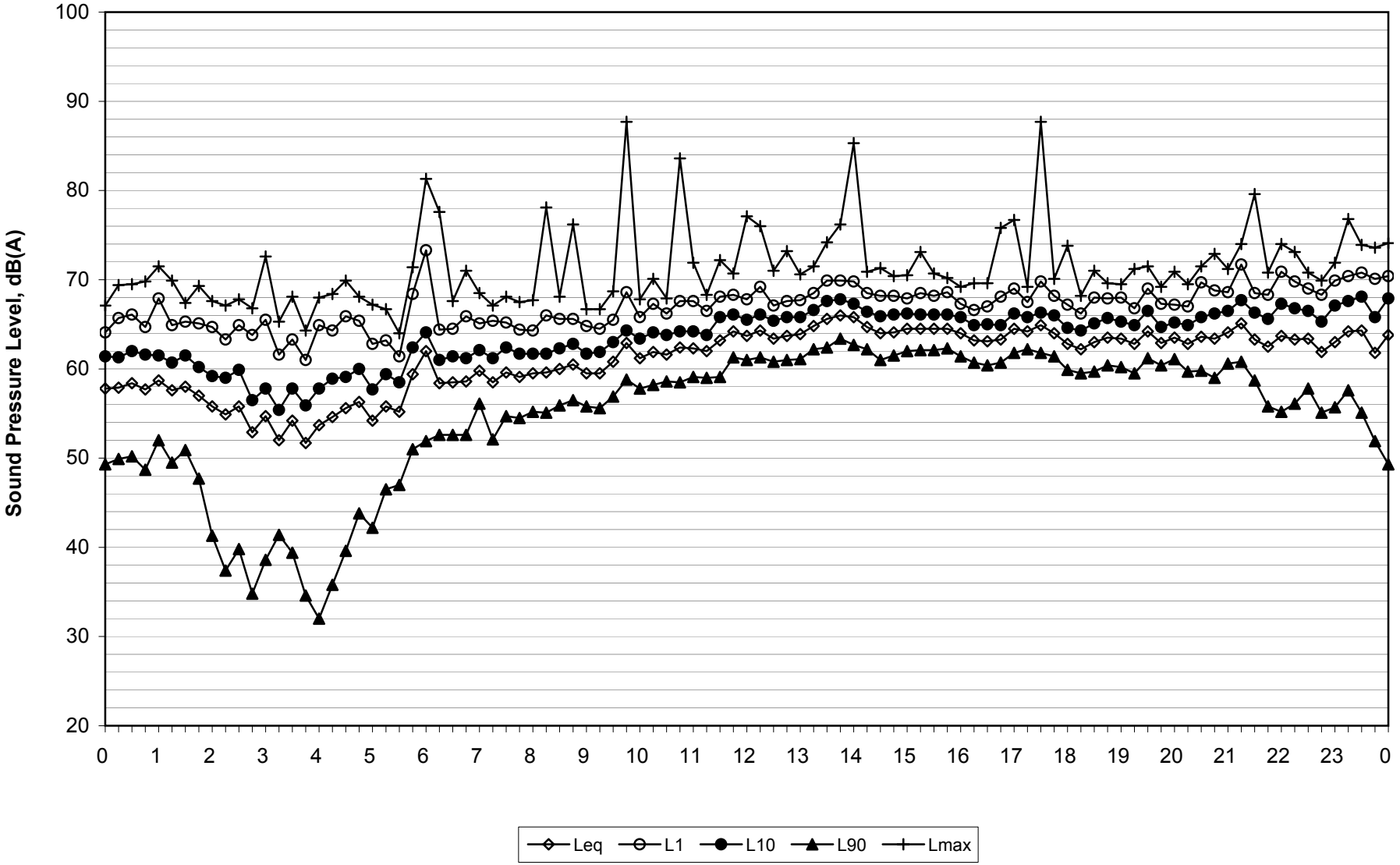
Saturday 11 November 2006



Reference Location M4
209 Bushells Ridge Road

Ambient Sound Pressure Levels

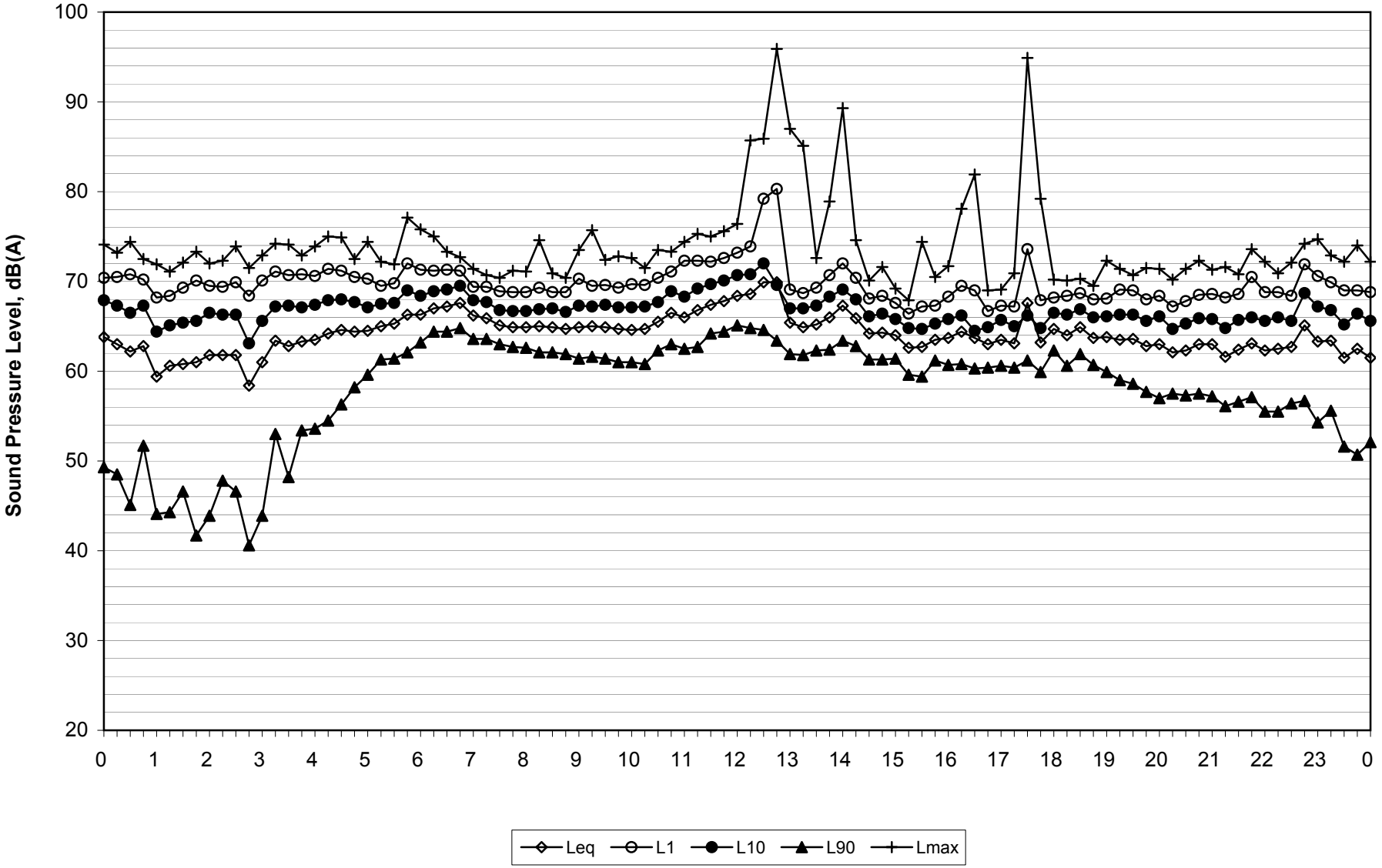
Sunday 12 November 2006



Reference Location M4
209 Bushells Ridge Road

Ambient Sound Pressure Levels

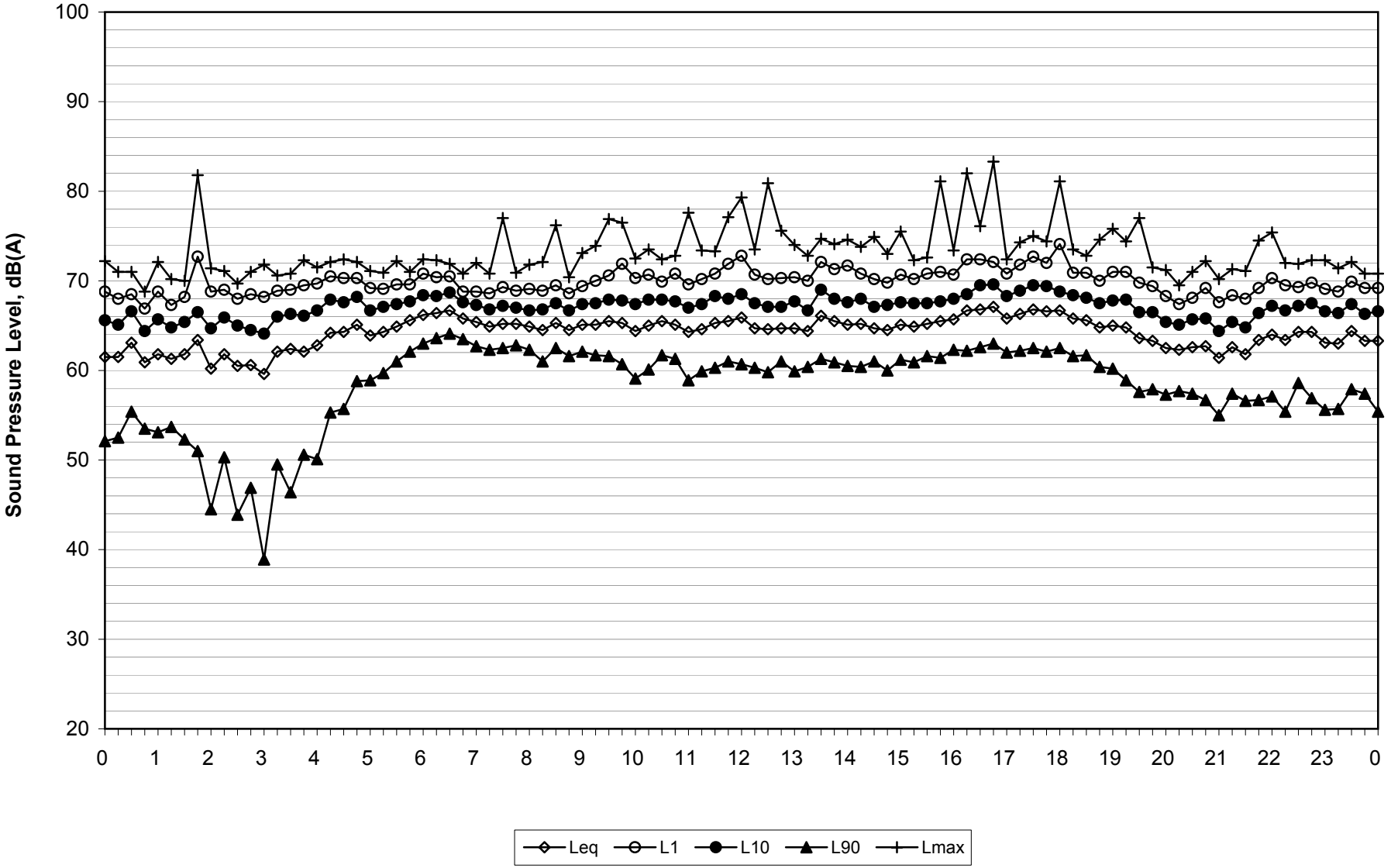
Monday 13 November 2006



Reference Location M4
209 Bushells Ridge Road

Ambient Sound Pressure Levels

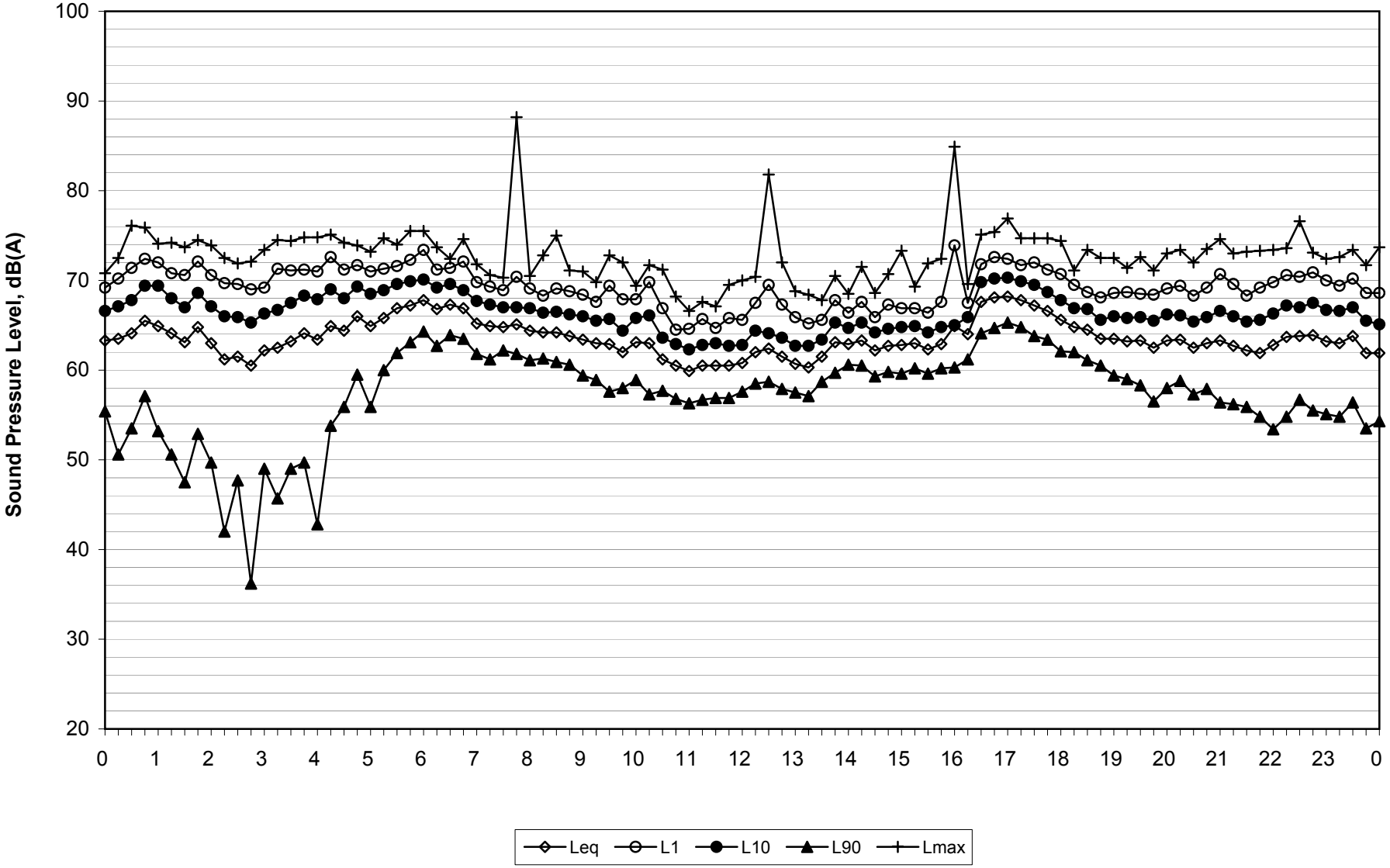
Tuesday 14 November 2006



Reference Location M4
209 Bushells Ridge Road

Ambient Sound Pressure Levels

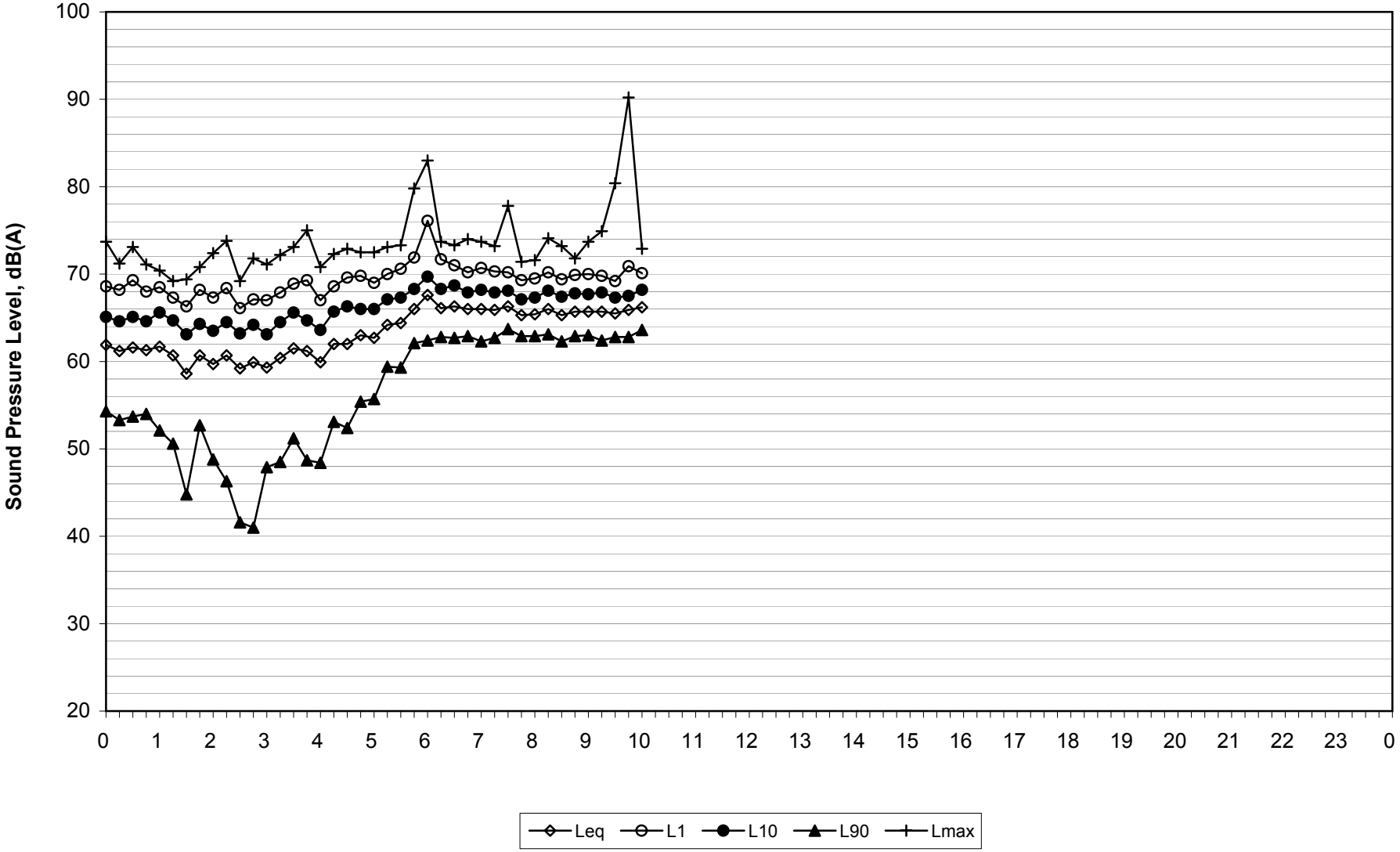
Wednesday 15 November 2006



Reference Location M4
209 Bushells Ridge Road

Ambient Sound Pressure Levels

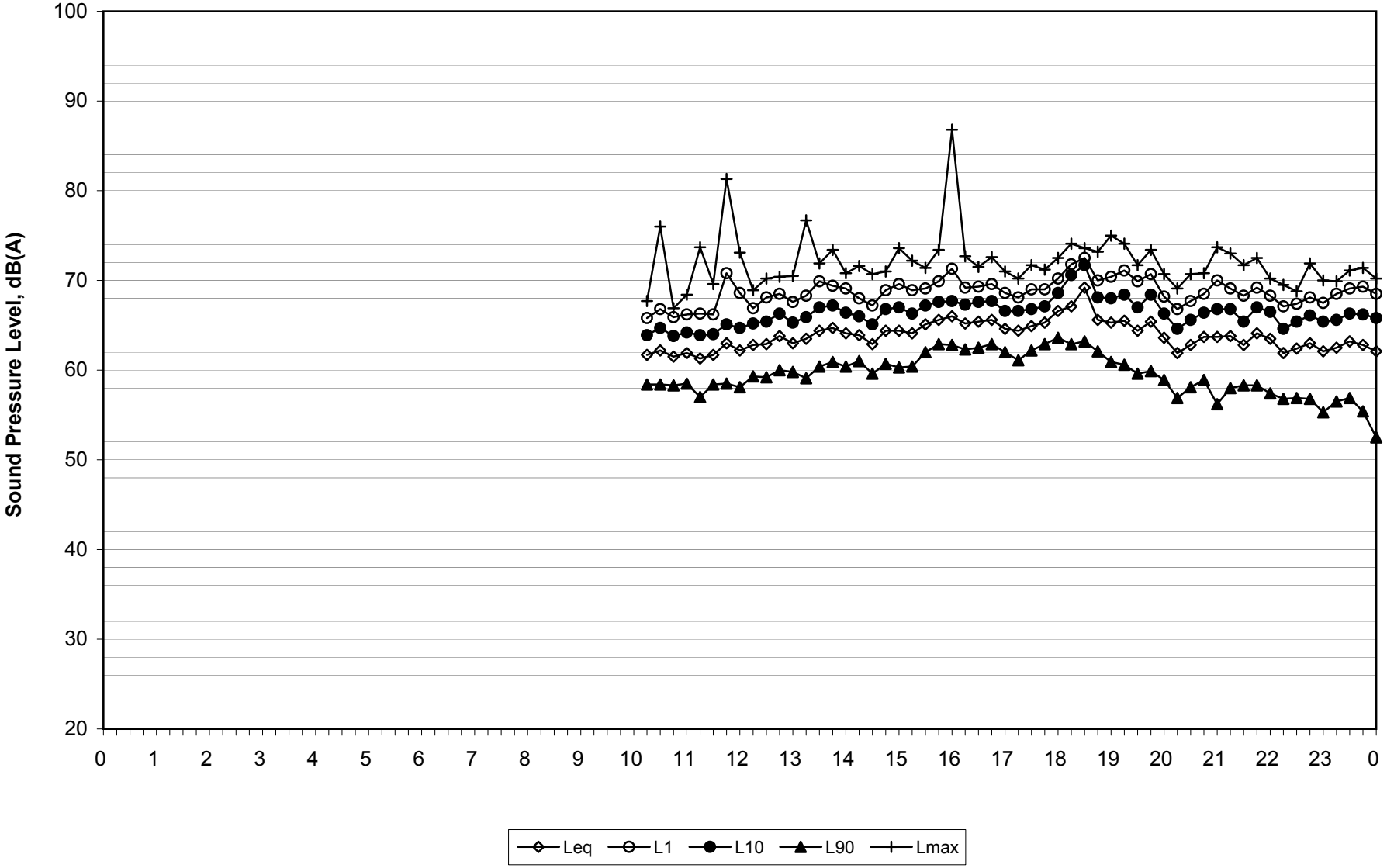
Thursday 16 November 2006



Reference Location M4
209 Bushells Ridge Road

Ambient Sound Pressure Levels

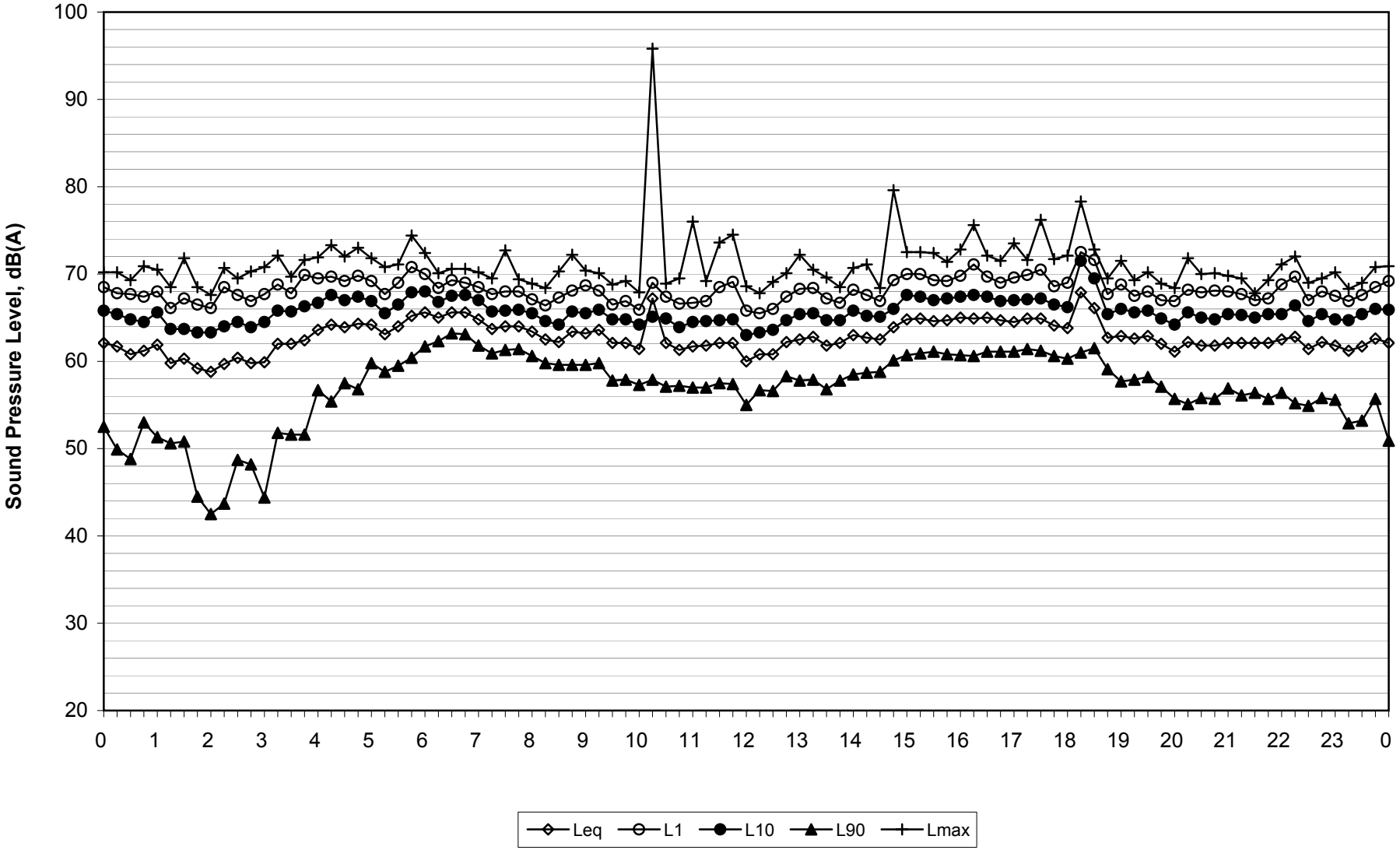
Tuesday 27 March 2007



Reference Location M4
209 Bushells Ridge Road

Ambient Sound Pressure Levels

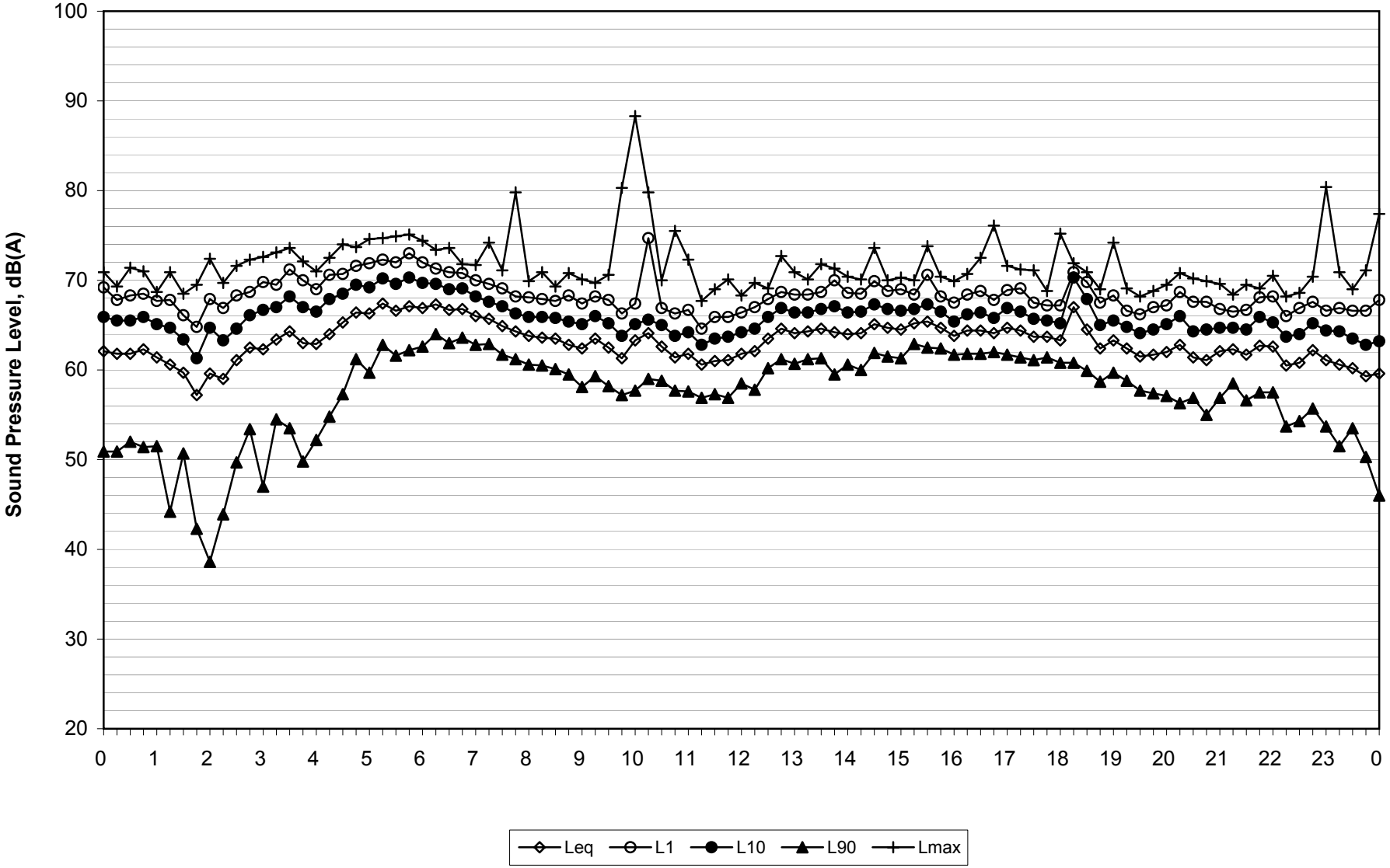
Wednesday 28 March 2007



Reference Location M4
209 Bushells Ridge Road

Ambient Sound Pressure Levels

Thursday 29 March 2007

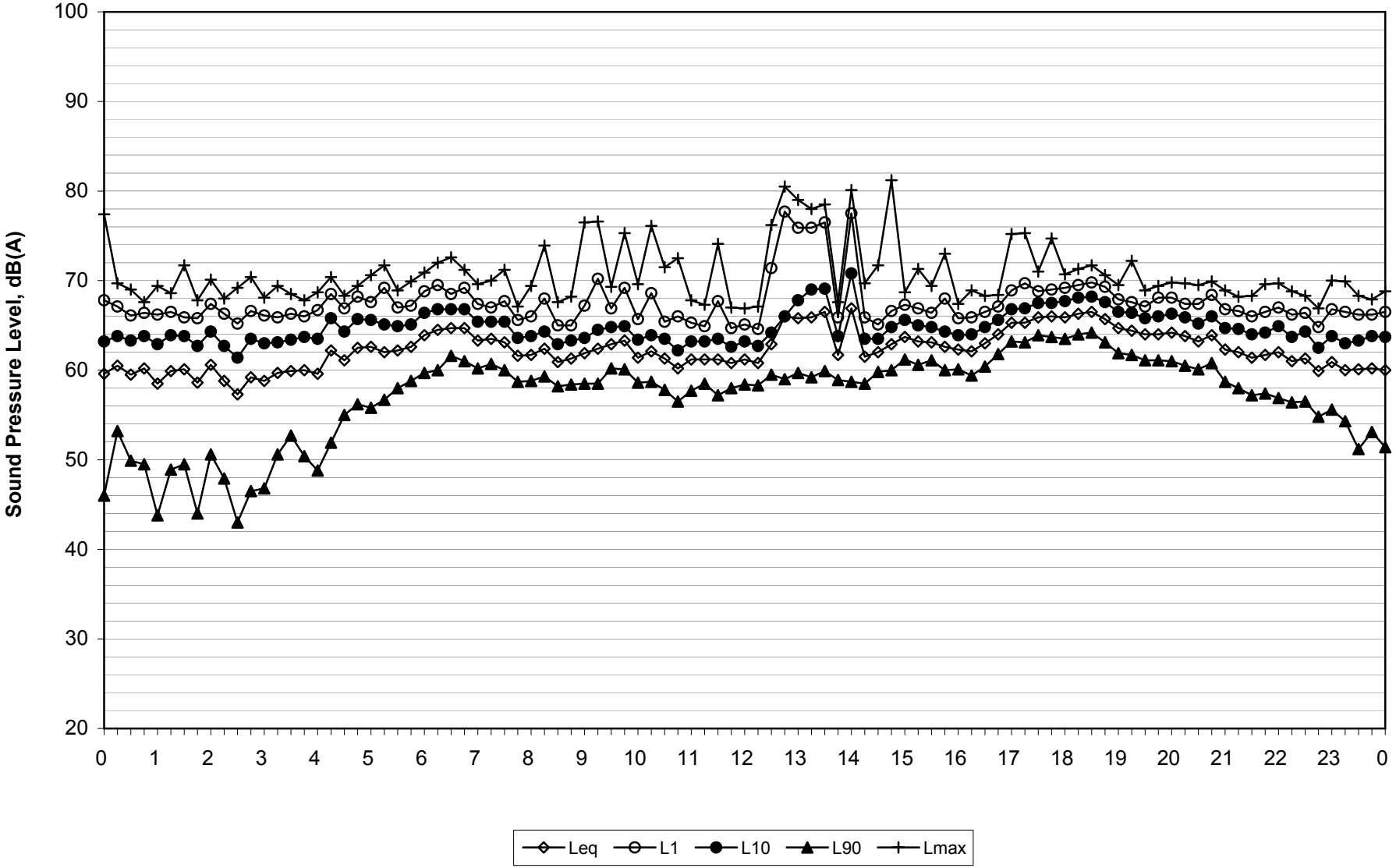


Reference Location M4
209 Bushells Ridge Road

5987R4_b.xls

Ambient Sound Pressure Levels

Friday 30 March 2007

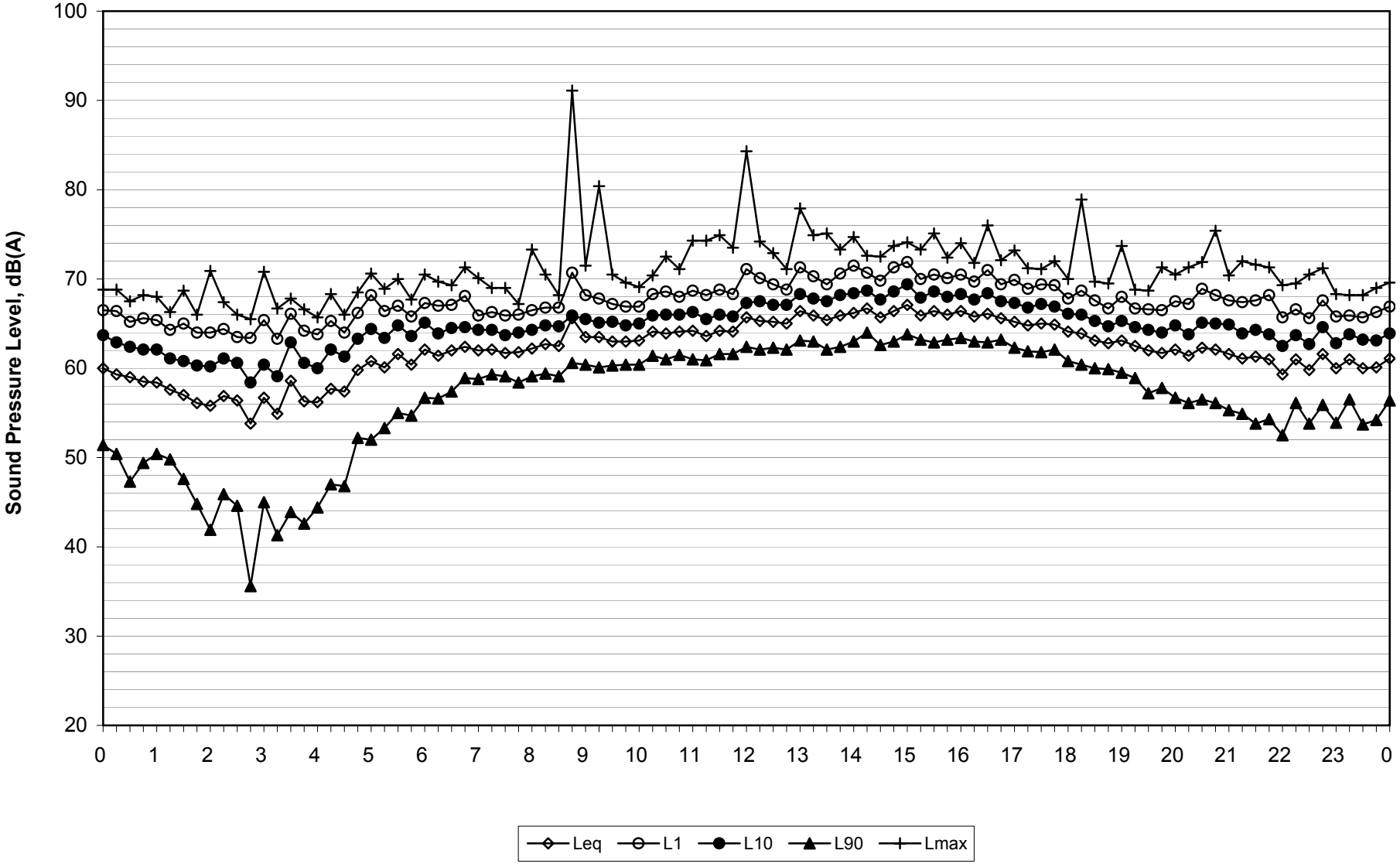


Reference Location M4
209 Bushells Ridge Road

5987R4_b.xls

Ambient Sound Pressure Levels

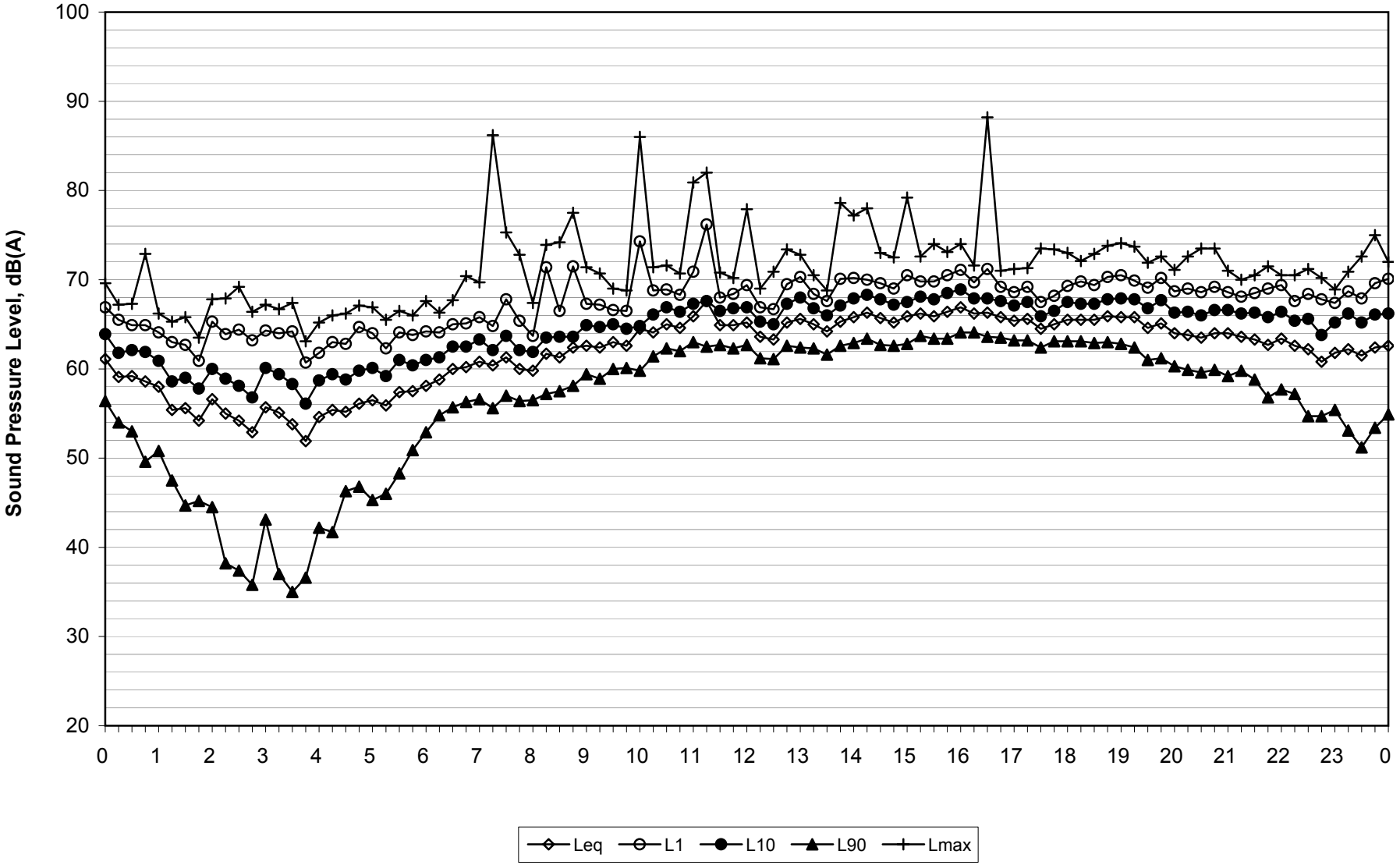
Saturday 31 March 2007



Reference Location M4
209 Bushells Ridge Road

Ambient Sound Pressure Levels

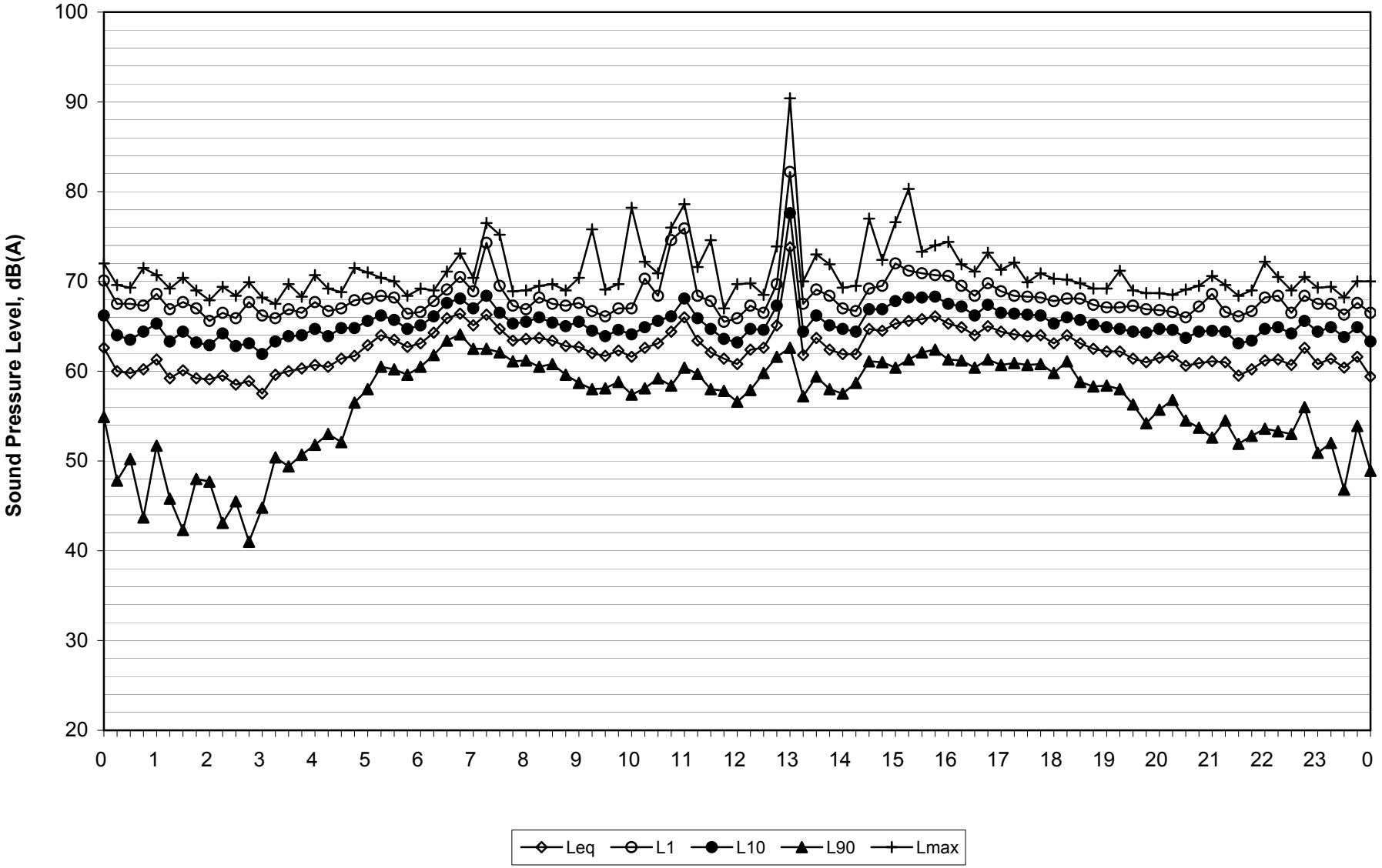
Sunday 01 April 2007



Reference Location M4
209 Bushells Ridge Road

Ambient Sound Pressure Levels

Monday 02 April 2007

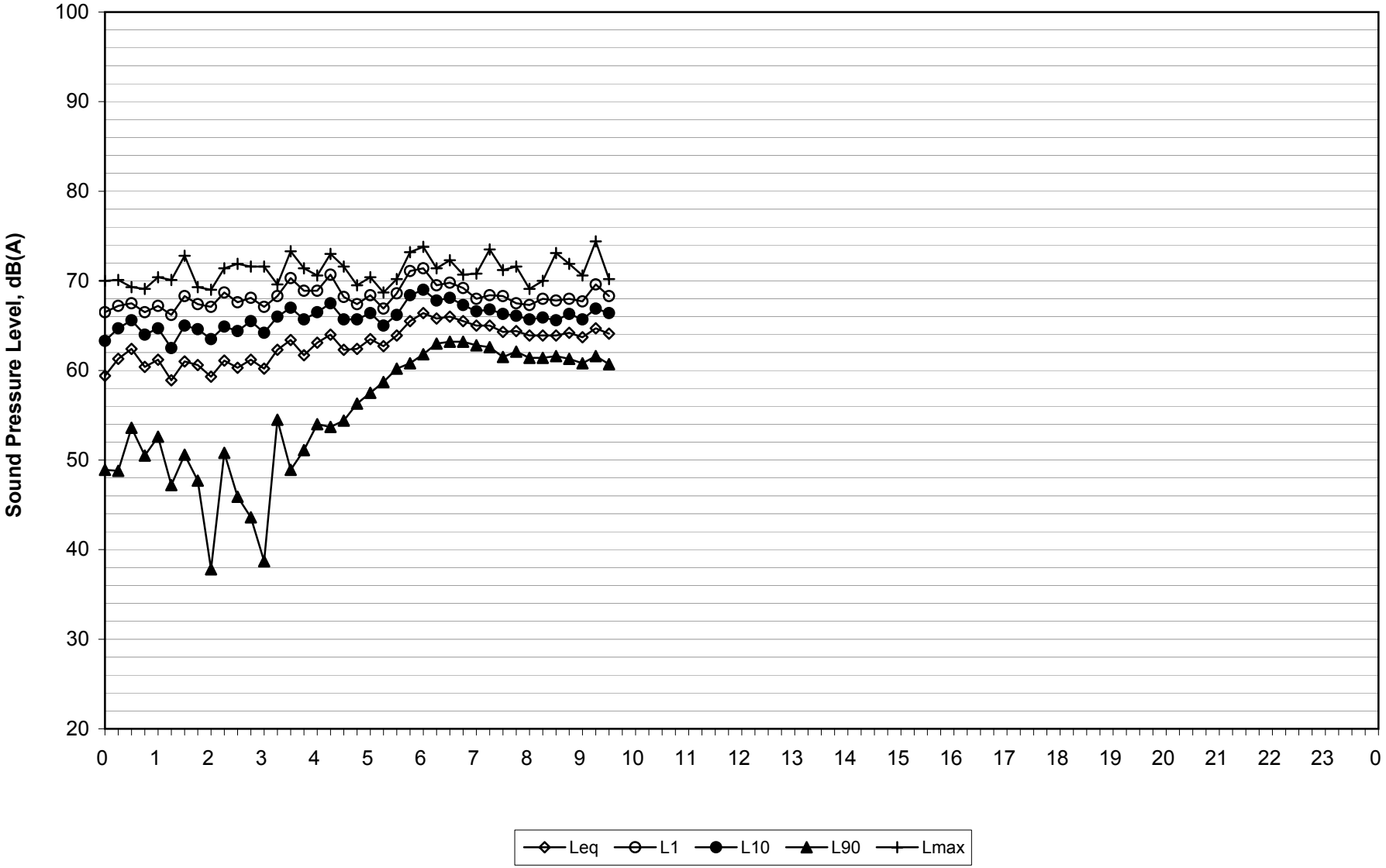


Reference Location M4
209 Bushells Ridge Road

5987R4_b.xls

Ambient Sound Pressure Levels

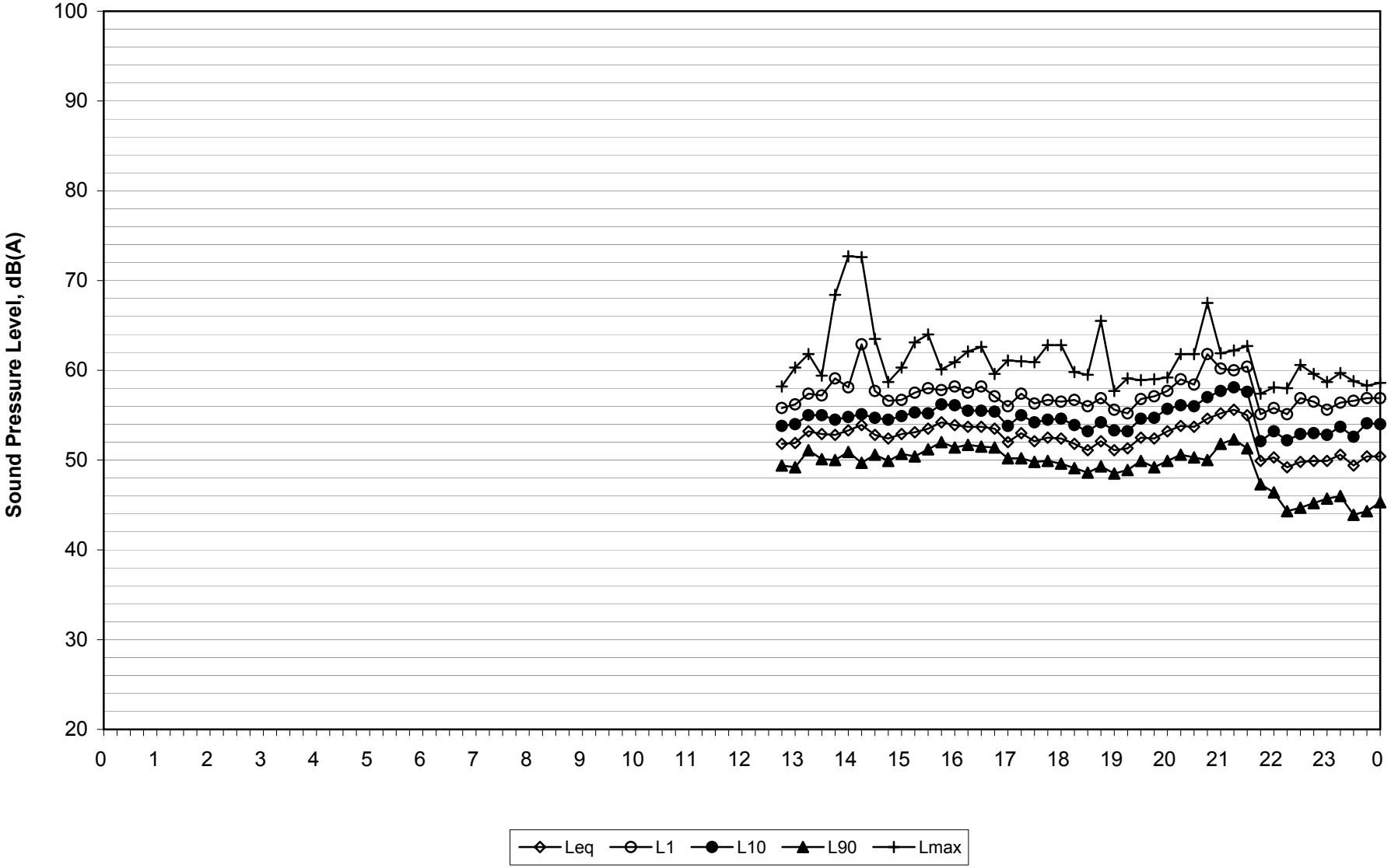
Tuesday 03 April 2007



Reference Location M4
209 Bushells Ridge Road

Ambient Sound Pressure Levels

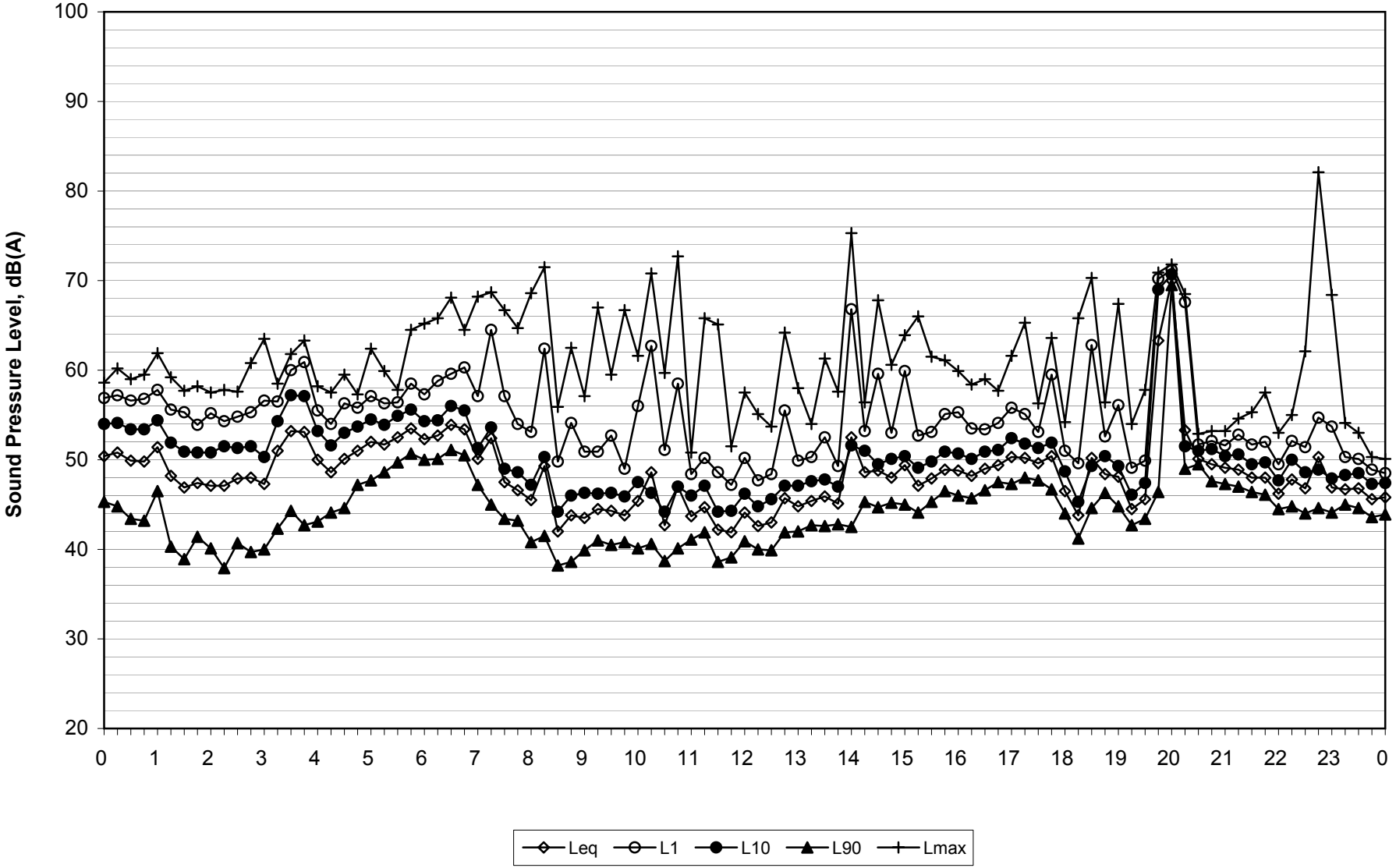
Thursday 09 November 2006



Reference Location M5
97 Bushell Ridge Road

Ambient Sound Pressure Levels

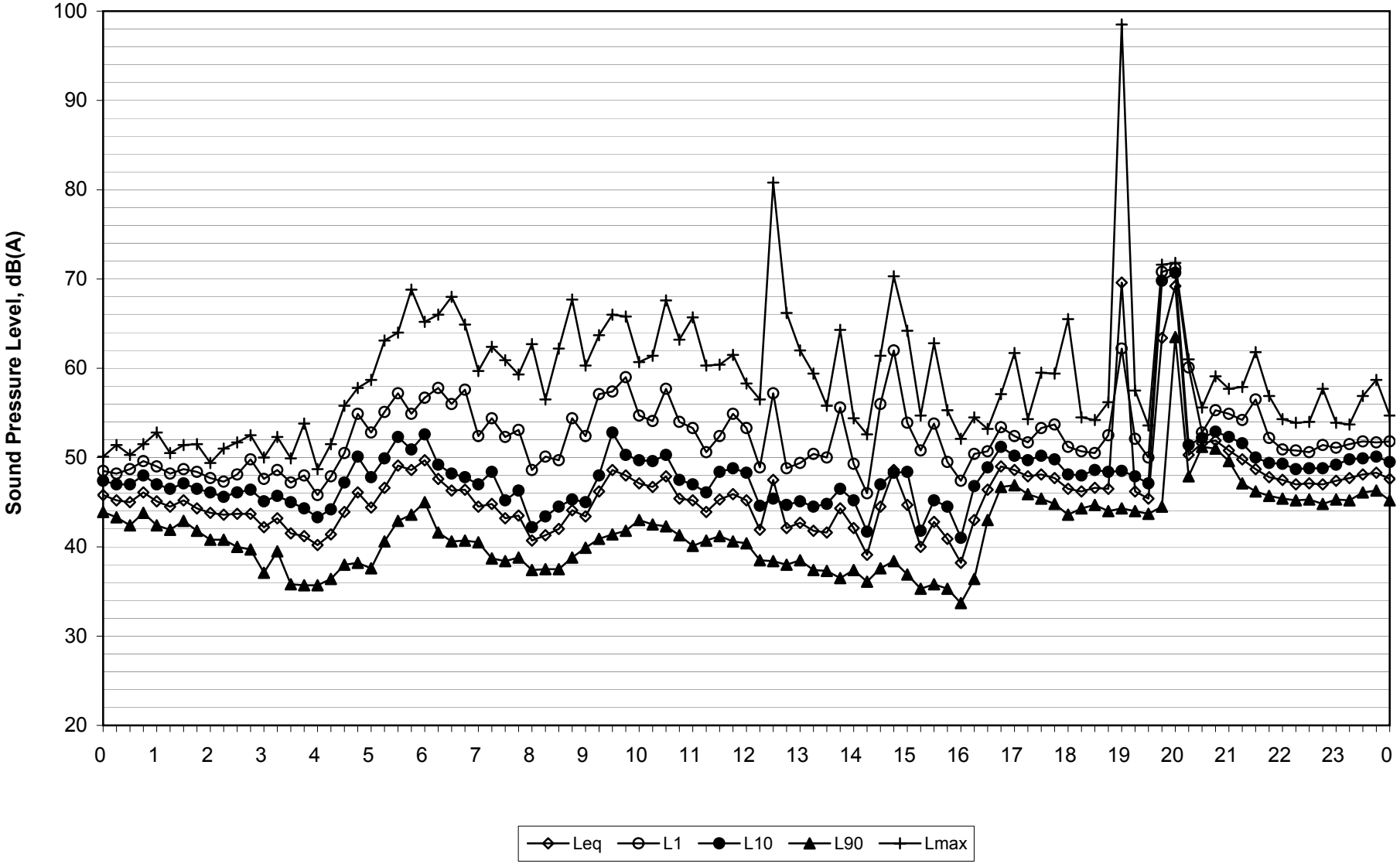
Friday 10 November 2006



Reference Location M5
97 Bushell Ridge Road

Ambient Sound Pressure Levels

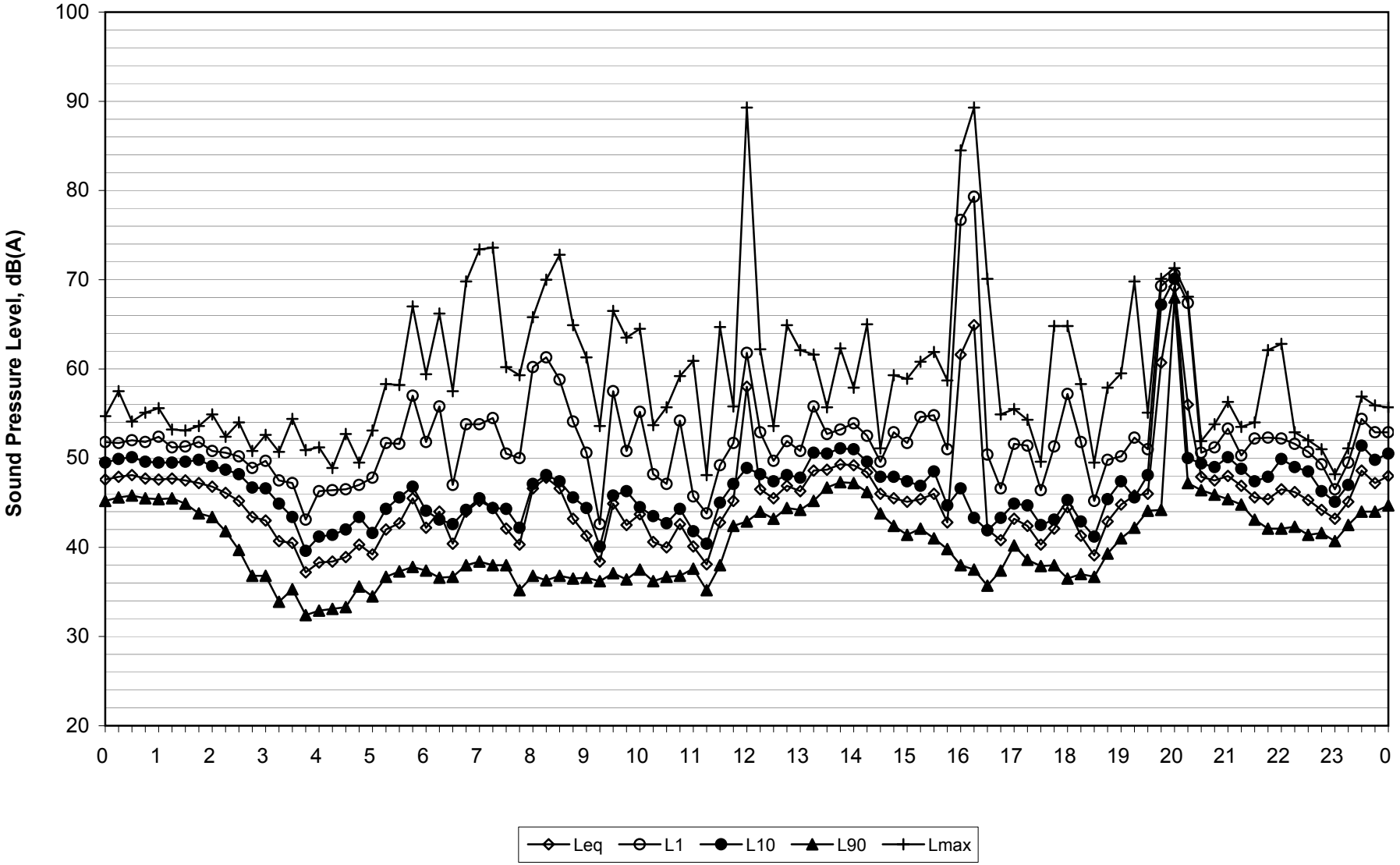
Saturday 11 November 2006



Reference Location M5
97 Bushell Ridge Road

Ambient Sound Pressure Levels

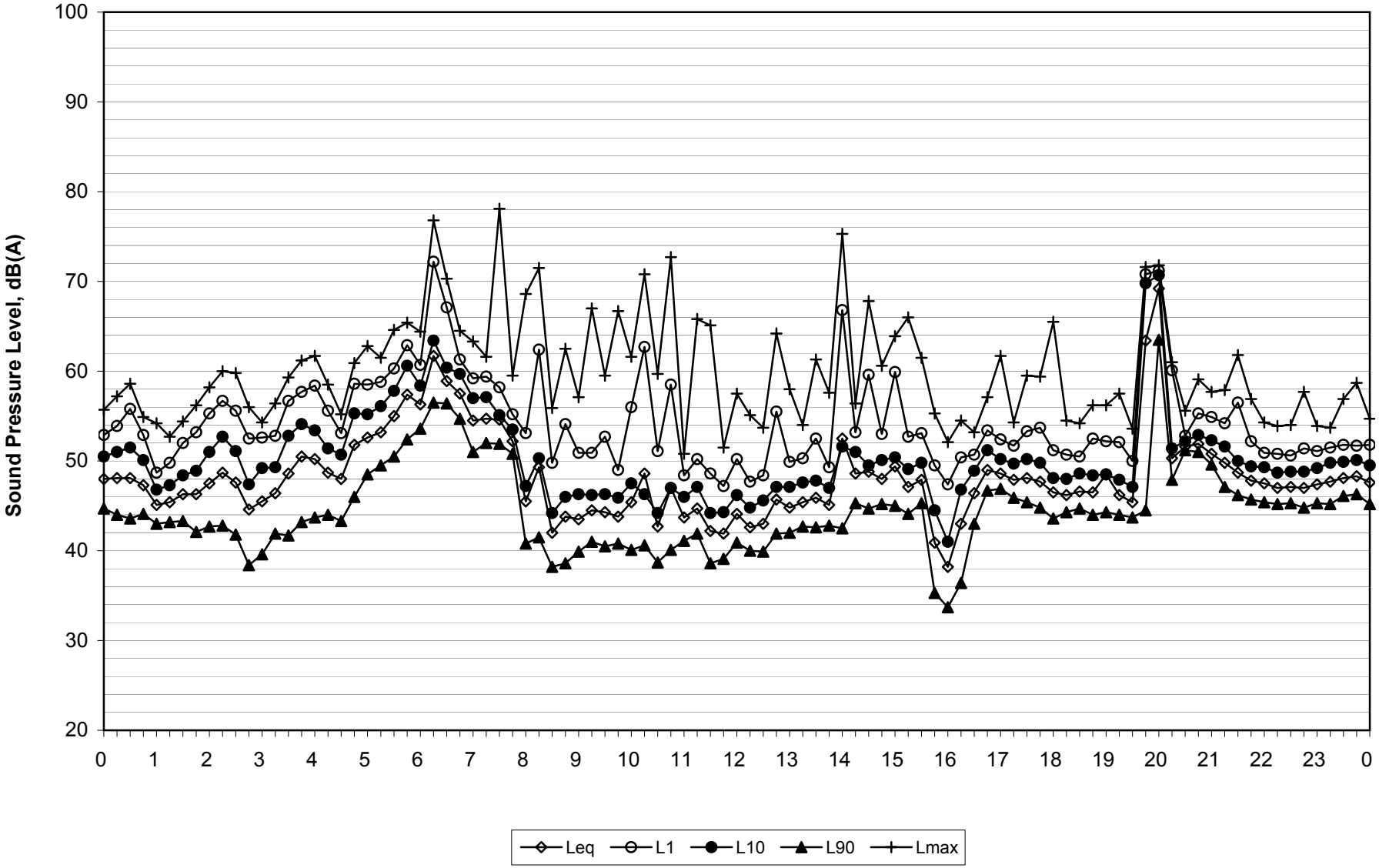
Sunday 12 November 2006



Reference Location M5
97 Bushell Ridge Road

Ambient Sound Pressure Levels

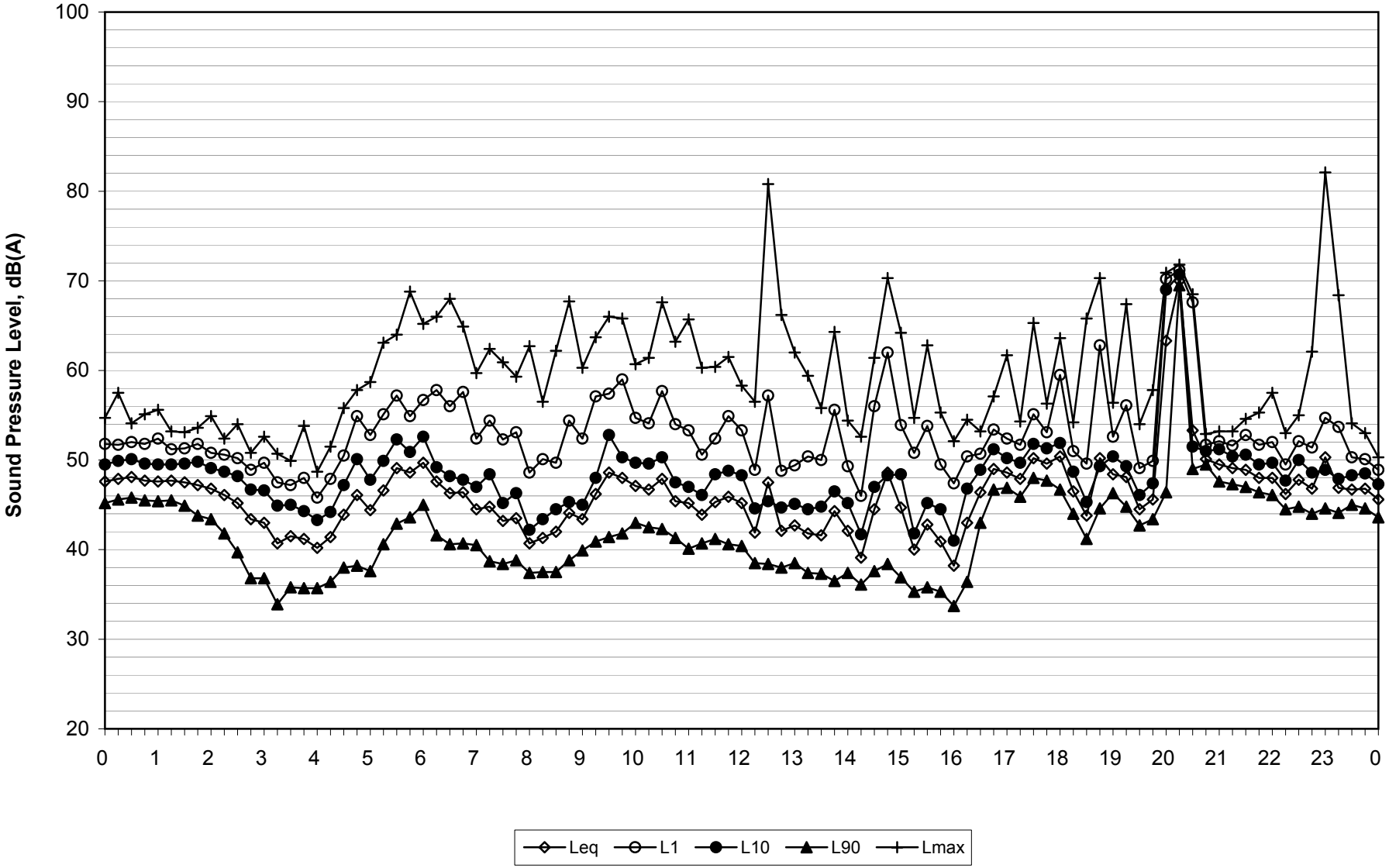
Monday 13 November 2006



Reference Location M5
97 Bushell Ridge Road

Ambient Sound Pressure Levels

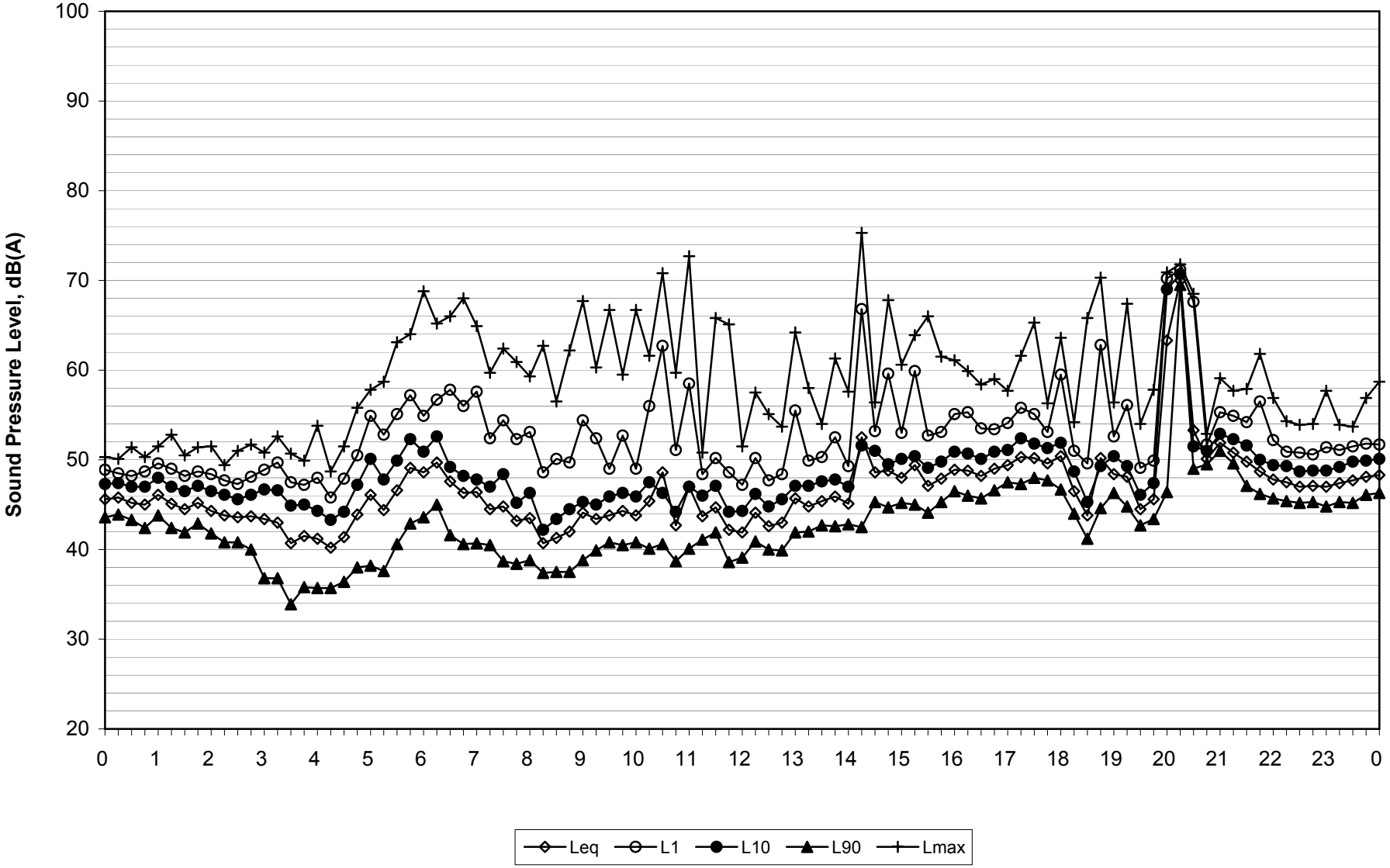
Tuesday 14 November 2006



Reference Location M5
97 Bushell Ridge Road

Ambient Sound Pressure Levels

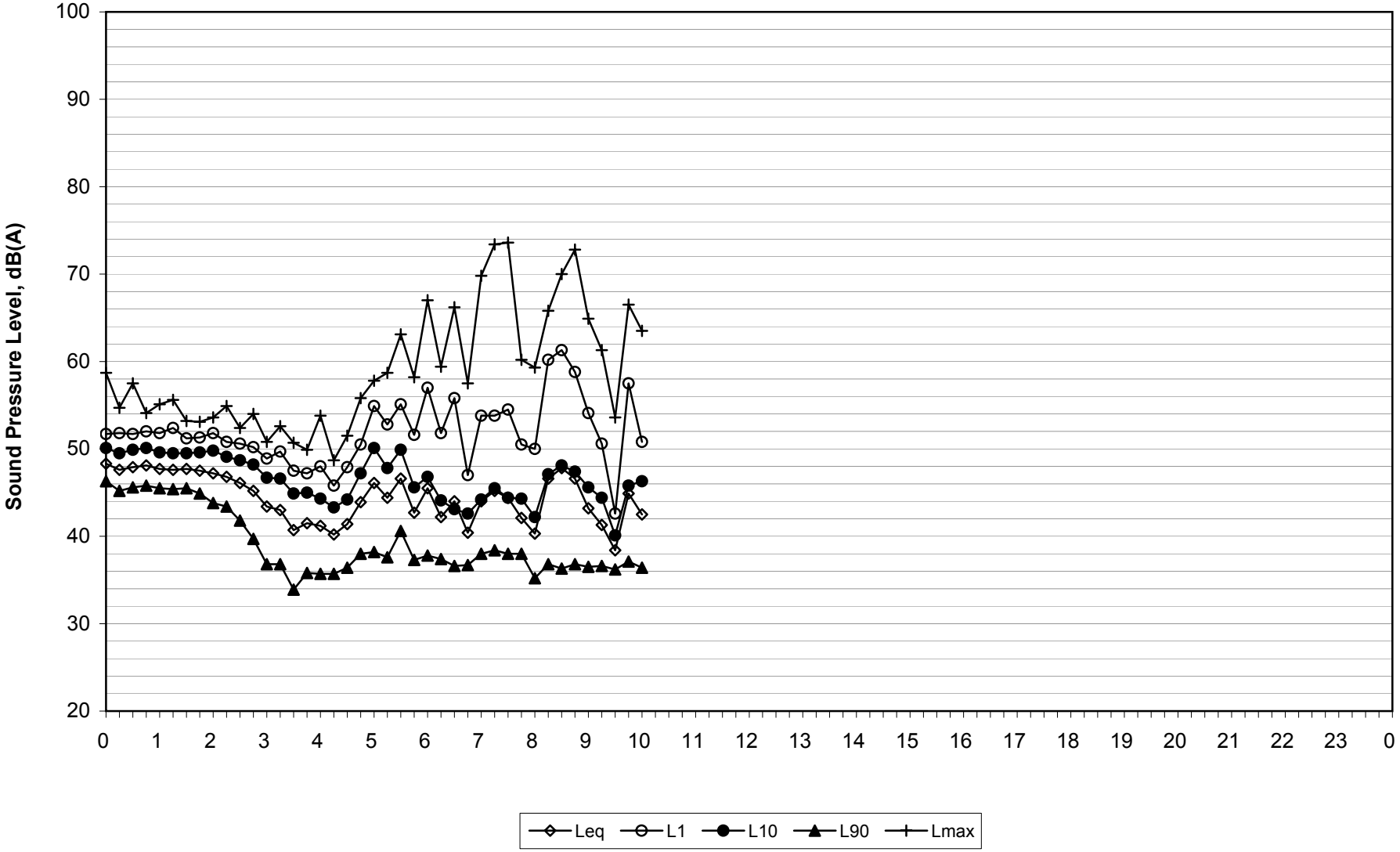
Wednesday 15 November 2006



Reference Location M5
97 Bushell Ridge Road

Ambient Sound Pressure Levels

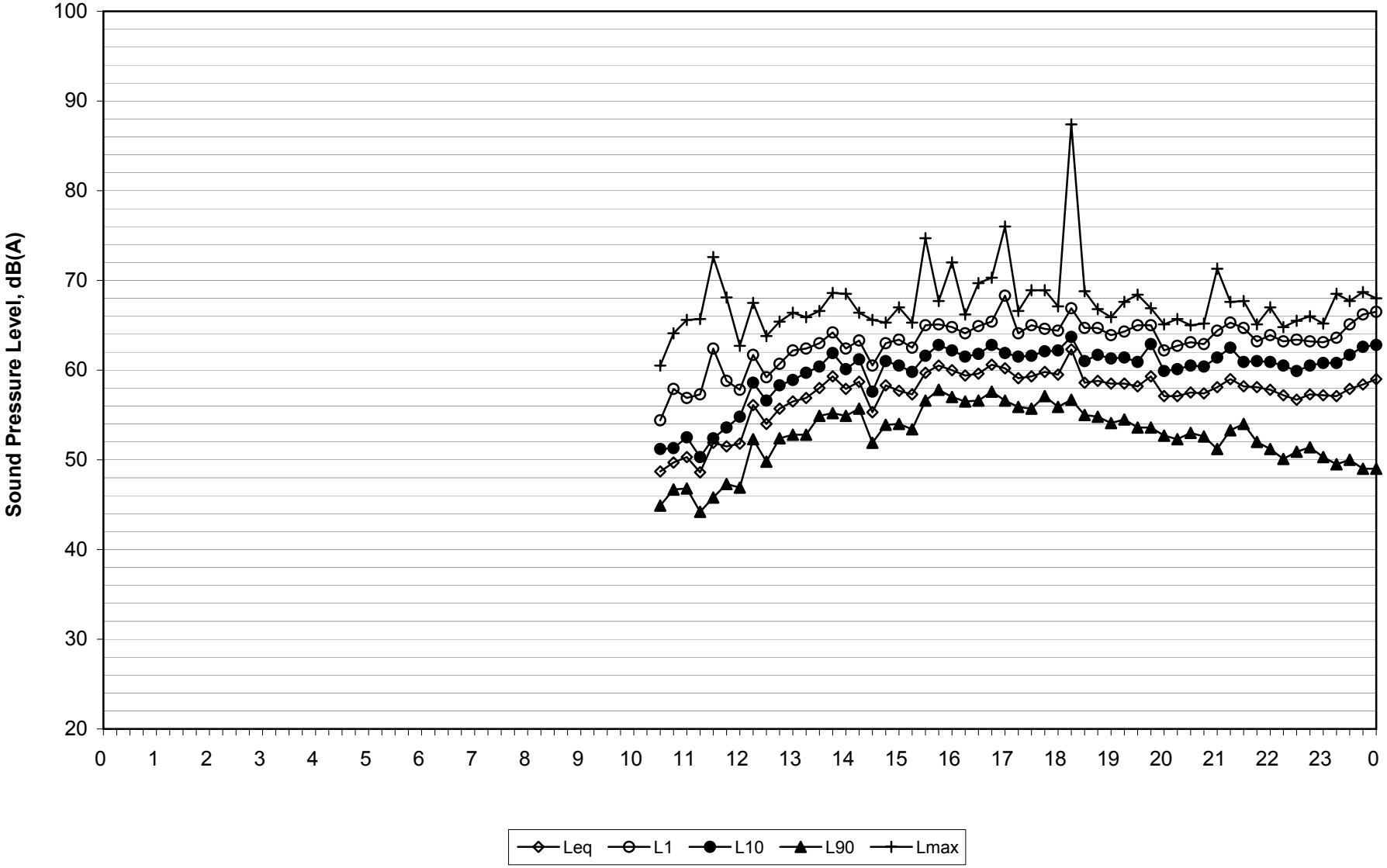
Thursday 16 November 2006



Reference Location M5
97 Bushell Ridge Road

Ambient Sound Pressure Levels

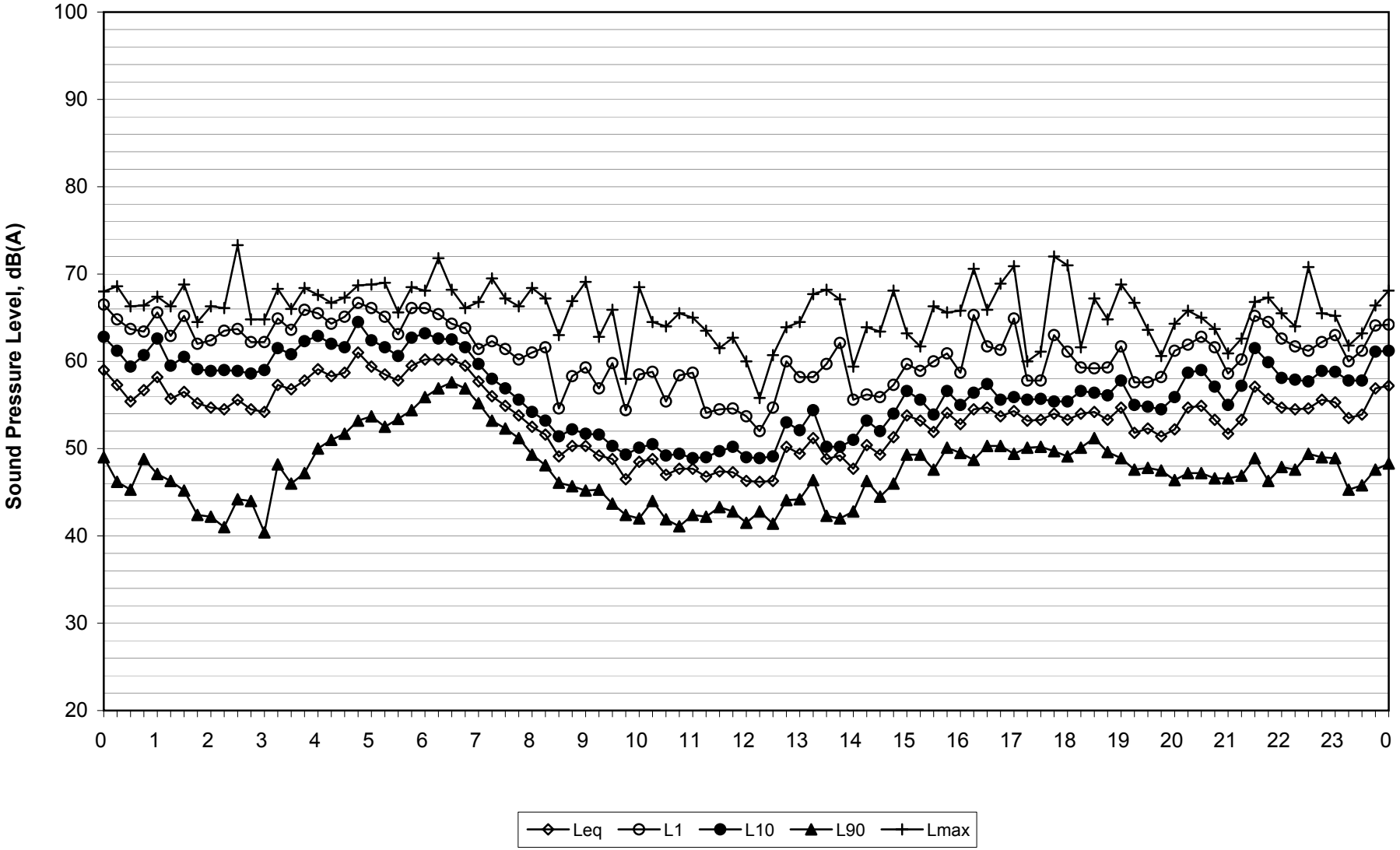
Tuesday 27 March 2007



Reference Location M5
97 Bushells Ridge Road

Ambient Sound Pressure Levels

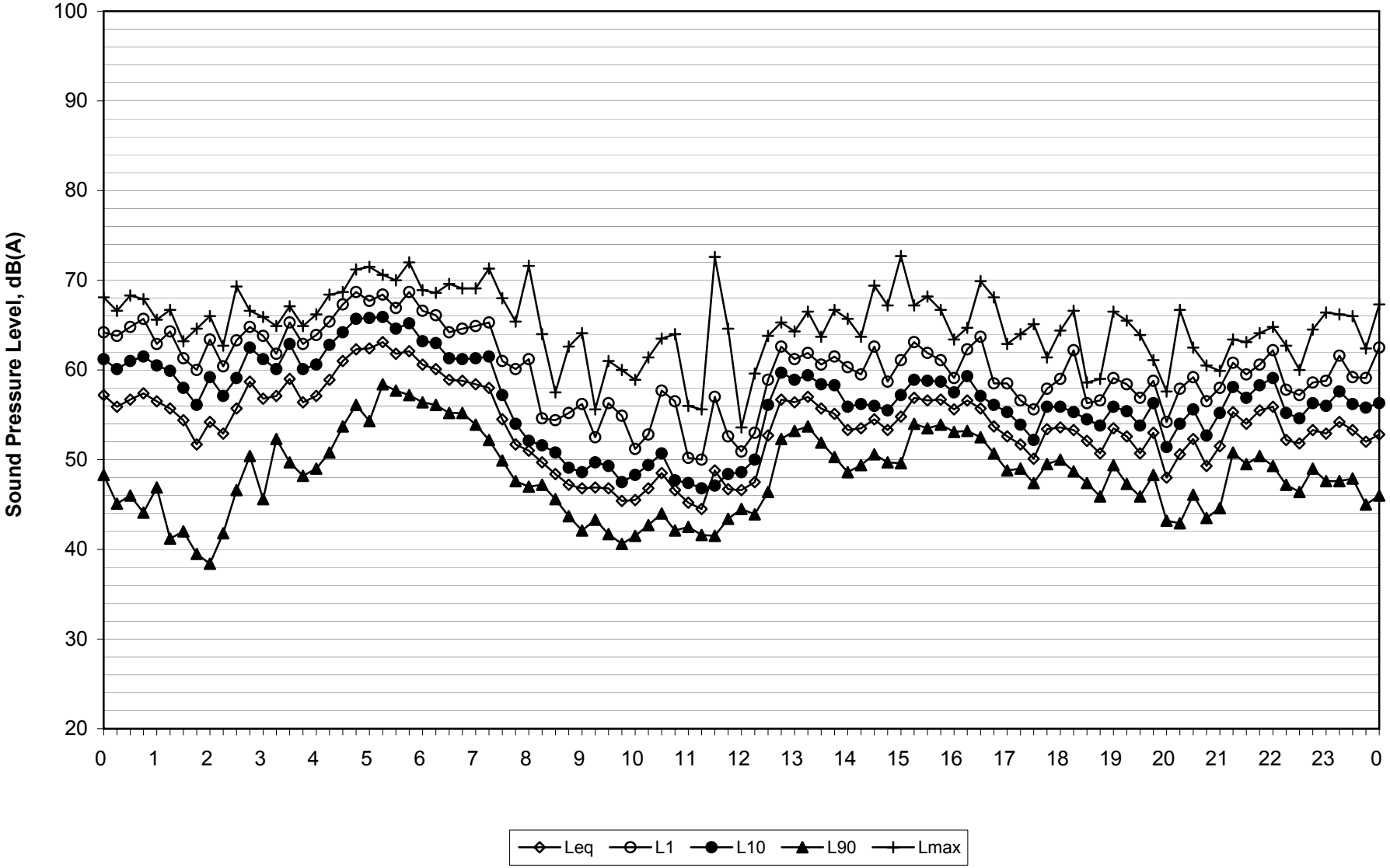
Wednesday 28 March 2007



Reference Location M5
97 Bushells Ridge Road

Ambient Sound Pressure Levels

Thursday 29 March 2007

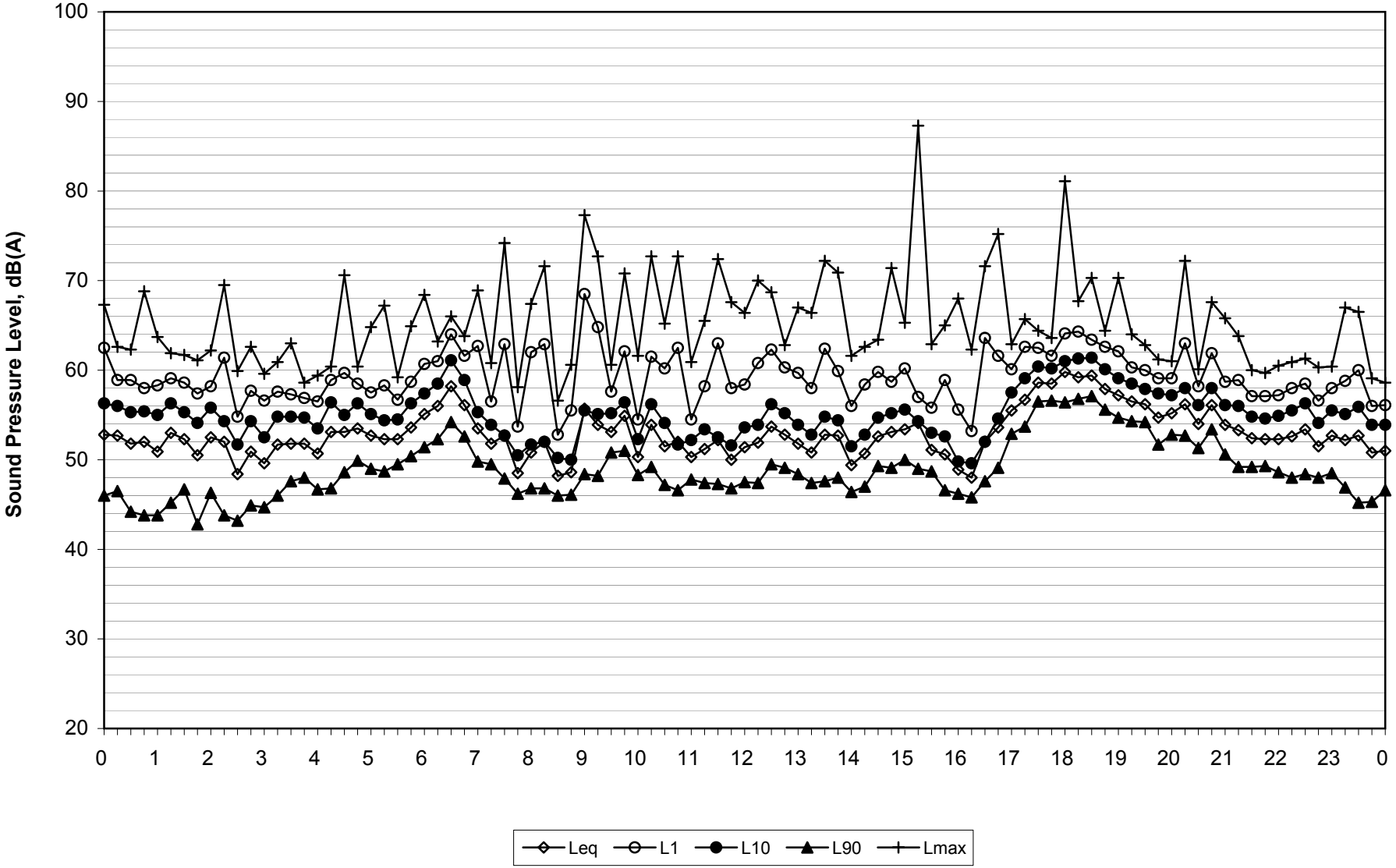


Reference Location M5
97 Bushells Ridge Road

5987R5_b.xls

Ambient Sound Pressure Levels

Friday 30 March 2007

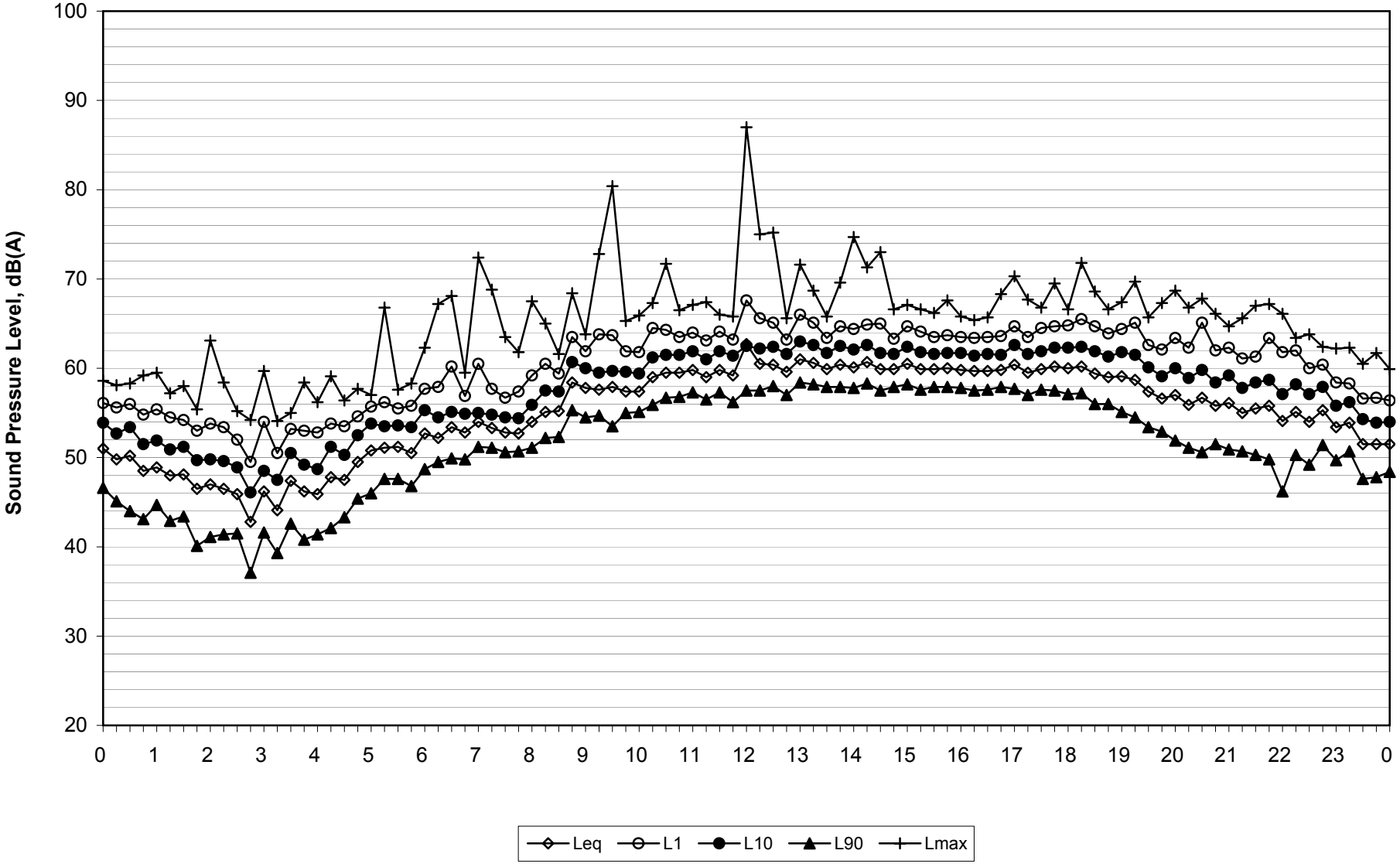


Reference Location M5
97 Bushells Ridge Road

5987R5_b.xls

Ambient Sound Pressure Levels

Saturday 31 March 2007

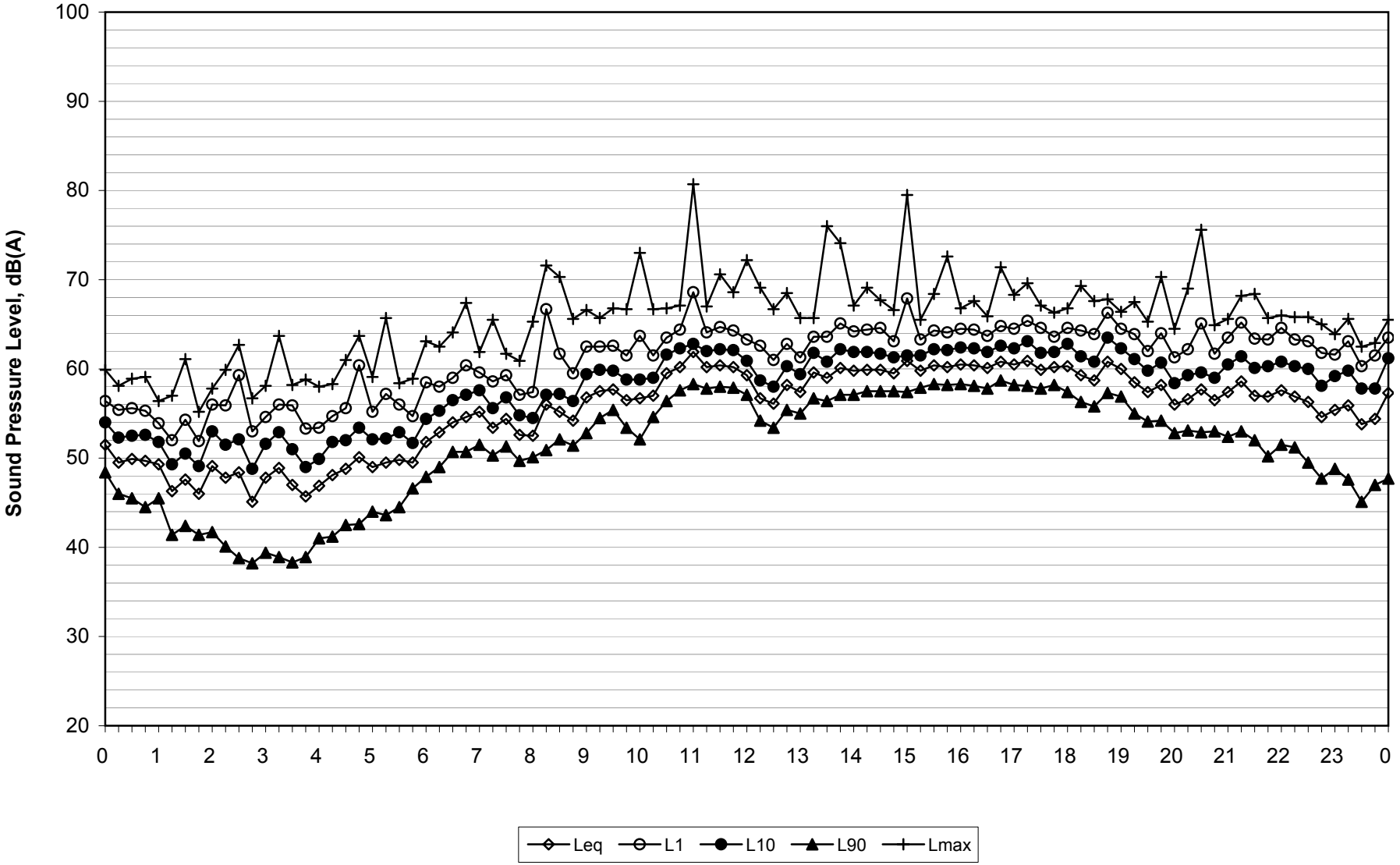


Reference Location M5
97 Bushells Ridge Road

5987R5_b.xls

Ambient Sound Pressure Levels

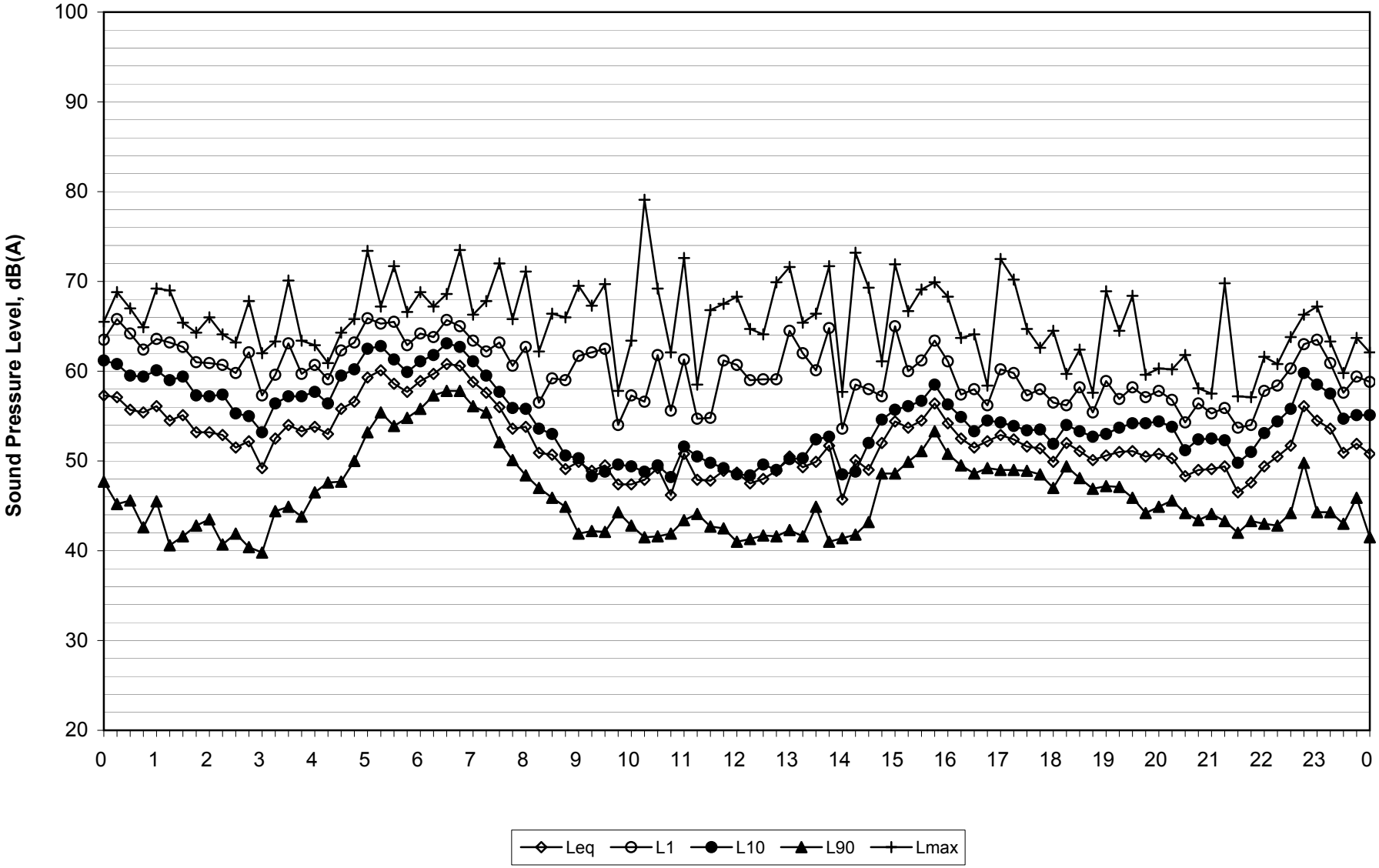
Sunday 01 April 2007



Reference Location M5
97 Bushells Ridge Road

Ambient Sound Pressure Levels

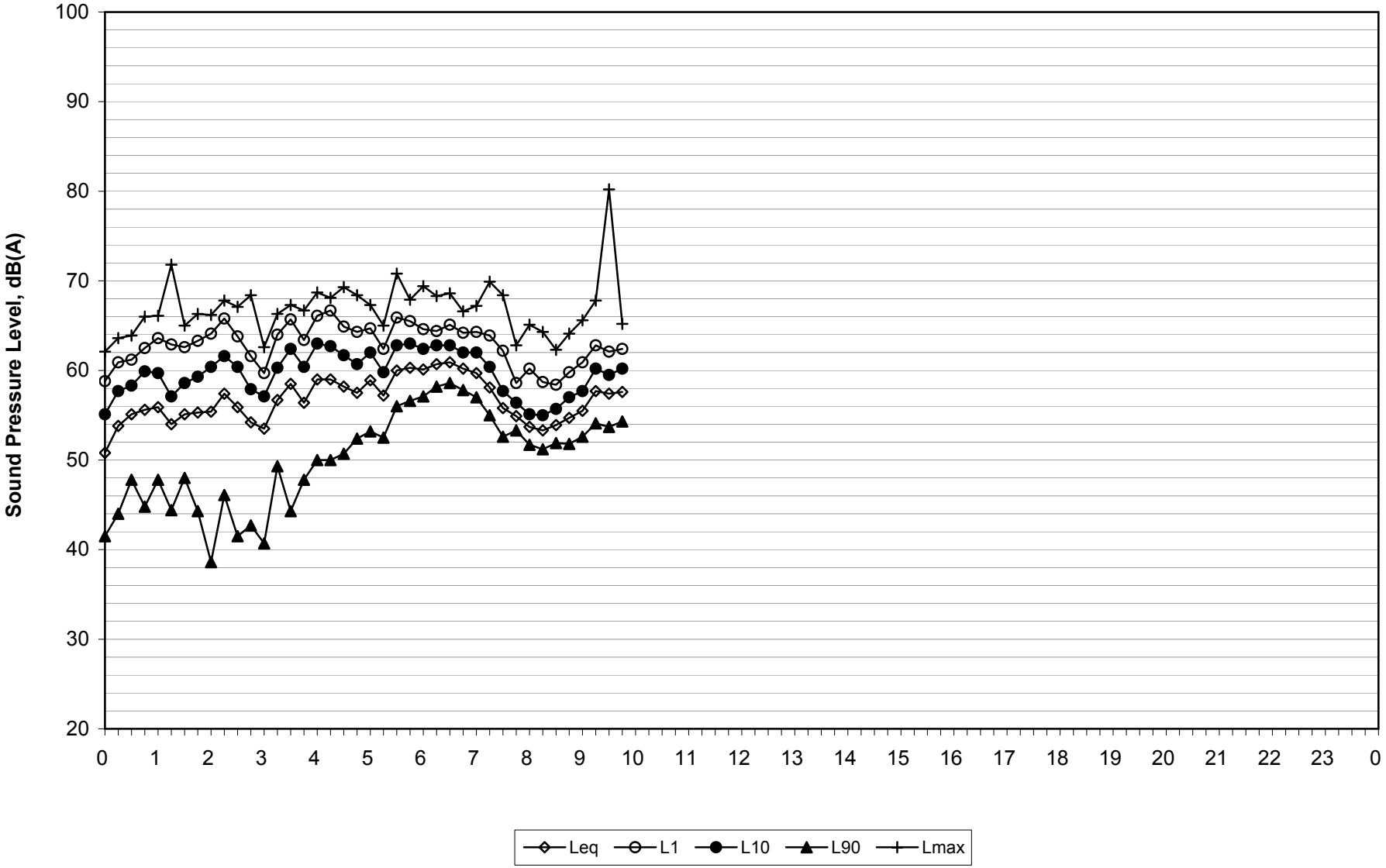
Monday 02 April 2007



Reference Location M5
97 Bushells Ridge Road

Ambient Sound Pressure Levels

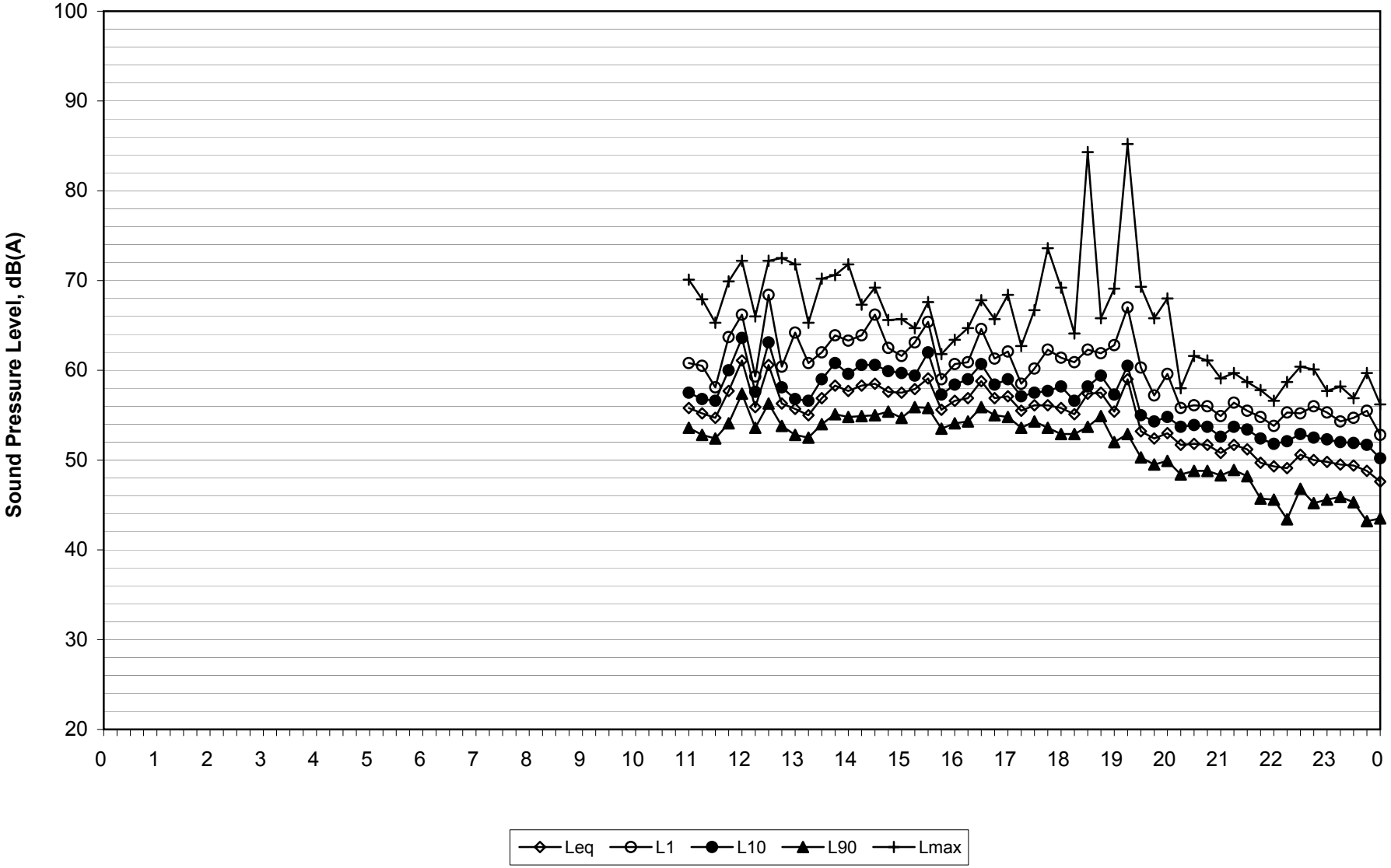
Tuesday 03 April 2007



Reference Location M5
97 Bushells Ridge Road

Ambient Sound Pressure Levels

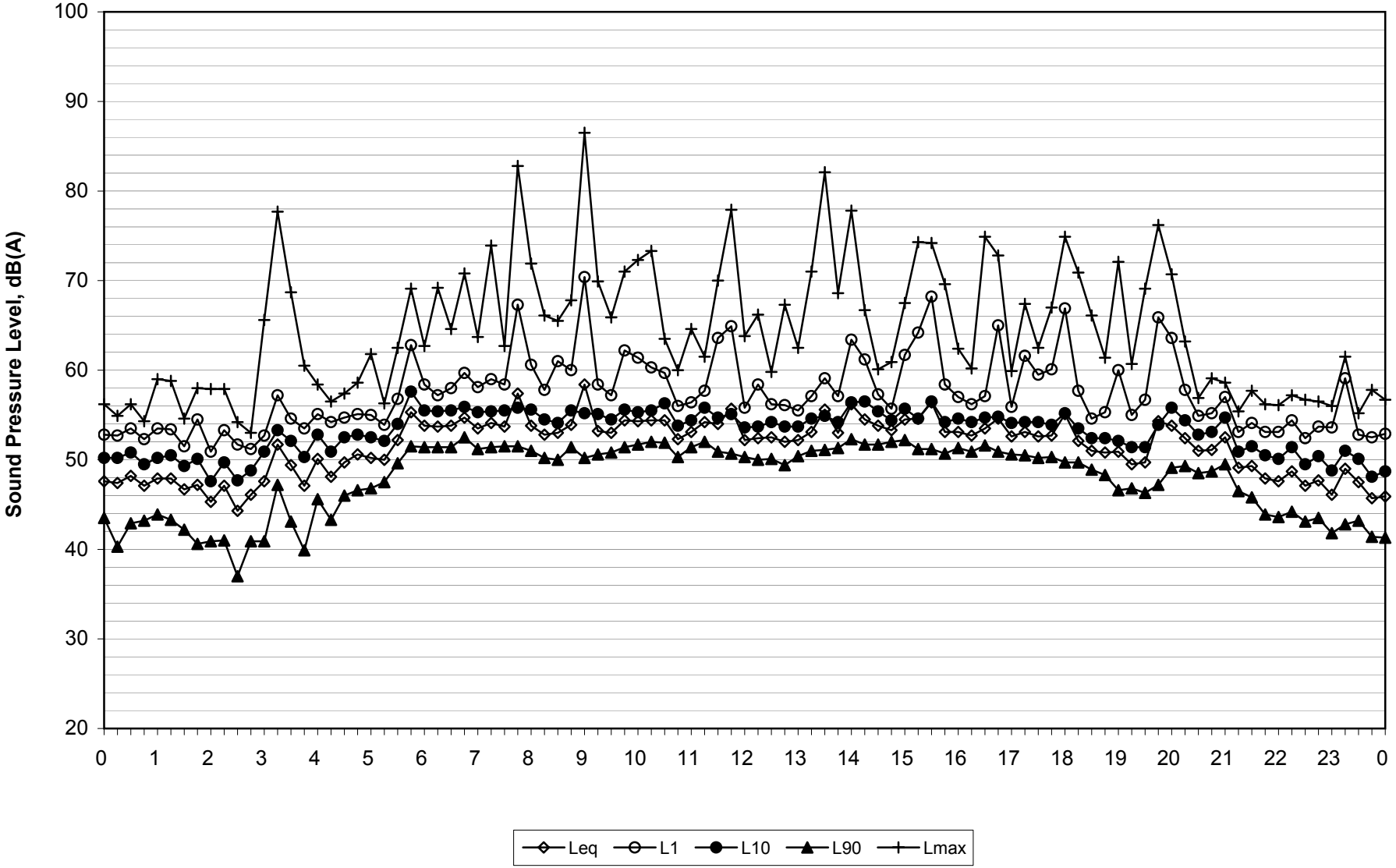
Thursday 16 November 2006



Reference Location M6
4 Kira Ridge Road

Ambient Sound Pressure Levels

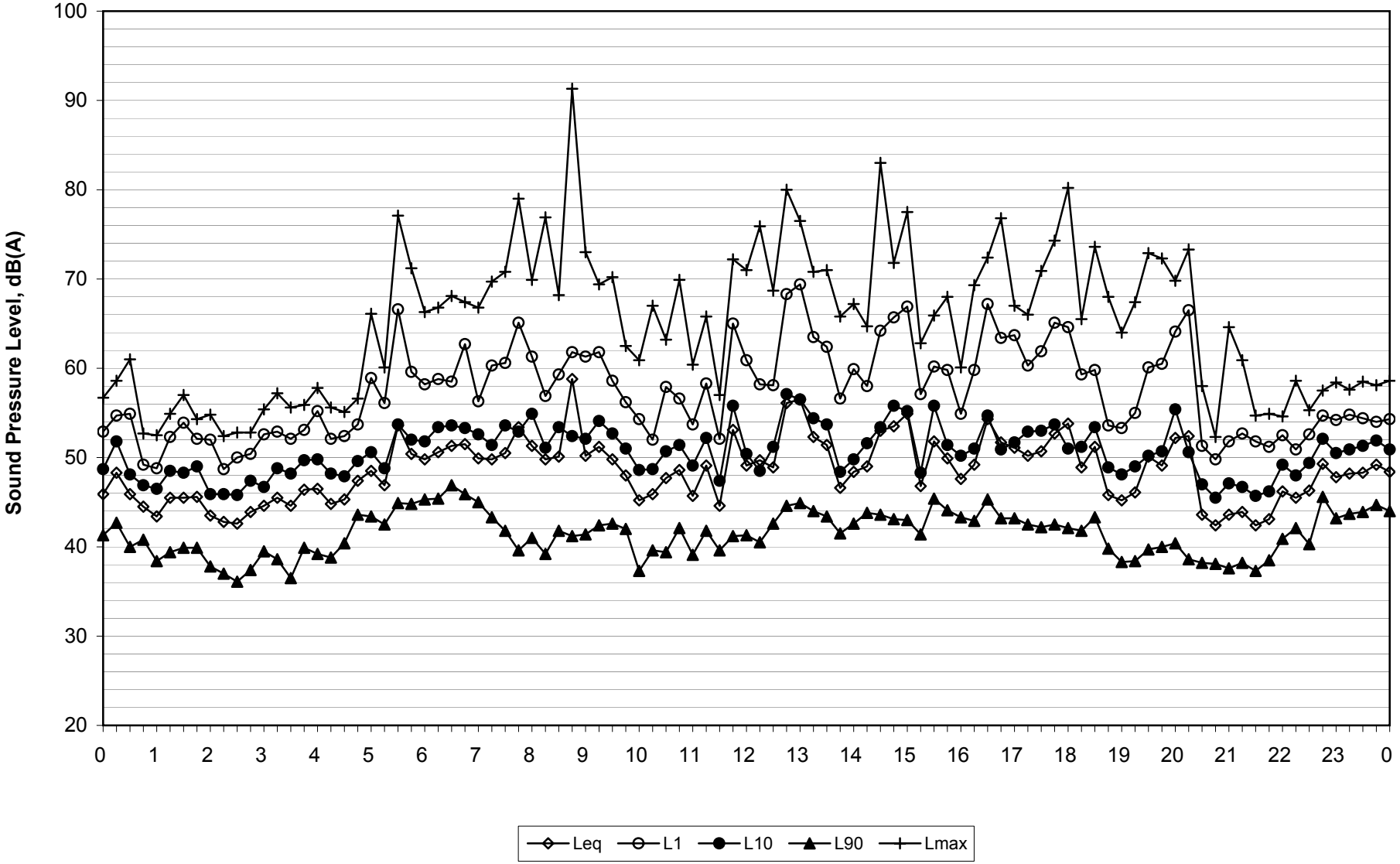
Friday 17 November 2006



Reference Location M6
4 Kira Ridge Road

Ambient Sound Pressure Levels

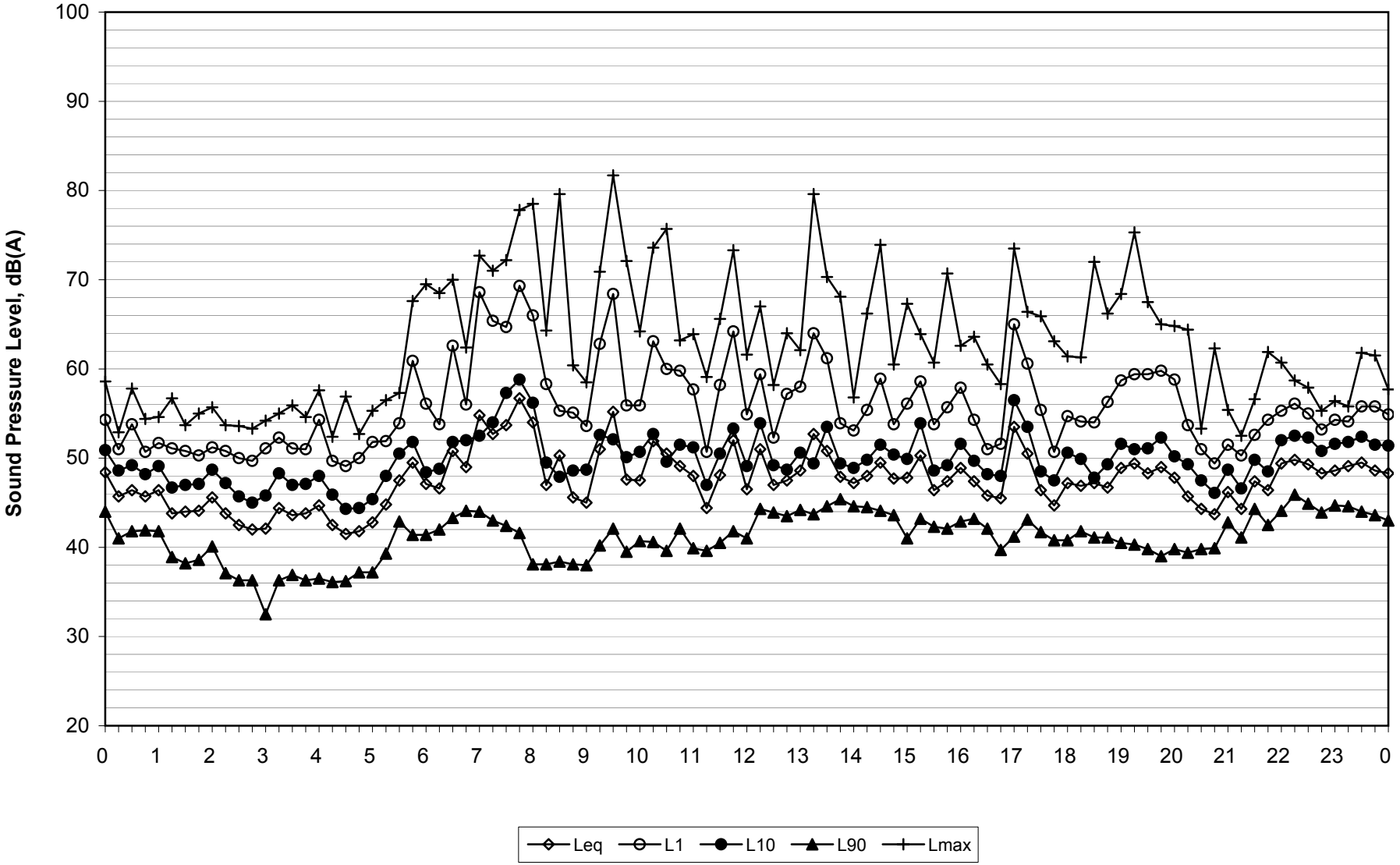
Saturday 18 November 2006



Reference Location M6
4 Kira Ridge Road

Ambient Sound Pressure Levels

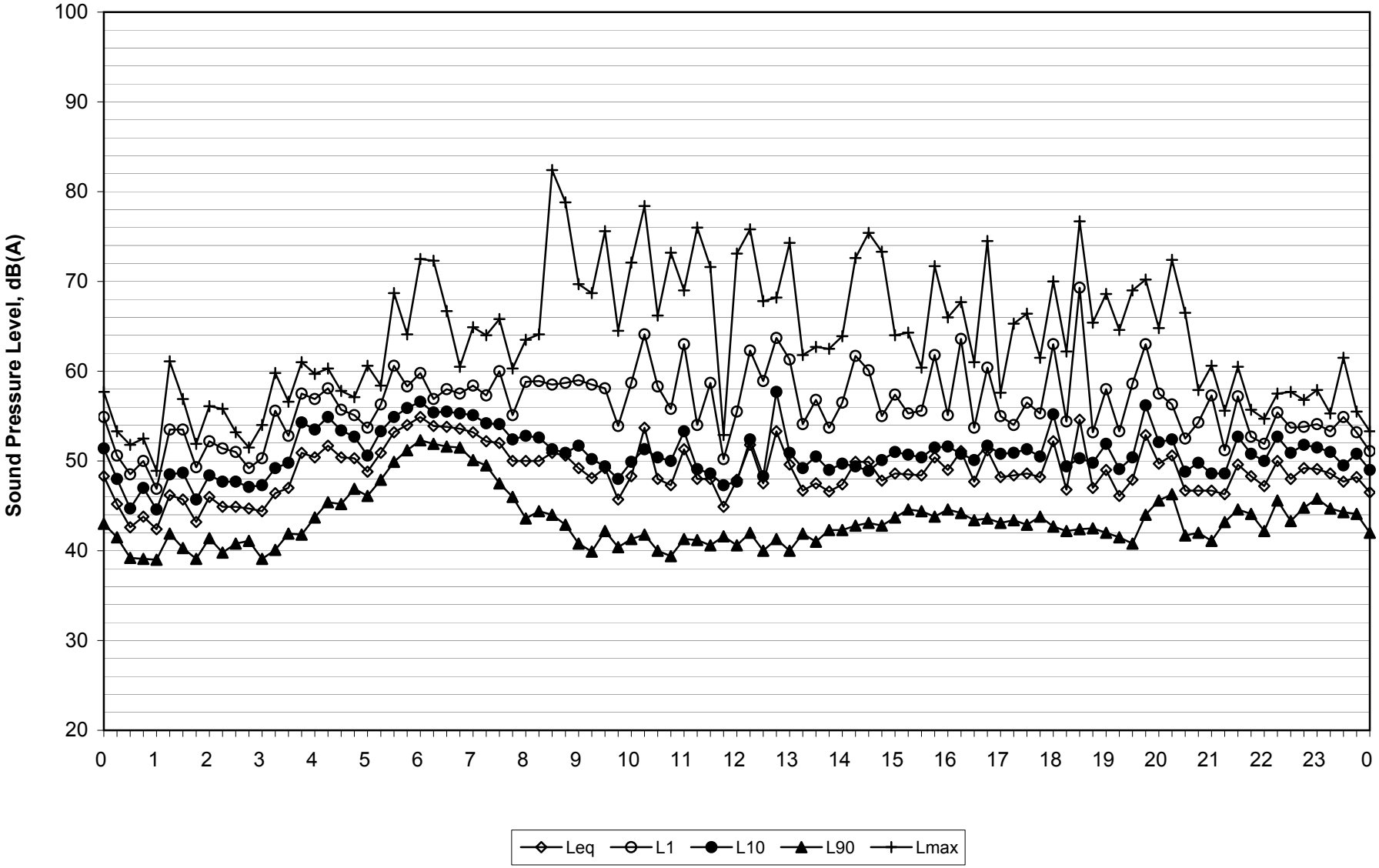
Sunday 19 November 2006



Reference Location M6
4 Kira Ridge Road

Ambient Sound Pressure Levels

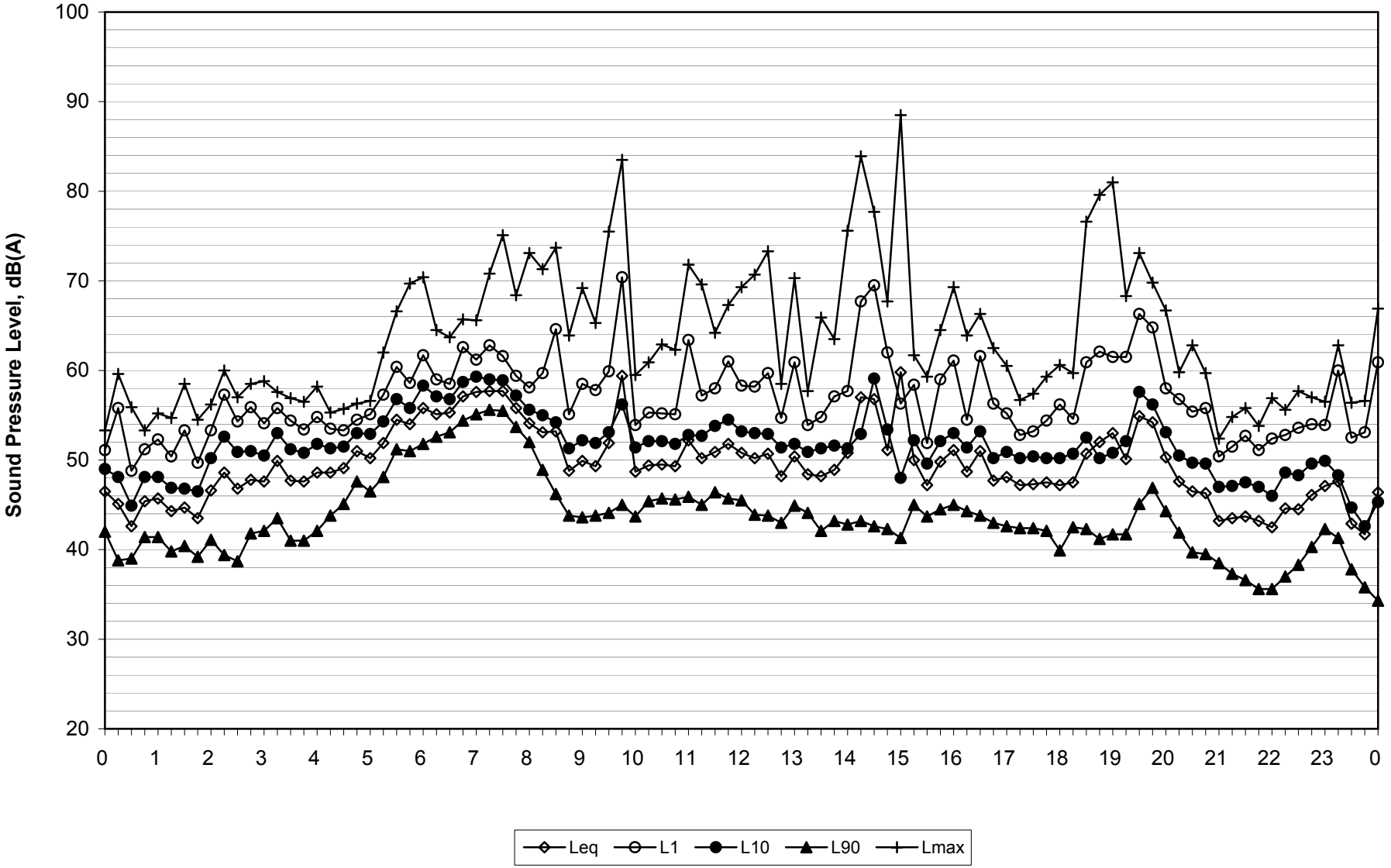
Monday 20 November 2006



Reference Location M6
4 Kira Ridge Road

Ambient Sound Pressure Levels

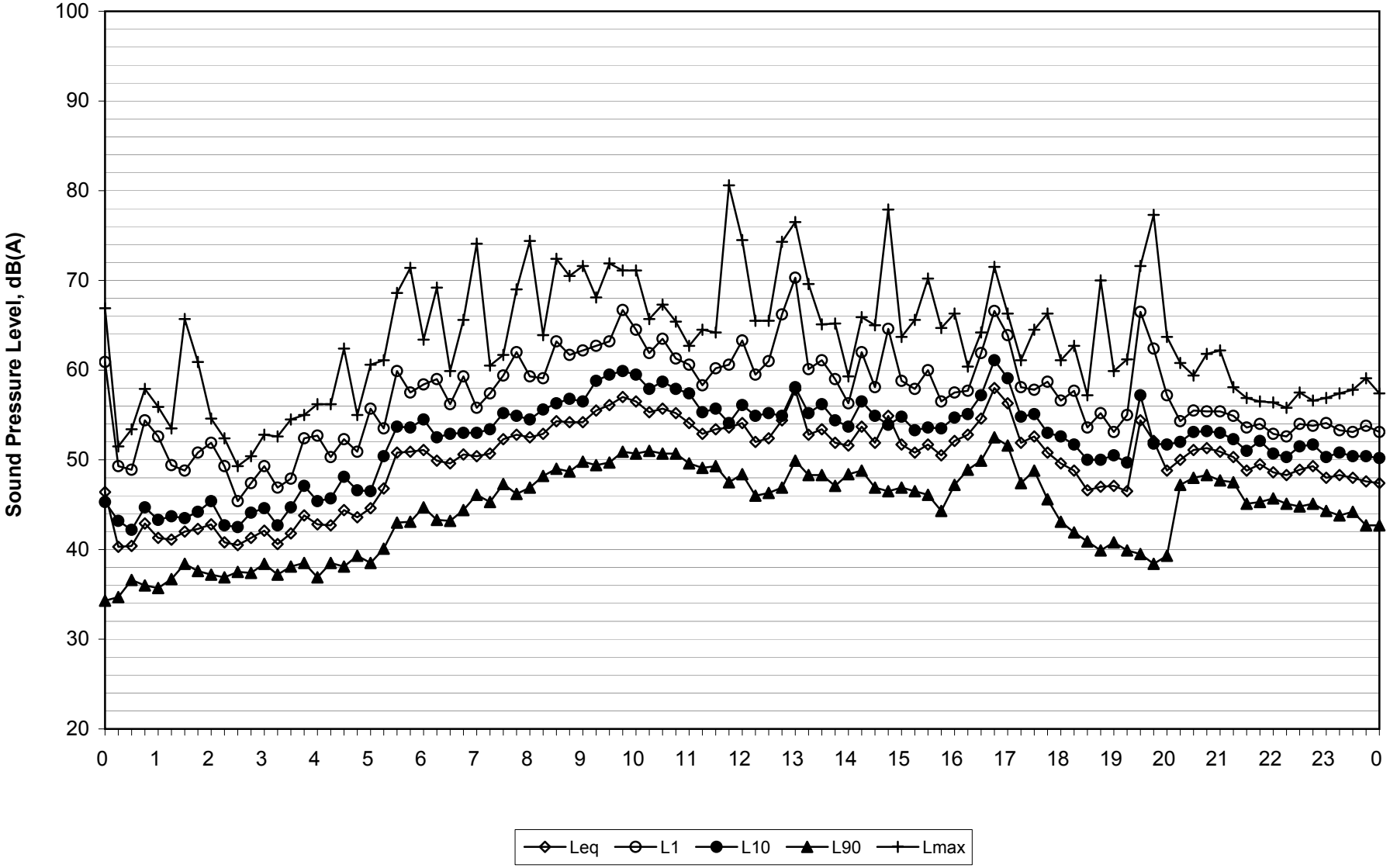
Tuesday 21 November 2006



Reference Location M6
4 Kira Ridge Road

Ambient Sound Pressure Levels

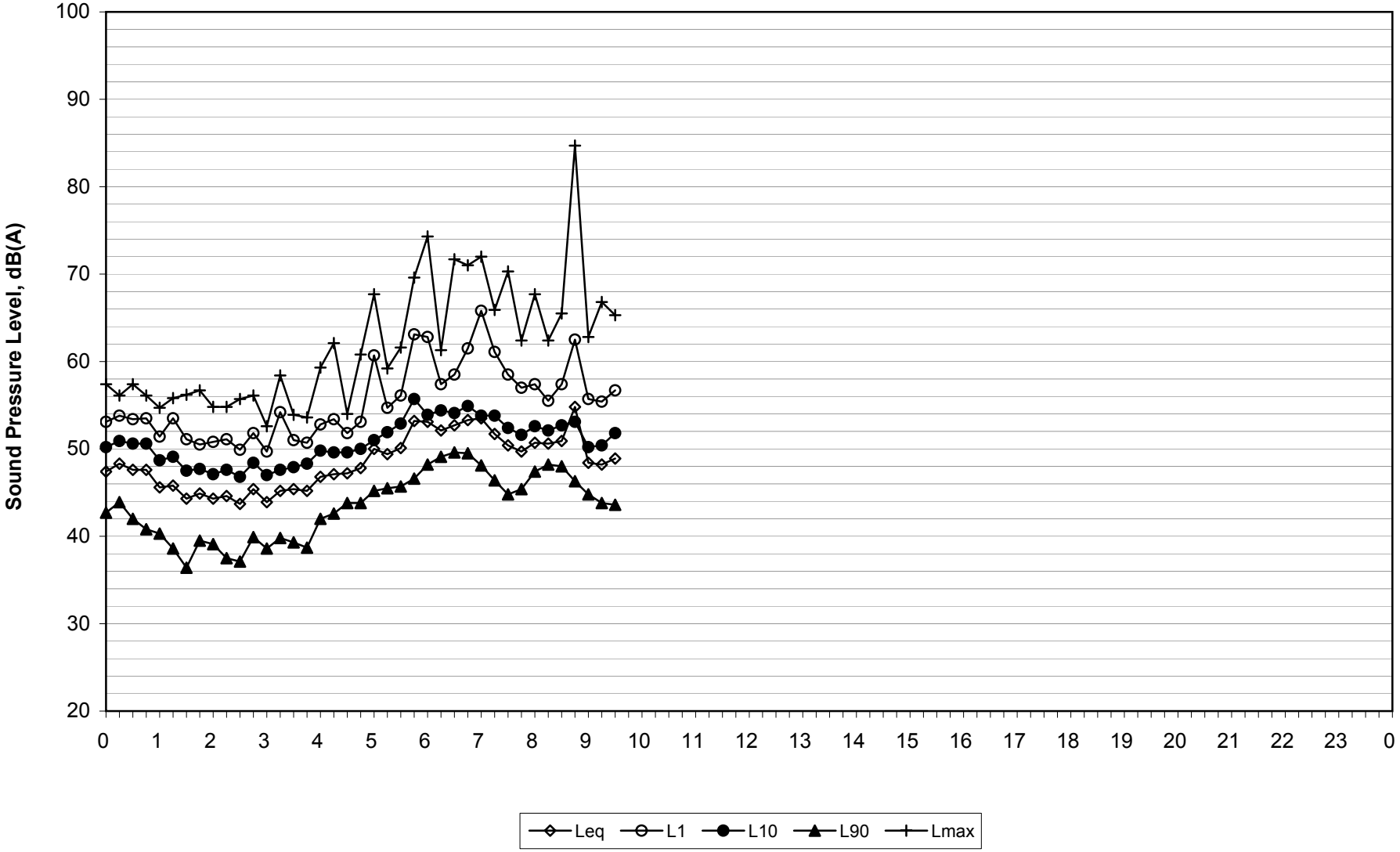
Wednesday 22 November 2006



Reference Location M6
4 Kira Ridge Road

Ambient Sound Pressure Levels

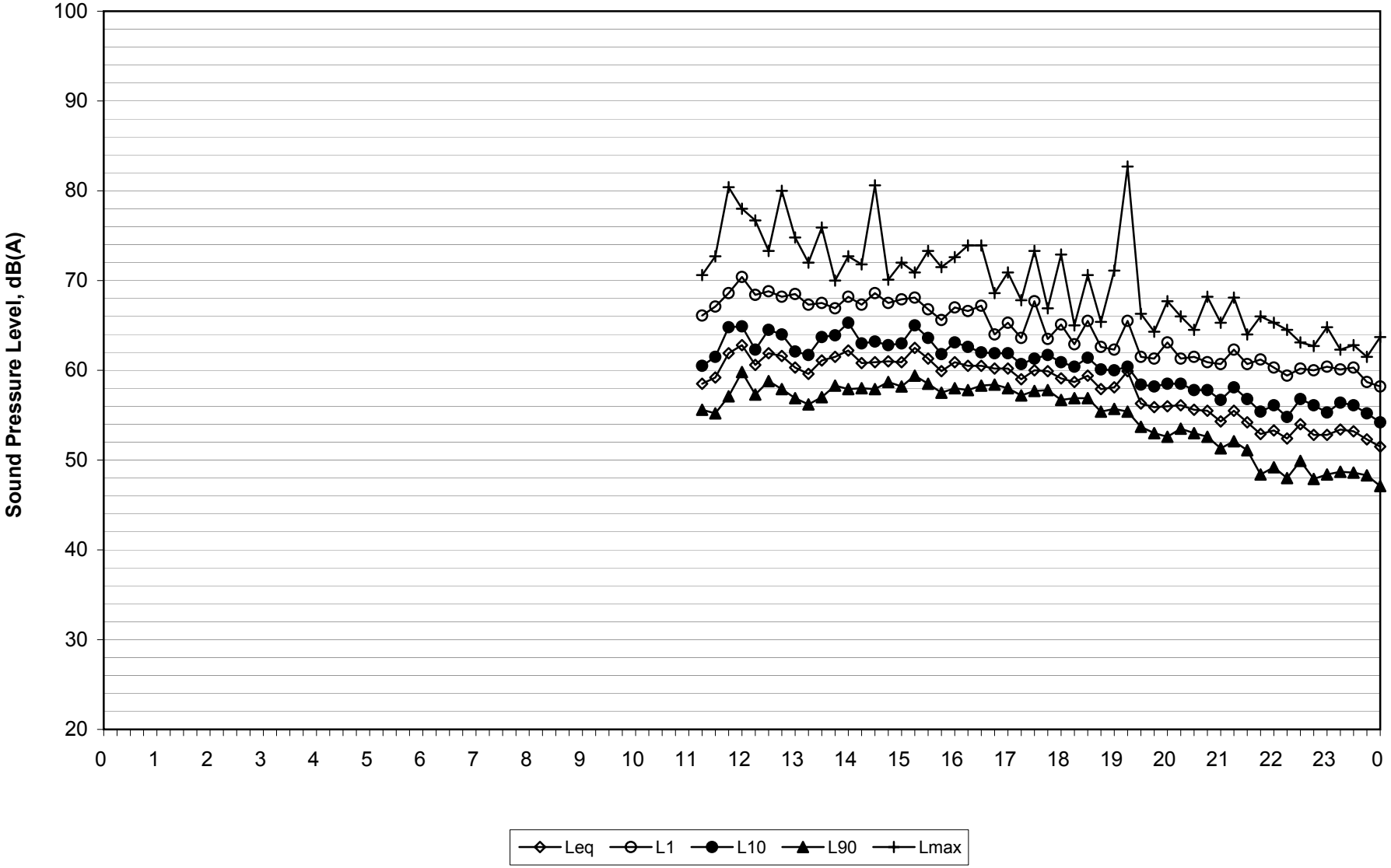
Thursday 23 November 2006



Reference Location M6
4 Kira Ridge Road

Ambient Sound Pressure Levels

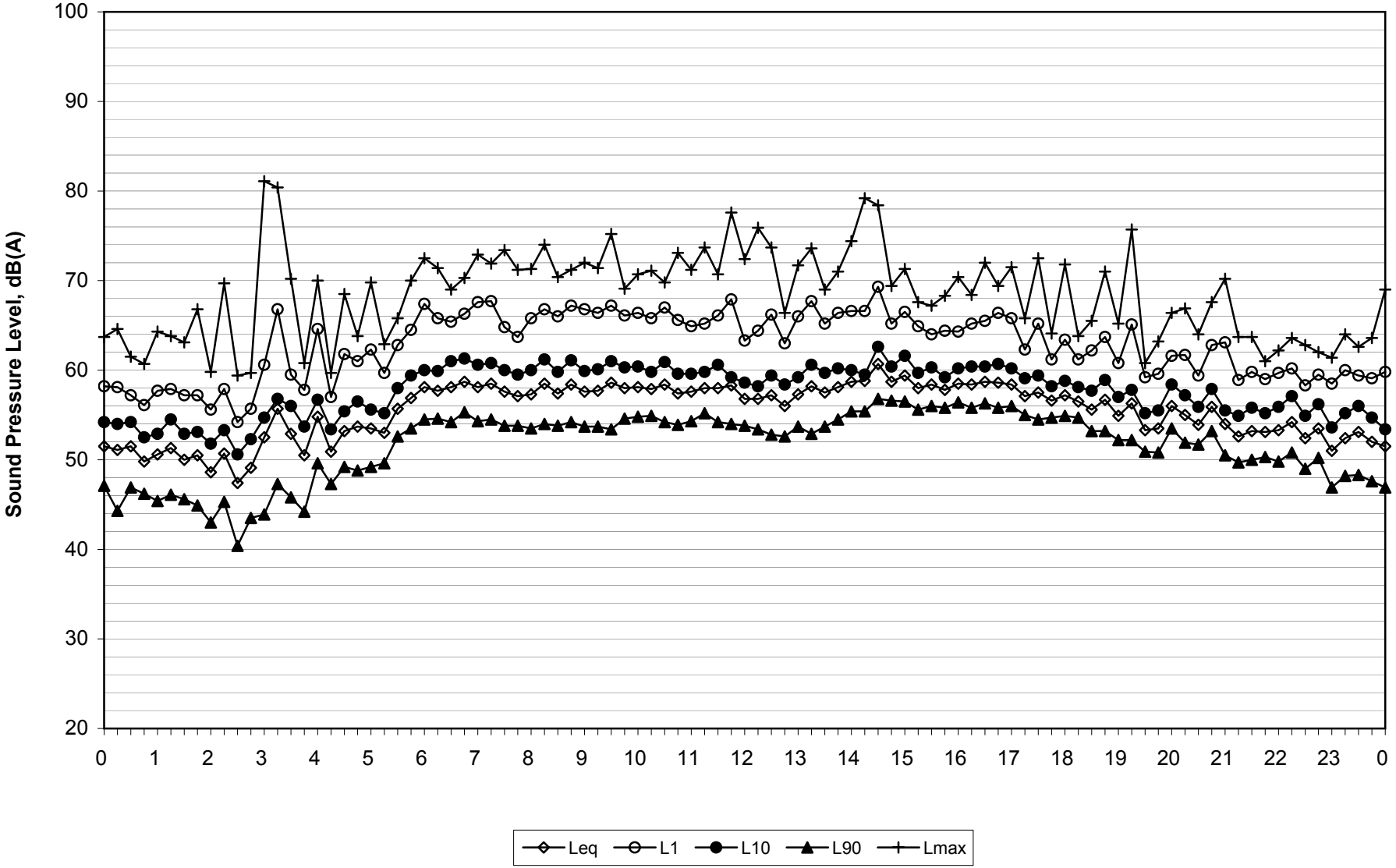
Thursday 16 November 2006



Reference Location M7
Hue Hue Road

Ambient Sound Pressure Levels

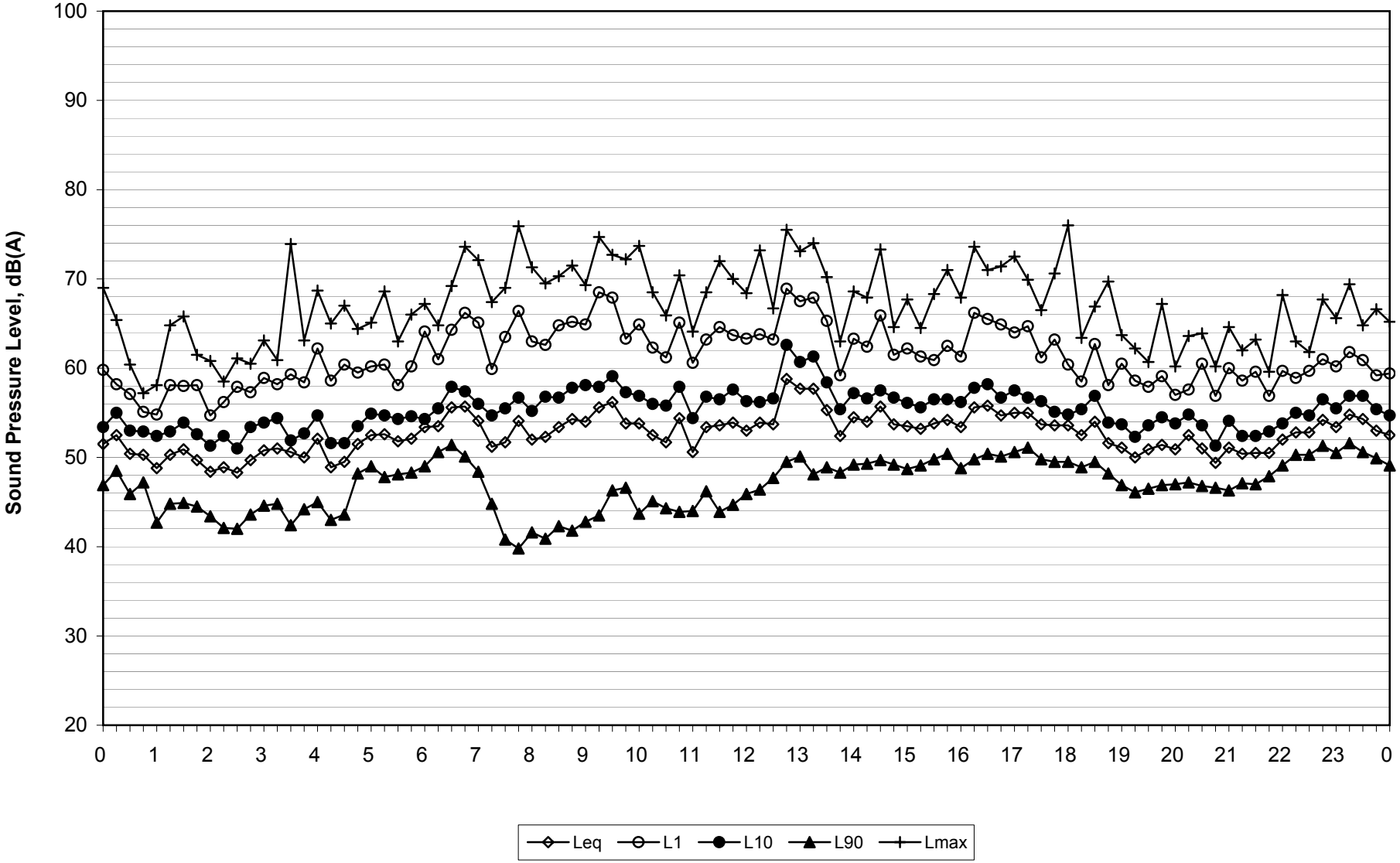
Friday 17 November 2006



Reference Location M7
Hue Hue Road

Ambient Sound Pressure Levels

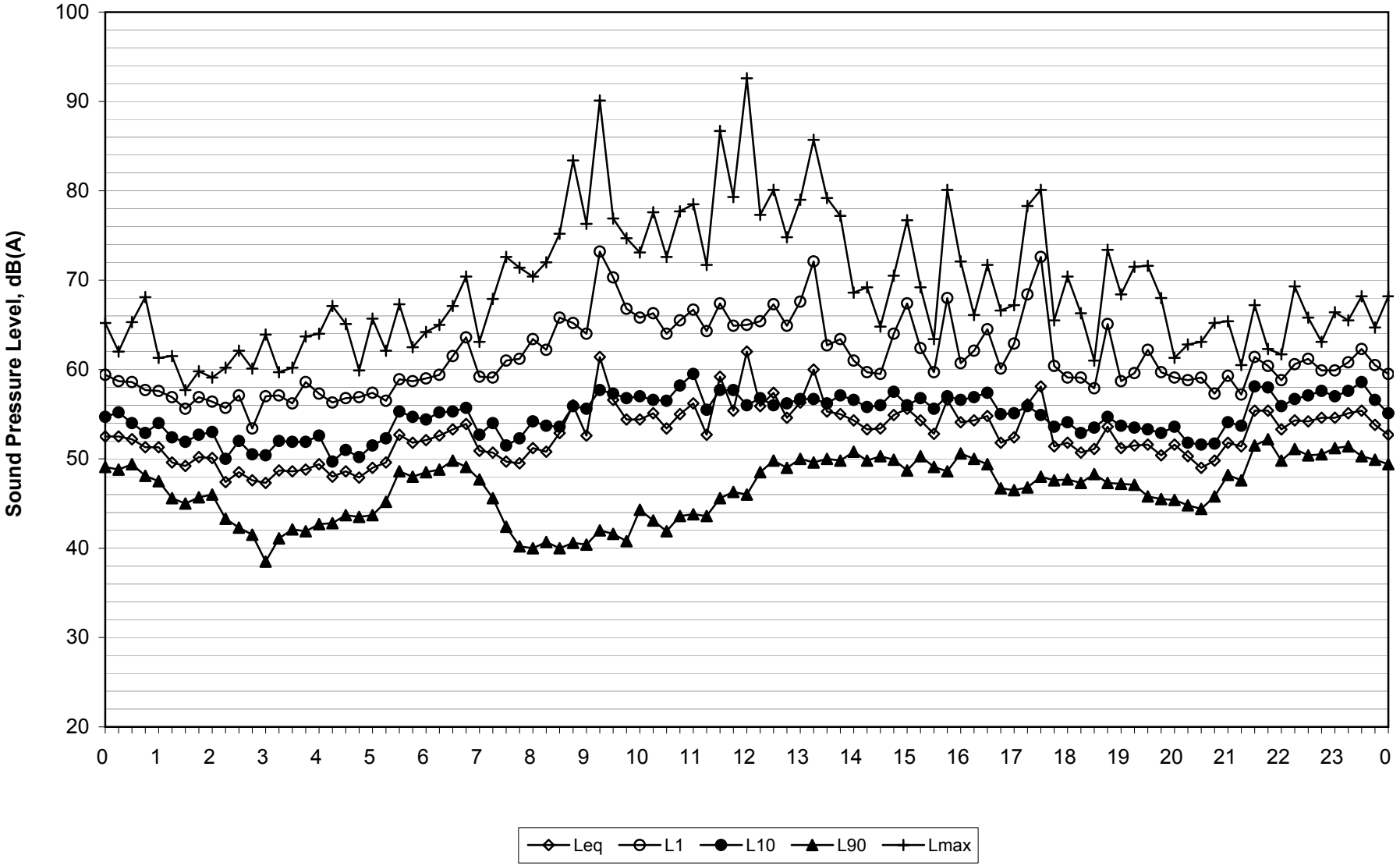
Saturday 18 November 2006



Reference Location M7
Hue Hue Road

Ambient Sound Pressure Levels

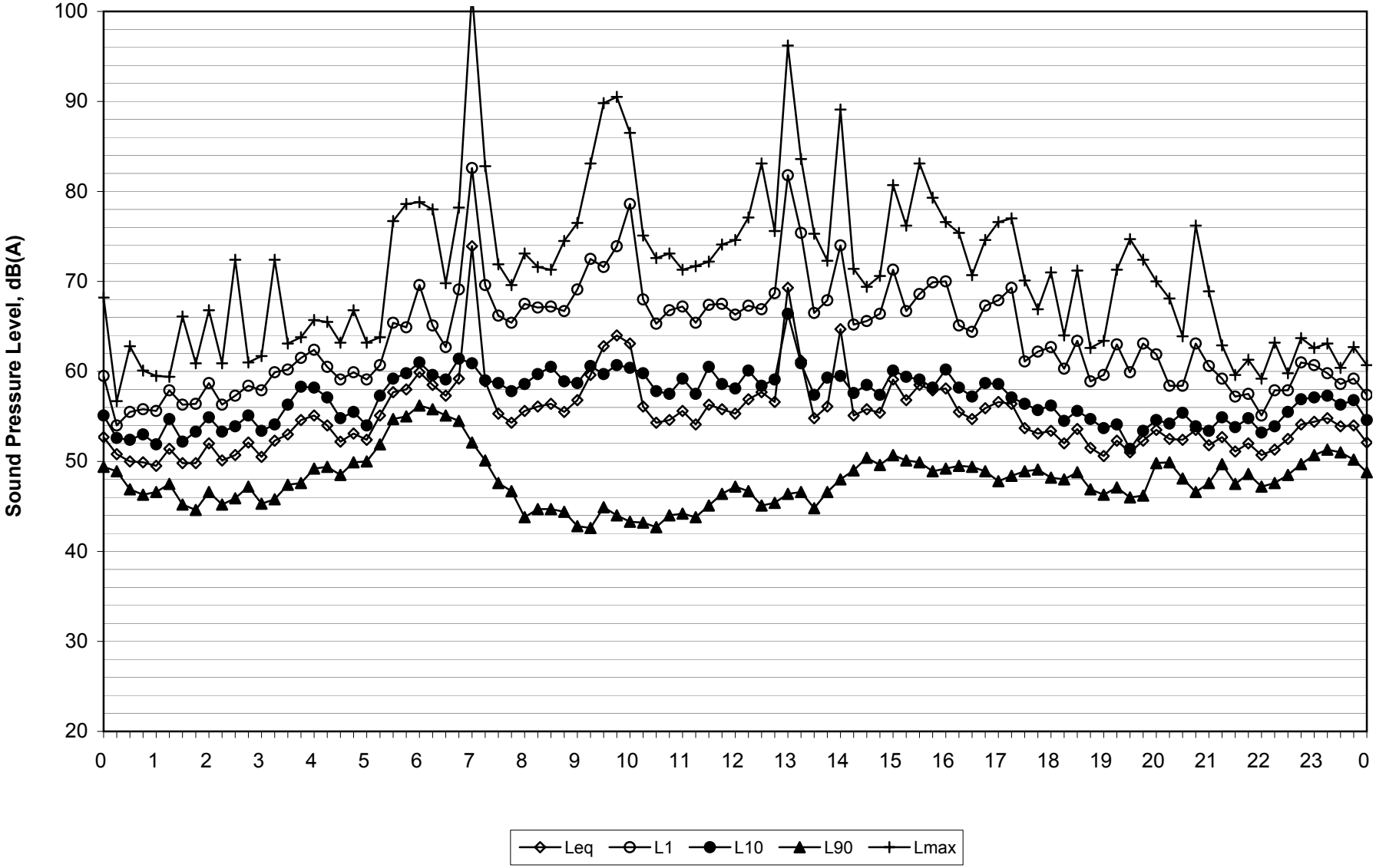
Sunday 19 November 2006



Reference Location M7
Hue Hue Road

Ambient Sound Pressure Levels

Monday 20 November 2006

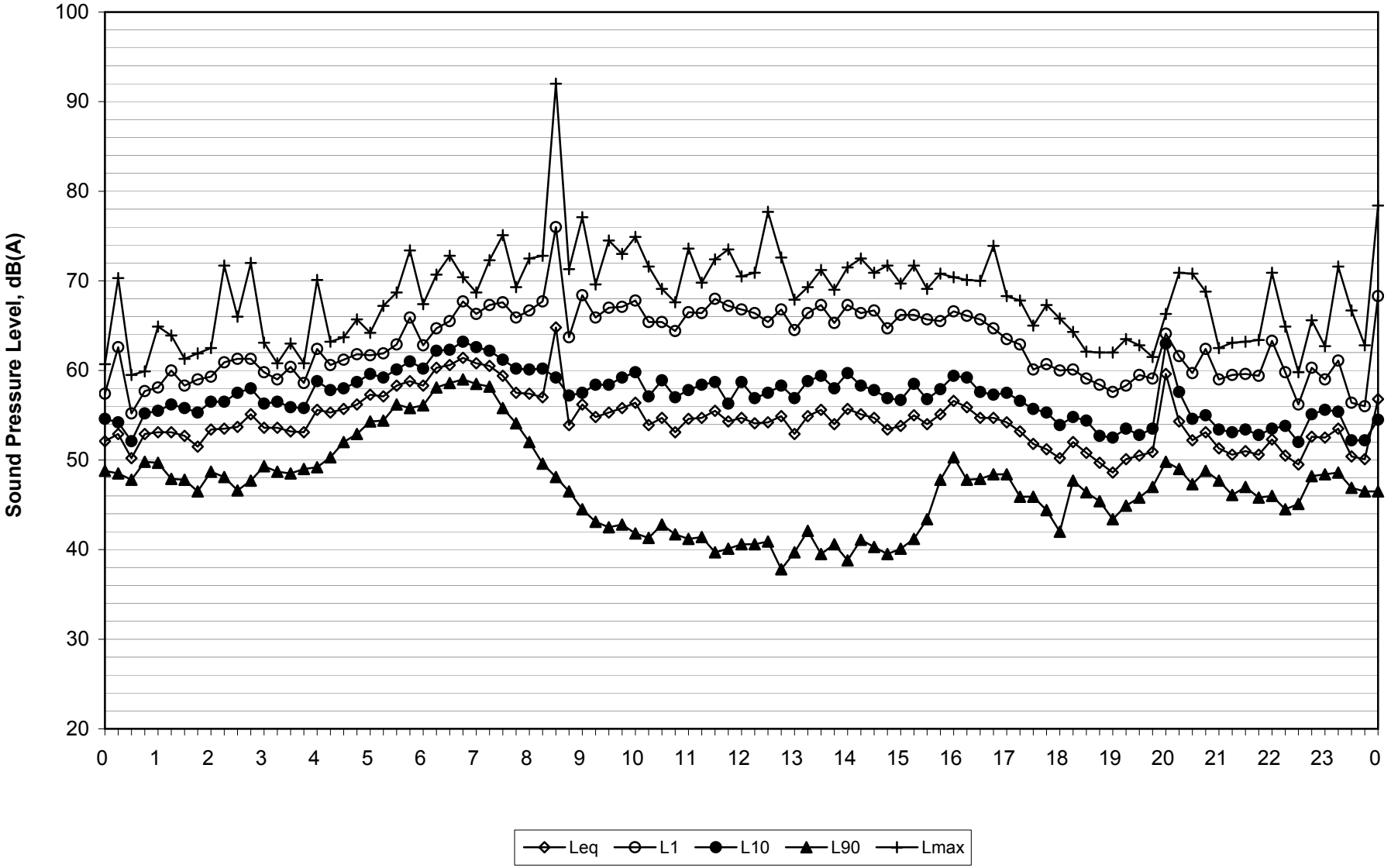


Reference Location M7
Hue Hue Road

5987R7.xls

Ambient Sound Pressure Levels

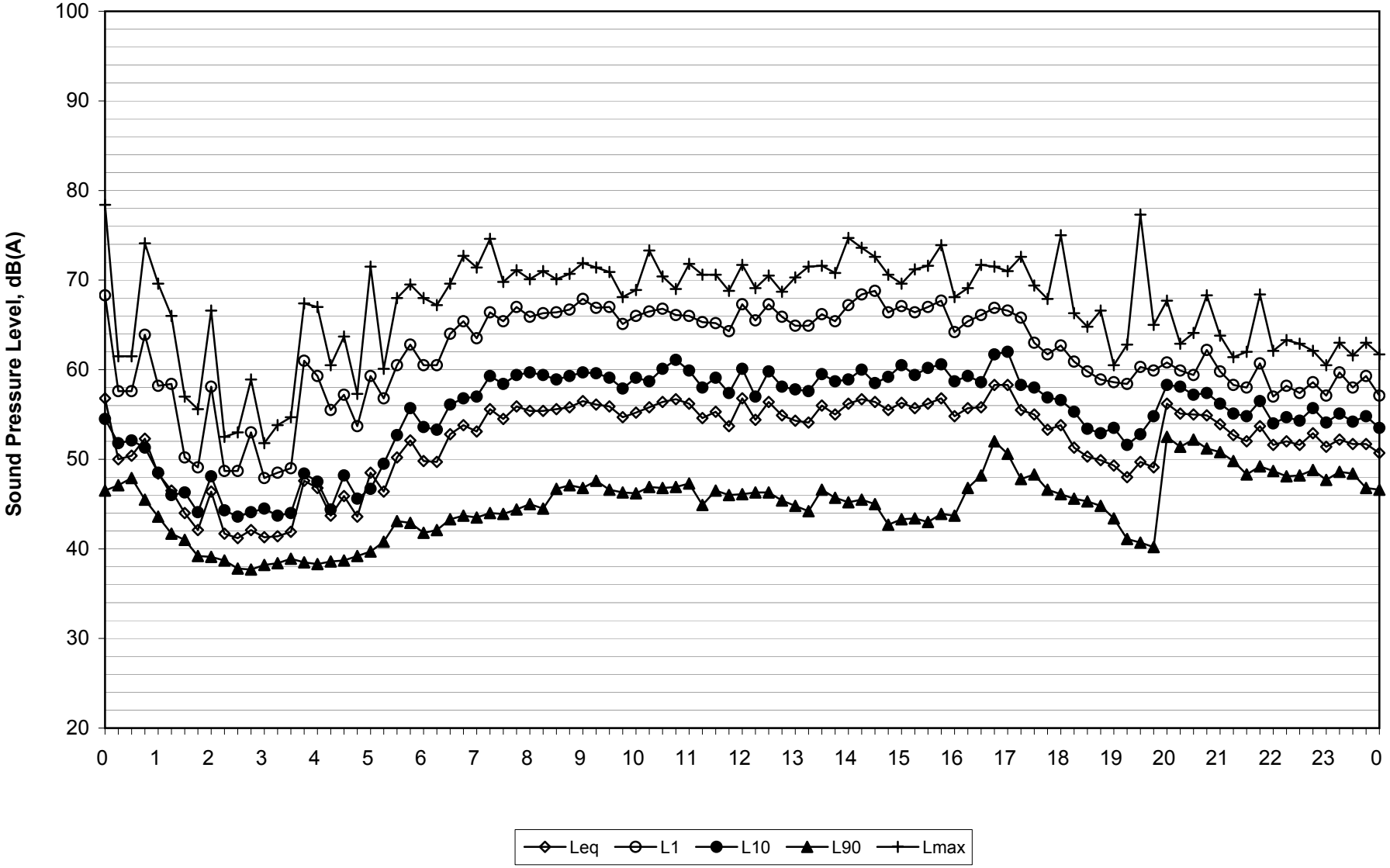
Tuesday 21 November 2006



Reference Location M7
Hue Hue Road

Ambient Sound Pressure Levels

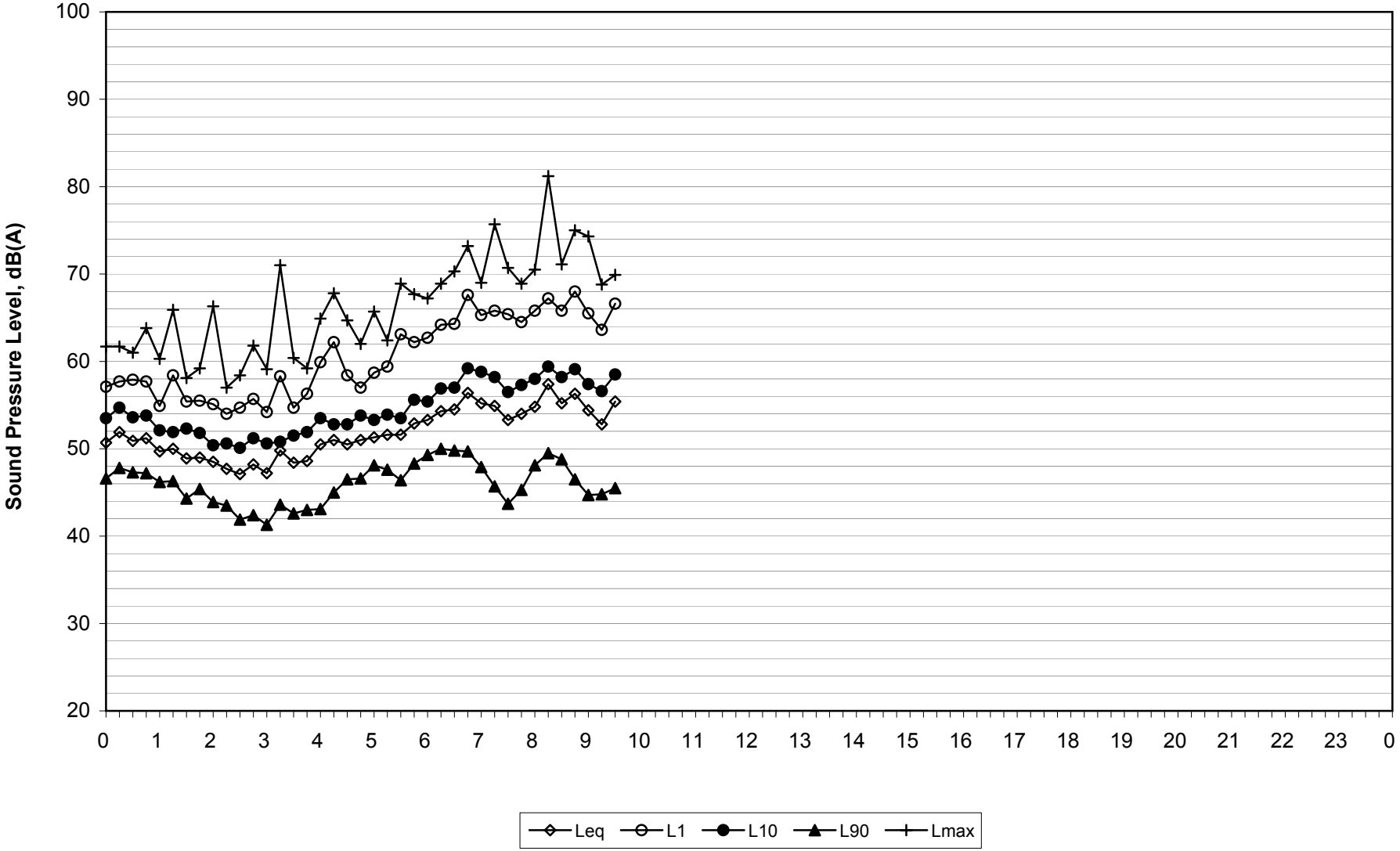
Wednesday 22 November 2006



Reference Location M7
Hue Hue Road

Ambient Sound Pressure Levels

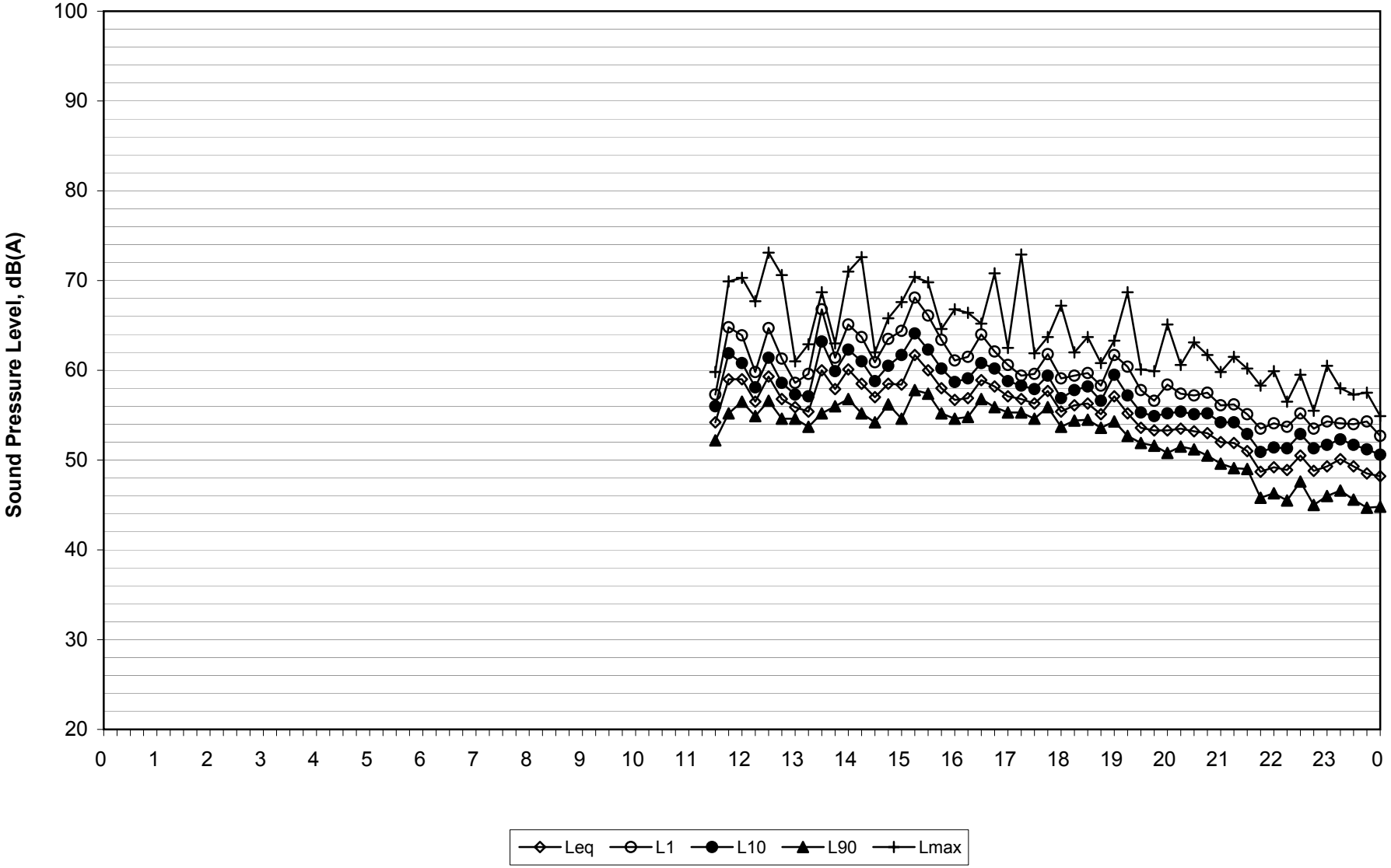
Thursday 23 November 2006



Reference Location M7
Hue Hue Road

Ambient Sound Pressure Levels

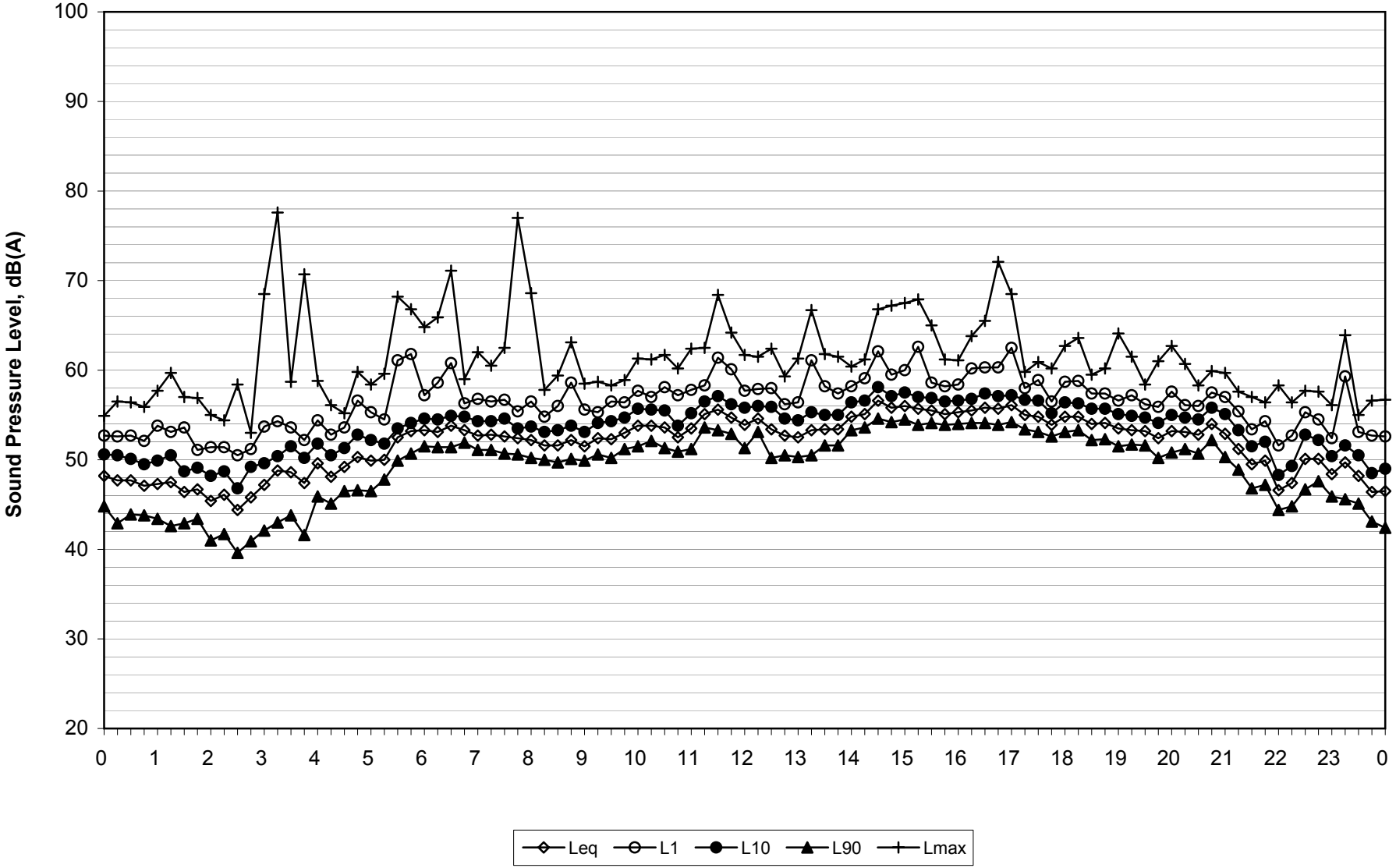
Thursday 16 November 2006



Reference Location M8
Amberwood Road

Ambient Sound Pressure Levels

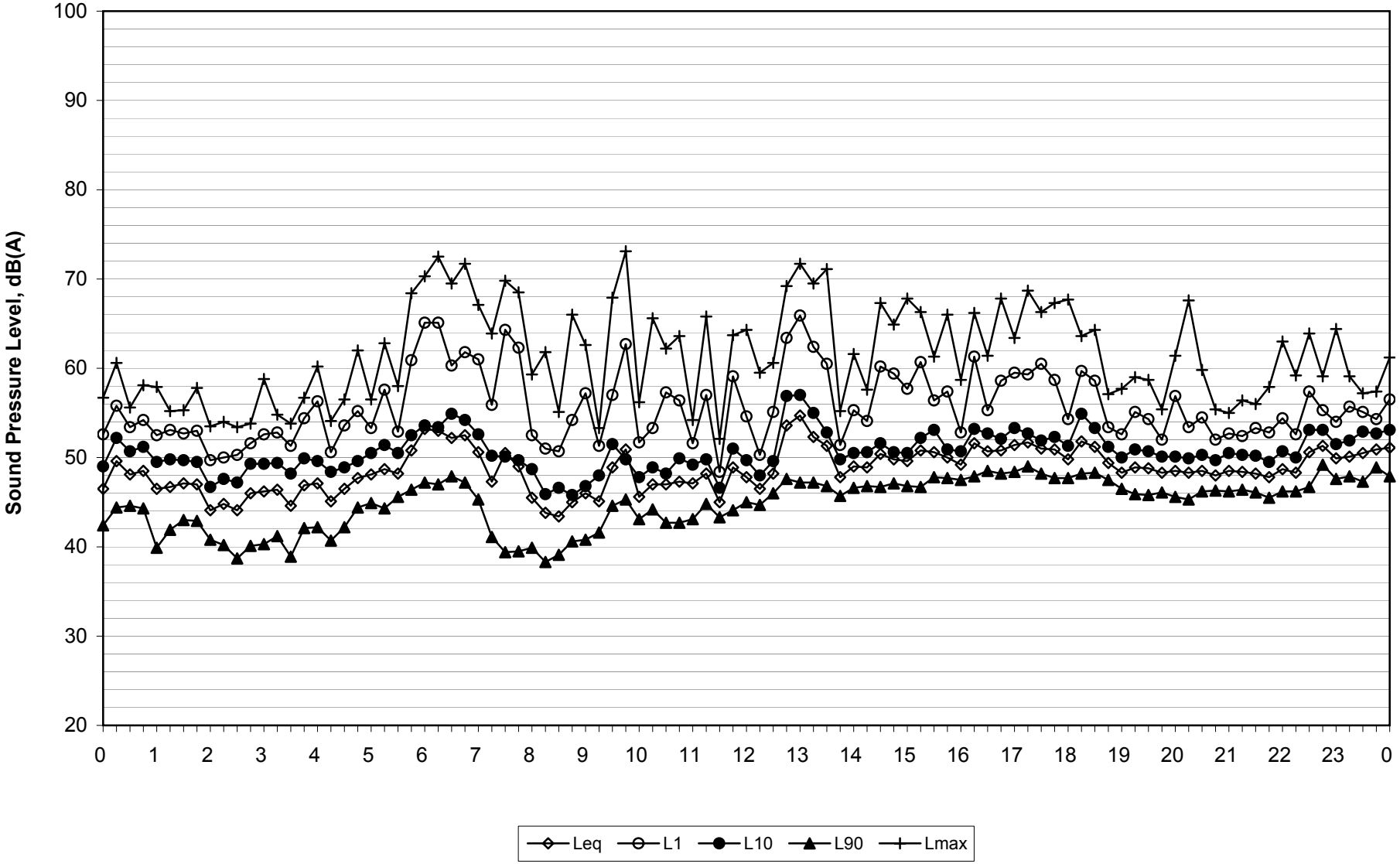
Friday 17 November 2006



Reference Location M8
Amberwood Road

Ambient Sound Pressure Levels

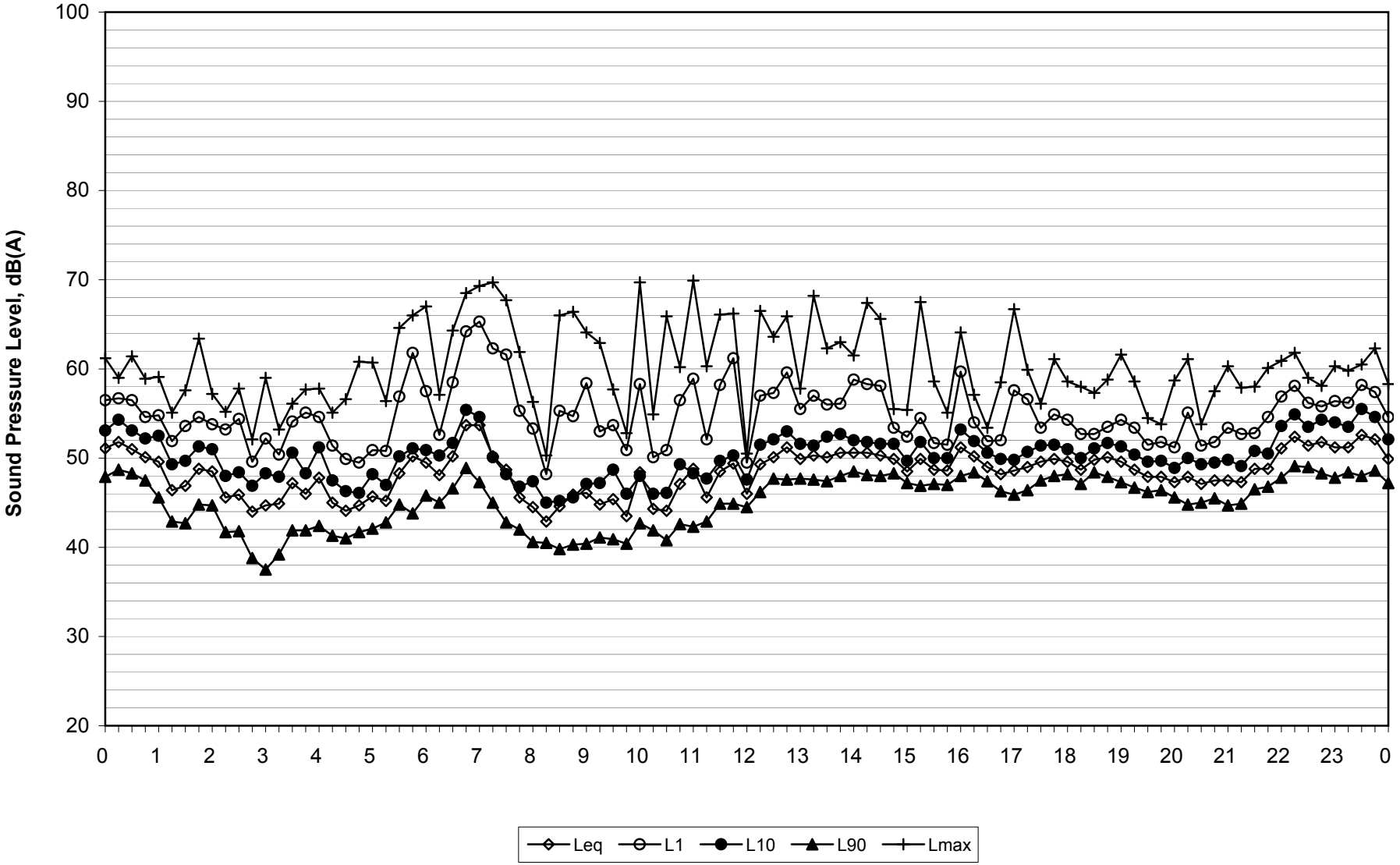
Saturday 18 November 2006



Reference Location M8
Amberwood Road

Ambient Sound Pressure Levels

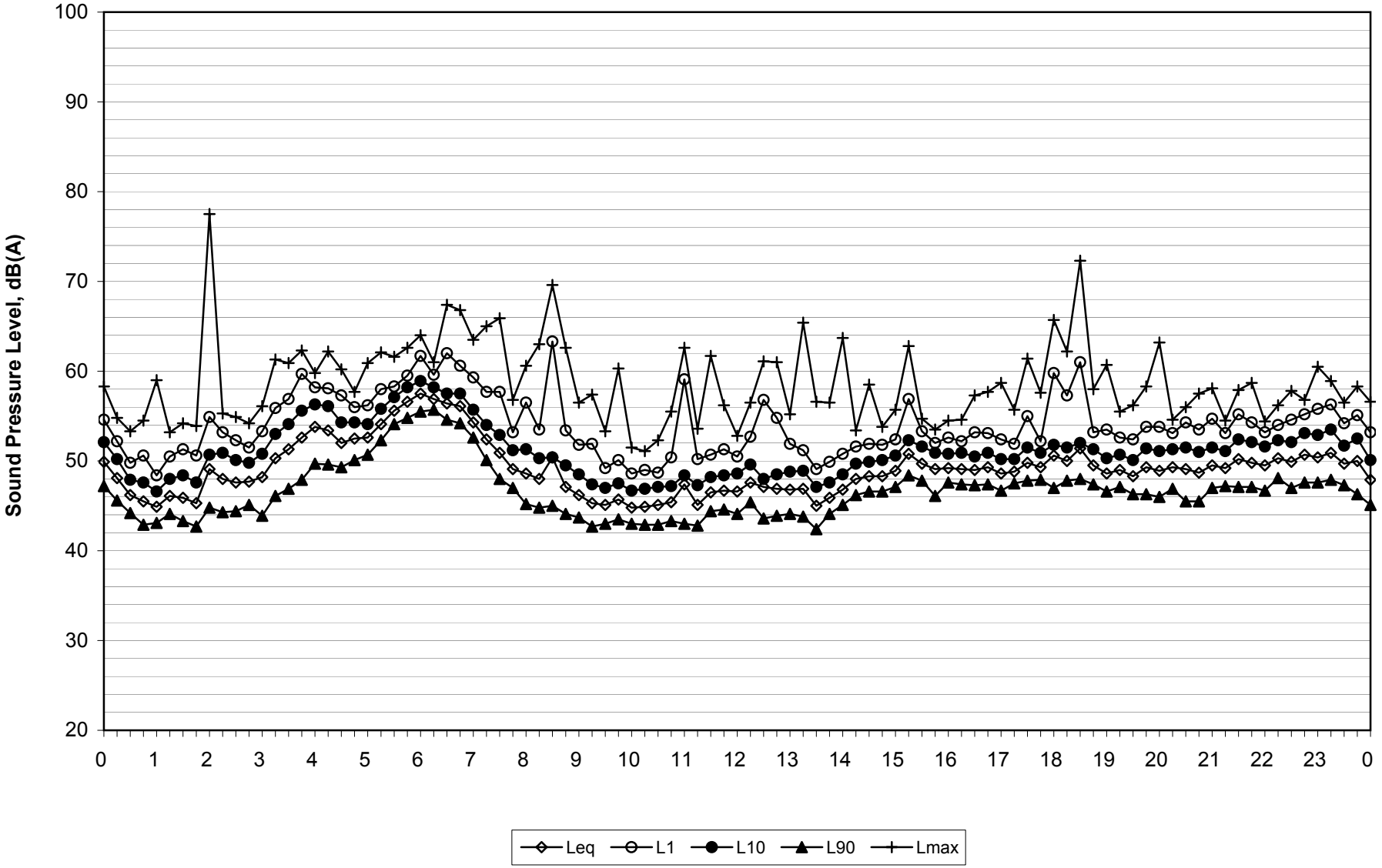
Sunday 19 November 2006



Reference Location M8
Amberwood Road

Ambient Sound Pressure Levels

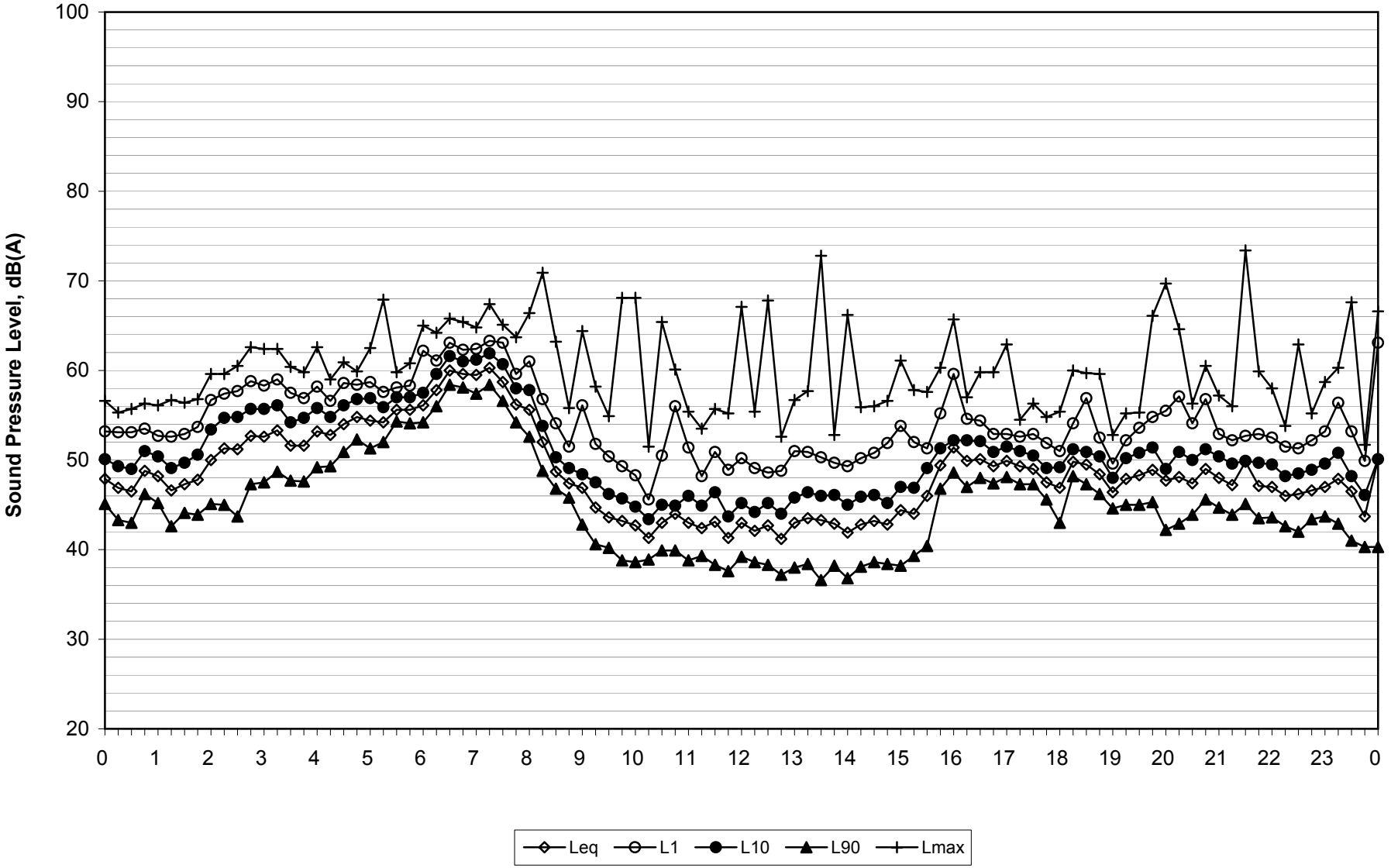
Monday 20 November 2006



Reference Location M8
Amberwood Road

Ambient Sound Pressure Levels

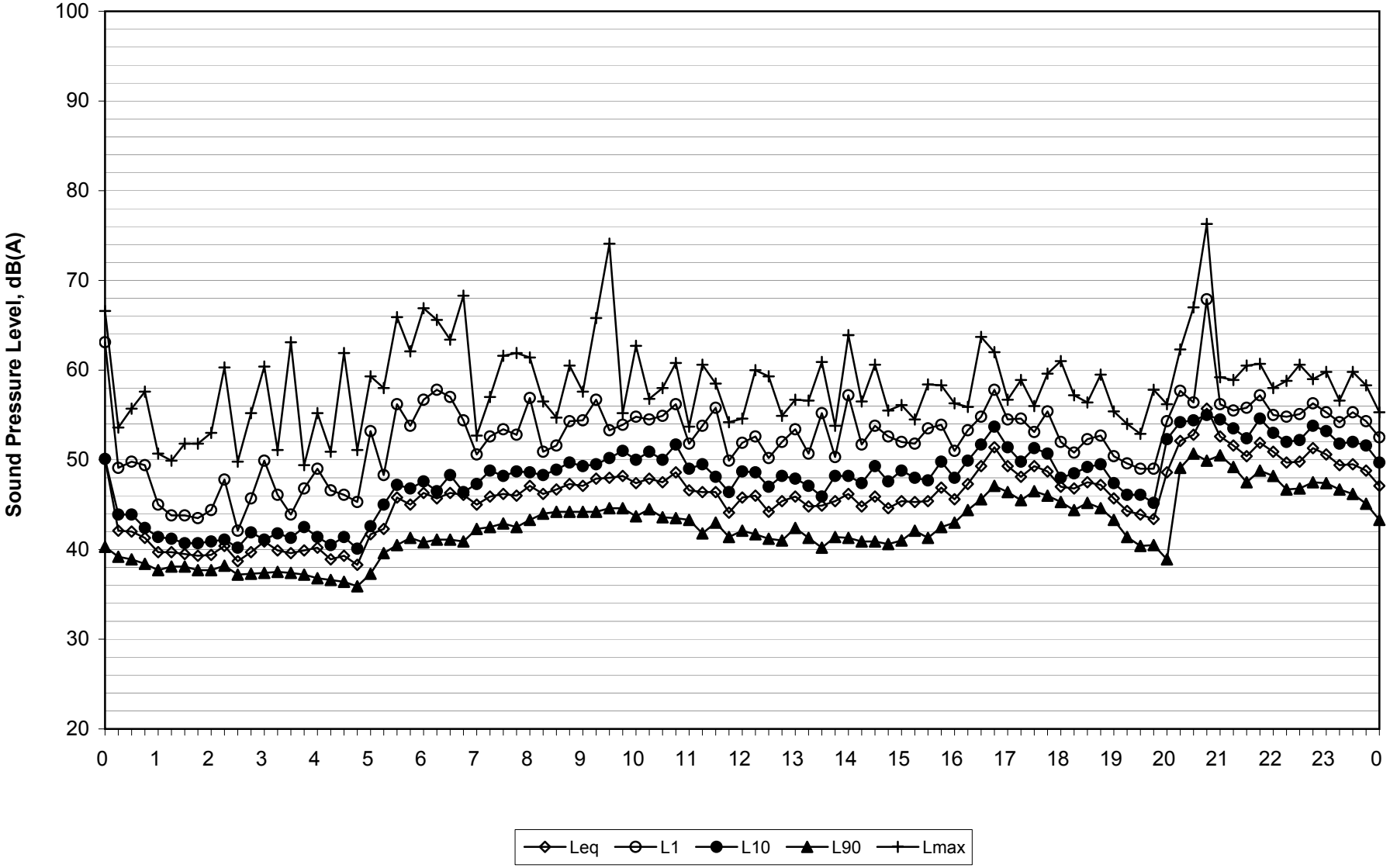
Tuesday 21 November 2006



Reference Location M8
Amberwood Road

Ambient Sound Pressure Levels

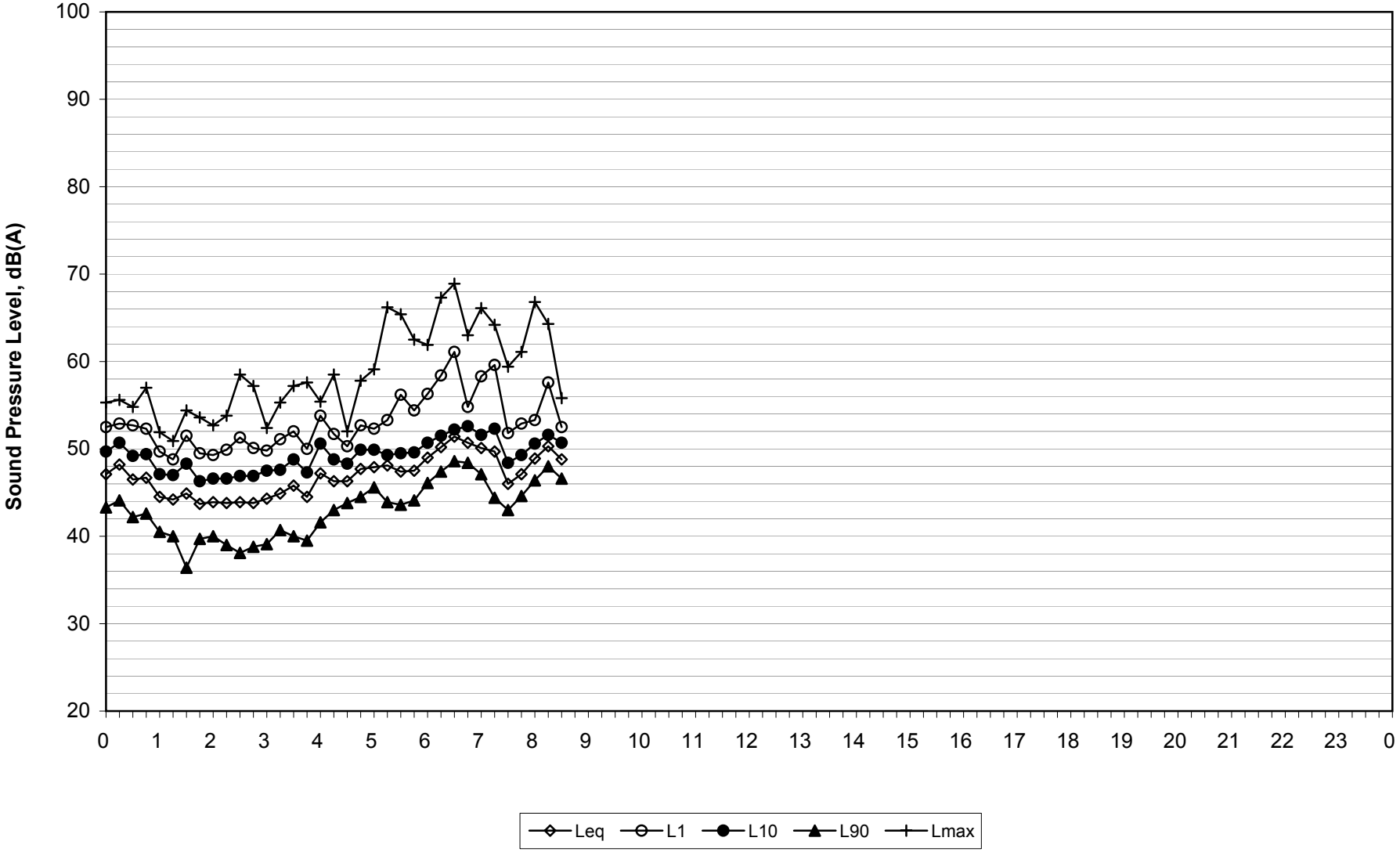
Wednesday 22 November 2006



Reference Location M8
Amberwood Road

Ambient Sound Pressure Levels

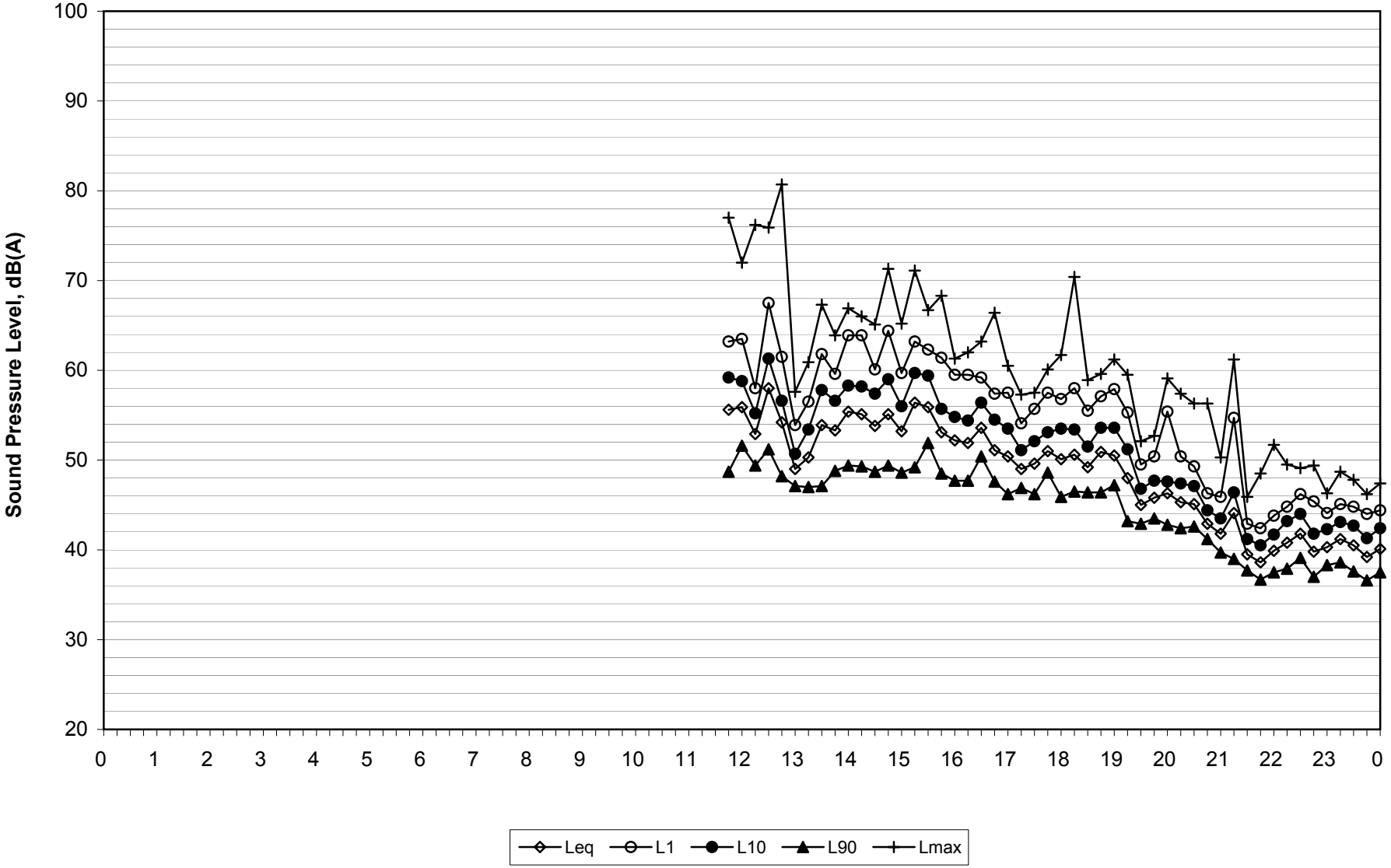
Thursday 23 November 2006



Reference Location M8
Amberwood Road

Ambient Sound Pressure Levels

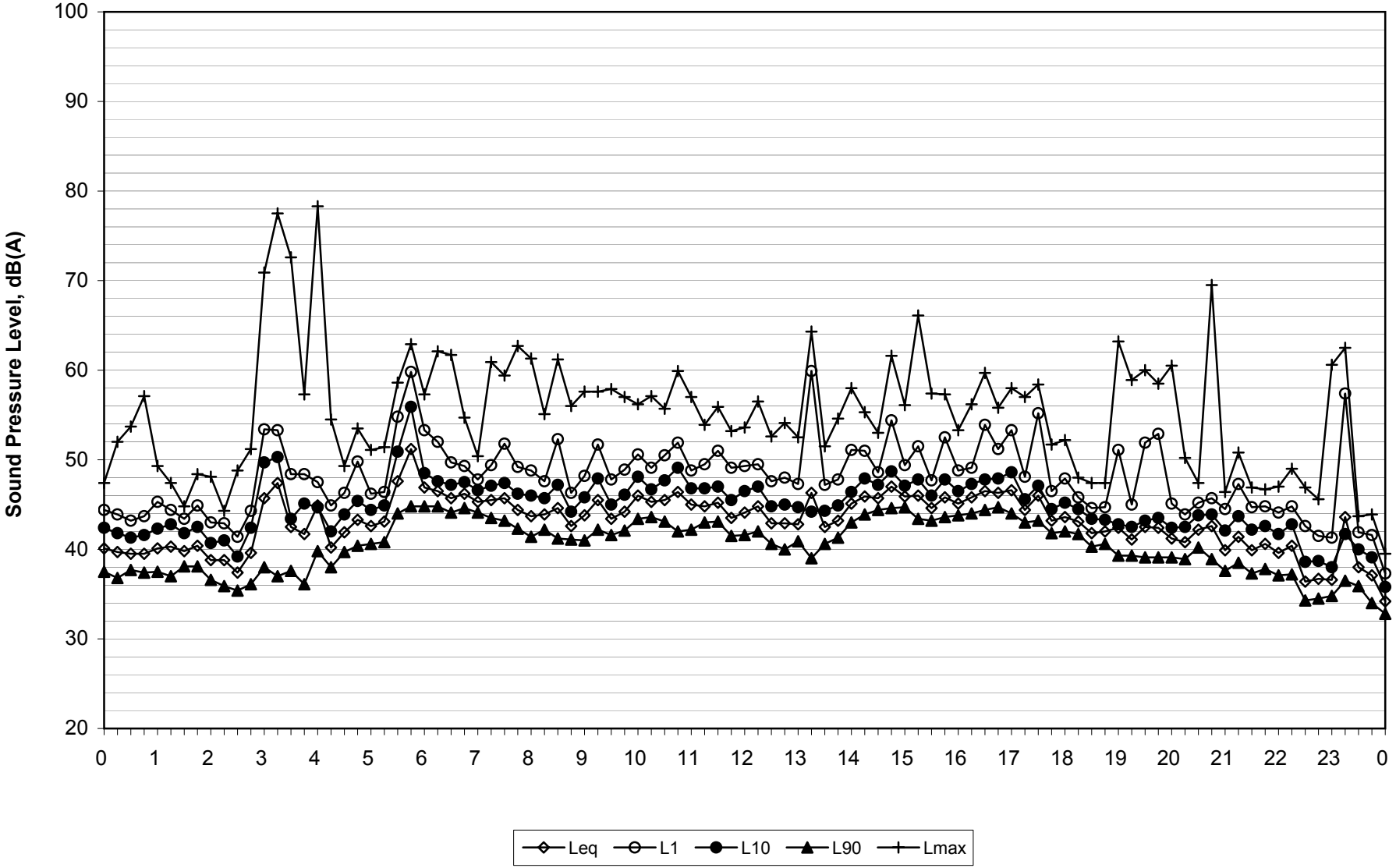
Thursday 16 November 2006



Reference Location M9
Sandra Road

Ambient Sound Pressure Levels

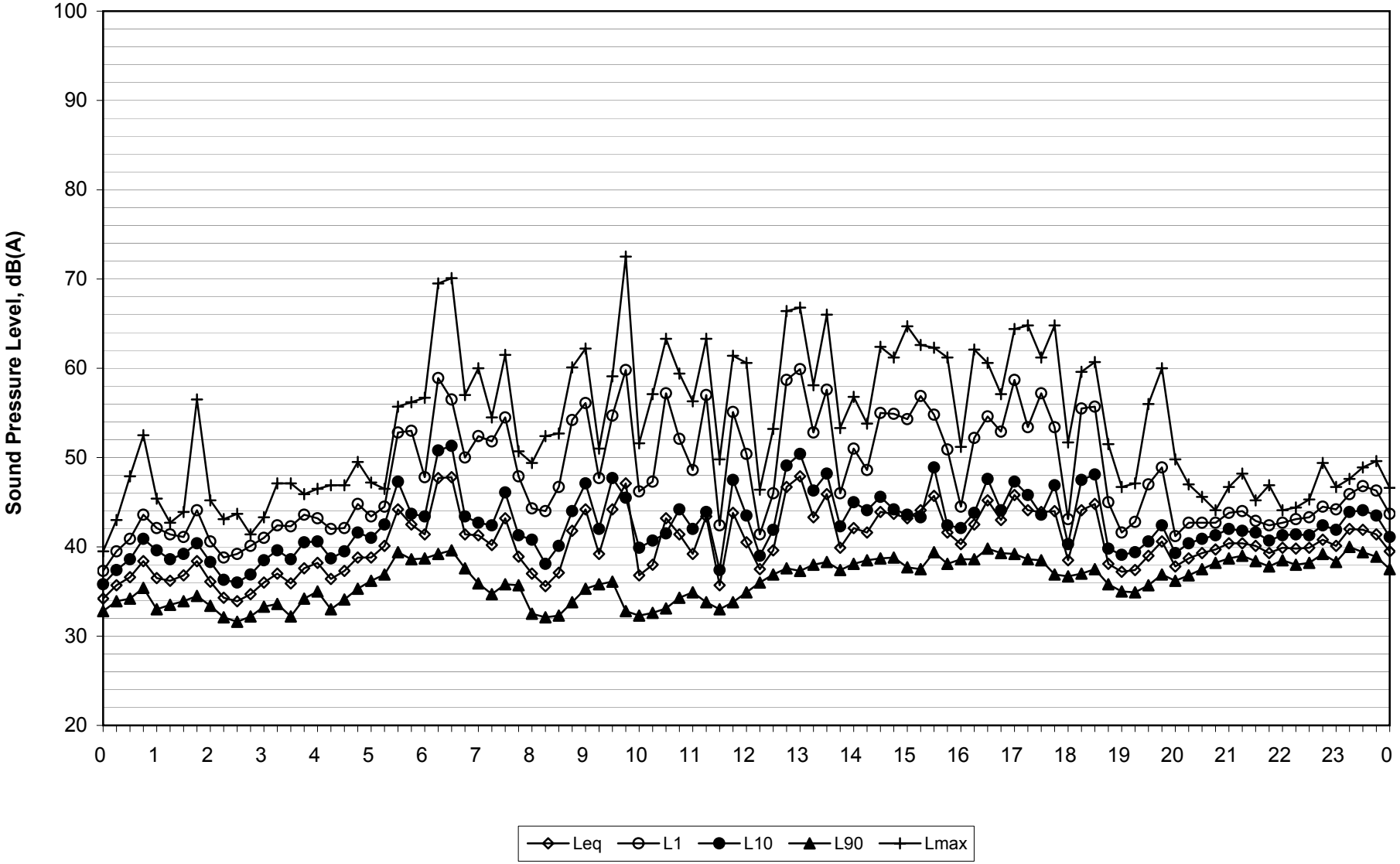
Friday 17 November 2006



Reference Location M9
Sandra Road

Ambient Sound Pressure Levels

Saturday 18 November 2006

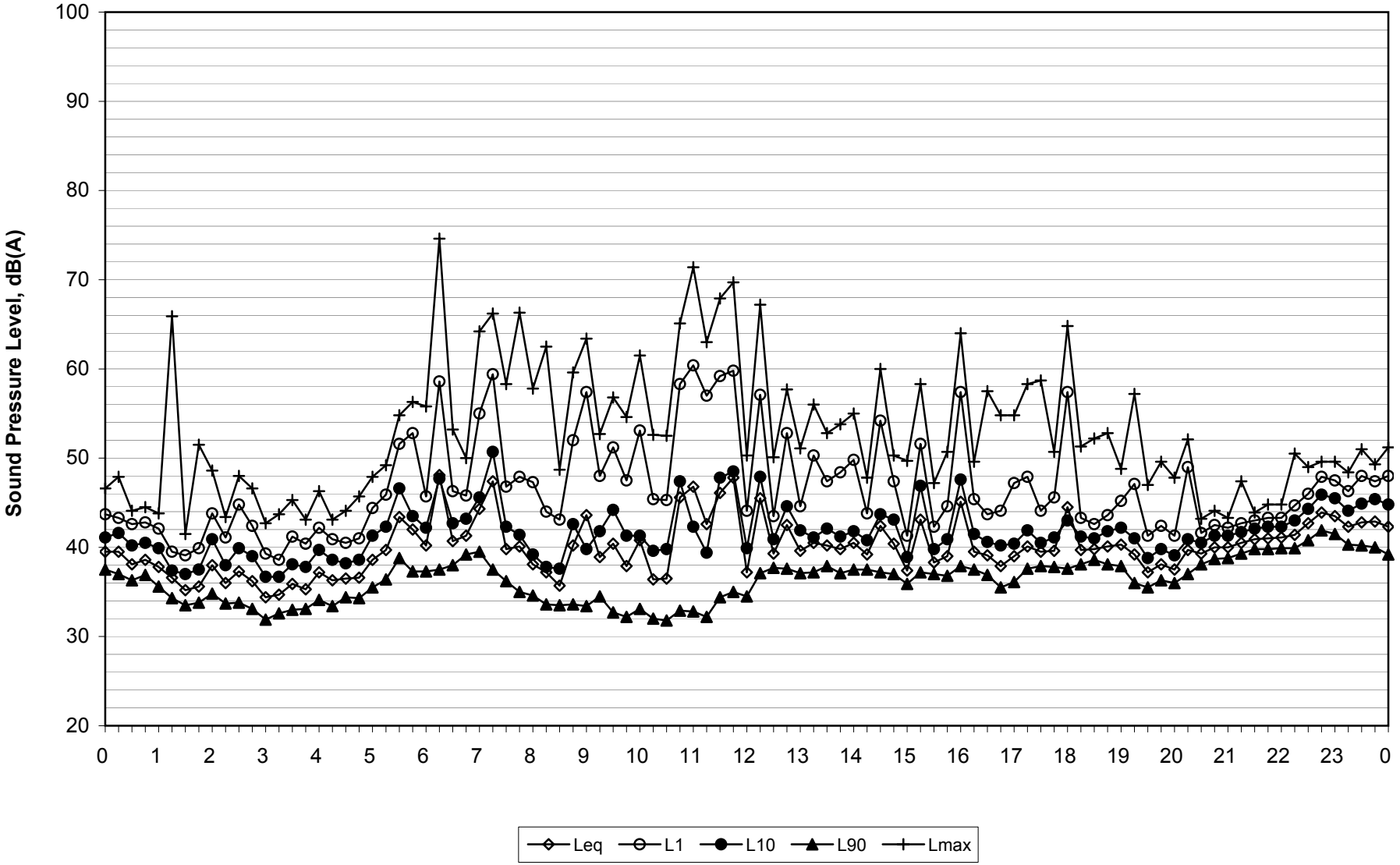


Reference Location M9
Sandra Road

5987R9.xls

Ambient Sound Pressure Levels

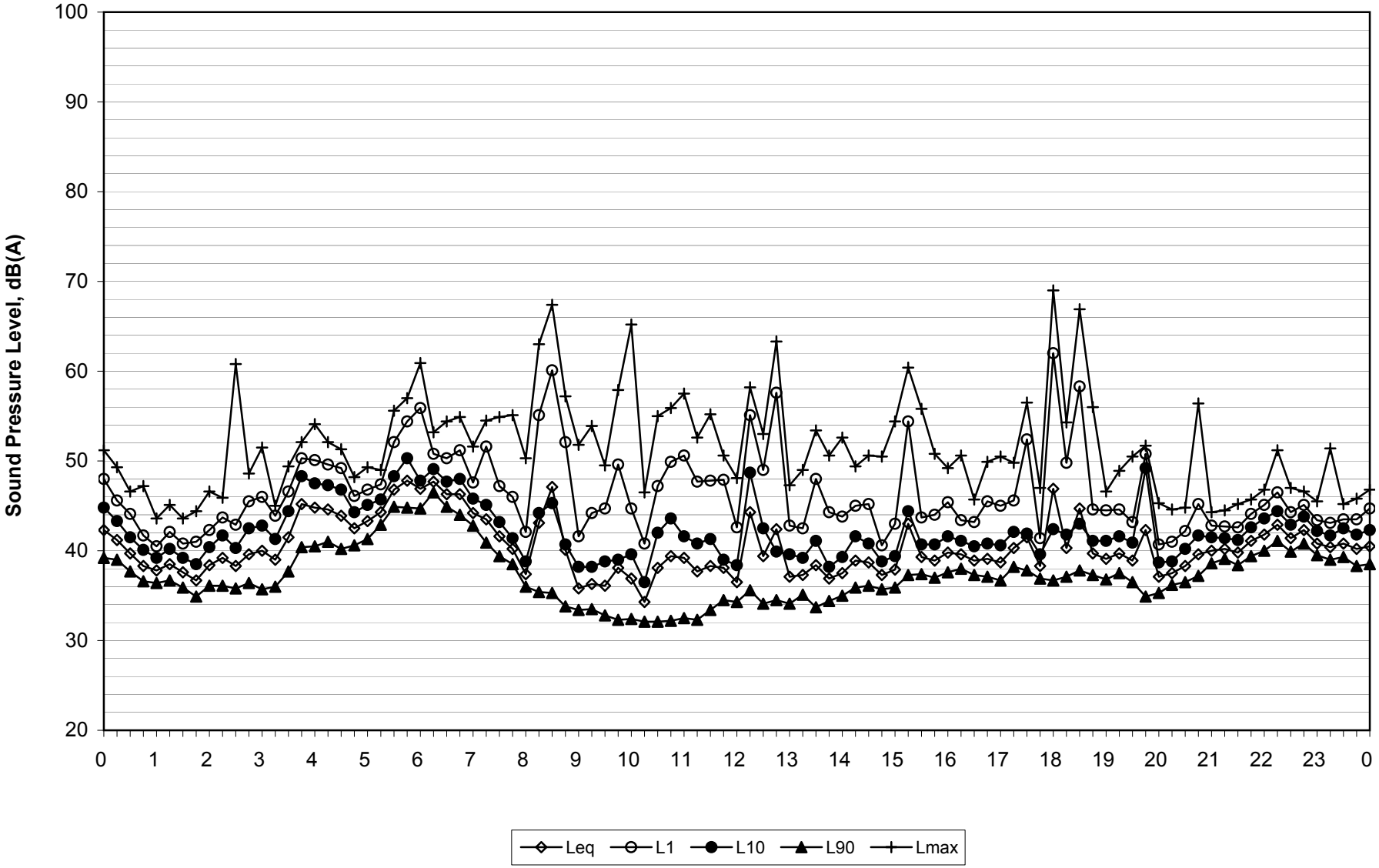
Sunday 19 November 2006



Reference Location M9
Sandra Road

Ambient Sound Pressure Levels

Monday 20 November 2006

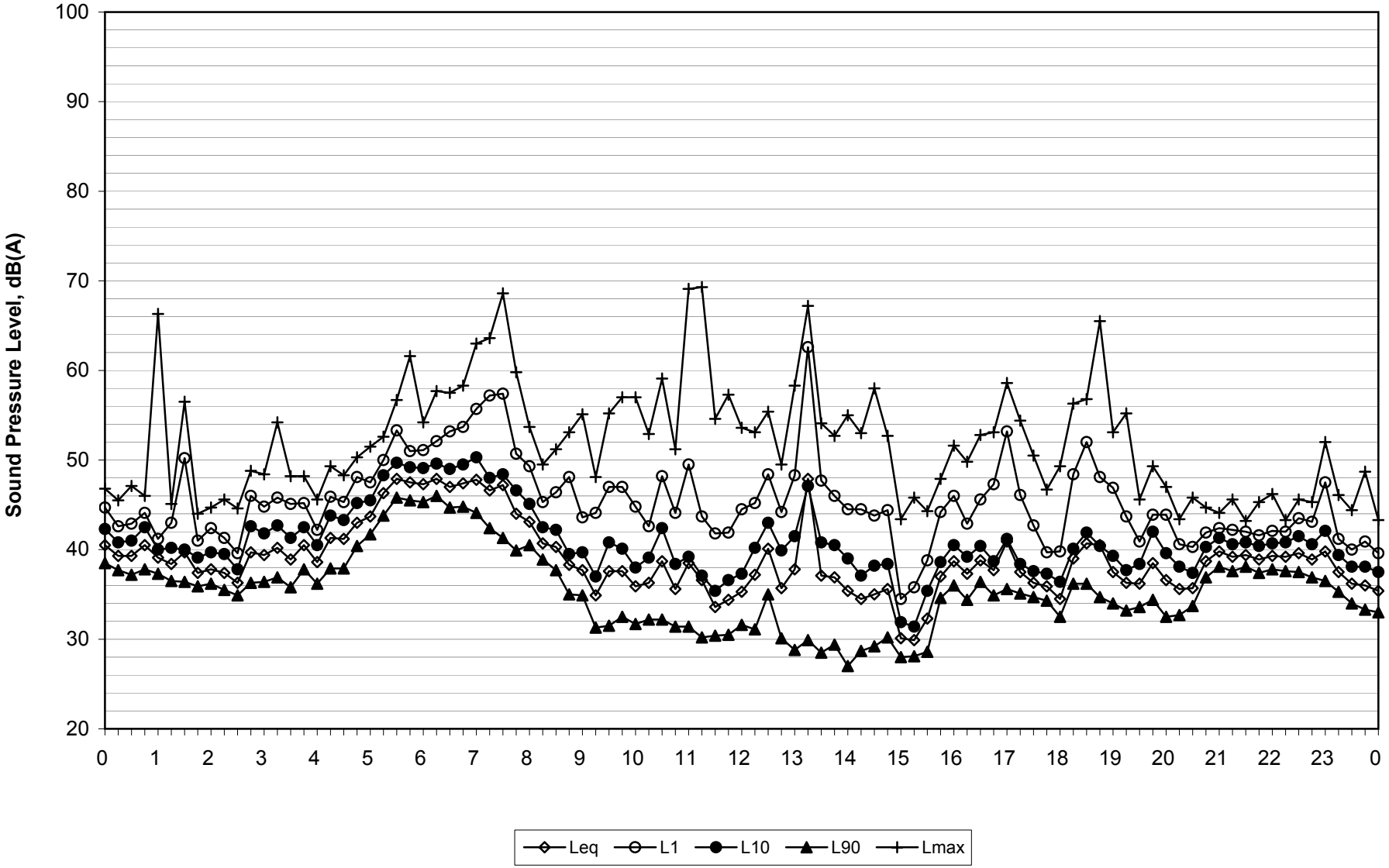


Reference Location M9
Sandra Road

5987R9.xls

Ambient Sound Pressure Levels

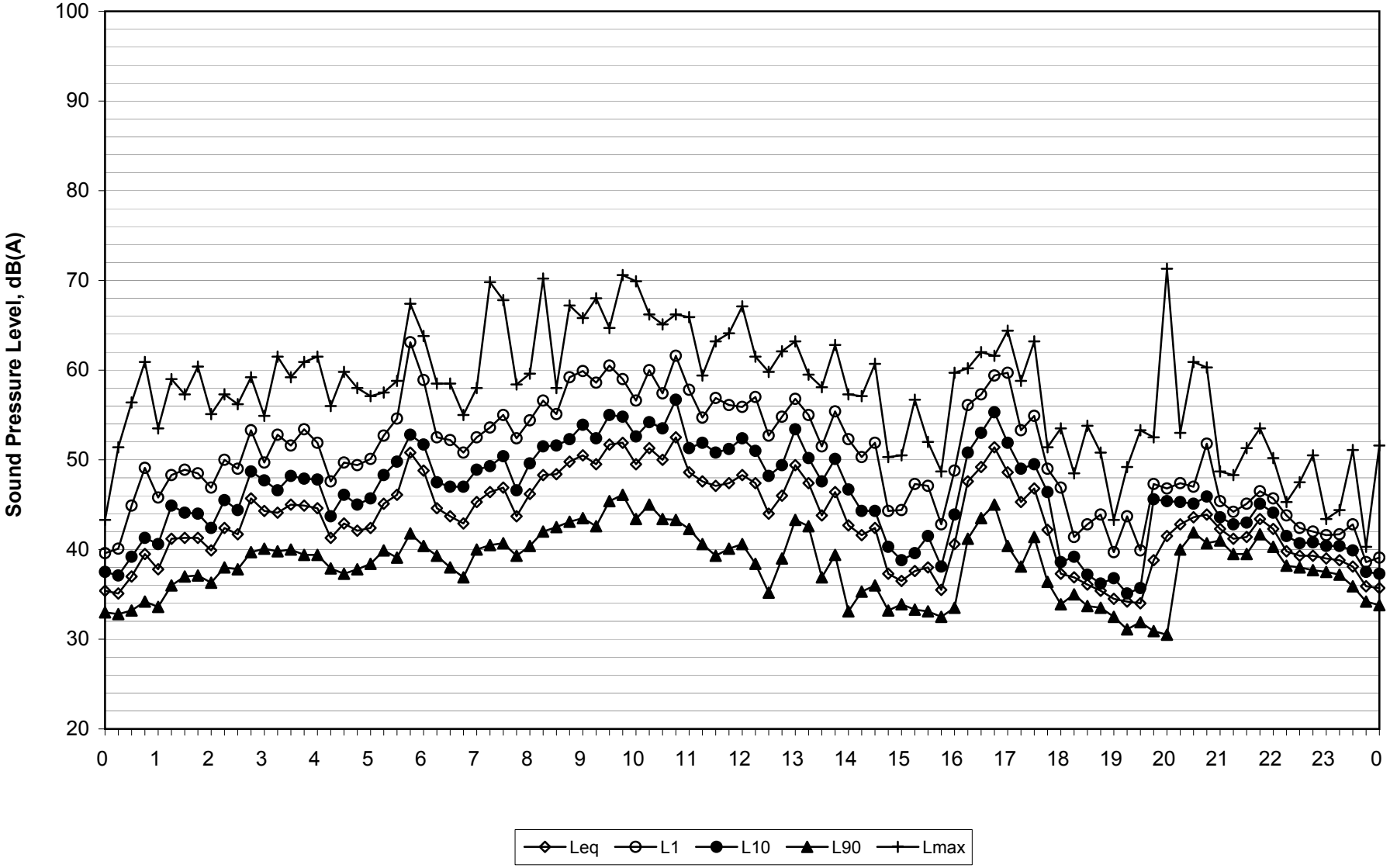
Tuesday 21 November 2006



Reference Location M9
Sandra Road

Ambient Sound Pressure Levels

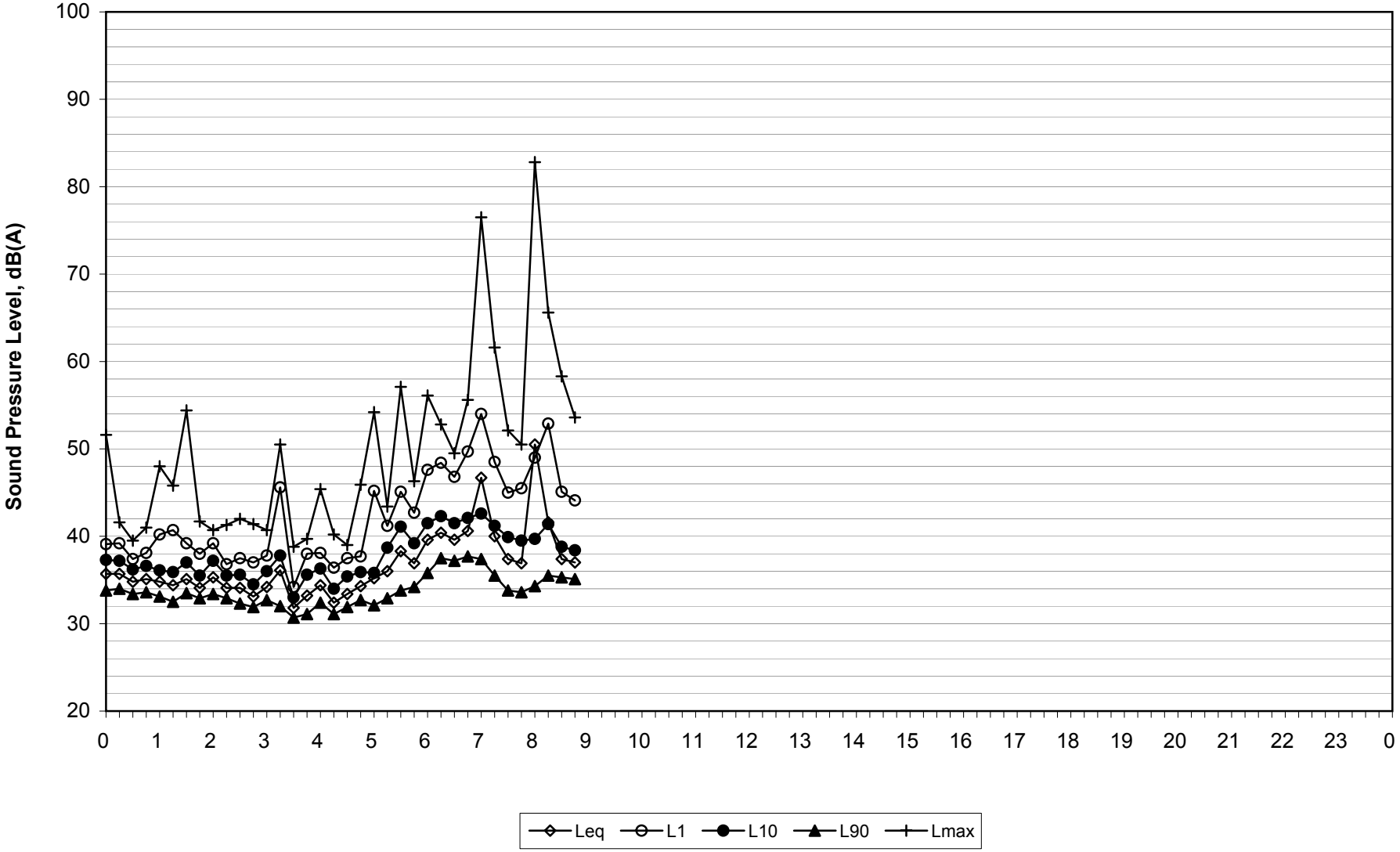
Wednesday 22 November 2006



Reference Location M9
Sandra Road

Ambient Sound Pressure Levels

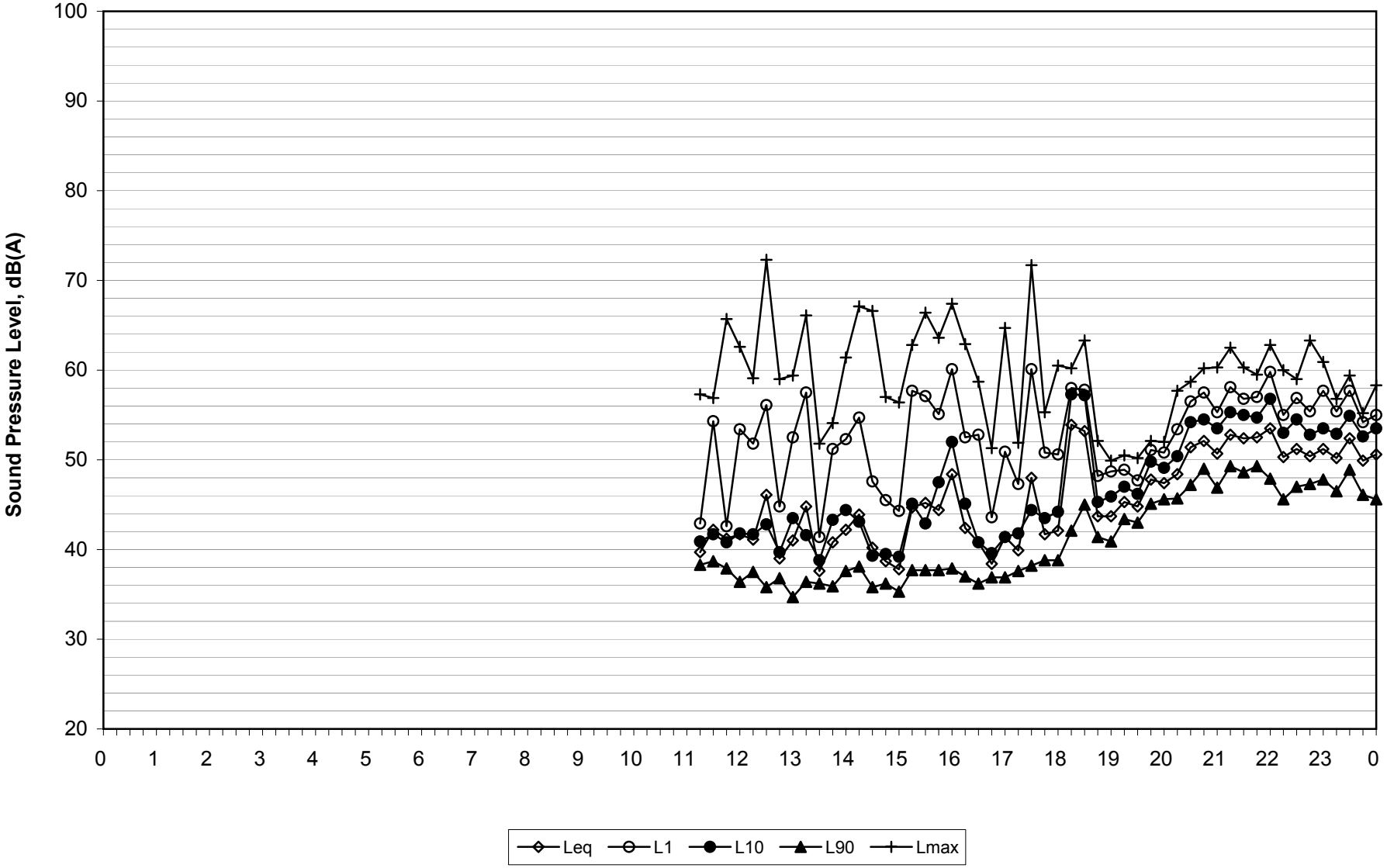
Thursday 23 November 2006



Reference Location M9
Sandra Road

Ambient Sound Pressure Levels

Tuesday 27 March 2007

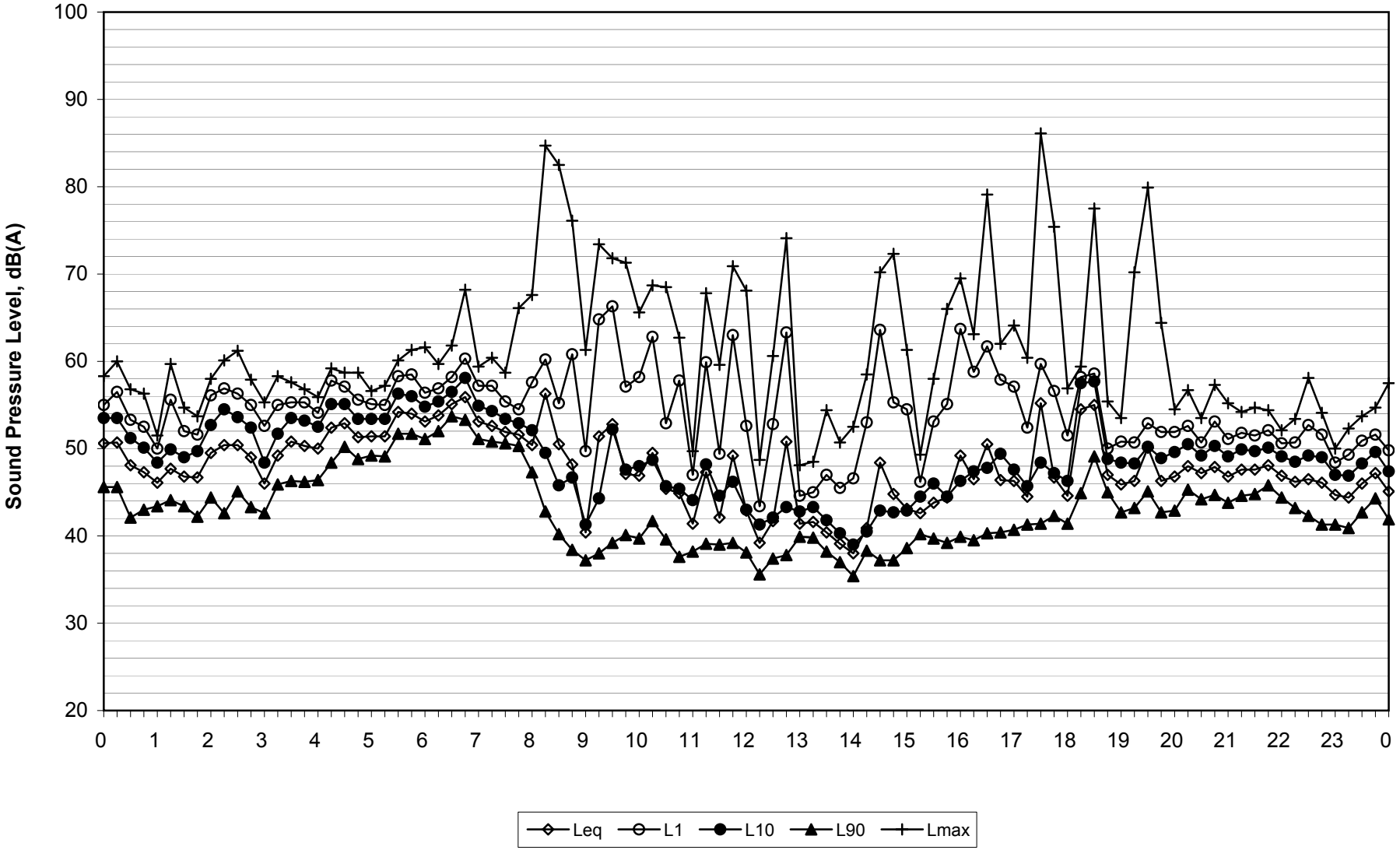


Reference Location M10
113A Mountain Road

5987R10.xls

Ambient Sound Pressure Levels

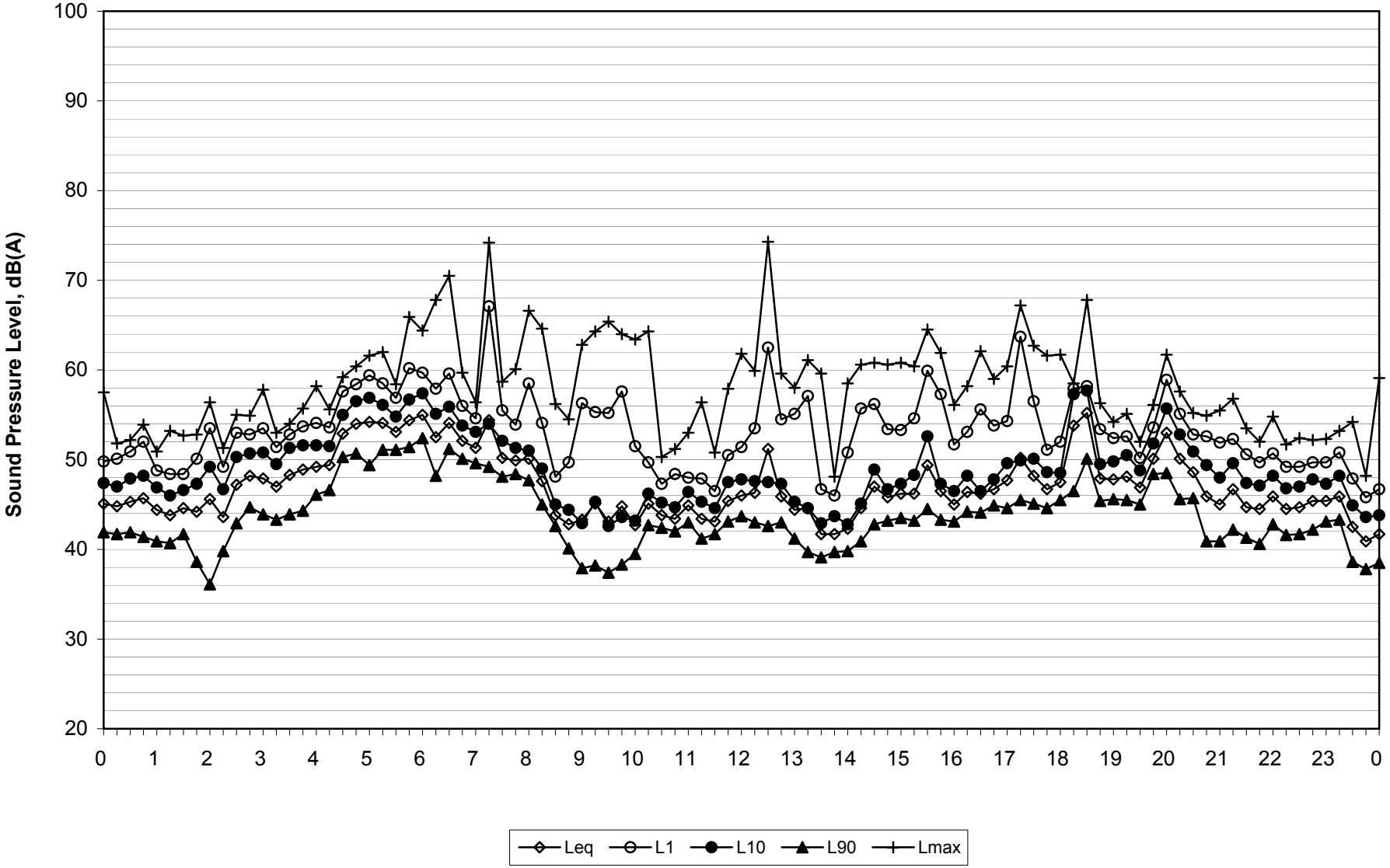
Wednesday 28 March 2007



Reference Location M10
113A Mountain Road

Ambient Sound Pressure Levels

Thursday 29 March 2007

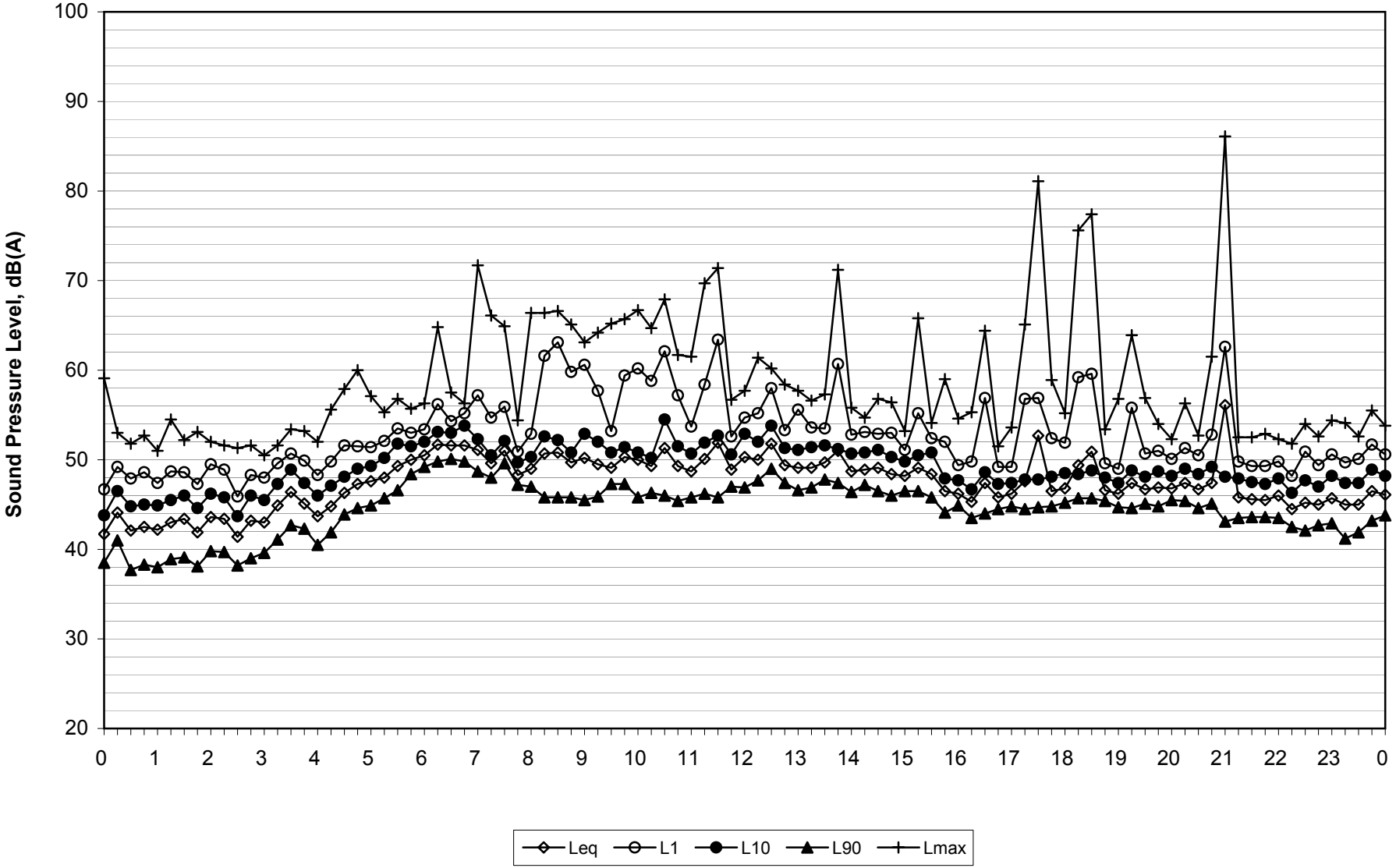


Reference Location M10
113A Mountain Road

5987R10.xls

Ambient Sound Pressure Levels

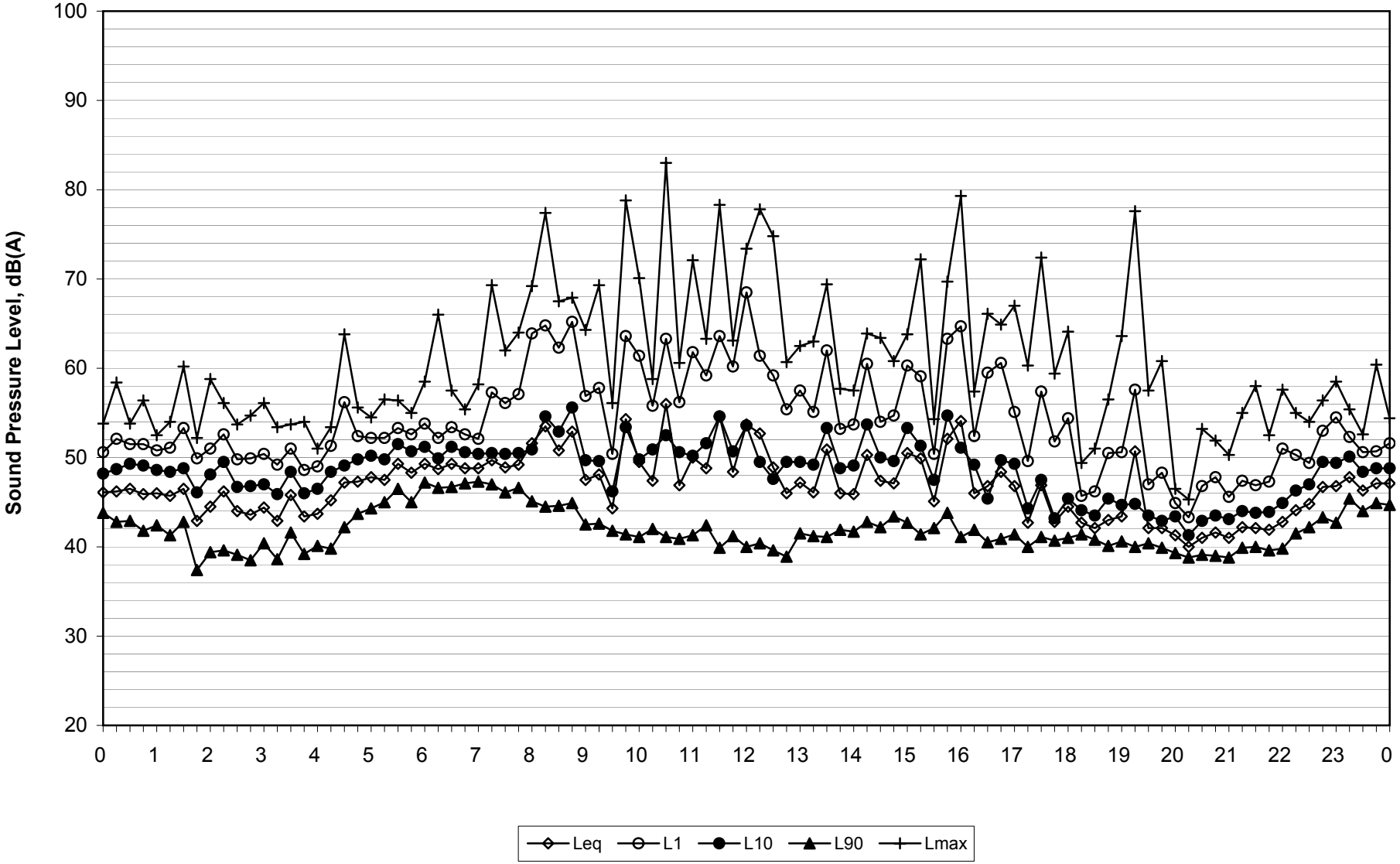
Friday 30 March 2007



Reference Location M10
113A Mountain Road

Ambient Sound Pressure Levels

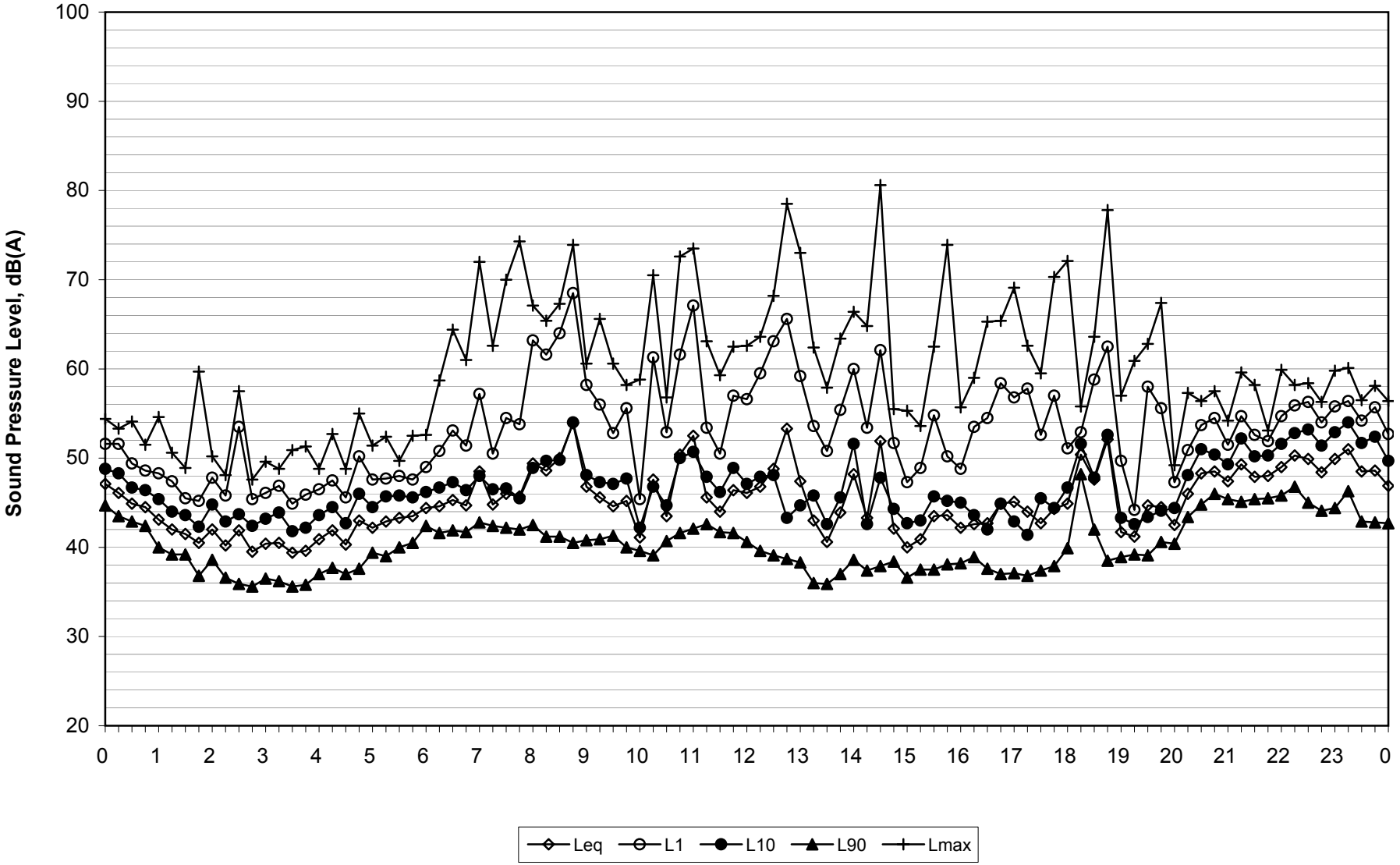
Saturday 31 March 2007



Reference Location M10
113A Mountain Road

Ambient Sound Pressure Levels

Sunday 01 April 2007

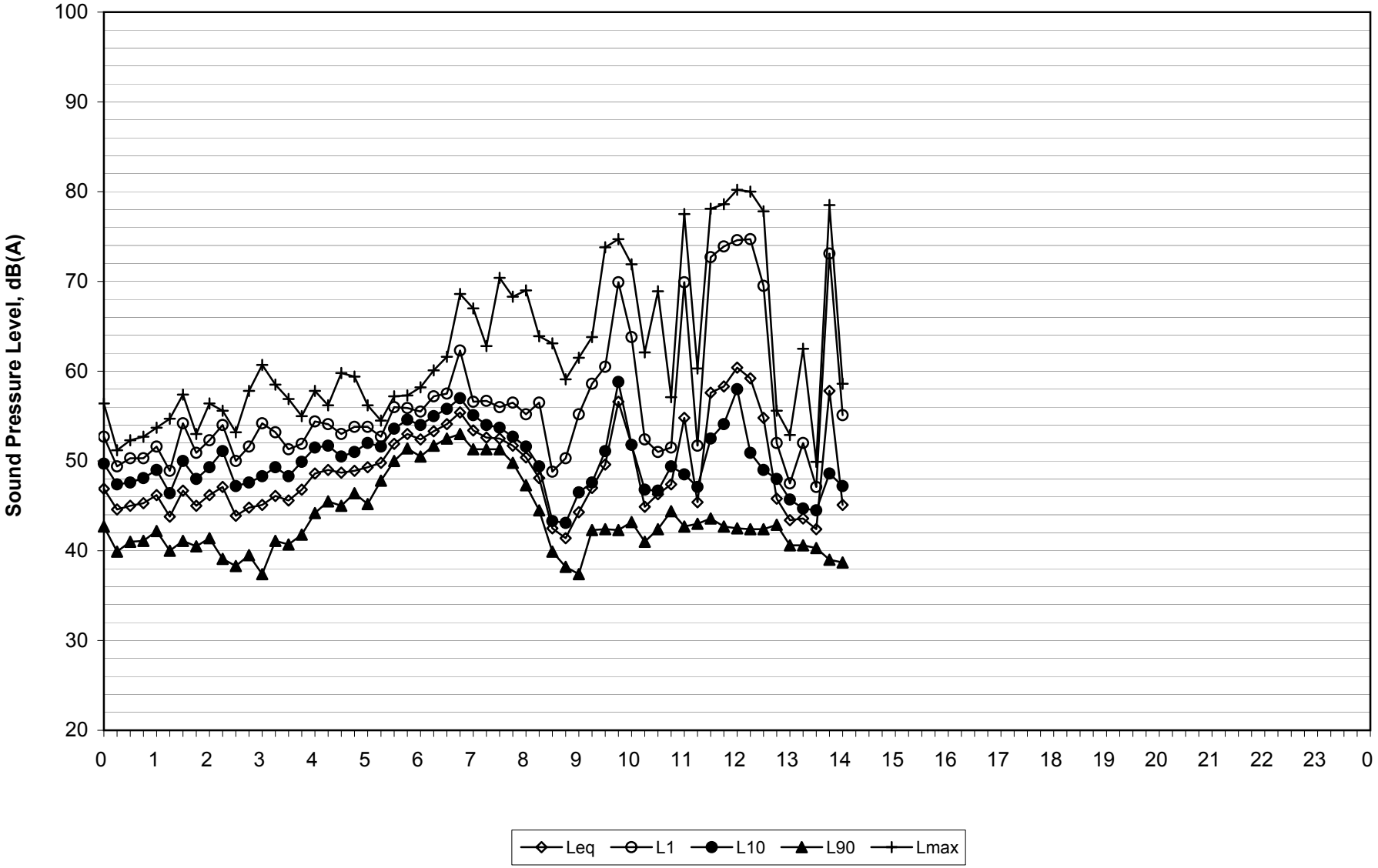


Reference Location M10
113A Mountain Road

5987R10.xls

Ambient Sound Pressure Levels

Monday 02 April 2007

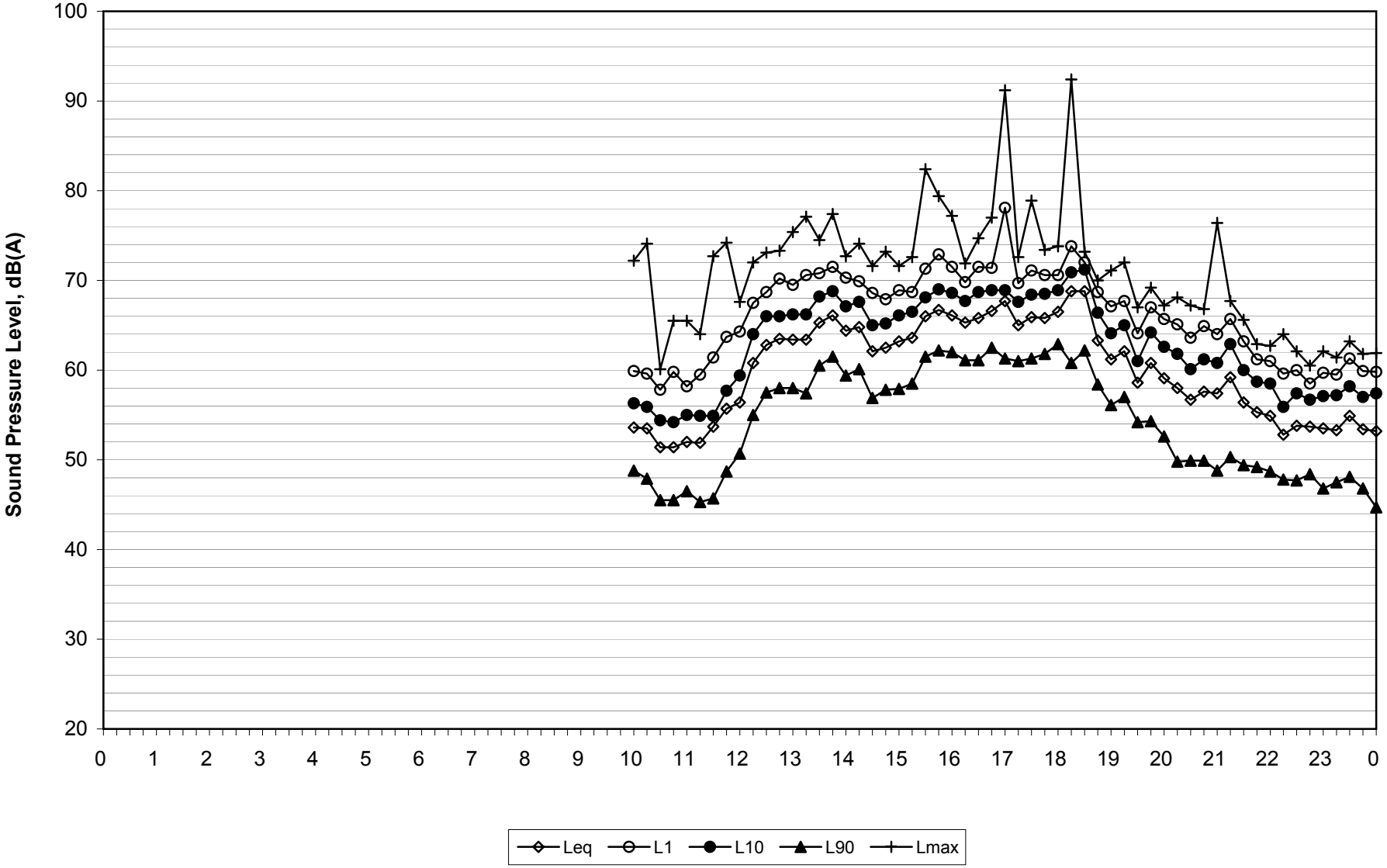


Reference Location M10
113A Mountain Road

5987R10.xls

Ambient Sound Pressure Levels

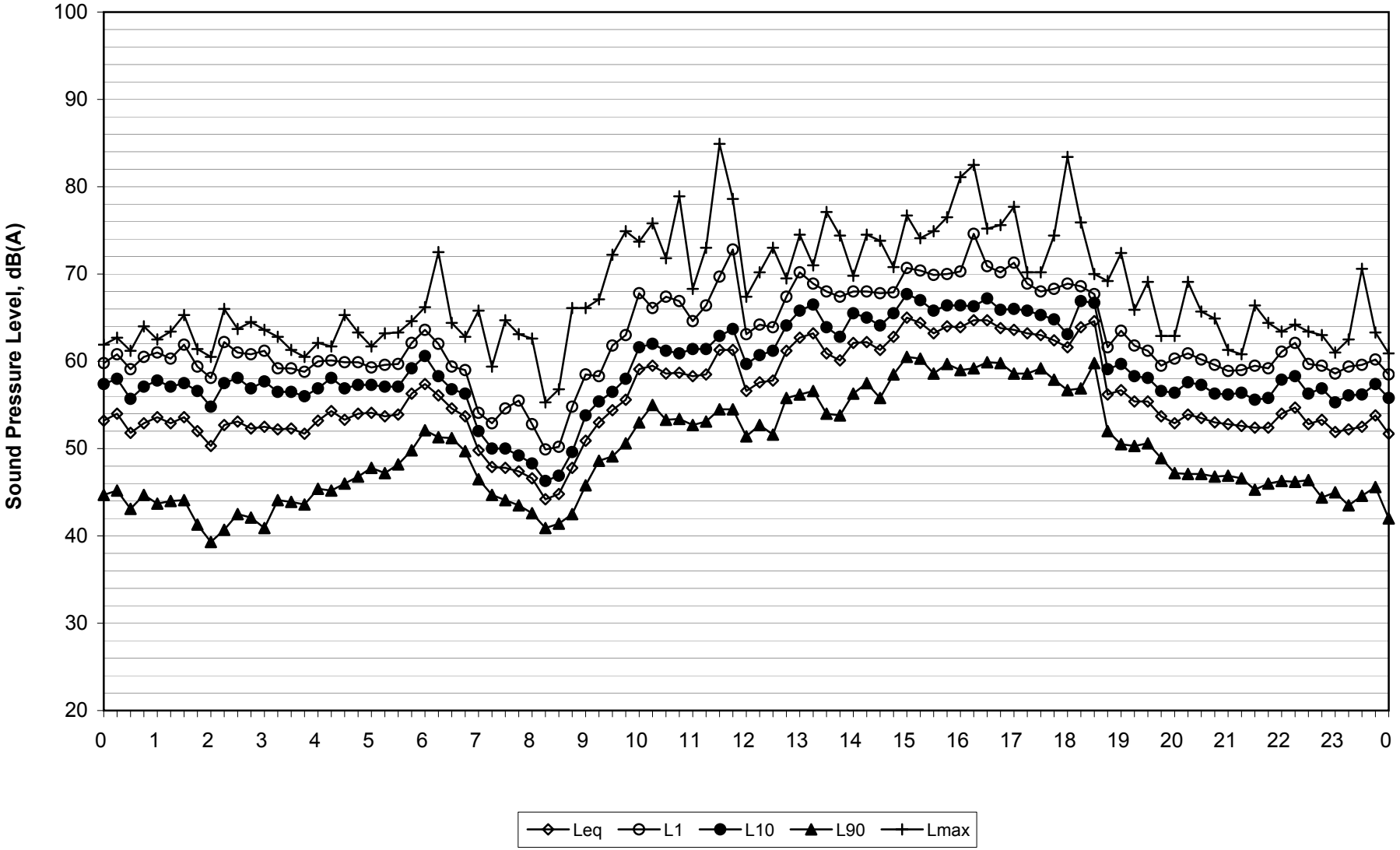
Tuesday 27 March 2007



Reference Location M11
20 Bushells Ridge Road

Ambient Sound Pressure Levels

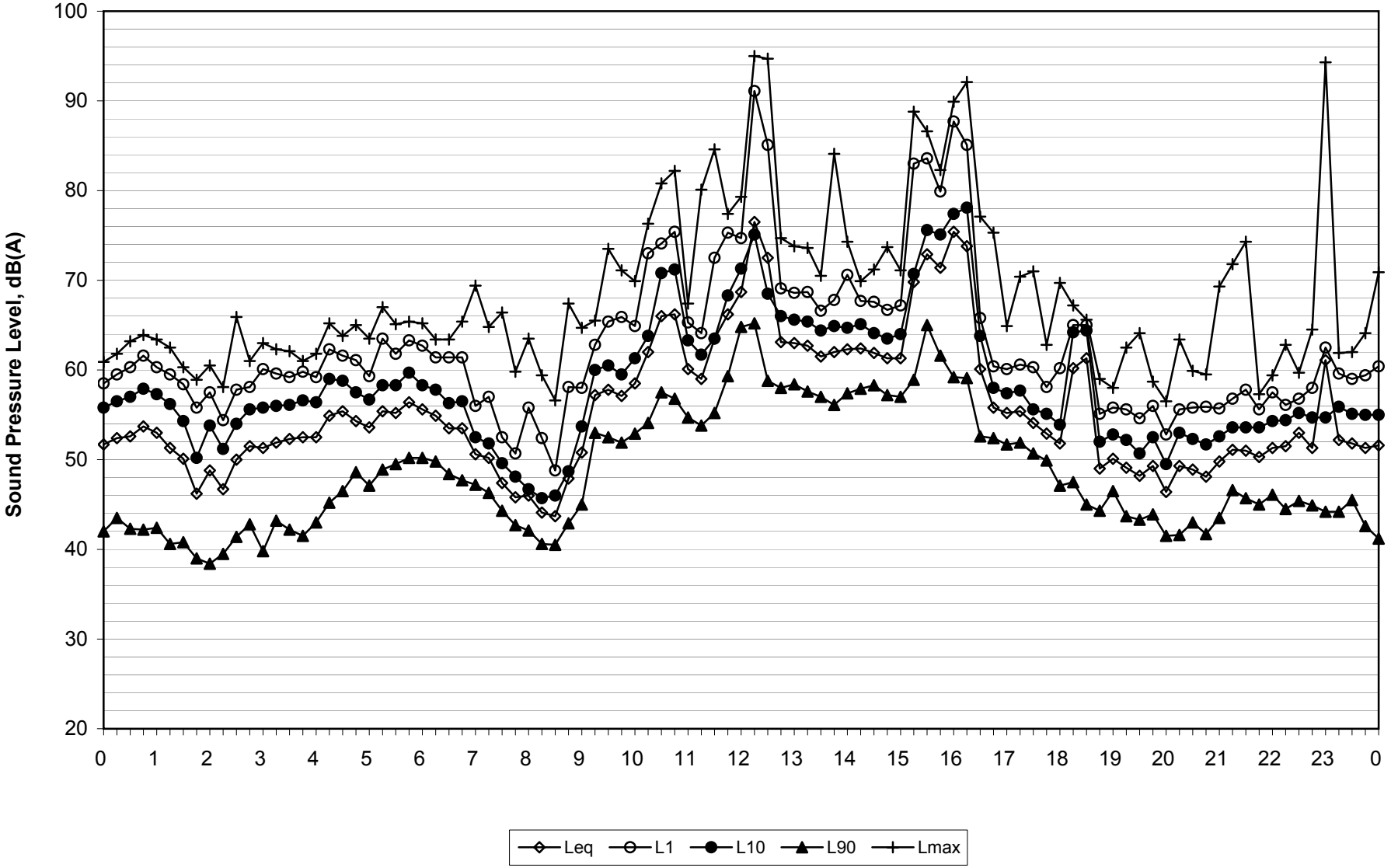
Wednesday 28 March 2007



Reference Location M11
20 Bushells Ridge Road

Ambient Sound Pressure Levels

Thursday 29 March 2007

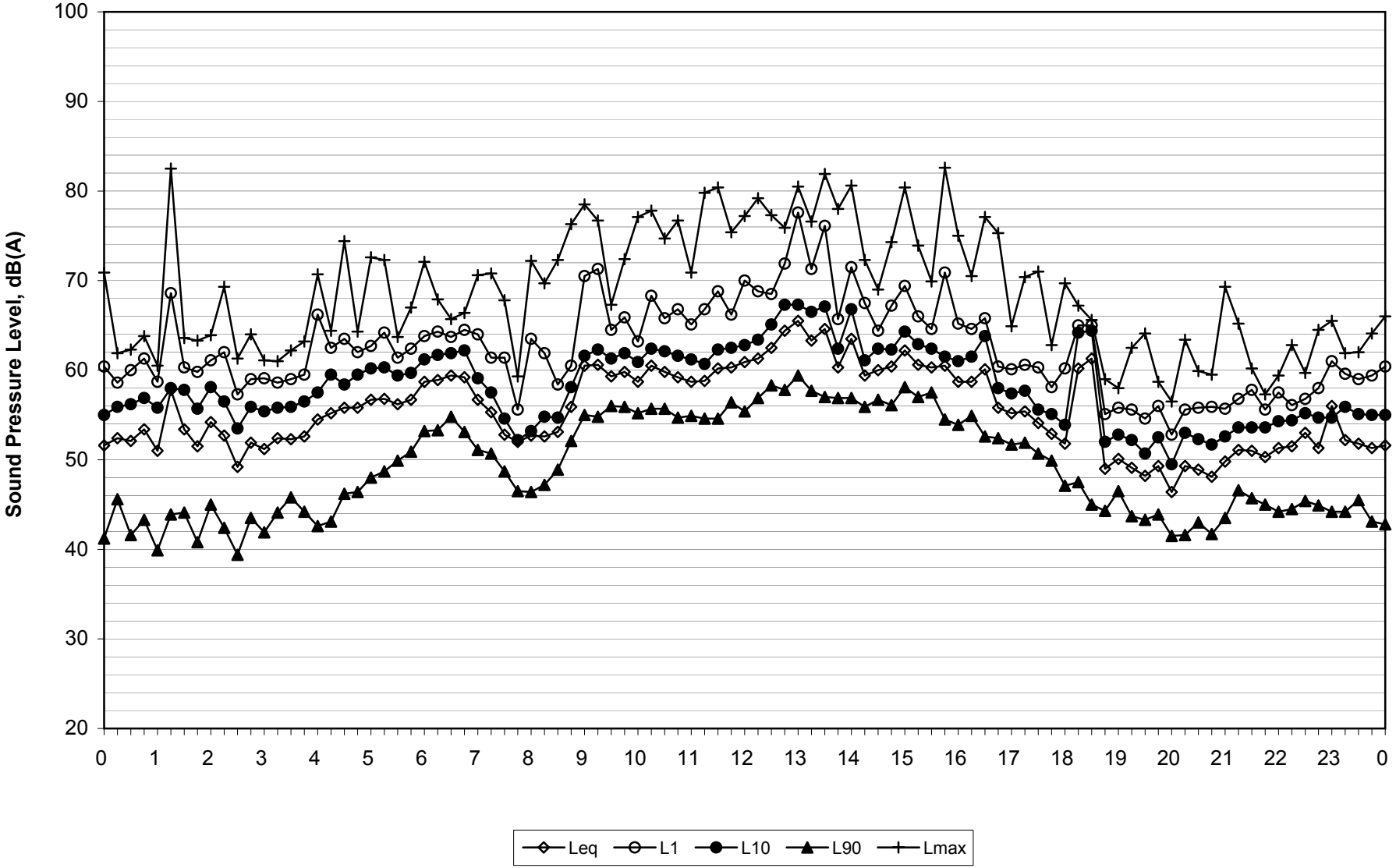


Reference Location M11
20 Bushells Ridge Road

5987R11.xls

Ambient Sound Pressure Levels

Friday 30 March 2007

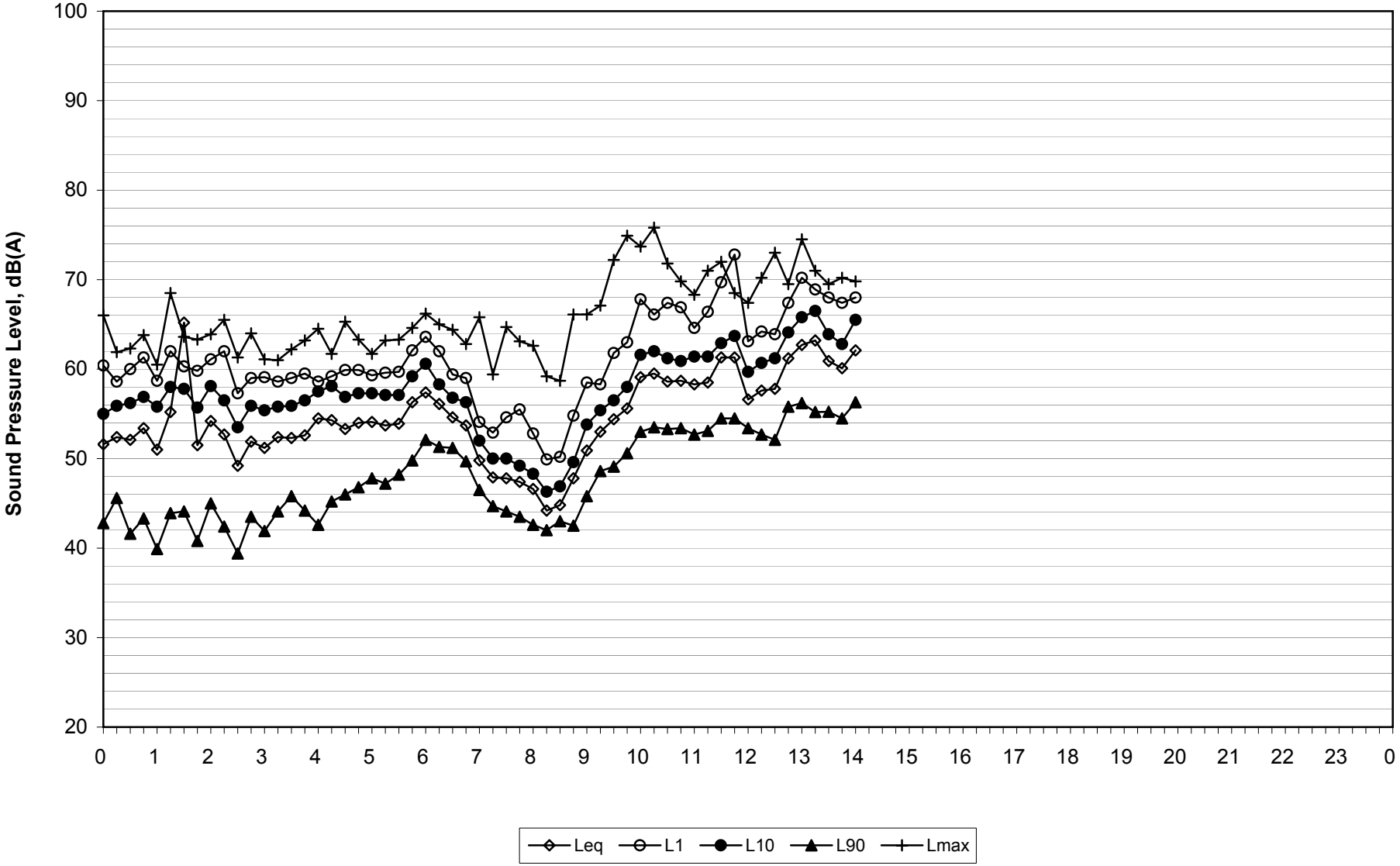


Reference Location M11
20 Bushells Ridge Road

5987R11.xls

Ambient Sound Pressure Levels

Saturday 31 March 2007

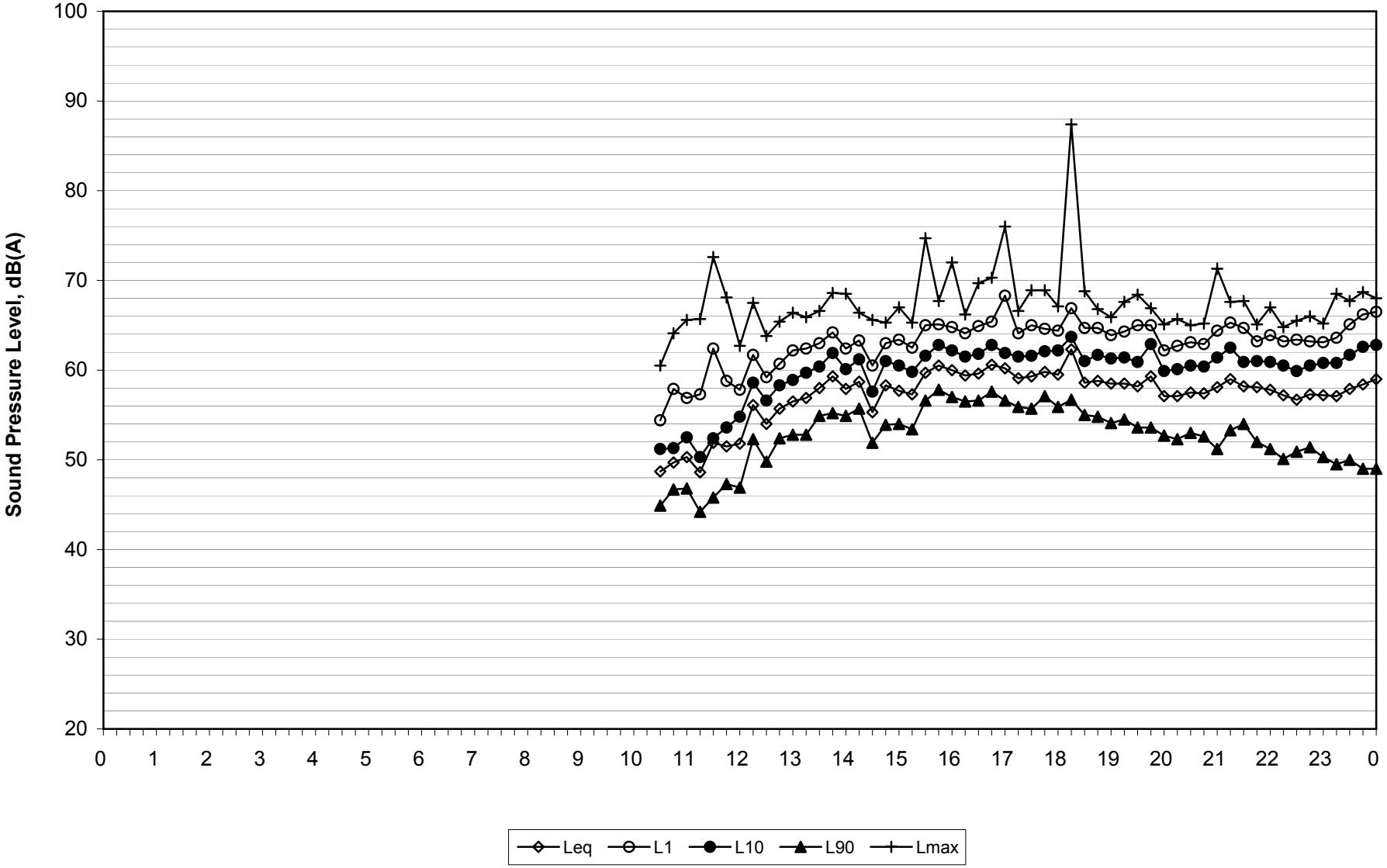


Reference Location M11
20 Bushells Ridge Road

5987R11.xls

Ambient Sound Pressure Levels

Tuesday 27 March 2007

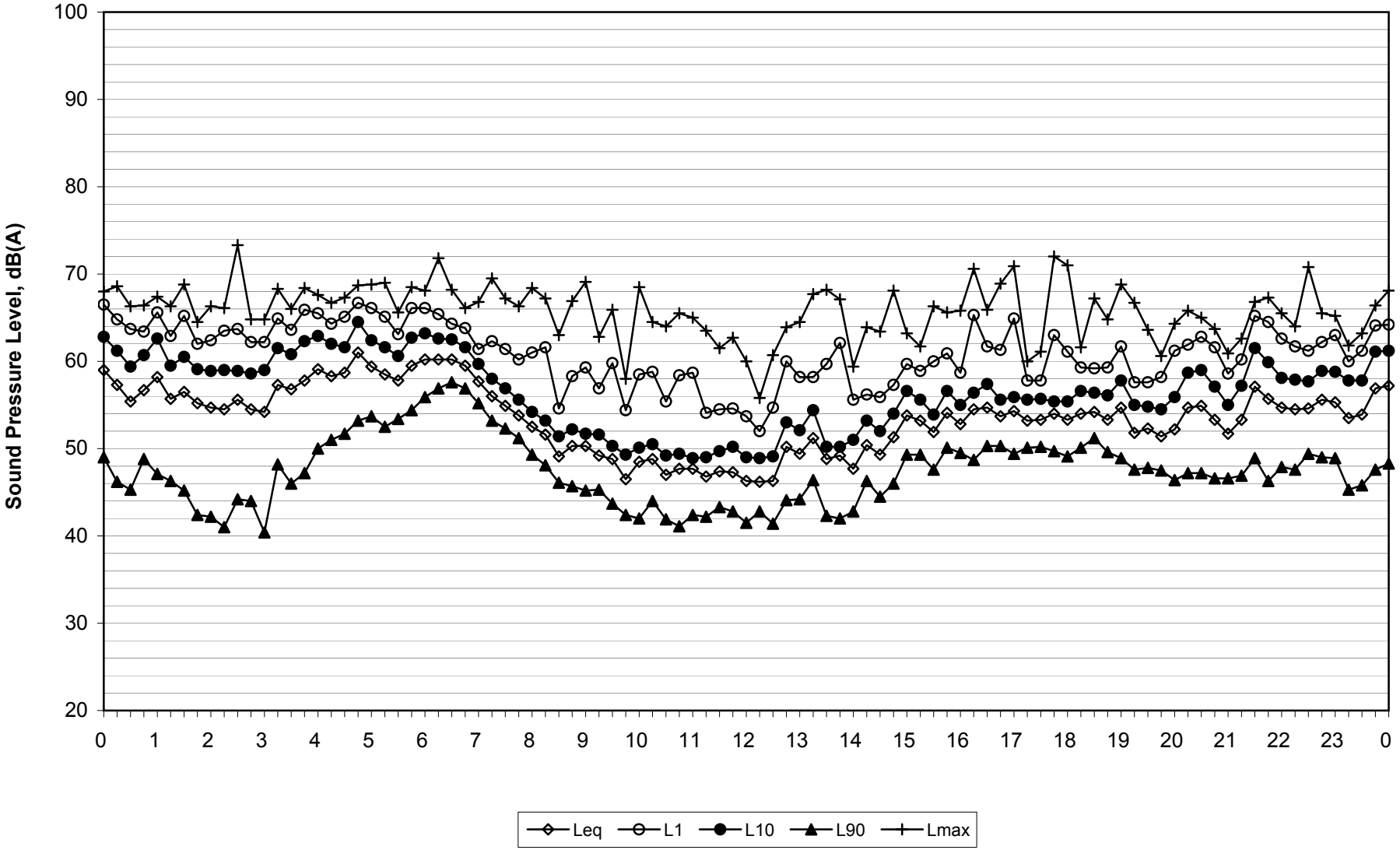


Reference Location M12
Bushells Ridge Road

5987R12.xls

Ambient Sound Pressure Levels

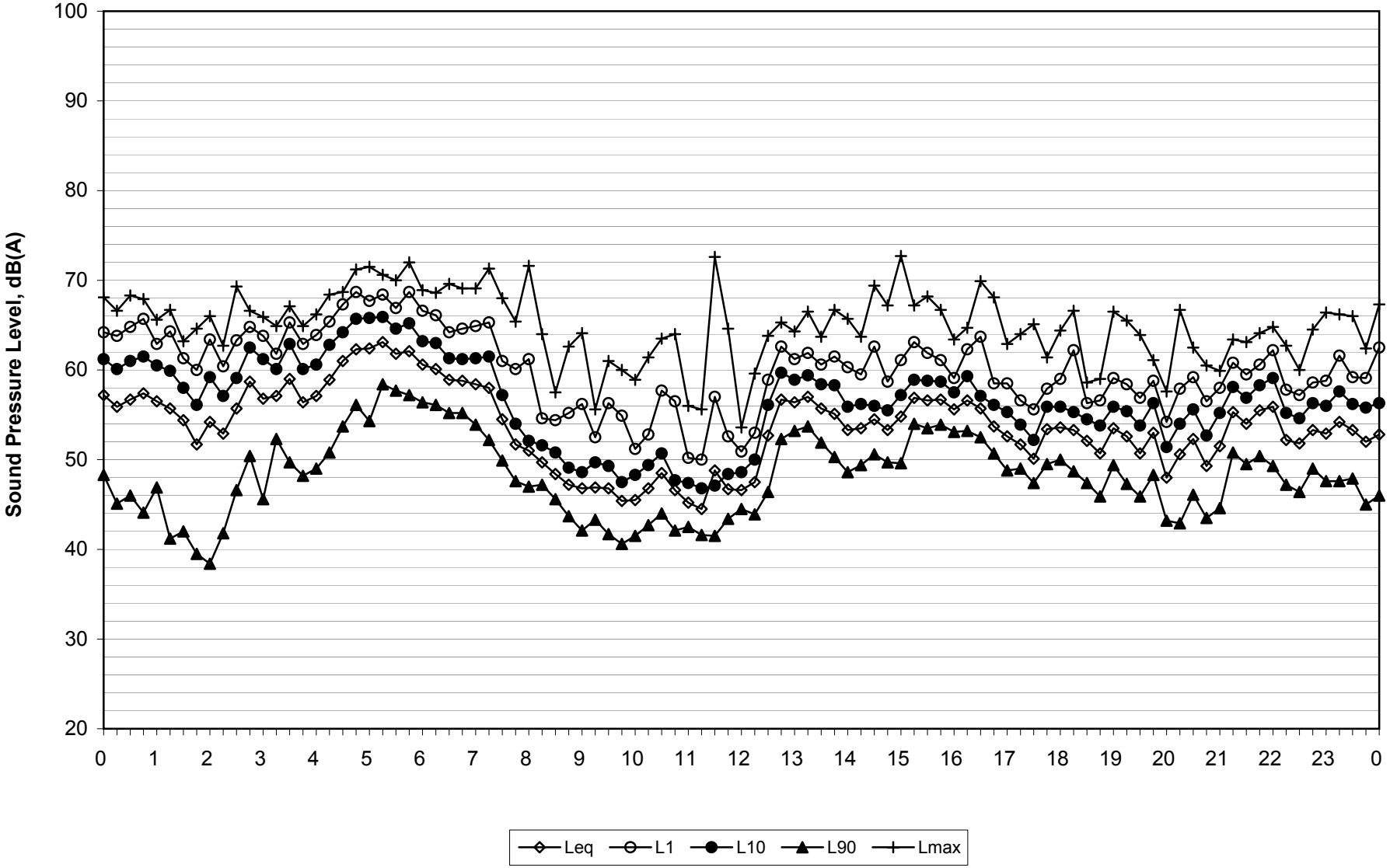
Wednesday 28 March 2007



Reference Location M12
Bushells Ridge Road

Ambient Sound Pressure Levels

Thursday 29 March 2007

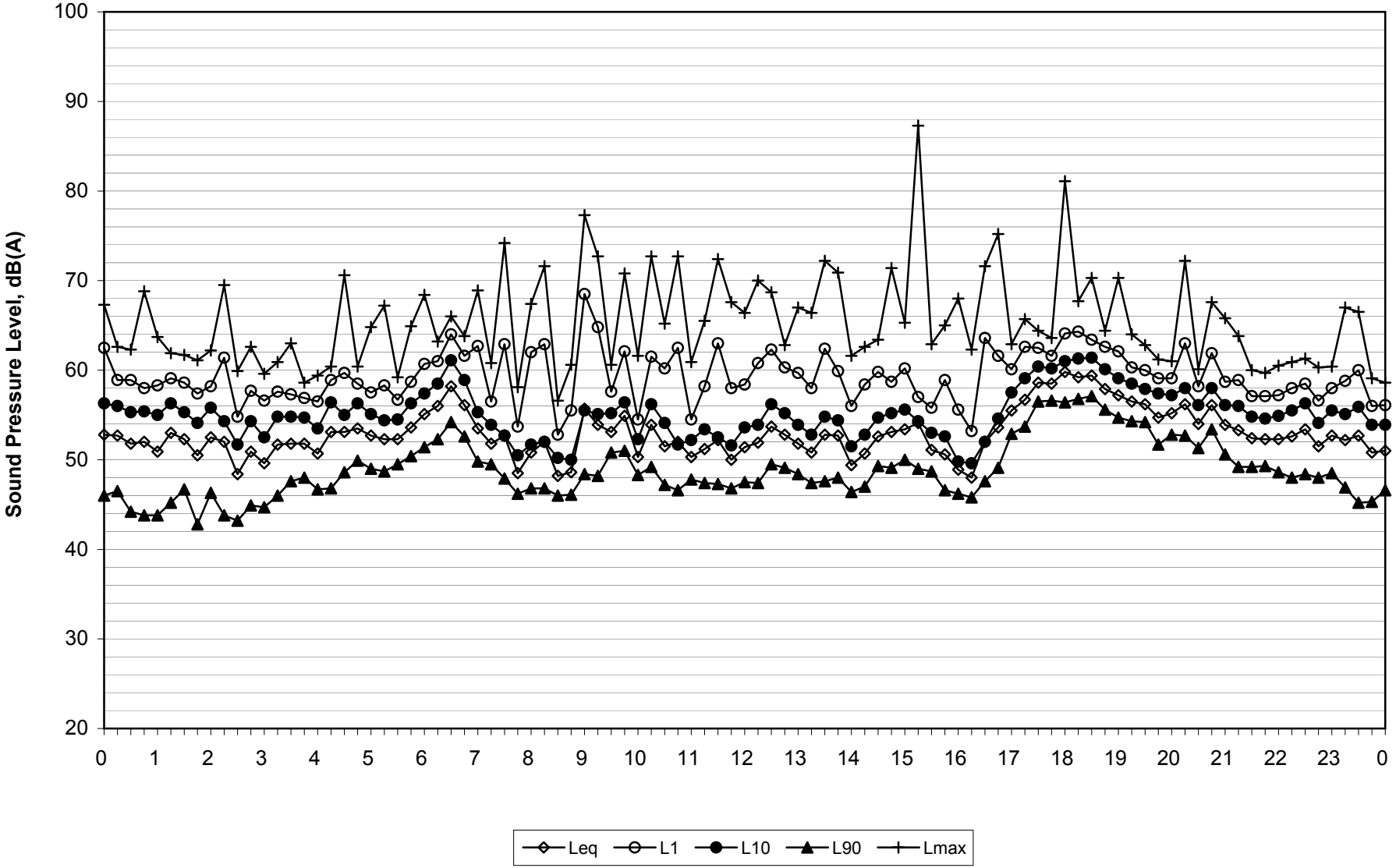


Reference Location M12
Bushells Ridge Road

5987R12.xls

Ambient Sound Pressure Levels

Friday 30 March 2007

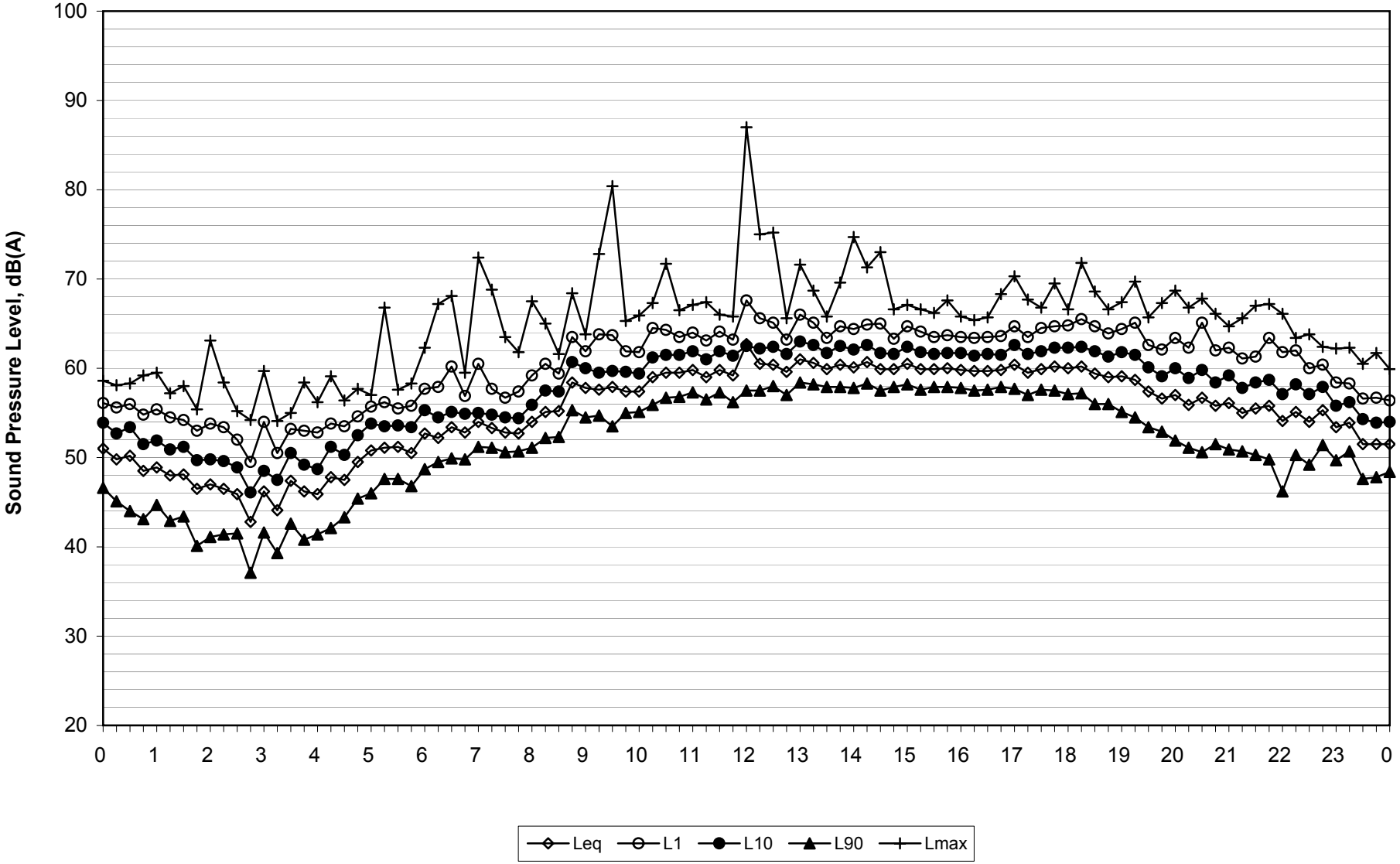


Reference Location M12
Bushells Ridge Road

5987R12.xls

Ambient Sound Pressure Levels

Saturday 31 March 2007

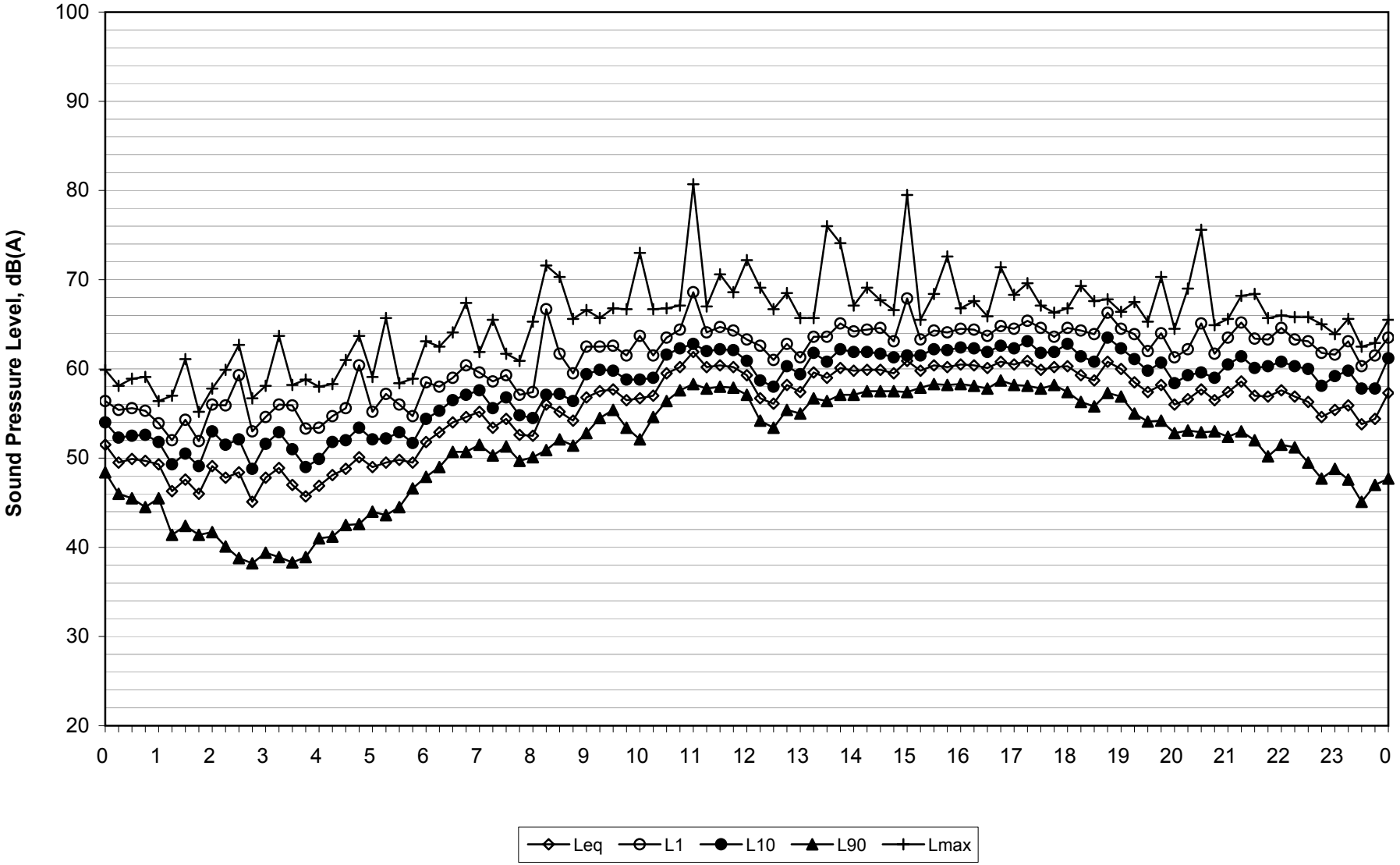


Reference Location M12
Bushells Ridge Road

5987R12.xls

Ambient Sound Pressure Levels

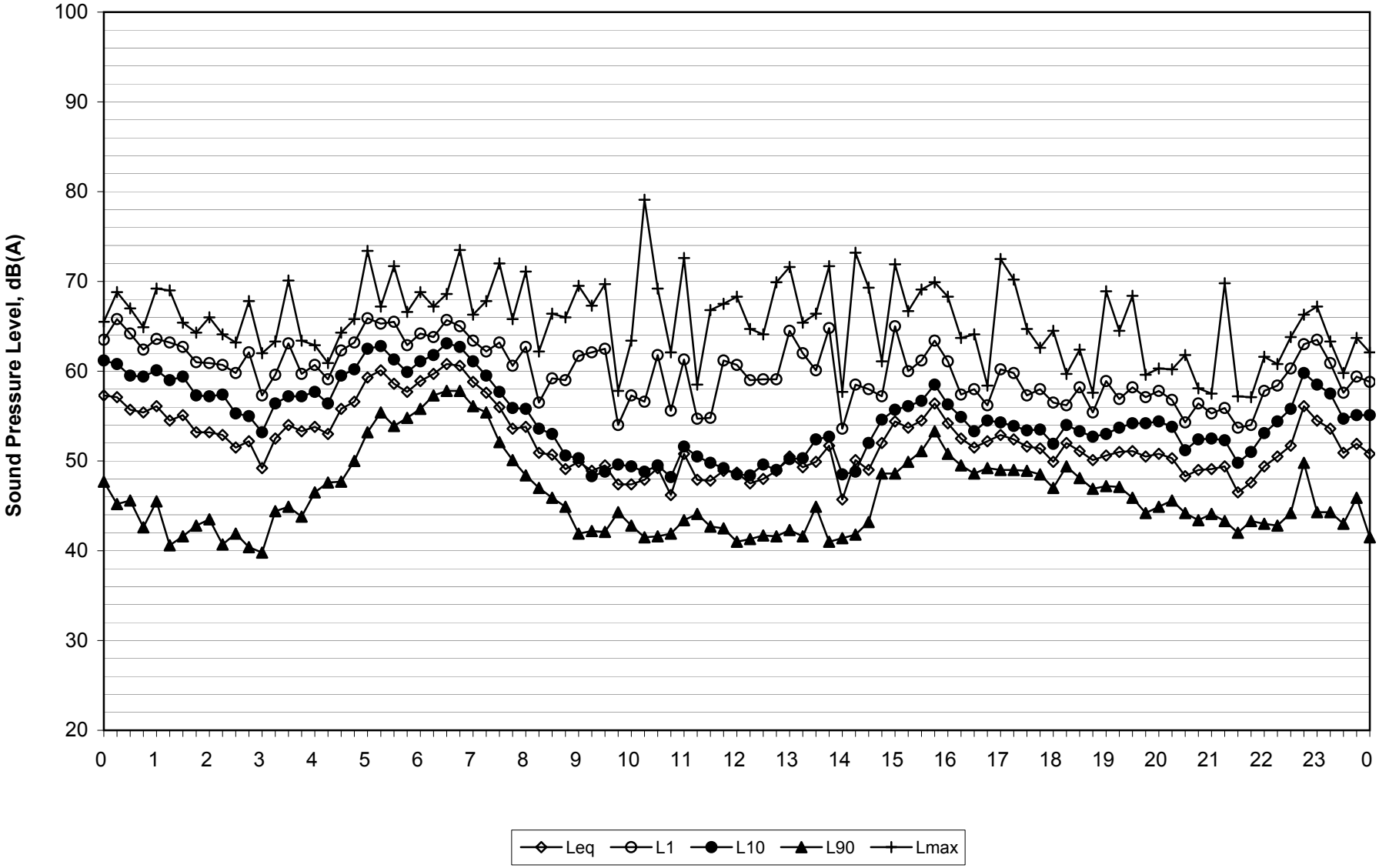
Sunday 01 April 2007



Reference Location M12
Bushells Ridge Road

Ambient Sound Pressure Levels

Monday 02 April 2007

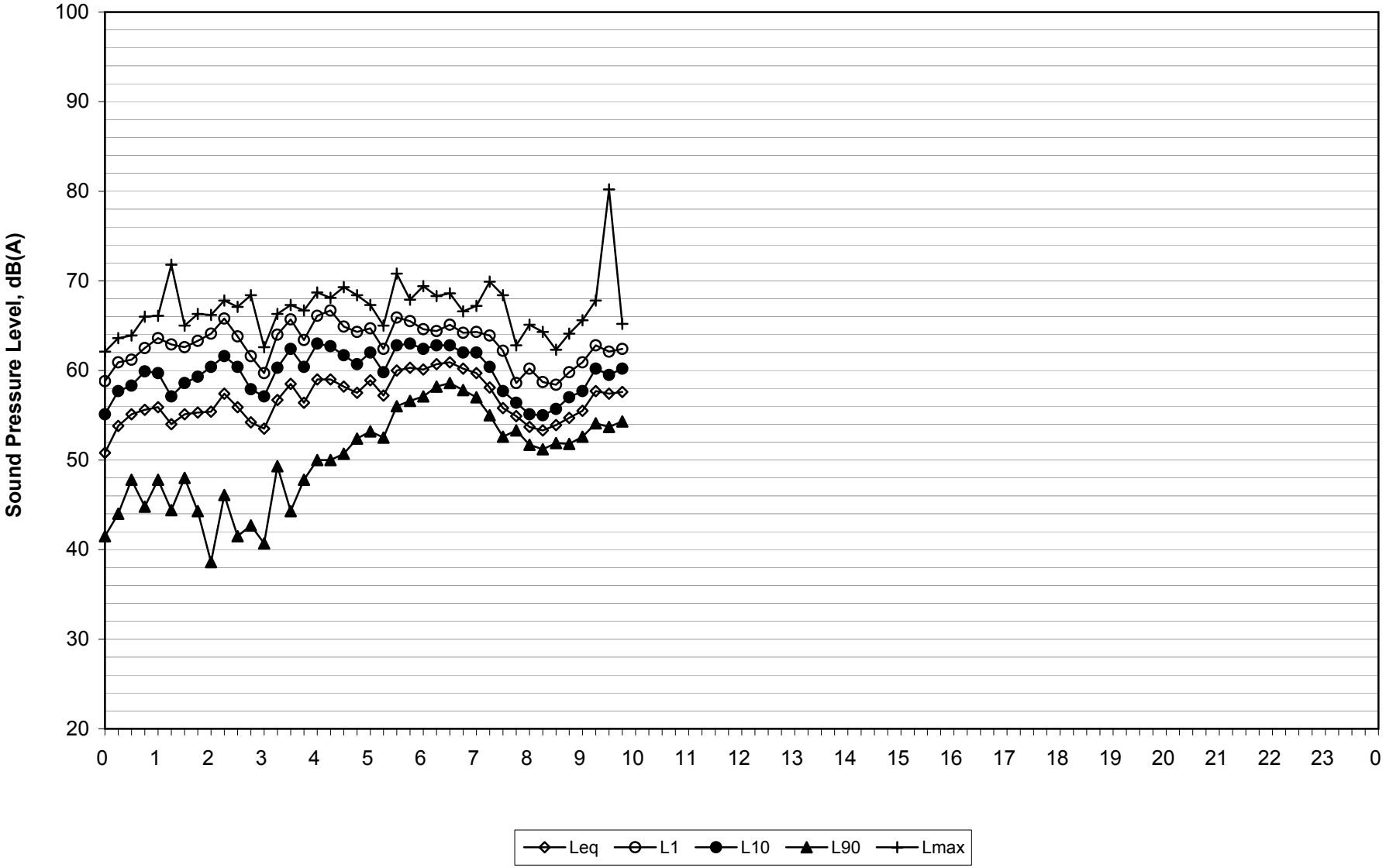


Reference Location M12
Bushells Ridge Road

5987R12.xls

Ambient Sound Pressure Levels

Tuesday 03 April 2007



Reference Location M12
Bushells Ridge Road

ATTACHMENT 3. PREVAILNG WEATHER CONDITIONS

Date	Time	Wind Speed (AVG)	Wind Dir	Wind Dir	Rain
11/9/2006	12:00 AM	1.8	SSE	157.5	0
11/9/2006	12:10 AM	3.1	SSE	157.5	0
11/9/2006	12:20 AM	2.2	S	180	0
11/9/2006	12:30 AM	1.3	S	180	0
11/9/2006	12:40 AM	1.8	SSE	157.5	0
11/9/2006	12:50 AM	1.8	S	180	0
11/9/2006	1:00 AM	1.8	SSE	157.5	0
11/9/2006	1:10 AM	1.3	SSE	157.5	0
11/9/2006	1:20 AM	1.8	SSE	157.5	0
11/9/2006	1:30 AM	0.9	S	180	0
11/9/2006	1:40 AM	1.8	S	180	0
11/9/2006	1:50 AM	3.1	SSE	157.5	0
11/9/2006	2:00 AM	3.6	SSE	157.5	0
11/9/2006	2:10 AM	1.8	SE	135	0
11/9/2006	2:20 AM	0.9	S	180	0
11/9/2006	2:30 AM	1.8	S	180	0
11/9/2006	2:40 AM	2.2	S	180	0
11/9/2006	2:50 AM	0.9	S	180	0
11/9/2006	3:00 AM	1.3	WSW	247.5	0
11/9/2006	3:10 AM	1.3	WSW	247.5	0
11/9/2006	3:20 AM	1.3	WSW	247.5	0
11/9/2006	3:30 AM	0.9	SW	225	0
11/9/2006	3:40 AM	1.3	SSW	202.5	0
11/9/2006	3:50 AM	1.3	SW	225	0
11/9/2006	4:00 AM	1.3	SSW	202.5	0
11/9/2006	4:10 AM	1.8	SSW	202.5	0
11/9/2006	4:20 AM	2.2	SSW	202.5	0
11/9/2006	4:30 AM	2.2	SW	225	0.2
11/9/2006	4:40 AM	1.8	WSW	247.5	0
11/9/2006	4:50 AM	1.3	WSW	247.5	0
11/9/2006	5:00 AM	0.9	WSW	247.5	0
11/9/2006	5:10 AM	0.4	SW	225	0
11/9/2006	5:20 AM	0.9	SW	225	0
11/9/2006	5:30 AM	0.9	SW	225	0
11/9/2006	5:40 AM	0.9	WSW	247.5	0
11/9/2006	5:50 AM	0.9	WSW	247.5	0
11/9/2006	6:00 AM	0.9	WSW	247.5	0
11/9/2006	6:10 AM	1.3	WSW	247.5	0
11/9/2006	6:20 AM	1.3	WSW	247.5	0
11/9/2006	6:30 AM	1.3	WSW	247.5	0
11/9/2006	6:40 AM	0.9	SW	225	0
11/9/2006	6:50 AM	0.4	SW	225	0
11/9/2006	7:00 AM	0.9	SW	225	0
11/9/2006	7:10 AM	0.9	WSW	247.5	0
11/9/2006	7:20 AM	1.3	SW	225	0
11/9/2006	7:30 AM	1.8	SW	225	0
11/9/2006	7:40 AM	1.3	WSW	247.5	0
11/9/2006	7:50 AM	0.9	WSW	247.5	0

11/9/2006	8:00 AM	0.9	SW	225	0
11/9/2006	8:10 AM	0.4	SSW	202.5	0
11/9/2006	8:20 AM	0.9	SSW	202.5	0
11/9/2006	8:30 AM	0.9	SW	225	0
11/9/2006	8:40 AM	1.3	SW	225	0
11/9/2006	8:50 AM	1.3	SW	225	0
11/9/2006	9:00 AM	1.3	SW	225	0
11/9/2006	9:10 AM	1.3	SW	225	0
11/9/2006	9:20 AM	1.3	SSW	202.5	0
11/9/2006	9:30 AM	2.2	SSW	202.5	0
11/9/2006	9:40 AM	1.8	S	180	0
11/9/2006	9:50 AM	2.2	S	180	0
11/9/2006	10:00 AM	2.7	S	180	0
11/9/2006	10:10 AM	2.7	SE	135	0
11/9/2006	10:20 AM	2.2	S	180	0
11/9/2006	10:30 AM	2.7	SE	135	0
11/9/2006	10:40 AM	3.1	S	180	0
11/9/2006	10:50 AM	2.7	S	180	0
11/9/2006	11:00 AM	2.7	S	180	0
11/9/2006	11:10 AM	2.7	ESE	112.5	0
11/9/2006	11:20 AM	3.1	SE	135	0
11/9/2006	11:30 AM	2.7	SE	135	0
11/9/2006	11:40 AM	2.7	SE	135	0
11/9/2006	11:50 AM	2.2	SE	135	0
11/9/2006	12:00 PM	2.7	SE	135	0
11/9/2006	12:10 PM	1.8	ESE	112.5	0
11/9/2006	12:20 PM	1.8	SE	135	0
11/9/2006	12:30 PM	2.2	ESE	112.5	0
11/9/2006	12:40 PM	2.7	SE	135	0
11/9/2006	12:50 PM	2.2	S	180	0
11/9/2006	1:00 PM	3.1	SE	135	0
11/9/2006	1:10 PM	2.2	SE	135	0
11/9/2006	1:20 PM	1.8	SE	135	0
11/9/2006	1:30 PM	2.2	SE	135	0
11/9/2006	1:40 PM	2.7	SE	135	0
11/9/2006	1:50 PM	2.2	SE	135	0
11/9/2006	2:00 PM	1.8	SE	135	0
11/9/2006	2:10 PM	3.1	SE	135	0
11/9/2006	2:20 PM	3.1	SE	135	0
11/9/2006	2:30 PM	2.7	SE	135	0
11/9/2006	2:40 PM	2.7	SSE	157.5	0
11/9/2006	2:50 PM	2.7	SSE	157.5	0
11/9/2006	3:00 PM	2.7	S	180	0
11/9/2006	3:10 PM	2.7	SE	135	0
11/9/2006	3:20 PM	2.2	SE	135	0
11/9/2006	3:30 PM	2.7	SE	135	0
11/9/2006	3:40 PM	2.2	SE	135	0
11/9/2006	3:50 PM	2.7	SSE	157.5	0
11/9/2006	4:00 PM	2.7	SE	135	0
11/9/2006	4:10 PM	3.1	SE	135	0
11/9/2006	4:20 PM	3.1	SE	135	0
11/9/2006	4:30 PM	3.6	SE	135	0

11/9/2006	4:40 PM	3.6	SE	135	0
11/9/2006	4:50 PM	2.7	SE	135	0
11/9/2006	5:00 PM	2.2	SE	135	0
11/9/2006	5:10 PM	2.7	SE	135	0
11/9/2006	5:20 PM	2.2	SE	135	0
11/9/2006	5:30 PM	2.2	SE	135	0
11/9/2006	5:40 PM	1.3	SE	135	0
11/9/2006	5:50 PM	1.8	SE	135	0
11/9/2006	6:00 PM	1.3	SE	135	0
11/9/2006	6:10 PM	1.3	ESE	112.5	0
11/9/2006	6:20 PM	0.4	ESE	112.5	0
11/9/2006	6:30 PM	0.4	ESE	112.5	0
11/9/2006	6:40 PM	0.4	ESE	112.5	0
11/9/2006	6:50 PM	0	ESE	112.5	0
11/9/2006	7:00 PM	0	ESE	112.5	0
11/9/2006	7:10 PM	0.4	ESE	112.5	0
11/9/2006	7:20 PM	0	ESE	112.5	0
11/9/2006	7:30 PM	0	ESE	112.5	0
11/9/2006	7:40 PM	0	ESE	112.5	0
11/9/2006	7:50 PM	0	ESE	112.5	0
11/9/2006	8:00 PM	0	---		0
11/9/2006	8:10 PM	0	ESE	112.5	0
11/9/2006	8:20 PM	0	---		0
11/9/2006	8:30 PM	0	---		0
11/9/2006	8:40 PM	0	---		0
11/9/2006	8:50 PM	0	---		0
11/9/2006	9:00 PM	0	ESE	112.5	0
11/9/2006	9:10 PM	0	ESE	112.5	0
11/9/2006	9:20 PM	0	---		0
11/9/2006	9:30 PM	0	SSE	157.5	0
11/9/2006	9:40 PM	0	SSE	157.5	0
11/9/2006	9:50 PM	0	S	180	0
11/9/2006	10:00 PM	0	S	180	0
11/9/2006	10:10 PM	0	S	180	0
11/9/2006	10:20 PM	0	---		0
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11/9/2006	11:40 PM	0	---		0
11/9/2006	11:50 PM	0	S	180	0
11/10/2006	12:00 AM	0.4	S	180	0
11/10/2006	12:10 AM	0	---		0
11/10/2006	12:20 AM	0	S	180	0
11/10/2006	12:30 AM	0	---		0
11/10/2006	12:40 AM	0.4	S	180	0
11/10/2006	12:50 AM	0	S	180	0
11/10/2006	1:00 AM	0	S	180	0
11/10/2006	1:10 AM	0	S	180	0

11/10/2006	1:20 AM	0	S	180	0
11/10/2006	1:30 AM	0.4	S	180	0
11/10/2006	1:40 AM	0	S	180	0
11/10/2006	1:50 AM	0	---		0
11/10/2006	2:00 AM	0	---		0
11/10/2006	2:10 AM	0	---		0
11/10/2006	2:20 AM	0	---		0
11/10/2006	2:30 AM	0	S	180	0
11/10/2006	2:40 AM	0	---		0
11/10/2006	2:50 AM	0	S	180	0
11/10/2006	3:00 AM	0.4	S	180	0
11/10/2006	3:10 AM	0	S	180	0
11/10/2006	3:20 AM	0	---		0
11/10/2006	3:30 AM	0	---		0
11/10/2006	3:40 AM	0	---		0
11/10/2006	3:50 AM	0	---		0
11/10/2006	4:00 AM	0.4	S	180	0
11/10/2006	4:10 AM	0	S	180	0
11/10/2006	4:20 AM	0	---		0
11/10/2006	4:30 AM	0	---		0
11/10/2006	4:40 AM	0	---		0
11/10/2006	4:50 AM	0	S	180	0
11/10/2006	5:00 AM	0	---		0
11/10/2006	5:10 AM	0	---		0
11/10/2006	5:20 AM	0	S	180	0
11/10/2006	5:30 AM	0	---		0
11/10/2006	5:40 AM	0	---		0
11/10/2006	5:50 AM	0	---		0
11/10/2006	6:00 AM	0	S	180	0
11/10/2006	6:10 AM	0	S	180	0
11/10/2006	6:20 AM	0	---		0
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11/10/2006	6:40 AM	0	---		0
11/10/2006	6:50 AM	0	---		0
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11/10/2006	7:50 AM	0	S	180	0
11/10/2006	8:00 AM	0	S	180	0
11/10/2006	8:10 AM	0.4	S	180	0
11/10/2006	8:20 AM	0	SE	135	0
11/10/2006	8:30 AM	1.3	NNE	22.5	0
11/10/2006	8:40 AM	1.8	NNW	337.5	0
11/10/2006	8:50 AM	2.2	N	0	0
11/10/2006	9:00 AM	1.8	N	0	0
11/10/2006	9:10 AM	2.2	NNW	337.5	0
11/10/2006	9:20 AM	2.2	N	0	0
11/10/2006	9:30 AM	2.7	NE	45	0
11/10/2006	9:40 AM	2.2	NNW	337.5	0
11/10/2006	9:50 AM	2.7	N	0	0

11/10/2006	10:00 AM	2.2	NE	45	0
11/10/2006	10:10 AM	1.3	N	0	0
11/10/2006	10:20 AM	2.2	ENE	67.5	0
11/10/2006	10:30 AM	2.2	NNW	337.5	0
11/10/2006	10:40 AM	1.8	NNE	22.5	0
11/10/2006	10:50 AM	2.2	NNE	22.5	0
11/10/2006	11:00 AM	2.2	NE	45	0
11/10/2006	11:10 AM	2.7	N	0	0
11/10/2006	11:20 AM	2.2	NNE	22.5	0
11/10/2006	11:30 AM	2.7	N	0	0
11/10/2006	11:40 AM	1.8	E	90	0
11/10/2006	11:50 AM	2.2	ENE	67.5	0
11/10/2006	12:00 PM	2.2	NNE	22.5	0
11/10/2006	12:10 PM	2.7	N	0	0
11/10/2006	12:20 PM	2.2	N	0	0
11/10/2006	12:30 PM	3.1	NNW	337.5	0
11/10/2006	12:40 PM	3.1	N	0	0
11/10/2006	12:50 PM	3.6	NE	45	0
11/10/2006	1:00 PM	3.6	NE	45	0
11/10/2006	1:10 PM	4	N	0	0
11/10/2006	1:20 PM	3.1	NNE	22.5	0
11/10/2006	1:30 PM	3.6	N	0	0
11/10/2006	1:40 PM	3.1	NNE	22.5	0
11/10/2006	1:50 PM	3.6	NE	45	0
11/10/2006	2:00 PM	3.6	ENE	67.5	0
11/10/2006	2:10 PM	4	NE	45	0
11/10/2006	2:20 PM	4	NNE	22.5	0
11/10/2006	2:30 PM	4	NE	45	0
11/10/2006	2:40 PM	4	NE	45	0
11/10/2006	2:50 PM	4.5	NE	45	0
11/10/2006	3:00 PM	4.5	NE	45	0
11/10/2006	3:10 PM	4	NE	45	0
11/10/2006	3:20 PM	4.5	NE	45	0
11/10/2006	3:30 PM	4.5	NNE	22.5	0
11/10/2006	3:40 PM	4.5	NE	45	0
11/10/2006	3:50 PM	4	NE	45	0
11/10/2006	4:00 PM	4.9	NNE	22.5	0
11/10/2006	4:10 PM	5.4	NNE	22.5	0
11/10/2006	4:20 PM	4	NNE	22.5	0
11/10/2006	4:30 PM	4.5	NE	45	0
11/10/2006	4:40 PM	4	NNE	22.5	0
11/10/2006	4:50 PM	4	NE	45	0
11/10/2006	5:00 PM	3.6	NE	45	0
11/10/2006	5:10 PM	3.6	NE	45	0
11/10/2006	5:20 PM	3.1	NNE	22.5	0
11/10/2006	5:30 PM	2.7	NNE	22.5	0
11/10/2006	5:40 PM	2.7	NNE	22.5	0
11/10/2006	5:50 PM	3.1	NNE	22.5	0
11/10/2006	6:00 PM	2.2	NNE	22.5	0
11/10/2006	6:10 PM	1.8	N	0	0
11/10/2006	6:20 PM	3.6	N	0	0
11/10/2006	6:30 PM	2.7	NNE	22.5	0

11/10/2006	6:40 PM	2.7	N	0	0
11/10/2006	6:50 PM	2.2	NE	45	0
11/10/2006	7:00 PM	1.3	NNE	22.5	0
11/10/2006	7:10 PM	1.3	NW	315	0
11/10/2006	7:20 PM	1.8	N	0	0
11/10/2006	7:30 PM	2.2	NNE	22.5	0
11/10/2006	7:40 PM	1.3	NE	45	0
11/10/2006	7:50 PM	1.8	NNE	22.5	0
11/10/2006	8:00 PM	1.8	NNE	22.5	0
11/10/2006	8:10 PM	1.3	NNE	22.5	0
11/10/2006	8:20 PM	0.4	NNE	22.5	0
11/10/2006	8:30 PM	0	---		0
11/10/2006	8:40 PM	0	NE	45	0
11/10/2006	8:50 PM	0.4	NE	45	0
11/10/2006	9:00 PM	0	---		0
11/10/2006	9:10 PM	0	---		0
11/10/2006	9:20 PM	0	NE	45	0
11/10/2006	9:30 PM	0	NNE	22.5	0
11/10/2006	9:40 PM	1.3	NNW	337.5	0
11/10/2006	9:50 PM	1.8	N	0	0
11/10/2006	10:00 PM	1.3	NW	315	0
11/10/2006	10:10 PM	1.8	SSW	202.5	0
11/10/2006	10:20 PM	2.2	W	270	0
11/10/2006	10:30 PM	1.8	W	270	0
11/10/2006	10:40 PM	0.9	SW	225	0
11/10/2006	10:50 PM	0.4	SSW	202.5	0
11/10/2006	11:00 PM	0.4	S	180	0
11/10/2006	11:10 PM	0.9	S	180	0
11/10/2006	11:20 PM	1.3	NE	45	0
11/10/2006	11:30 PM	1.3	NNE	22.5	0
11/10/2006	11:40 PM	0.9	NNE	22.5	0
11/10/2006	11:50 PM	2.2	NNW	337.5	0
11/11/2006	12:00 AM	2.2	NNW	337.5	0
11/11/2006	12:10 AM	1.8	NNW	337.5	0
11/11/2006	12:20 AM	2.2	NNW	337.5	0
11/11/2006	12:30 AM	1.8	NW	315	0
11/11/2006	12:40 AM	1.8	NNW	337.5	0
11/11/2006	12:50 AM	1.8	NW	315	0
11/11/2006	1:00 AM	1.8	NNW	337.5	0
11/11/2006	1:10 AM	1.3	NW	315	0
11/11/2006	1:20 AM	1.3	NW	315	0
11/11/2006	1:30 AM	1.8	NW	315	0
11/11/2006	1:40 AM	1.3	NW	315	0
11/11/2006	1:50 AM	0.9	NNW	337.5	0
11/11/2006	2:00 AM	0.9	NNW	337.5	0
11/11/2006	2:10 AM	0.9	NW	315	0
11/11/2006	2:20 AM	0.4	NNW	337.5	0
11/11/2006	2:30 AM	0	---		0
11/11/2006	2:40 AM	0	NNW	337.5	0
11/11/2006	2:50 AM	0.4	W	270	0
11/11/2006	3:00 AM	0	W	270	0
11/11/2006	3:10 AM	0	W	270	0

11/11/2006	3:20 AM	0.4	W	270	0
11/11/2006	3:30 AM	0	SW	225	0
11/11/2006	3:40 AM	0	---		0
11/11/2006	3:50 AM	0	---		0
11/11/2006	4:00 AM	0	SW	225	0
11/11/2006	4:10 AM	0	SW	225	0
11/11/2006	4:20 AM	0	---		0
11/11/2006	4:30 AM	0	---		0
11/11/2006	4:40 AM	0.4	SW	225	0
11/11/2006	4:50 AM	0.4	SSW	202.5	0
11/11/2006	5:00 AM	0	SSW	202.5	0
11/11/2006	5:10 AM	0	---		0
11/11/2006	5:20 AM	0	SSW	202.5	0
11/11/2006	5:30 AM	0	---		0
11/11/2006	5:40 AM	0	SSW	202.5	0
11/11/2006	5:50 AM	0	SSW	202.5	0
11/11/2006	6:00 AM	0	SSW	202.5	0
11/11/2006	6:10 AM	0	SSW	202.5	0
11/11/2006	6:20 AM	0	SSW	202.5	0
11/11/2006	6:30 AM	0	---		0
11/11/2006	6:40 AM	0	SSW	202.5	0
11/11/2006	6:50 AM	0	SSW	202.5	0
11/11/2006	7:00 AM	0	SSW	202.5	0
11/11/2006	7:10 AM	0	SSW	202.5	0
11/11/2006	7:20 AM	0.4	SSW	202.5	0
11/11/2006	7:30 AM	0.4	SSW	202.5	0
11/11/2006	7:40 AM	0.9	WSW	247.5	0
11/11/2006	7:50 AM	1.3	WSW	247.5	0
11/11/2006	8:00 AM	1.8	WSW	247.5	0
11/11/2006	8:10 AM	2.2	WSW	247.5	0
11/11/2006	8:20 AM	2.2	W	270	0
11/11/2006	8:30 AM	3.1	W	270	0
11/11/2006	8:40 AM	2.7	W	270	0
11/11/2006	8:50 AM	2.7	W	270	0
11/11/2006	9:00 AM	3.6	W	270	0
11/11/2006	9:10 AM	4	W	270	0
11/11/2006	9:20 AM	4	W	270	0
11/11/2006	9:30 AM	5.4	W	270	0
11/11/2006	9:40 AM	5.4	W	270	0
11/11/2006	9:50 AM	5.4	W	270	0
11/11/2006	10:00 AM	5.4	W	270	0
11/11/2006	10:10 AM	5.4	W	270	0
11/11/2006	10:20 AM	5.4	W	270	0
11/11/2006	10:30 AM	5.8	W	270	0
11/11/2006	10:40 AM	4.9	WNW	292.5	0
11/11/2006	10:50 AM	4.5	W	270	0
11/11/2006	11:00 AM	4	W	270	0
11/11/2006	11:10 AM	4.5	W	270	0
11/11/2006	11:20 AM	4.5	W	270	0
11/11/2006	11:30 AM	4.5	WNW	292.5	0
11/11/2006	11:40 AM	4.9	W	270	0
11/11/2006	11:50 AM	4.9	W	270	0

11/11/2006	12:00 PM	3.6	W	270	0
11/11/2006	12:10 PM	4	W	270	0
11/11/2006	12:20 PM	2.7	W	270	0
11/11/2006	12:30 PM	4	WNW	292.5	0
11/11/2006	12:40 PM	4	W	270	0
11/11/2006	12:50 PM	3.6	W	270	0
11/11/2006	1:00 PM	2.2	WSW	247.5	0
11/11/2006	1:10 PM	1.8	SW	225	0
11/11/2006	1:20 PM	3.6	SW	225	0
11/11/2006	1:30 PM	4	NW	315	0
11/11/2006	1:40 PM	3.1	WNW	292.5	0
11/11/2006	1:50 PM	3.1	W	270	0
11/11/2006	2:00 PM	3.6	WSW	247.5	0
11/11/2006	2:10 PM	4	W	270	0
11/11/2006	2:20 PM	2.2	W	270	0
11/11/2006	2:30 PM	4	WNW	292.5	0
11/11/2006	2:40 PM	3.6	WSW	247.5	0
11/11/2006	2:50 PM	2.2	WNW	292.5	0
11/11/2006	3:00 PM	2.7	WNW	292.5	0
11/11/2006	3:10 PM	2.2	W	270	0
11/11/2006	3:20 PM	2.2	NW	315	0
11/11/2006	3:30 PM	3.1	WNW	292.5	0
11/11/2006	3:40 PM	2.2	W	270	0
11/11/2006	3:50 PM	3.1	NNW	337.5	0
11/11/2006	4:00 PM	2.7	NNW	337.5	0
11/11/2006	4:10 PM	1.8	NW	315	0
11/11/2006	4:20 PM	4	E	90	0
11/11/2006	4:30 PM	2.7	E	90	0
11/11/2006	4:40 PM	3.1	E	90	0
11/11/2006	4:50 PM	2.7	ENE	67.5	0
11/11/2006	5:00 PM	2.2	E	90	0
11/11/2006	5:10 PM	1.8	E	90	0
11/11/2006	5:20 PM	2.2	ENE	67.5	0
11/11/2006	5:30 PM	2.2	ENE	67.5	0
11/11/2006	5:40 PM	2.2	ENE	67.5	0
11/11/2006	5:50 PM	1.3	ENE	67.5	0
11/11/2006	6:00 PM	1.3	E	90	0
11/11/2006	6:10 PM	2.2	NNE	22.5	0
11/11/2006	6:20 PM	1.8	NE	45	0
11/11/2006	6:30 PM	1.8	NE	45	0
11/11/2006	6:40 PM	1.3	NNE	22.5	0
11/11/2006	6:50 PM	0.4	NNE	22.5	0
11/11/2006	7:00 PM	1.8	NNE	22.5	0
11/11/2006	7:10 PM	1.8	NNE	22.5	0
11/11/2006	7:20 PM	1.8	NNE	22.5	0
11/11/2006	7:30 PM	2.2	NNE	22.5	0
11/11/2006	7:40 PM	2.2	N	0	0
11/11/2006	7:50 PM	1.8	NNE	22.5	0
11/11/2006	8:00 PM	1.8	N	0	0
11/11/2006	8:10 PM	1.3	N	0	0
11/11/2006	8:20 PM	0.4	NNW	337.5	0
11/11/2006	8:30 PM	0.9	SW	225	0

11/11/2006	8:40 PM	0.9	SW	225	0
11/11/2006	8:50 PM	0.4	SSW	202.5	0
11/11/2006	9:00 PM	0.4	SSW	202.5	0
11/11/2006	9:10 PM	0.4	SSW	202.5	0
11/11/2006	9:20 PM	0.4	WSW	247.5	0
11/11/2006	9:30 PM	0.9	SW	225	0
11/11/2006	9:40 PM	0.9	WSW	247.5	0
11/11/2006	9:50 PM	0.9	SW	225	0
11/11/2006	10:00 PM	1.8	SW	225	0
11/11/2006	10:10 PM	1.8	SW	225	0
11/11/2006	10:20 PM	1.8	SSW	202.5	0
11/11/2006	10:30 PM	1.8	SSW	202.5	0
11/11/2006	10:40 PM	1.8	SW	225	0
11/11/2006	10:50 PM	1.8	SSW	202.5	0
11/11/2006	11:00 PM	2.2	SSW	202.5	0
11/11/2006	11:10 PM	1.8	SSW	202.5	0
11/11/2006	11:20 PM	1.8	SSW	202.5	0
11/11/2006	11:30 PM	1.3	SSW	202.5	0
11/11/2006	11:40 PM	1.8	SSW	202.5	0
11/11/2006	11:50 PM	2.2	SSW	202.5	0
11/12/2006	12:00 AM	1.8	SW	225	0
11/12/2006	12:10 AM	1.8	SW	225	0
11/12/2006	12:20 AM	1.8	SSW	202.5	0
11/12/2006	12:30 AM	2.2	SSW	202.5	0
11/12/2006	12:40 AM	2.2	SSW	202.5	0
11/12/2006	12:50 AM	2.7	SSW	202.5	0
11/12/2006	1:00 AM	2.2	S	180	0
11/12/2006	1:10 AM	2.2	SSW	202.5	0
11/12/2006	1:20 AM	2.2	S	180	0
11/12/2006	1:30 AM	2.7	S	180	0
11/12/2006	1:40 AM	2.7	S	180	0
11/12/2006	1:50 AM	1.8	S	180	0
11/12/2006	2:00 AM	1.3	S	180	0
11/12/2006	2:10 AM	1.3	S	180	0
11/12/2006	2:20 AM	0.9	S	180	0
11/12/2006	2:30 AM	1.3	SSW	202.5	0
11/12/2006	2:40 AM	1.3	S	180	0
11/12/2006	2:50 AM	0.9	S	180	0
11/12/2006	3:00 AM	0.4	S	180	0
11/12/2006	3:10 AM	0.4	SSE	157.5	0
11/12/2006	3:20 AM	0.4	SSE	157.5	0
11/12/2006	3:30 AM	0.9	SSW	202.5	0
11/12/2006	3:40 AM	0.9	S	180	0
11/12/2006	3:50 AM	0.9	SSW	202.5	0
11/12/2006	4:00 AM	0.4	SSW	202.5	0
11/12/2006	4:10 AM	0.4	S	180	0
11/12/2006	4:20 AM	0	S	180	0
11/12/2006	4:30 AM	0.4	S	180	0
11/12/2006	4:40 AM	0	S	180	0
11/12/2006	4:50 AM	0.4	S	180	0
11/12/2006	5:00 AM	0.9	SSW	202.5	0
11/12/2006	5:10 AM	0.4	SSW	202.5	0

11/12/2006	5:20 AM	0.4	SSW	202.5	0
11/12/2006	5:30 AM	0	SSW	202.5	0
11/12/2006	5:40 AM	0	---		0
11/12/2006	5:50 AM	0	SSW	202.5	0
11/12/2006	6:00 AM	0	---		0
11/12/2006	6:10 AM	0	SSW	202.5	0
11/12/2006	6:20 AM	0	SSW	202.5	0
11/12/2006	6:30 AM	0	SSW	202.5	0
11/12/2006	6:40 AM	0	SSW	202.5	0
11/12/2006	6:50 AM	0	SSW	202.5	0
11/12/2006	7:00 AM	0.4	ESE	112.5	0
11/12/2006	7:10 AM	0.9	NE	45	0
11/12/2006	7:20 AM	0	SSW	202.5	0
11/12/2006	7:30 AM	0.4	SSW	202.5	0
11/12/2006	7:40 AM	0.9	NNW	337.5	0
11/12/2006	7:50 AM	0.4	NW	315	0
11/12/2006	8:00 AM	0.4	N	0	0
11/12/2006	8:10 AM	0.9	NW	315	0
11/12/2006	8:20 AM	1.3	NW	315	0
11/12/2006	8:30 AM	1.3	NNW	337.5	0
11/12/2006	8:40 AM	2.7	N	0	0
11/12/2006	8:50 AM	2.7	NW	315	0
11/12/2006	9:00 AM	3.1	N	0	0
11/12/2006	9:10 AM	2.7	NW	315	0
11/12/2006	9:20 AM	1.8	NW	315	0
11/12/2006	9:30 AM	1.8	N	0	0
11/12/2006	9:40 AM	1.8	NNE	22.5	0
11/12/2006	9:50 AM	1.8	N	0	0
11/12/2006	10:00 AM	1.8	NNE	22.5	0
11/12/2006	10:10 AM	1.8	NE	45	0
11/12/2006	10:20 AM	1.8	N	0	0
11/12/2006	10:30 AM	1.3	NW	315	0
11/12/2006	10:40 AM	1.3	NE	45	0
11/12/2006	10:50 AM	1.3	NNW	337.5	0
11/12/2006	11:00 AM	0.9	SW	225	0
11/12/2006	11:10 AM	1.3	ENE	67.5	0
11/12/2006	11:20 AM	1.3	ESE	112.5	0
11/12/2006	11:30 AM	1.3	ENE	67.5	0
11/12/2006	11:40 AM	1.8	E	90	0
11/12/2006	11:50 AM	2.2	ESE	112.5	0
11/12/2006	12:00 PM	2.2	SE	135	0
11/12/2006	12:10 PM	1.8	ESE	112.5	0
11/12/2006	12:20 PM	2.2	ESE	112.5	0
11/12/2006	12:30 PM	2.2	SE	135	0
11/12/2006	12:40 PM	2.7	SE	135	0
11/12/2006	12:50 PM	2.2	ESE	112.5	0
11/12/2006	1:00 PM	2.2	SE	135	0
11/12/2006	1:10 PM	2.7	SE	135	0
11/12/2006	1:20 PM	2.7	SE	135	0
11/12/2006	1:30 PM	2.2	ESE	112.5	0
11/12/2006	1:40 PM	1.8	ESE	112.5	0
11/12/2006	1:50 PM	1.8	E	90	0

11/12/2006	2:00 PM	1.8	ESE	112.5	0
11/12/2006	2:10 PM	2.2	E	90	0
11/12/2006	2:20 PM	2.2	E	90	0
11/12/2006	2:30 PM	2.2	ENE	67.5	0
11/12/2006	2:40 PM	1.8	ESE	112.5	0
11/12/2006	2:50 PM	1.3	NE	45	0
11/12/2006	3:00 PM	1.3	E	90	0
11/12/2006	3:10 PM	1.8	NNE	22.5	0
11/12/2006	3:20 PM	1.8	NE	45	0
11/12/2006	3:30 PM	1.8	N	0	0
11/12/2006	3:40 PM	0.9	E	90	0
11/12/2006	3:50 PM	0.9	NE	45	0
11/12/2006	4:00 PM	1.3	NE	45	0
11/12/2006	4:10 PM	0.9	NNE	22.5	0
11/12/2006	4:20 PM	0.4	NE	45	0
11/12/2006	4:30 PM	0.4	NW	315	0
11/12/2006	4:40 PM	0.4	W	270	0
11/12/2006	4:50 PM	0.4	SSE	157.5	0
11/12/2006	5:00 PM	0.4	WSW	247.5	0
11/12/2006	5:10 PM	0.4	ESE	112.5	0
11/12/2006	5:20 PM	0.4	SSW	202.5	0
11/12/2006	5:30 PM	0	SSW	202.5	0
11/12/2006	5:40 PM	0.4	NE	45	0
11/12/2006	5:50 PM	0.9	NNE	22.5	0
11/12/2006	6:00 PM	0.4	N	0	0
11/12/2006	6:10 PM	0	N	0	0
11/12/2006	6:20 PM	0	N	0	0
11/12/2006	6:30 PM	0	N	0	0
11/12/2006	6:40 PM	0	---		0
11/12/2006	6:50 PM	0	---		0
11/12/2006	7:00 PM	0	---		0
11/12/2006	7:10 PM	0	---		0
11/12/2006	7:20 PM	0	---		0
11/12/2006	7:30 PM	0	---		0
11/12/2006	7:40 PM	0	---		0
11/12/2006	7:50 PM	0	N	0	0
11/12/2006	8:00 PM	0	---		0
11/12/2006	8:10 PM	0	---		0
11/12/2006	8:20 PM	0	---		0
11/12/2006	8:30 PM	0	N	0	0
11/12/2006	8:40 PM	0	N	0	0
11/12/2006	8:50 PM	0	---		0
11/12/2006	9:00 PM	0	---		0
11/12/2006	9:10 PM	0	N	0	0
11/12/2006	9:20 PM	0.4	NNW	337.5	0
11/12/2006	9:30 PM	1.3	NNW	337.5	0
11/12/2006	9:40 PM	1.3	NW	315	0
11/12/2006	9:50 PM	1.3	NW	315	0
11/12/2006	10:00 PM	0.9	NNW	337.5	0
11/12/2006	10:10 PM	0	---		0
11/12/2006	10:20 PM	0	---		0
11/12/2006	10:30 PM	0	W	270	0

11/12/2006	10:40 PM	0.9	S	180	0
11/12/2006	10:50 PM	0	---		0
11/12/2006	11:00 PM	0	---		0
11/12/2006	11:10 PM	0	---		0
11/12/2006	11:20 PM	0	---		0
11/12/2006	11:30 PM	0	S	180	0
11/12/2006	11:40 PM	0	S	180	0
11/12/2006	11:50 PM	0	S	180	0
11/13/2006	12:00 AM	0	---		0
11/13/2006	12:10 AM	0	---		0
11/13/2006	12:20 AM	0	S	180	0
11/13/2006	12:30 AM	0	S	180	0
11/13/2006	12:40 AM	0	S	180	0
11/13/2006	12:50 AM	0.4	S	180	0
11/13/2006	1:00 AM	1.8	N	0	0
11/13/2006	1:10 AM	1.8	N	0	0
11/13/2006	1:20 AM	1.3	N	0	0
11/13/2006	1:30 AM	0.4	N	0	0
11/13/2006	1:40 AM	0	---		0
11/13/2006	1:50 AM	0	N	0	0
11/13/2006	2:00 AM	0	N	0	0
11/13/2006	2:10 AM	0	N	0	0
11/13/2006	2:20 AM	0.4	N	0	0
11/13/2006	2:30 AM	0.9	WSW	247.5	0
11/13/2006	2:40 AM	1.3	SSW	202.5	0
11/13/2006	2:50 AM	0.9	SSW	202.5	0
11/13/2006	3:00 AM	0	SSW	202.5	0
11/13/2006	3:10 AM	0	---		0
11/13/2006	3:20 AM	0	SSW	202.5	0
11/13/2006	3:30 AM	0	---		0
11/13/2006	3:40 AM	0	SSW	202.5	0
11/13/2006	3:50 AM	0	SSW	202.5	0
11/13/2006	4:00 AM	0	SSW	202.5	0
11/13/2006	4:10 AM	0	---		0
11/13/2006	4:20 AM	0	SSW	202.5	0
11/13/2006	4:30 AM	0.4	SW	225	0
11/13/2006	4:40 AM	0	SW	225	0
11/13/2006	4:50 AM	0	SW	225	0
11/13/2006	5:00 AM	0	SW	225	0
11/13/2006	5:10 AM	0	SW	225	0
11/13/2006	5:20 AM	0.4	SW	225	0
11/13/2006	5:30 AM	0.4	SW	225	0
11/13/2006	5:40 AM	0.4	SSW	202.5	0
11/13/2006	5:50 AM	0	SSW	202.5	0
11/13/2006	6:00 AM	0	SSW	202.5	0
11/13/2006	6:10 AM	0	---		0
11/13/2006	6:20 AM	0	SSW	202.5	0
11/13/2006	6:30 AM	0	SW	225	0
11/13/2006	6:40 AM	0	WSW	247.5	0
11/13/2006	6:50 AM	0	WSW	247.5	0
11/13/2006	7:00 AM	0	WSW	247.5	0
11/13/2006	7:10 AM	0	---		0

11/13/2006	7:20 AM	0	WSW	247.5	0
11/13/2006	7:30 AM	0.4	WSW	247.5	0
11/13/2006	7:40 AM	0.9	SSW	202.5	0
11/13/2006	7:50 AM	0.9	SSW	202.5	0
11/13/2006	8:00 AM	0.4	S	180	0
11/13/2006	8:10 AM	0.9	S	180	0
11/13/2006	8:20 AM	0.9	S	180	0
11/13/2006	8:30 AM	1.8	SSW	202.5	0
11/13/2006	8:40 AM	1.8	SSW	202.5	0
11/13/2006	8:50 AM	1.8	SSW	202.5	0
11/13/2006	9:00 AM	1.8	S	180	0
11/13/2006	9:10 AM	1.8	S	180	0
11/13/2006	9:20 AM	1.8	S	180	0
11/13/2006	9:30 AM	1.8	SSW	202.5	0
11/13/2006	9:40 AM	1.8	S	180	0
11/13/2006	9:50 AM	1.8	SSE	157.5	0
11/13/2006	10:00 AM	1.8	SE	135	0
11/13/2006	10:10 AM	0.9	SSE	157.5	0
11/13/2006	10:20 AM	1.3	SE	135	0
11/13/2006	10:30 AM	2.7	SE	135	0
11/13/2006	10:40 AM	2.7	SE	135	0
11/13/2006	10:50 AM	2.7	SE	135	0
11/13/2006	11:00 AM	2.2	ESE	112.5	0
11/13/2006	11:10 AM	2.7	SE	135	0
11/13/2006	11:20 AM	4	SE	135	0
11/13/2006	11:30 AM	4	SSE	157.5	0
11/13/2006	11:40 AM	4.5	SE	135	0
11/13/2006	11:50 AM	4.5	SE	135	0
11/13/2006	12:00 PM	4.9	SSE	157.5	0
11/13/2006	12:10 PM	4.9	SSE	157.5	0
11/13/2006	12:20 PM	5.4	SSE	157.5	0.2
11/13/2006	12:30 PM	4.9	SSW	202.5	1.8
11/13/2006	12:40 PM	2.2	SW	225	2.2
11/13/2006	12:50 PM	1.8	SSW	202.5	0.2
11/13/2006	1:00 PM	1.3	WSW	247.5	0
11/13/2006	1:10 PM	1.3	S	180	0
11/13/2006	1:20 PM	1.8	SSE	157.5	0
11/13/2006	1:30 PM	2.2	S	180	0
11/13/2006	1:40 PM	3.1	S	180	0
11/13/2006	1:50 PM	2.7	S	180	0
11/13/2006	2:00 PM	3.1	S	180	0
11/13/2006	2:10 PM	2.7	SSW	202.5	0
11/13/2006	2:20 PM	2.7	SSW	202.5	0
11/13/2006	2:30 PM	2.2	SSE	157.5	0
11/13/2006	2:40 PM	3.6	SW	225	0
11/13/2006	2:50 PM	2.2	SW	225	0
11/13/2006	3:00 PM	1.3	SW	225	0
11/13/2006	3:10 PM	2.2	SSW	202.5	0
11/13/2006	3:20 PM	1.8	WSW	247.5	0.2
11/13/2006	3:30 PM	1.8	WSW	247.5	0
11/13/2006	3:40 PM	3.6	WSW	247.5	0
11/13/2006	3:50 PM	3.6	WSW	247.5	0

11/13/2006	4:00 PM	5.4	WSW	247.5	0
11/13/2006	4:10 PM	4	WSW	247.5	0
11/13/2006	4:20 PM	5.4	W	270	0
11/13/2006	4:30 PM	4.9	W	270	0
11/13/2006	4:40 PM	4.9	W	270	0
11/13/2006	4:50 PM	5.4	W	270	0
11/13/2006	5:00 PM	4	W	270	0
11/13/2006	5:10 PM	4.5	W	270	0
11/13/2006	5:20 PM	3.6	W	270	0
11/13/2006	5:30 PM	4.5	W	270	0
11/13/2006	5:40 PM	4.5	W	270	0
11/13/2006	5:50 PM	3.1	W	270	0
11/13/2006	6:00 PM	3.6	WSW	247.5	0
11/13/2006	6:10 PM	3.1	WSW	247.5	0
11/13/2006	6:20 PM	2.7	WSW	247.5	0
11/13/2006	6:30 PM	1.3	SW	225	0
11/13/2006	6:40 PM	1.3	WSW	247.5	0
11/13/2006	6:50 PM	1.3	SW	225	0
11/13/2006	7:00 PM	3.6	SW	225	0
11/13/2006	7:10 PM	4.9	SW	225	0
11/13/2006	7:20 PM	4	SW	225	0
11/13/2006	7:30 PM	3.6	SW	225	0
11/13/2006	7:40 PM	4.9	WSW	247.5	0
11/13/2006	7:50 PM	3.1	SW	225	0
11/13/2006	8:00 PM	4	WSW	247.5	0
11/13/2006	8:10 PM	3.6	SW	225	0
11/13/2006	8:20 PM	2.7	SW	225	0
11/13/2006	8:30 PM	2.7	WSW	247.5	0
11/13/2006	8:40 PM	2.7	SW	225	0
11/13/2006	8:50 PM	3.6	SW	225	0
11/13/2006	9:00 PM	4	WSW	247.5	0
11/13/2006	9:10 PM	4.5	WSW	247.5	0
11/13/2006	9:20 PM	4	SW	225	0
11/13/2006	9:30 PM	2.7	SW	225	0
11/13/2006	9:40 PM	4	SW	225	0
11/13/2006	9:50 PM	4	SW	225	0
11/13/2006	10:00 PM	4	SW	225	0
11/13/2006	10:10 PM	3.6	SW	225	0
11/13/2006	10:20 PM	3.1	SW	225	0
11/13/2006	10:30 PM	3.1	SW	225	0
11/13/2006	10:40 PM	3.1	SSE	157.5	0
11/13/2006	10:50 PM	4.5	SSE	157.5	0
11/13/2006	11:00 PM	3.1	SSE	157.5	0
11/13/2006	11:10 PM	2.7	SSE	157.5	0
11/13/2006	11:20 PM	1.8	SSE	157.5	0
11/13/2006	11:30 PM	2.7	S	180	0
11/13/2006	11:40 PM	2.7	S	180	0
11/13/2006	11:50 PM	1.8	S	180	0
11/14/2006	12:00 AM	1.8	S	180	0
11/14/2006	12:10 AM	0.9	S	180	0
11/14/2006	12:20 AM	0.9	S	180	0
11/14/2006	12:30 AM	0.4	SW	225	0

11/14/2006	12:40 AM	0.4	SW	225	0
11/14/2006	12:50 AM	0.4	SW	225	0
11/14/2006	1:00 AM	0	WSW	247.5	0
11/14/2006	1:10 AM	0	WSW	247.5	0
11/14/2006	1:20 AM	0	---		0
11/14/2006	1:30 AM	0	---		0
11/14/2006	1:40 AM	0.4	WSW	247.5	0
11/14/2006	1:50 AM	0.4	WSW	247.5	0
11/14/2006	2:00 AM	0	WSW	247.5	0
11/14/2006	2:10 AM	0	WSW	247.5	0
11/14/2006	2:20 AM	0	---		0
11/14/2006	2:30 AM	0	WSW	247.5	0
11/14/2006	2:40 AM	0.4	WSW	247.5	0
11/14/2006	2:50 AM	0.4	SW	225	0
11/14/2006	3:00 AM	0	SW	225	0
11/14/2006	3:10 AM	0	SW	225	0
11/14/2006	3:20 AM	0	SW	225	0
11/14/2006	3:30 AM	0.4	SW	225	0
11/14/2006	3:40 AM	0.4	SW	225	0
11/14/2006	3:50 AM	0	SW	225	0
11/14/2006	4:00 AM	0	---		0
11/14/2006	4:10 AM	0	SW	225	0
11/14/2006	4:20 AM	0.4	SW	225	0
11/14/2006	4:30 AM	0.4	SW	225	0
11/14/2006	4:40 AM	0.4	SW	225	0
11/14/2006	4:50 AM	0	SW	225	0
11/14/2006	5:00 AM	0	SW	225	0
11/14/2006	5:10 AM	0.4	SW	225	0
11/14/2006	5:20 AM	0	SW	225	0
11/14/2006	5:30 AM	0.4	SW	225	0
11/14/2006	5:40 AM	0.4	SW	225	0
11/14/2006	5:50 AM	0.9	SW	225	0
11/14/2006	6:00 AM	0.9	SW	225	0
11/14/2006	6:10 AM	0.9	SW	225	0
11/14/2006	6:20 AM	0	SSW	202.5	0
11/14/2006	6:30 AM	0.4	SSW	202.5	0
11/14/2006	6:40 AM	0.9	SW	225	0
11/14/2006	6:50 AM	0.4	SW	225	0
11/14/2006	7:00 AM	0.9	SW	225	0
11/14/2006	7:10 AM	1.3	SW	225	0
11/14/2006	7:20 AM	1.3	SW	225	0
11/14/2006	7:30 AM	1.8	SSW	202.5	0
11/14/2006	7:40 AM	1.3	SSW	202.5	0
11/14/2006	7:50 AM	1.3	SSW	202.5	0
11/14/2006	8:00 AM	1.8	SW	225	0
11/14/2006	8:10 AM	1.8	SW	225	0
11/14/2006	8:20 AM	1.3	SSW	202.5	0
11/14/2006	8:30 AM	1.8	S	180	0
11/14/2006	8:40 AM	1.8	SSW	202.5	0
11/14/2006	8:50 AM	1.8	SE	135	0
11/14/2006	9:00 AM	1.8	SE	135	0
11/14/2006	9:10 AM	1.3	SE	135	0

11/14/2006	9:20 AM	2.2	SE	135	0
11/14/2006	9:30 AM	1.8	SE	135	0
11/14/2006	9:40 AM	0.9	SSE	157.5	0
11/14/2006	9:50 AM	0.4	SE	135	0
11/14/2006	10:00 AM	1.3	SE	135	0
11/14/2006	10:10 AM	1.3	NNE	22.5	0
11/14/2006	10:20 AM	1.8	ESE	112.5	0
11/14/2006	10:30 AM	0.9	ESE	112.5	0
11/14/2006	10:40 AM	0.9	ESE	112.5	0
11/14/2006	10:50 AM	0.9	SE	135	0
11/14/2006	11:00 AM	0.4	SE	135	0
11/14/2006	11:10 AM	1.8	SE	135	0
11/14/2006	11:20 AM	2.7	E	90	0
11/14/2006	11:30 AM	2.2	ENE	67.5	0
11/14/2006	11:40 AM	1.8	ESE	112.5	0
11/14/2006	11:50 AM	1.3	E	90	0
11/14/2006	12:00 PM	2.2	ESE	112.5	0
11/14/2006	12:10 PM	2.2	E	90	0
11/14/2006	12:20 PM	2.2	NE	45	0
11/14/2006	12:30 PM	2.2	ESE	112.5	0
11/14/2006	12:40 PM	3.1	NE	45	0
11/14/2006	12:50 PM	2.7	ENE	67.5	0
11/14/2006	1:00 PM	2.7	E	90	0
11/14/2006	1:10 PM	2.7	E	90	0
11/14/2006	1:20 PM	3.1	NE	45	0
11/14/2006	1:30 PM	3.6	ENE	67.5	0
11/14/2006	1:40 PM	2.2	ENE	67.5	0
11/14/2006	1:50 PM	3.1	ENE	67.5	0
11/14/2006	2:00 PM	4	NE	45	0
11/14/2006	2:10 PM	3.1	NE	45	0
11/14/2006	2:20 PM	3.6	ENE	67.5	0
11/14/2006	2:30 PM	3.6	NE	45	0
11/14/2006	2:40 PM	4	NNE	22.5	0
11/14/2006	2:50 PM	3.1	NE	45	0
11/14/2006	3:00 PM	4.5	NNE	22.5	0
11/14/2006	3:10 PM	3.6	NNE	22.5	0
11/14/2006	3:20 PM	4.5	NNE	22.5	0
11/14/2006	3:30 PM	4.5	NE	45	0
11/14/2006	3:40 PM	4.9	NNE	22.5	0
11/14/2006	3:50 PM	4.5	NNE	22.5	0
11/14/2006	4:00 PM	4.5	N	0	0
11/14/2006	4:10 PM	4.5	NE	45	0
11/14/2006	4:20 PM	4.5	NE	45	0
11/14/2006	4:30 PM	4.5	NE	45	0
11/14/2006	4:40 PM	4.9	NE	45	0
11/14/2006	4:50 PM	5.4	NNE	22.5	0
11/14/2006	5:00 PM	4.9	NNE	22.5	0
11/14/2006	5:10 PM	4.9	NNE	22.5	0
11/14/2006	5:20 PM	4.9	NE	45	0
11/14/2006	5:30 PM	4	NE	45	0
11/14/2006	5:40 PM	4.5	NNE	22.5	0
11/14/2006	5:50 PM	4.9	NNE	22.5	0

11/14/2006	6:00 PM	5.4	NE	45	0
11/14/2006	6:10 PM	5.4	NNE	22.5	0
11/14/2006	6:20 PM	5.8	NNE	22.5	0
11/14/2006	6:30 PM	4.5	NE	45	0
11/14/2006	6:40 PM	4.5	NNE	22.5	0
11/14/2006	6:50 PM	4.5	NNE	22.5	0
11/14/2006	7:00 PM	4.5	NNE	22.5	0
11/14/2006	7:10 PM	4	NNE	22.5	0
11/14/2006	7:20 PM	4.5	N	0	0
11/14/2006	7:30 PM	3.6	N	0	0
11/14/2006	7:40 PM	3.1	NNE	22.5	0
11/14/2006	7:50 PM	1.8	NNE	22.5	0
11/14/2006	8:00 PM	1.3	NNE	22.5	0
11/14/2006	8:10 PM	1.3	NW	315	0
11/14/2006	8:20 PM	1.8	NW	315	0
11/14/2006	8:30 PM	1.8	NNW	337.5	0
11/14/2006	8:40 PM	2.2	NNW	337.5	0
11/14/2006	8:50 PM	2.2	N	0	0
11/14/2006	9:00 PM	1.8	N	0	0
11/14/2006	9:10 PM	0	NW	315	0
11/14/2006	9:20 PM	0	NW	315	0
11/14/2006	9:30 PM	0	NW	315	0
11/14/2006	9:40 PM	0	NW	315	0
11/14/2006	9:50 PM	0	NW	315	0
11/14/2006	10:00 PM	0.4	SW	225	0
11/14/2006	10:10 PM	0	---		0
11/14/2006	10:20 PM	0	---		0
11/14/2006	10:30 PM	0	WSW	247.5	0
11/14/2006	10:40 PM	0	WSW	247.5	0
11/14/2006	10:50 PM	0.4	SSW	202.5	0
11/14/2006	11:00 PM	0.4	SSW	202.5	0
11/14/2006	11:10 PM	0	---		0
11/14/2006	11:20 PM	0	SSW	202.5	0
11/14/2006	11:30 PM	0	SSW	202.5	0
11/14/2006	11:40 PM	0	---		0
11/14/2006	11:50 PM	0	SSW	202.5	0
11/15/2006	12:00 AM	0	---		0
11/15/2006	12:10 AM	0	SSW	202.5	0
11/15/2006	12:20 AM	0	SSW	202.5	0
11/15/2006	12:30 AM	0	---		0
11/15/2006	12:40 AM	0	---		0
11/15/2006	12:50 AM	0	---		0
11/15/2006	1:00 AM	0	---		0
11/15/2006	1:10 AM	0	SSW	202.5	0
11/15/2006	1:20 AM	0	---		0
11/15/2006	1:30 AM	0	---		0
11/15/2006	1:40 AM	0	SSW	202.5	0
11/15/2006	1:50 AM	0	---		0
11/15/2006	2:00 AM	0	SSW	202.5	0
11/15/2006	2:10 AM	0	---		0
11/15/2006	2:20 AM	0	---		0
11/15/2006	2:30 AM	0	---		0

11/15/2006	2:40 AM	0	---		0
11/15/2006	2:50 AM	0	---		0
11/15/2006	3:00 AM	0	SSW	202.5	0
11/15/2006	3:10 AM	0	SSW	202.5	0
11/15/2006	3:20 AM	0	SSW	202.5	0
11/15/2006	3:30 AM	0	---		0
11/15/2006	3:40 AM	0	---		0
11/15/2006	3:50 AM	0	---		0
11/15/2006	4:00 AM	0	SSW	202.5	0
11/15/2006	4:10 AM	0	SSW	202.5	0
11/15/2006	4:20 AM	0	---		0
11/15/2006	4:30 AM	0	---		0
11/15/2006	4:40 AM	0	SSW	202.5	0
11/15/2006	4:50 AM	0	SSW	202.5	0
11/15/2006	5:00 AM	0	SSW	202.5	0
11/15/2006	5:10 AM	0	SSW	202.5	0
11/15/2006	5:20 AM	0	---		0
11/15/2006	5:30 AM	0	---		0
11/15/2006	5:40 AM	0	---		0
11/15/2006	5:50 AM	0	SSW	202.5	0
11/15/2006	6:00 AM	0	SSW	202.5	0
11/15/2006	6:10 AM	0	---		0
11/15/2006	6:20 AM	0	SSW	202.5	0
11/15/2006	6:30 AM	0	SW	225	0
11/15/2006	6:40 AM	0.4	WSW	247.5	0
11/15/2006	6:50 AM	0.9	NNW	337.5	0
11/15/2006	7:00 AM	0.9	N	0	0
11/15/2006	7:10 AM	1.8	N	0	0
11/15/2006	7:20 AM	2.2	NNW	337.5	0
11/15/2006	7:30 AM	2.7	N	0	0
11/15/2006	7:40 AM	2.7	N	0	0
11/15/2006	7:50 AM	2.7	N	0	0
11/15/2006	8:00 AM	3.1	N	0	0
11/15/2006	8:10 AM	2.7	NNW	337.5	0
11/15/2006	8:20 AM	2.2	N	0	0
11/15/2006	8:30 AM	2.7	N	0	0
11/15/2006	8:40 AM	3.6	NNW	337.5	0
11/15/2006	8:50 AM	4	NNW	337.5	0
11/15/2006	9:00 AM	3.6	NNW	337.5	0
11/15/2006	9:10 AM	3.6	NW	315	0
11/15/2006	9:20 AM	3.6	NNW	337.5	0
11/15/2006	9:30 AM	3.1	NW	315	0
11/15/2006	9:40 AM	3.6	NW	315	0
11/15/2006	9:50 AM	4	NW	315	0
11/15/2006	10:00 AM	4	WNW	292.5	0
11/15/2006	10:10 AM	3.1	WNW	292.5	0
11/15/2006	10:20 AM	4.9	NW	315	0
11/15/2006	10:30 AM	4.5	WNW	292.5	0
11/15/2006	10:40 AM	5.4	W	270	0
11/15/2006	10:50 AM	4.9	W	270	0
11/15/2006	11:00 AM	5.4	W	270	0
11/15/2006	11:10 AM	5.4	W	270	0

11/15/2006	11:20 AM	5.4	WNW	292.5	0
11/15/2006	11:30 AM	5.8	W	270	0
11/15/2006	11:40 AM	5.4	NW	315	0
11/15/2006	11:50 AM	5.8	WNW	292.5	0
11/15/2006	12:00 PM	6.3	WNW	292.5	0
11/15/2006	12:10 PM	6.7	WNW	292.5	0
11/15/2006	12:20 PM	7.6	W	270	0
11/15/2006	12:30 PM	7.2	W	270	0
11/15/2006	12:40 PM	6.7	W	270	0
11/15/2006	12:50 PM	6.7	WNW	292.5	0
11/15/2006	1:00 PM	4.9	W	270	0
11/15/2006	1:10 PM	6.7	WNW	292.5	0
11/15/2006	1:20 PM	6.3	WNW	292.5	0
11/15/2006	1:30 PM	5.8	W	270	0
11/15/2006	1:40 PM	5.8	WSW	247.5	0
11/15/2006	1:50 PM	6.7	WSW	247.5	0
11/15/2006	2:00 PM	6.3	WSW	247.5	0
11/15/2006	2:10 PM	7.2	WSW	247.5	0
11/15/2006	2:20 PM	6.7	WSW	247.5	0
11/15/2006	2:30 PM	6.3	W	270	0
11/15/2006	2:40 PM	6.7	W	270	0
11/15/2006	2:50 PM	4	WSW	247.5	0
11/15/2006	3:00 PM	4.9	WSW	247.5	0
11/15/2006	3:10 PM	4.5	WSW	247.5	0
11/15/2006	3:20 PM	4.5	WSW	247.5	0
11/15/2006	3:30 PM	4	WSW	247.5	0
11/15/2006	3:40 PM	4	WSW	247.5	0
11/15/2006	3:50 PM	4	WSW	247.5	0
11/15/2006	4:00 PM	4	W	270	0
11/15/2006	4:10 PM	3.1	WSW	247.5	0
11/15/2006	4:20 PM	3.1	ESE	112.5	0
11/15/2006	4:30 PM	2.2	SE	135	0
11/15/2006	4:40 PM	2.7	SE	135	0
11/15/2006	4:50 PM	3.1	SE	135	0
11/15/2006	5:00 PM	4	SE	135	0
11/15/2006	5:10 PM	4	SSE	157.5	0
11/15/2006	5:20 PM	4	SSE	157.5	0
11/15/2006	5:30 PM	4.5	S	180	0
11/15/2006	5:40 PM	4	S	180	0
11/15/2006	5:50 PM	5.8	SW	225	0
11/15/2006	6:00 PM	5.4	SSW	202.5	0
11/15/2006	6:10 PM	5.4	SW	225	0
11/15/2006	6:20 PM	5.8	WSW	247.5	0
11/15/2006	6:30 PM	5.4	WSW	247.5	0
11/15/2006	6:40 PM	4.9	WSW	247.5	0
11/15/2006	6:50 PM	4.9	WSW	247.5	0
11/15/2006	7:00 PM	4	SW	225	0
11/15/2006	7:10 PM	6.3	SW	225	0
11/15/2006	7:20 PM	4	SW	225	0
11/15/2006	7:30 PM	4.9	SW	225	0
11/15/2006	7:40 PM	4	SW	225	0
11/15/2006	7:50 PM	4.5	WSW	247.5	0

11/15/2006	8:00 PM	4.5	SW	225	0
11/15/2006	8:10 PM	4.5	SW	225	0
11/15/2006	8:20 PM	4	SW	225	0
11/15/2006	8:30 PM	4	SW	225	0
11/15/2006	8:40 PM	4	SSW	202.5	0
11/15/2006	8:50 PM	4.9	SSW	202.5	0
11/15/2006	9:00 PM	3.6	SSW	202.5	0
11/15/2006	9:10 PM	4	SSW	202.5	0
11/15/2006	9:20 PM	2.2	SSW	202.5	0
11/15/2006	9:30 PM	3.1	SSW	202.5	0
11/15/2006	9:40 PM	1.8	SSW	202.5	0
11/15/2006	9:50 PM	3.6	SSW	202.5	0
11/15/2006	10:00 PM	3.1	S	180	0
11/15/2006	10:10 PM	2.7	S	180	0
11/15/2006	10:20 PM	2.2	S	180	0
11/15/2006	10:30 PM	3.1	SSE	157.5	0
11/15/2006	10:40 PM	3.6	S	180	0
11/15/2006	10:50 PM	3.1	S	180	0
11/15/2006	11:00 PM	3.1	S	180	0
11/15/2006	11:10 PM	3.6	S	180	0
11/15/2006	11:20 PM	3.1	S	180	0
11/15/2006	11:30 PM	2.2	S	180	0
11/15/2006	11:40 PM	1.8	S	180	0
11/15/2006	11:50 PM	0.9	S	180	0
11/16/2006	12:00 AM	1.8	S	180	0
11/16/2006	12:10 AM	1.3	S	180	0
11/16/2006	12:20 AM	1.3	SSW	202.5	0
11/16/2006	12:30 AM	1.3	SSW	202.5	0
11/16/2006	12:40 AM	1.3	SSW	202.5	0
11/16/2006	12:50 AM	1.3	SSW	202.5	0
11/16/2006	1:00 AM	1.3	SW	225	0
11/16/2006	1:10 AM	1.3	SW	225	0
11/16/2006	1:20 AM	1.3	S	180	0
11/16/2006	1:30 AM	1.3	SSW	202.5	0
11/16/2006	1:40 AM	1.3	SSW	202.5	0
11/16/2006	1:50 AM	1.3	SW	225	0
11/16/2006	2:00 AM	0.9	SSW	202.5	0
11/16/2006	2:10 AM	1.3	SW	225	0
11/16/2006	2:20 AM	1.3	SW	225	0
11/16/2006	2:30 AM	1.3	SW	225	0
11/16/2006	2:40 AM	1.8	SSW	202.5	0
11/16/2006	2:50 AM	2.2	SW	225	0
11/16/2006	3:00 AM	2.2	SSW	202.5	0
11/16/2006	3:10 AM	1.8	SSW	202.5	0
11/16/2006	3:20 AM	1.8	SSW	202.5	0
11/16/2006	3:30 AM	1.8	SSW	202.5	0
11/16/2006	3:40 AM	1.3	SSW	202.5	0
11/16/2006	3:50 AM	2.2	SSW	202.5	0
11/16/2006	4:00 AM	2.2	SW	225	0
11/16/2006	4:10 AM	2.2	SW	225	0
11/16/2006	4:20 AM	1.8	SW	225	0
11/16/2006	4:30 AM	2.7	SW	225	0

11/16/2006	4:40 AM	3.6	SSW	202.5	0
11/16/2006	4:50 AM	2.7	SSW	202.5	0
11/16/2006	5:00 AM	2.2	SSW	202.5	0
11/16/2006	5:10 AM	2.2	SW	225	0
11/16/2006	5:20 AM	2.7	SSW	202.5	0
11/16/2006	5:30 AM	3.6	SSW	202.5	0
11/16/2006	5:40 AM	4.9	SSW	202.5	0
11/16/2006	5:50 AM	4	SW	225	0
11/16/2006	6:00 AM	2.2	SSW	202.5	0
11/16/2006	6:10 AM	3.1	SW	225	0
11/16/2006	6:20 AM	3.6	SW	225	0
11/16/2006	6:30 AM	3.6	SSW	202.5	0
11/16/2006	6:40 AM	3.6	SSW	202.5	0
11/16/2006	6:50 AM	4	SW	225	0
11/16/2006	7:00 AM	3.6	SW	225	0
11/16/2006	7:10 AM	4	SW	225	0
11/16/2006	7:20 AM	4	WSW	247.5	0
11/16/2006	7:30 AM	4.5	SW	225	0
11/16/2006	7:40 AM	4.5	SW	225	0
11/16/2006	7:50 AM	4	WSW	247.5	0
11/16/2006	8:00 AM	3.6	SW	225	0
11/16/2006	8:10 AM	4.5	SW	225	0
11/16/2006	8:20 AM	3.6	SW	225	0
11/16/2006	8:30 AM	3.6	SW	225	0
11/16/2006	8:40 AM	3.1	SW	225	0
11/16/2006	8:50 AM	3.6	WSW	247.5	0
11/16/2006	9:00 AM	3.1	SW	225	0
11/16/2006	9:10 AM	2.7	SSW	202.5	0
11/16/2006	9:20 AM	3.1	SW	225	0
11/16/2006	9:30 AM	3.1	SW	225	0
11/16/2006	9:40 AM	2.2	SW	225	0
11/16/2006	9:50 AM	2.7	SSW	202.5	0
11/16/2006	10:00 AM	2.2	SSW	202.5	0
11/16/2006	10:10 AM	3.6	SSW	202.5	0
11/16/2006	10:20 AM	2.7	SSW	202.5	0
11/16/2006	10:30 AM	3.6	SSW	202.5	0
11/16/2006	10:40 AM	4	SSW	202.5	0
11/16/2006	10:50 AM	4	SSW	202.5	0
11/16/2006	11:00 AM	4.5	SSW	202.5	0
11/16/2006	11:10 AM	4.5	SSW	202.5	0
11/16/2006	11:20 AM	3.6	SSW	202.5	0
11/16/2006	11:30 AM	3.1	S	180	0
11/16/2006	11:40 AM	4	SSW	202.5	0
11/16/2006	11:50 AM	5.4	S	180	0
11/16/2006	12:00 PM	5.8	S	180	0.2
11/16/2006	12:10 PM	4.9	SSW	202.5	0.2
11/16/2006	12:20 PM	4.5	SSW	202.5	0
11/16/2006	12:30 PM	5.8	S	180	0
11/16/2006	12:40 PM	5.8	SSW	202.5	0
11/16/2006	12:50 PM	4.5	S	180	0
11/16/2006	1:00 PM	4.5	S	180	0
11/16/2006	1:10 PM	4.9	S	180	0

11/16/2006	1:20 PM	5.8	S	180	0
11/16/2006	1:30 PM	6.7	S	180	0
11/16/2006	1:40 PM	4.9	SSE	157.5	0
11/16/2006	1:50 PM	5.8	S	180	0
11/16/2006	2:00 PM	5.8	S	180	0
11/16/2006	2:10 PM	6.3	S	180	0
11/16/2006	2:20 PM	6.7	S	180	0
11/16/2006	2:30 PM	5.8	S	180	0
11/16/2006	2:40 PM	6.7	S	180	0
11/16/2006	2:50 PM	5.8	S	180	0
11/16/2006	3:00 PM	6.3	S	180	0
11/16/2006	3:10 PM	6.3	S	180	0
11/16/2006	3:20 PM	5.8	S	180	0
11/16/2006	3:30 PM	6.3	S	180	0
11/16/2006	3:40 PM	6.3	SSE	157.5	0
11/16/2006	3:50 PM	4.9	S	180	0
11/16/2006	4:00 PM	4.9	S	180	0
11/16/2006	4:10 PM	6.3	S	180	0
11/16/2006	4:20 PM	7.2	S	180	0
11/16/2006	4:30 PM	5.4	SSE	157.5	0
11/16/2006	4:40 PM	6.3	S	180	0
11/16/2006	4:50 PM	6.3	S	180	0
11/16/2006	5:00 PM	5.8	S	180	0
11/16/2006	5:10 PM	6.3	S	180	0
11/16/2006	5:20 PM	5.8	S	180	0
11/16/2006	5:30 PM	6.3	S	180	0
11/16/2006	5:40 PM	5.8	S	180	0
11/16/2006	5:50 PM	5.4	S	180	0
11/16/2006	6:00 PM	4.9	SSE	157.5	0
11/16/2006	6:10 PM	5.8	SSE	157.5	0
11/16/2006	6:20 PM	4.9	S	180	0
11/16/2006	6:30 PM	4	S	180	0
11/16/2006	6:40 PM	4	S	180	0
11/16/2006	6:50 PM	4.9	S	180	0
11/16/2006	7:00 PM	3.6	S	180	0
11/16/2006	7:10 PM	4.5	S	180	0
11/16/2006	7:20 PM	4.5	S	180	0
11/16/2006	7:30 PM	5.4	S	180	0
11/16/2006	7:40 PM	3.1	S	180	0
11/16/2006	7:50 PM	3.6	S	180	0
11/16/2006	8:00 PM	2.7	S	180	0
11/16/2006	8:10 PM	2.7	S	180	0
11/16/2006	8:20 PM	3.1	S	180	0
11/16/2006	8:30 PM	2.7	S	180	0
11/16/2006	8:40 PM	3.1	S	180	0
11/16/2006	8:50 PM	2.2	SSW	202.5	0
11/16/2006	9:00 PM	2.7	SSW	202.5	0
11/16/2006	9:10 PM	2.2	SSW	202.5	0
11/16/2006	9:20 PM	2.2	S	180	0
11/16/2006	9:30 PM	2.2	S	180	0
11/16/2006	9:40 PM	2.2	SSW	202.5	0
11/16/2006	9:50 PM	1.8	SSW	202.5	0

11/16/2006	10:00 PM	1.8	SW	225	0
11/16/2006	10:10 PM	1.3	SW	225	0
11/16/2006	10:20 PM	0.9	SW	225	0
11/16/2006	10:30 PM	0.9	SW	225	0
11/16/2006	10:40 PM	0.4	SW	225	0
11/16/2006	10:50 PM	1.3	WSW	247.5	0
11/16/2006	11:00 PM	1.3	SW	225	0
11/16/2006	11:10 PM	1.3	SW	225	0
11/16/2006	11:20 PM	0.9	SW	225	0
11/16/2006	11:30 PM	1.3	SW	225	0
11/16/2006	11:40 PM	1.3	SW	225	0
11/16/2006	11:50 PM	1.8	SW	225	0
11/17/2006	12:00 AM	0.9	SW	225	0
11/17/2006	12:10 AM	1.3	SW	225	0
11/17/2006	12:20 AM	1.3	SW	225	0
11/17/2006	12:30 AM	1.3	SW	225	0
11/17/2006	12:40 AM	1.8	SSW	202.5	0
11/17/2006	12:50 AM	1.3	SSW	202.5	0
11/17/2006	1:00 AM	1.3	SW	225	0
11/17/2006	1:10 AM	1.3	SW	225	0
11/17/2006	1:20 AM	1.3	SSW	202.5	0
11/17/2006	1:30 AM	1.8	SW	225	0
11/17/2006	1:40 AM	1.8	SW	225	0
11/17/2006	1:50 AM	1.8	SW	225	0
11/17/2006	2:00 AM	2.2	SW	225	0
11/17/2006	2:10 AM	2.2	SW	225	0
11/17/2006	2:20 AM	1.8	SW	225	0
11/17/2006	2:30 AM	1.8	SW	225	0
11/17/2006	2:40 AM	1.8	SW	225	0
11/17/2006	2:50 AM	1.8	SW	225	0
11/17/2006	3:00 AM	1.8	SW	225	0
11/17/2006	3:10 AM	2.2	SW	225	0.4
11/17/2006	3:20 AM	1.3	SW	225	0.4
11/17/2006	3:30 AM	1.3	WSW	247.5	0.2
11/17/2006	3:40 AM	0.9	SW	225	0
11/17/2006	3:50 AM	1.3	SW	225	0
11/17/2006	4:00 AM	1.8	SW	225	0
11/17/2006	4:10 AM	1.3	SW	225	0
11/17/2006	4:20 AM	1.3	SW	225	0
11/17/2006	4:30 AM	1.3	SW	225	0
11/17/2006	4:40 AM	1.8	SW	225	0
11/17/2006	4:50 AM	1.8	SW	225	0
11/17/2006	5:00 AM	1.8	SW	225	0
11/17/2006	5:10 AM	1.8	SW	225	0
11/17/2006	5:20 AM	1.8	SW	225	0
11/17/2006	5:30 AM	1.3	SW	225	0
11/17/2006	5:40 AM	1.3	SW	225	0
11/17/2006	5:50 AM	1.8	SW	225	0
11/17/2006	6:00 AM	1.8	SW	225	0
11/17/2006	6:10 AM	1.8	SW	225	0
11/17/2006	6:20 AM	1.8	SW	225	0
11/17/2006	6:30 AM	1.8	SW	225	0

11/17/2006	6:40 AM	2.2	SW	225	0
11/17/2006	6:50 AM	2.2	SW	225	0
11/17/2006	7:00 AM	2.7	SW	225	0
11/17/2006	7:10 AM	2.7	SW	225	0
11/17/2006	7:20 AM	2.7	SW	225	0
11/17/2006	7:30 AM	2.7	SW	225	0
11/17/2006	7:40 AM	2.7	SW	225	0
11/17/2006	7:50 AM	3.6	SSW	202.5	0
11/17/2006	8:00 AM	2.7	SSW	202.5	0
11/17/2006	8:10 AM	3.1	SSW	202.5	0
11/17/2006	8:20 AM	3.1	SSW	202.5	0
11/17/2006	8:30 AM	3.6	SW	225	0
11/17/2006	8:40 AM	3.1	SSW	202.5	0
11/17/2006	8:50 AM	2.7	SSW	202.5	0
11/17/2006	9:00 AM	3.1	SSW	202.5	0
11/17/2006	9:10 AM	2.7	S	180	0
11/17/2006	9:20 AM	3.6	S	180	0
11/17/2006	9:30 AM	3.1	S	180	0
11/17/2006	9:40 AM	4	S	180	0
11/17/2006	9:50 AM	4	S	180	0
11/17/2006	10:00 AM	3.1	S	180	0
11/17/2006	10:10 AM	4	S	180	0
11/17/2006	10:20 AM	4	S	180	0
11/17/2006	10:30 AM	4	S	180	0
11/17/2006	10:40 AM	3.1	S	180	0
11/17/2006	10:50 AM	3.6	SSW	202.5	0
11/17/2006	11:00 AM	3.6	S	180	0
11/17/2006	11:10 AM	4	S	180	0
11/17/2006	11:20 AM	2.7	S	180	0
11/17/2006	11:30 AM	2.7	S	180	0
11/17/2006	11:40 AM	3.6	S	180	0
11/17/2006	11:50 AM	4.5	SSE	157.5	0
11/17/2006	12:00 PM	3.6	SSE	157.5	0
11/17/2006	12:10 PM	3.6	SSE	157.5	0
11/17/2006	12:20 PM	4.5	SSE	157.5	0
11/17/2006	12:30 PM	4	SE	135	0
11/17/2006	12:40 PM	3.6	SE	135	0
11/17/2006	12:50 PM	4	SE	135	0
11/17/2006	1:00 PM	4	SE	135	0
11/17/2006	1:10 PM	4	SE	135	0
11/17/2006	1:20 PM	4	SSE	157.5	0
11/17/2006	1:30 PM	4	SSE	157.5	0
11/17/2006	1:40 PM	4.9	SSE	157.5	0
11/17/2006	1:50 PM	4.5	SSE	157.5	0
11/17/2006	2:00 PM	4.9	SSE	157.5	0
11/17/2006	2:10 PM	5.4	SSE	157.5	0
11/17/2006	2:20 PM	5.4	SSE	157.5	0
11/17/2006	2:30 PM	4.9	SSE	157.5	0
11/17/2006	2:40 PM	4.5	S	180	0
11/17/2006	2:50 PM	4.5	SSE	157.5	0
11/17/2006	3:00 PM	4	S	180	0
11/17/2006	3:10 PM	4.5	SE	135	0

11/17/2006	3:20 PM	4	SSE	157.5	0
11/17/2006	3:30 PM	3.6	SE	135	0
11/17/2006	3:40 PM	4	ESE	112.5	0
11/17/2006	3:50 PM	4	ESE	112.5	0
11/17/2006	4:00 PM	4	SE	135	0
11/17/2006	4:10 PM	3.6	SE	135	0
11/17/2006	4:20 PM	4	SE	135	0
11/17/2006	4:30 PM	4.5	SE	135	0
11/17/2006	4:40 PM	3.6	SE	135	0
11/17/2006	4:50 PM	3.6	SSE	157.5	0
11/17/2006	5:00 PM	4	SE	135	0
11/17/2006	5:10 PM	3.1	SE	135	0
11/17/2006	5:20 PM	3.1	SE	135	0
11/17/2006	5:30 PM	2.2	SE	135	0
11/17/2006	5:40 PM	2.7	SE	135	0
11/17/2006	5:50 PM	2.7	SE	135	0
11/17/2006	6:00 PM	2.2	SE	135	0
11/17/2006	6:10 PM	2.7	SE	135	0
11/17/2006	6:20 PM	2.2	SE	135	0
11/17/2006	6:30 PM	2.2	SSE	157.5	0
11/17/2006	6:40 PM	2.2	SSE	157.5	0
11/17/2006	6:50 PM	2.2	SSE	157.5	0
11/17/2006	7:00 PM	1.3	SE	135	0
11/17/2006	7:10 PM	0.9	SE	135	0
11/17/2006	7:20 PM	0.9	SE	135	0
11/17/2006	7:30 PM	0	ESE	112.5	0
11/17/2006	7:40 PM	0	---		0
11/17/2006	7:50 PM	0	---		0
11/17/2006	8:00 PM	0	---		0
11/17/2006	8:10 PM	0	---		0
11/17/2006	8:20 PM	0.4	ESE	112.5	0
11/17/2006	8:30 PM	0	---		0
11/17/2006	8:40 PM	0.4	ESE	112.5	0
11/17/2006	8:50 PM	0	---		0
11/17/2006	9:00 PM	0	---		0
11/17/2006	9:10 PM	0.4	S	180	0
11/17/2006	9:20 PM	0	---		0
11/17/2006	9:30 PM	0	---		0
11/17/2006	9:40 PM	0	S	180	0
11/17/2006	9:50 PM	0	S	180	0
11/17/2006	10:00 PM	0	---		0
11/17/2006	10:10 PM	0	S	180	0
11/17/2006	10:20 PM	0.4	S	180	0
11/17/2006	10:30 PM	0	S	180	0
11/17/2006	10:40 PM	0	S	180	0
11/17/2006	10:50 PM	0.4	S	180	0
11/17/2006	11:00 PM	0	---		0
11/17/2006	11:10 PM	0	---		0
11/17/2006	11:20 PM	0	---		0
11/17/2006	11:30 PM	0	---		0
11/17/2006	11:40 PM	0	---		0
11/17/2006	11:50 PM	0	---		0

11/18/2006	12:00 AM	0	S	180	0
11/18/2006	12:10 AM	0	S	180	0
11/18/2006	12:20 AM	0	---		0
11/18/2006	12:30 AM	0	---		0
11/18/2006	12:40 AM	0.4	S	180	0
11/18/2006	12:50 AM	0.4	S	180	0
11/18/2006	1:00 AM	0	S	180	0
11/18/2006	1:10 AM	0.4	S	180	0
11/18/2006	1:20 AM	0	---		0
11/18/2006	1:30 AM	0	---		0
11/18/2006	1:40 AM	0	---		0
11/18/2006	1:50 AM	0.4	S	180	0
11/18/2006	2:00 AM	0.4	S	180	0
11/18/2006	2:10 AM	0.4	S	180	0
11/18/2006	2:20 AM	0.4	S	180	0
11/18/2006	2:30 AM	0	S	180	0
11/18/2006	2:40 AM	0.4	S	180	0
11/18/2006	2:50 AM	0	S	180	0
11/18/2006	3:00 AM	0	S	180	0
11/18/2006	3:10 AM	0.4	S	180	0
11/18/2006	3:20 AM	0	S	180	0
11/18/2006	3:30 AM	0	S	180	0
11/18/2006	3:40 AM	0.9	S	180	0
11/18/2006	3:50 AM	0.4	S	180	0
11/18/2006	4:00 AM	0	S	180	0
11/18/2006	4:10 AM	0	---		0
11/18/2006	4:20 AM	0	---		0
11/18/2006	4:30 AM	0	---		0
11/18/2006	4:40 AM	0	---		0
11/18/2006	4:50 AM	0	---		0
11/18/2006	5:00 AM	0	S	180	0
11/18/2006	5:10 AM	0	S	180	0
11/18/2006	5:20 AM	0.4	S	180	0
11/18/2006	5:30 AM	0	---		0
11/18/2006	5:40 AM	0.4	S	180	0
11/18/2006	5:50 AM	0	---		0
11/18/2006	6:00 AM	0	---		0
11/18/2006	6:10 AM	0	---		0
11/18/2006	6:20 AM	0	---		0
11/18/2006	6:30 AM	0	---		0
11/18/2006	6:40 AM	0	---		0
11/18/2006	6:50 AM	0	---		0
11/18/2006	7:00 AM	0	---		0
11/18/2006	7:10 AM	0	S	180	0
11/18/2006	7:20 AM	0	S	180	0
11/18/2006	7:30 AM	0	S	180	0
11/18/2006	7:40 AM	0.4	S	180	0
11/18/2006	7:50 AM	0.9	SSW	202.5	0
11/18/2006	8:00 AM	0.9	SSW	202.5	0
11/18/2006	8:10 AM	0.4	S	180	0
11/18/2006	8:20 AM	1.8	WNW	292.5	0
11/18/2006	8:30 AM	1.3	NW	315	0

11/18/2006	8:40 AM	1.8	NW	315	0
11/18/2006	8:50 AM	1.8	NW	315	0
11/18/2006	9:00 AM	1.8	NW	315	0
11/18/2006	9:10 AM	2.2	NNE	22.5	0
11/18/2006	9:20 AM	1.8	NW	315	0
11/18/2006	9:30 AM	2.2	N	0	0
11/18/2006	9:40 AM	2.7	NNE	22.5	0
11/18/2006	9:50 AM	2.2	NE	45	0
11/18/2006	10:00 AM	2.2	NE	45	0
11/18/2006	10:10 AM	2.7	NNE	22.5	0
11/18/2006	10:20 AM	2.2	WNW	292.5	0
11/18/2006	10:30 AM	2.2	NNE	22.5	0
11/18/2006	10:40 AM	1.8	NE	45	0
11/18/2006	10:50 AM	2.7	NNE	22.5	0
11/18/2006	11:00 AM	3.1	NE	45	0
11/18/2006	11:10 AM	2.7	N	0	0
11/18/2006	11:20 AM	2.7	N	0	0
11/18/2006	11:30 AM	2.7	SE	135	0
11/18/2006	11:40 AM	2.7	N	0	0
11/18/2006	11:50 AM	2.7	NNE	22.5	0
11/18/2006	12:00 PM	3.6	NNE	22.5	0
11/18/2006	12:10 PM	3.1	N	0	0
11/18/2006	12:20 PM	2.7	NE	45	0
11/18/2006	12:30 PM	3.1	NNE	22.5	0
11/18/2006	12:40 PM	3.1	NNE	22.5	0
11/18/2006	12:50 PM	3.1	NNE	22.5	0
11/18/2006	1:00 PM	3.6	NNW	337.5	0
11/18/2006	1:10 PM	4	NNE	22.5	0
11/18/2006	1:20 PM	3.6	NE	45	0
11/18/2006	1:30 PM	3.6	ENE	67.5	0
11/18/2006	1:40 PM	3.6	NNE	22.5	0
11/18/2006	1:50 PM	3.1	NE	45	0
11/18/2006	2:00 PM	3.6	NE	45	0
11/18/2006	2:10 PM	3.6	NE	45	0
11/18/2006	2:20 PM	3.1	NE	45	0
11/18/2006	2:30 PM	3.6	NE	45	0
11/18/2006	2:40 PM	3.1	NNE	22.5	0
11/18/2006	2:50 PM	2.7	NNE	22.5	0
11/18/2006	3:00 PM	3.1	NE	45	0
11/18/2006	3:10 PM	3.6	NE	45	0
11/18/2006	3:20 PM	3.6	NNE	22.5	0
11/18/2006	3:30 PM	3.1	NE	45	0
11/18/2006	3:40 PM	3.6	NNE	22.5	0
11/18/2006	3:50 PM	2.7	NE	45	0
11/18/2006	4:00 PM	3.1	ENE	67.5	0
11/18/2006	4:10 PM	3.1	NNE	22.5	0
11/18/2006	4:20 PM	3.1	NE	45	0
11/18/2006	4:30 PM	4	NNE	22.5	0
11/18/2006	4:40 PM	4.5	NNE	22.5	0
11/18/2006	4:50 PM	3.6	NE	45	0
11/18/2006	5:00 PM	3.6	NE	45	0
11/18/2006	5:10 PM	3.1	NNE	22.5	0

11/18/2006	5:20 PM	3.6	NNE	22.5	0
11/18/2006	5:30 PM	3.6	NE	45	0
11/18/2006	5:40 PM	3.1	NE	45	0
11/18/2006	5:50 PM	3.6	NE	45	0
11/18/2006	6:00 PM	3.6	NE	45	0
11/18/2006	6:10 PM	3.6	NE	45	0
11/18/2006	6:20 PM	3.6	NNE	22.5	0
11/18/2006	6:30 PM	2.7	NE	45	0
11/18/2006	6:40 PM	2.7	NE	45	0
11/18/2006	6:50 PM	2.7	NE	45	0
11/18/2006	7:00 PM	2.2	NNE	22.5	0
11/18/2006	7:10 PM	1.8	NNE	22.5	0
11/18/2006	7:20 PM	2.2	NNE	22.5	0
11/18/2006	7:30 PM	1.3	NE	45	0
11/18/2006	7:40 PM	0.9	NNE	22.5	0
11/18/2006	7:50 PM	1.3	NNE	22.5	0
11/18/2006	8:00 PM	1.3	NNE	22.5	0
11/18/2006	8:10 PM	1.3	NNE	22.5	0
11/18/2006	8:20 PM	2.2	NNE	22.5	0
11/18/2006	8:30 PM	2.7	NNE	22.5	0
11/18/2006	8:40 PM	1.8	NNE	22.5	0
11/18/2006	8:50 PM	1.8	NNE	22.5	0
11/18/2006	9:00 PM	1.8	NNE	22.5	0
11/18/2006	9:10 PM	1.8	NNE	22.5	0
11/18/2006	9:20 PM	1.3	NNE	22.5	0
11/18/2006	9:30 PM	1.8	NNE	22.5	0
11/18/2006	9:40 PM	1.3	NNE	22.5	0
11/18/2006	9:50 PM	0.4	NNE	22.5	0
11/18/2006	10:00 PM	0	---		0
11/18/2006	10:10 PM	0	NNE	22.5	0
11/18/2006	10:20 PM	0	NNE	22.5	0
11/18/2006	10:30 PM	0	---		0
11/18/2006	10:40 PM	0	NNE	22.5	0
11/18/2006	10:50 PM	0	NNE	22.5	0
11/18/2006	11:00 PM	0	NNE	22.5	0
11/18/2006	11:10 PM	0	---		0
11/18/2006	11:20 PM	0	NNE	22.5	0
11/18/2006	11:30 PM	0	NNE	22.5	0
11/18/2006	11:40 PM	0	NNE	22.5	0
11/18/2006	11:50 PM	0	NNE	22.5	0
11/19/2006	12:00 AM	0	NNE	22.5	0
11/19/2006	12:10 AM	0	---		0
11/19/2006	12:20 AM	0	---		0
11/19/2006	12:30 AM	0	---		0
11/19/2006	12:40 AM	0	NNE	22.5	0
11/19/2006	12:50 AM	0	---		0
11/19/2006	1:00 AM	0	---		0
11/19/2006	1:10 AM	0.4	NNE	22.5	0
11/19/2006	1:20 AM	0.9	WSW	247.5	0
11/19/2006	1:30 AM	0.4	SSW	202.5	0
11/19/2006	1:40 AM	0	---		0
11/19/2006	1:50 AM	0	---		0

11/19/2006	2:00 AM	0	---		0
11/19/2006	2:10 AM	0	---		0
11/19/2006	2:20 AM	0	---		0
11/19/2006	2:30 AM	0	SSW	202.5	0
11/19/2006	2:40 AM	0.4	SSW	202.5	0
11/19/2006	2:50 AM	0.4	SSW	202.5	0
11/19/2006	3:00 AM	0.9	SSW	202.5	0
11/19/2006	3:10 AM	0.4	SSW	202.5	0
11/19/2006	3:20 AM	0	SSW	202.5	0
11/19/2006	3:30 AM	0	SSW	202.5	0
11/19/2006	3:40 AM	0.4	SSW	202.5	0
11/19/2006	3:50 AM	0	---		0
11/19/2006	4:00 AM	0	---		0
11/19/2006	4:10 AM	0	---		0
11/19/2006	4:20 AM	0	---		0
11/19/2006	4:30 AM	0	---		0
11/19/2006	4:40 AM	0.4	SSW	202.5	0
11/19/2006	4:50 AM	0	SSW	202.5	0
11/19/2006	5:00 AM	0	---		0
11/19/2006	5:10 AM	0	---		0
11/19/2006	5:20 AM	0	SSW	202.5	0
11/19/2006	5:30 AM	0.4	SSW	202.5	0
11/19/2006	5:40 AM	0.4	SSW	202.5	0
11/19/2006	5:50 AM	0	SSW	202.5	0
11/19/2006	6:00 AM	0	---		0
11/19/2006	6:10 AM	0.4	SSW	202.5	0
11/19/2006	6:20 AM	0.4	SSW	202.5	0
11/19/2006	6:30 AM	0	SSW	202.5	0
11/19/2006	6:40 AM	0	SSW	202.5	0
11/19/2006	6:50 AM	0.4	SSW	202.5	0
11/19/2006	7:00 AM	0	SSW	202.5	0
11/19/2006	7:10 AM	0.4	SSW	202.5	0
11/19/2006	7:20 AM	0.4	SSW	202.5	0
11/19/2006	7:30 AM	0.4	SSW	202.5	0
11/19/2006	7:40 AM	0.9	SSW	202.5	0
11/19/2006	7:50 AM	0.4	SSW	202.5	0
11/19/2006	8:00 AM	0.4	SSW	202.5	0
11/19/2006	8:10 AM	0.9	S	180	0
11/19/2006	8:20 AM	0.4	S	180	0
11/19/2006	8:30 AM	0.4	S	180	0
11/19/2006	8:40 AM	0.4	SSW	202.5	0.2
11/19/2006	8:50 AM	0.4	ESE	112.5	0
11/19/2006	9:00 AM	0.4	SE	135	0
11/19/2006	9:10 AM	0.4	WNW	292.5	0
11/19/2006	9:20 AM	0.9	E	90	0
11/19/2006	9:30 AM	1.3	N	0	0
11/19/2006	9:40 AM	0.9	SSE	157.5	0
11/19/2006	9:50 AM	1.8	N	0	0
11/19/2006	10:00 AM	0.9	NW	315	0
11/19/2006	10:10 AM	1.3	N	0	0
11/19/2006	10:20 AM	1.3	ENE	67.5	0
11/19/2006	10:30 AM	1.3	SE	135	0

11/19/2006	10:40 AM	1.8	ENE	67.5	0
11/19/2006	10:50 AM	1.8	ENE	67.5	0
11/19/2006	11:00 AM	1.8	ESE	112.5	0
11/19/2006	11:10 AM	1.8	E	90	0
11/19/2006	11:20 AM	1.3	ENE	67.5	0
11/19/2006	11:30 AM	2.2	N	0	0
11/19/2006	11:40 AM	2.2	ENE	67.5	0
11/19/2006	11:50 AM	2.7	E	90	0
11/19/2006	12:00 PM	2.2	ENE	67.5	0
11/19/2006	12:10 PM	2.7	ESE	112.5	0
11/19/2006	12:20 PM	2.7	SE	135	0
11/19/2006	12:30 PM	2.7	ESE	112.5	0
11/19/2006	12:40 PM	3.1	ESE	112.5	0
11/19/2006	12:50 PM	2.2	ESE	112.5	0
11/19/2006	1:00 PM	2.7	SE	135	0
11/19/2006	1:10 PM	2.2	ESE	112.5	0
11/19/2006	1:20 PM	3.6	SE	135	0
11/19/2006	1:30 PM	2.7	SE	135	0
11/19/2006	1:40 PM	2.7	ESE	112.5	0
11/19/2006	1:50 PM	2.7	ESE	112.5	0
11/19/2006	2:00 PM	2.7	ESE	112.5	0
11/19/2006	2:10 PM	2.7	E	90	0
11/19/2006	2:20 PM	2.7	ENE	67.5	0
11/19/2006	2:30 PM	2.7	E	90	0
11/19/2006	2:40 PM	3.1	NNE	22.5	0
11/19/2006	2:50 PM	4	N	0	0
11/19/2006	3:00 PM	3.1	NNE	22.5	0
11/19/2006	3:10 PM	3.6	NNE	22.5	0
11/19/2006	3:20 PM	3.1	NE	45	0
11/19/2006	3:30 PM	2.7	NE	45	0
11/19/2006	3:40 PM	2.7	NE	45	0
11/19/2006	3:50 PM	3.1	NE	45	0
11/19/2006	4:00 PM	3.6	NE	45	0
11/19/2006	4:10 PM	3.6	NNE	22.5	0
11/19/2006	4:20 PM	2.7	NE	45	0
11/19/2006	4:30 PM	3.1	NNE	22.5	0
11/19/2006	4:40 PM	3.6	NNE	22.5	0
11/19/2006	4:50 PM	3.1	NE	45	0
11/19/2006	5:00 PM	2.2	NE	45	0
11/19/2006	5:10 PM	2.2	NE	45	0
11/19/2006	5:20 PM	1.8	NE	45	0
11/19/2006	5:30 PM	1.3	NE	45	0
11/19/2006	5:40 PM	1.8	ENE	67.5	0
11/19/2006	5:50 PM	1.3	ENE	67.5	0
11/19/2006	6:00 PM	1.3	ENE	67.5	0
11/19/2006	6:10 PM	1.3	NE	45	0
11/19/2006	6:20 PM	2.2	NNE	22.5	0
11/19/2006	6:30 PM	1.8	NE	45	0
11/19/2006	6:40 PM	1.3	NE	45	0
11/19/2006	6:50 PM	1.3	NNE	22.5	0
11/19/2006	7:00 PM	1.8	NNE	22.5	0
11/19/2006	7:10 PM	1.8	NNE	22.5	0

11/19/2006	7:20 PM	1.8	NNE	22.5	0
11/19/2006	7:30 PM	1.3	NNE	22.5	0
11/19/2006	7:40 PM	0.9	NNE	22.5	0
11/19/2006	7:50 PM	0.9	NNE	22.5	0
11/19/2006	8:00 PM	0.9	N	0	0
11/19/2006	8:10 PM	0.9	NNE	22.5	0
11/19/2006	8:20 PM	0.4	N	0	0
11/19/2006	8:30 PM	0	N	0	0
11/19/2006	8:40 PM	0	---		0
11/19/2006	8:50 PM	0	---		0
11/19/2006	9:00 PM	0	N	0	0
11/19/2006	9:10 PM	0	---		0
11/19/2006	9:20 PM	0	---		0
11/19/2006	9:30 PM	0	---		0
11/19/2006	9:40 PM	0	NW	315	0
11/19/2006	9:50 PM	0	NW	315	0
11/19/2006	10:00 PM	0	NW	315	0
11/19/2006	10:10 PM	0	---		0
11/19/2006	10:20 PM	0	NW	315	0
11/19/2006	10:30 PM	0	---		0
11/19/2006	10:40 PM	0	---		0
11/19/2006	10:50 PM	0	---		0
11/19/2006	11:00 PM	0	---		0
11/19/2006	11:10 PM	0	NW	315	0
11/19/2006	11:20 PM	0.4	WSW	247.5	0
11/19/2006	11:30 PM	0	WSW	247.5	0
11/19/2006	11:40 PM	0	WSW	247.5	0
11/19/2006	11:50 PM	0	WSW	247.5	0
11/20/2006	12:00 AM	0.4	WSW	247.5	0
11/20/2006	12:10 AM	0	WSW	247.5	0
11/20/2006	12:20 AM	0.4	WSW	247.5	0
11/20/2006	12:30 AM	0	WSW	247.5	0
11/20/2006	12:40 AM	0	WSW	247.5	0
11/20/2006	12:50 AM	0	---		0
11/20/2006	1:00 AM	0	---		0
11/20/2006	1:10 AM	0	---		0
11/20/2006	1:20 AM	0	---		0
11/20/2006	1:30 AM	0.4	S	180	0
11/20/2006	1:40 AM	0.4	SSE	157.5	0
11/20/2006	1:50 AM	0	---		0
11/20/2006	2:00 AM	0	---		0
11/20/2006	2:10 AM	0	SSE	157.5	0
11/20/2006	2:20 AM	0	---		0
11/20/2006	2:30 AM	0	---		0
11/20/2006	2:40 AM	0	---		0
11/20/2006	2:50 AM	0	---		0
11/20/2006	3:00 AM	0	SSE	157.5	0
11/20/2006	3:10 AM	0.4	SSE	157.5	0
11/20/2006	3:20 AM	0.9	SSE	157.5	0
11/20/2006	3:30 AM	0	SSE	157.5	0
11/20/2006	3:40 AM	0	SSW	202.5	0
11/20/2006	3:50 AM	0.4	SSW	202.5	0

11/20/2006	4:00 AM	0.4	SW	225	0
11/20/2006	4:10 AM	0.4	SW	225	0
11/20/2006	4:20 AM	0.4	SW	225	0
11/20/2006	4:30 AM	0.4	SW	225	0
11/20/2006	4:40 AM	0.4	SW	225	0
11/20/2006	4:50 AM	0.4	SW	225	0
11/20/2006	5:00 AM	0	SW	225	0
11/20/2006	5:10 AM	0	SW	225	0
11/20/2006	5:20 AM	0.4	SW	225	0
11/20/2006	5:30 AM	0	SW	225	0
11/20/2006	5:40 AM	0.4	SW	225	0
11/20/2006	5:50 AM	0	SW	225	0
11/20/2006	6:00 AM	0	SW	225	0
11/20/2006	6:10 AM	0	SW	225	0
11/20/2006	6:20 AM	0	---		0
11/20/2006	6:30 AM	0	SW	225	0
11/20/2006	6:40 AM	0	SW	225	0
11/20/2006	6:50 AM	0	SW	225	0
11/20/2006	7:00 AM	0	SW	225	0
11/20/2006	7:10 AM	0	SW	225	0
11/20/2006	7:20 AM	0	SW	225	0
11/20/2006	7:30 AM	0.4	SW	225	0
11/20/2006	7:40 AM	0	SW	225	0
11/20/2006	7:50 AM	0	SW	225	0
11/20/2006	8:00 AM	0	SW	225	0
11/20/2006	8:10 AM	0.4	ENE	67.5	0
11/20/2006	8:20 AM	0.9	N	0	0
11/20/2006	8:30 AM	0.4	E	90	0
11/20/2006	8:40 AM	0.4	SSW	202.5	0
11/20/2006	8:50 AM	0.4	SSW	202.5	0
11/20/2006	9:00 AM	0.4	NNE	22.5	0
11/20/2006	9:10 AM	0.9	NE	45	0
11/20/2006	9:20 AM	0.9	NE	45	0
11/20/2006	9:30 AM	0.9	E	90	0
11/20/2006	9:40 AM	0.9	ESE	112.5	0
11/20/2006	9:50 AM	1.3	ENE	67.5	0
11/20/2006	10:00 AM	1.3	E	90	0
11/20/2006	10:10 AM	1.3	NE	45	0
11/20/2006	10:20 AM	1.8	NE	45	0
11/20/2006	10:30 AM	1.8	NE	45	0
11/20/2006	10:40 AM	1.8	NNE	22.5	0
11/20/2006	10:50 AM	2.2	NNE	22.5	0
11/20/2006	11:00 AM	2.2	NE	45	0
11/20/2006	11:10 AM	2.2	NNE	22.5	0
11/20/2006	11:20 AM	3.1	N	0	0
11/20/2006	11:30 AM	2.2	NNE	22.5	0
11/20/2006	11:40 AM	2.7	N	0	0
11/20/2006	11:50 AM	2.7	NNW	337.5	0
11/20/2006	12:00 PM	2.2	NNE	22.5	0
11/20/2006	12:10 PM	2.7	NE	45	0
11/20/2006	12:20 PM	2.2	NE	45	0
11/20/2006	12:30 PM	2.2	NE	45	0

11/20/2006	12:40 PM	1.8	NE	45	0
11/20/2006	12:50 PM	2.7	NE	45	0
11/20/2006	1:00 PM	3.1	NNE	22.5	0
11/20/2006	1:10 PM	2.2	ENE	67.5	0
11/20/2006	1:20 PM	2.7	NNE	22.5	0
11/20/2006	1:30 PM	2.7	NE	45	0
11/20/2006	1:40 PM	3.6	NNE	22.5	0
11/20/2006	1:50 PM	3.1	NE	45	0
11/20/2006	2:00 PM	3.6	NNE	22.5	0
11/20/2006	2:10 PM	3.1	NE	45	0
11/20/2006	2:20 PM	3.6	NNE	22.5	0
11/20/2006	2:30 PM	4	NNE	22.5	0
11/20/2006	2:40 PM	4	NNE	22.5	0
11/20/2006	2:50 PM	3.6	NNE	22.5	0
11/20/2006	3:00 PM	3.1	NNE	22.5	0
11/20/2006	3:10 PM	3.1	NNE	22.5	0
11/20/2006	3:20 PM	3.1	NE	45	0
11/20/2006	3:30 PM	2.7	NE	45	0
11/20/2006	3:40 PM	3.6	NNE	22.5	0
11/20/2006	3:50 PM	4	NE	45	0
11/20/2006	4:00 PM	2.7	NE	45	0
11/20/2006	4:10 PM	3.1	NNE	22.5	0
11/20/2006	4:20 PM	2.2	NNE	22.5	0
11/20/2006	4:30 PM	2.7	NE	45	0
11/20/2006	4:40 PM	3.1	NE	45	0
11/20/2006	4:50 PM	2.7	NE	45	0
11/20/2006	5:00 PM	2.2	NNE	22.5	0
11/20/2006	5:10 PM	2.7	NE	45	0
11/20/2006	5:20 PM	3.1	NNE	22.5	0
11/20/2006	5:30 PM	3.1	N	0	0
11/20/2006	5:40 PM	2.2	NNE	22.5	0
11/20/2006	5:50 PM	1.8	NE	45	0
11/20/2006	6:00 PM	2.2	NE	45	0
11/20/2006	6:10 PM	1.8	NE	45	0
11/20/2006	6:20 PM	2.2	NE	45	0
11/20/2006	6:30 PM	1.8	NNE	22.5	0
11/20/2006	6:40 PM	1.8	NNE	22.5	0
11/20/2006	6:50 PM	1.8	NE	45	0
11/20/2006	7:00 PM	1.3	NNE	22.5	0
11/20/2006	7:10 PM	0.4	N	0	0
11/20/2006	7:20 PM	0.4	N	0	0
11/20/2006	7:30 PM	0.4	N	0	0
11/20/2006	7:40 PM	0.4	NE	45	0
11/20/2006	7:50 PM	0	NE	45	0
11/20/2006	8:00 PM	0.4	E	90	0
11/20/2006	8:10 PM	0	ENE	67.5	0
11/20/2006	8:20 PM	0	---		0
11/20/2006	8:30 PM	0	ENE	67.5	0
11/20/2006	8:40 PM	0	ENE	67.5	0
11/20/2006	8:50 PM	0	---		0
11/20/2006	9:00 PM	0	ENE	67.5	0
11/20/2006	9:10 PM	0.4	WNW	292.5	0

11/20/2006	9:20 PM	0	WNW	292.5	0
11/20/2006	9:30 PM	0.4	WNW	292.5	0
11/20/2006	9:40 PM	0.4	SSW	202.5	0
11/20/2006	9:50 PM	0	---		0
11/20/2006	10:00 PM	0	WSW	247.5	0
11/20/2006	10:10 PM	0	WSW	247.5	0
11/20/2006	10:20 PM	0	---		0
11/20/2006	10:30 PM	0	---		0
11/20/2006	10:40 PM	0	---		0
11/20/2006	10:50 PM	0	---		0
11/20/2006	11:00 PM	0	---		0
11/20/2006	11:10 PM	0	---		0
11/20/2006	11:20 PM	0	---		0
11/20/2006	11:30 PM	0	---		0
11/20/2006	11:40 PM	0	---		0
11/20/2006	11:50 PM	0	WSW	247.5	0
11/21/2006	12:00 AM	0	---		0
11/21/2006	12:10 AM	0	---		0
11/21/2006	12:20 AM	0	NNW	337.5	0
11/21/2006	12:30 AM	0.9	NNW	337.5	0
11/21/2006	12:40 AM	1.3	N	0	0
11/21/2006	12:50 AM	1.3	N	0	0
11/21/2006	1:00 AM	1.3	N	0	0
11/21/2006	1:10 AM	1.3	N	0	0
11/21/2006	1:20 AM	0.9	N	0	0
11/21/2006	1:30 AM	0.4	NNE	22.5	0
11/21/2006	1:40 AM	0.4	NNE	22.5	0
11/21/2006	1:50 AM	0.9	NNE	22.5	0
11/21/2006	2:00 AM	0.4	N	0	0
11/21/2006	2:10 AM	0.4	SW	225	0
11/21/2006	2:20 AM	0.4	SSW	202.5	0
11/21/2006	2:30 AM	0.4	SSW	202.5	0
11/21/2006	2:40 AM	0.4	SSW	202.5	0
11/21/2006	2:50 AM	0.4	SSW	202.5	0
11/21/2006	3:00 AM	0	SSW	202.5	0
11/21/2006	3:10 AM	0.4	S	180	0
11/21/2006	3:20 AM	0.4	S	180	0
11/21/2006	3:30 AM	0	S	180	0
11/21/2006	3:40 AM	0	S	180	0
11/21/2006	3:50 AM	0	S	180	0
11/21/2006	4:00 AM	0	S	180	0
11/21/2006	4:10 AM	0	---		0
11/21/2006	4:20 AM	0	S	180	0
11/21/2006	4:30 AM	0	S	180	0
11/21/2006	4:40 AM	0	S	180	0
11/21/2006	4:50 AM	0	S	180	0
11/21/2006	5:00 AM	0	S	180	0
11/21/2006	5:10 AM	0	---		0
11/21/2006	5:20 AM	0	---		0
11/21/2006	5:30 AM	0	---		0
11/21/2006	5:40 AM	0	---		0
11/21/2006	5:50 AM	0	---		0

11/21/2006	6:00 AM	0	---		0
11/21/2006	6:10 AM	0	---		0
11/21/2006	6:20 AM	0	---		0
11/21/2006	6:30 AM	0	---		0
11/21/2006	6:40 AM	0	---		0
11/21/2006	6:50 AM	0	---		0
11/21/2006	7:00 AM	0	S	180	0
11/21/2006	7:10 AM	0	S	180	0
11/21/2006	7:20 AM	0	---		0
11/21/2006	7:30 AM	0	---		0
11/21/2006	7:40 AM	0	S	180	0
11/21/2006	7:50 AM	0	S	180	0
11/21/2006	8:00 AM	0.4	E	90	0
11/21/2006	8:10 AM	0.4	E	90	0
11/21/2006	8:20 AM	1.3	NNE	22.5	0
11/21/2006	8:30 AM	1.3	NNE	22.5	0
11/21/2006	8:40 AM	0.9	NNE	22.5	0
11/21/2006	8:50 AM	1.8	N	0	0
11/21/2006	9:00 AM	1.3	NNE	22.5	0
11/21/2006	9:10 AM	0.4	NE	45	0
11/21/2006	9:20 AM	0.4	SSE	157.5	0
11/21/2006	9:30 AM	0.4	S	180	0
11/21/2006	9:40 AM	0.4	S	180	0
11/21/2006	9:50 AM	1.8	WNW	292.5	0
11/21/2006	10:00 AM	3.1	WNW	292.5	0
11/21/2006	10:10 AM	3.1	W	270	0
11/21/2006	10:20 AM	3.6	W	270	0
11/21/2006	10:30 AM	2.7	W	270	0
11/21/2006	10:40 AM	2.7	W	270	0
11/21/2006	10:50 AM	1.8	W	270	0
11/21/2006	11:00 AM	2.7	W	270	0
11/21/2006	11:10 AM	2.2	W	270	0
11/21/2006	11:20 AM	2.7	W	270	0
11/21/2006	11:30 AM	2.7	WSW	247.5	0
11/21/2006	11:40 AM	1.3	NW	315	0
11/21/2006	11:50 AM	1.8	W	270	0
11/21/2006	12:00 PM	2.2	W	270	0
11/21/2006	12:10 PM	3.1	NW	315	0
11/21/2006	12:20 PM	3.1	W	270	0
11/21/2006	12:30 PM	2.7	W	270	0
11/21/2006	12:40 PM	2.7	W	270	0
11/21/2006	12:50 PM	4	NW	315	0
11/21/2006	1:00 PM	3.1	NW	315	0
11/21/2006	1:10 PM	2.7	WSW	247.5	0
11/21/2006	1:20 PM	1.8	WSW	247.5	0
11/21/2006	1:30 PM	2.7	W	270	0
11/21/2006	1:40 PM	2.7	W	270	0
11/21/2006	1:50 PM	2.2	W	270	0
11/21/2006	2:00 PM	3.1	WNW	292.5	0
11/21/2006	2:10 PM	2.2	NNW	337.5	0
11/21/2006	2:20 PM	1.8	NW	315	0
11/21/2006	2:30 PM	2.2	WNW	292.5	0

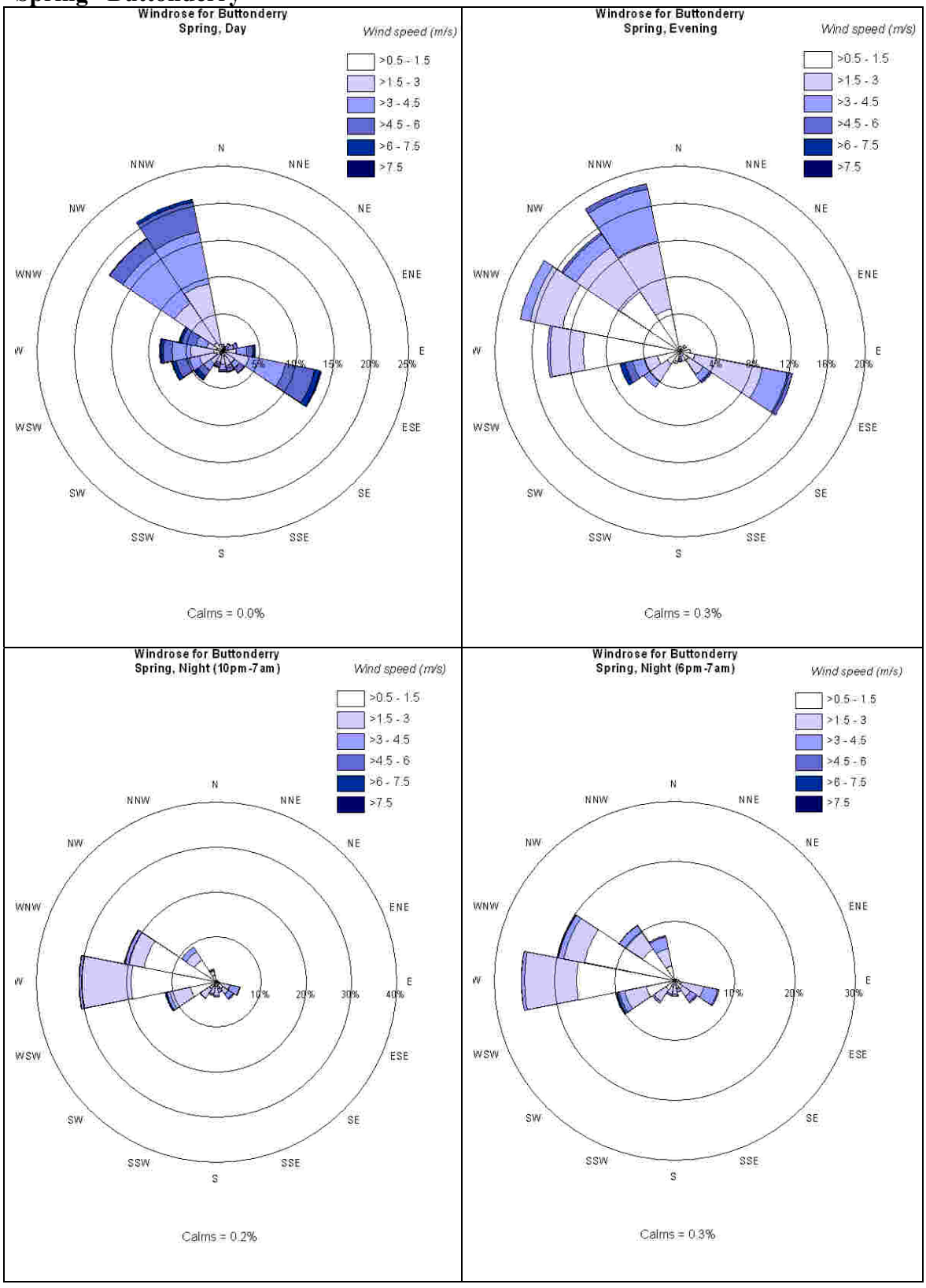
11/21/2006	2:40 PM	1.8	NNE	22.5	0
11/21/2006	2:50 PM	3.1	NNE	22.5	0
11/21/2006	3:00 PM	2.2	NNE	22.5	0
11/21/2006	3:10 PM	3.1	NNE	22.5	0
11/21/2006	3:20 PM	4	NNE	22.5	0
11/21/2006	3:30 PM	4	NNE	22.5	0
11/21/2006	3:40 PM	2.2	NNE	22.5	0
11/21/2006	3:50 PM	3.1	NNE	22.5	0
11/21/2006	4:00 PM	3.1	NNE	22.5	0
11/21/2006	4:10 PM	3.6	NNE	22.5	0
11/21/2006	4:20 PM	3.1	NNE	22.5	0
11/21/2006	4:30 PM	2.7	NE	45	0
11/21/2006	4:40 PM	2.2	NE	45	0
11/21/2006	4:50 PM	2.7	NE	45	0
11/21/2006	5:00 PM	2.7	NE	45	0
11/21/2006	5:10 PM	2.2	NE	45	0
11/21/2006	5:20 PM	1.8	NNE	22.5	0
11/21/2006	5:30 PM	1.3	NNE	22.5	0
11/21/2006	5:40 PM	1.3	NNE	22.5	0
11/21/2006	5:50 PM	0.4	NNE	22.5	0
11/21/2006	6:00 PM	0.4	N	0	0
11/21/2006	6:10 PM	1.3	SW	225	0
11/21/2006	6:20 PM	1.3	NNE	22.5	0
11/21/2006	6:30 PM	0.4	NNW	337.5	0
11/21/2006	6:40 PM	0.9	N	0	0
11/21/2006	6:50 PM	0.9	NNW	337.5	0
11/21/2006	7:00 PM	1.3	N	0	0
11/21/2006	7:10 PM	1.8	N	0	0
11/21/2006	7:20 PM	1.3	N	0	0
11/21/2006	7:30 PM	1.3	N	0	0
11/21/2006	7:40 PM	0.9	N	0	0
11/21/2006	7:50 PM	1.3	N	0	0
11/21/2006	8:00 PM	1.3	N	0	0
11/21/2006	8:10 PM	1.3	N	0	0
11/21/2006	8:20 PM	1.8	N	0	0
11/21/2006	8:30 PM	1.8	N	0	0
11/21/2006	8:40 PM	1.8	NNW	337.5	0
11/21/2006	8:50 PM	2.2	N	0	0
11/21/2006	9:00 PM	1.8	N	0	0
11/21/2006	9:10 PM	2.2	NNE	22.5	0
11/21/2006	9:20 PM	2.2	N	0	0
11/21/2006	9:30 PM	1.8	NNW	337.5	0
11/21/2006	9:40 PM	0.9	NNW	337.5	0
11/21/2006	9:50 PM	1.3	NNE	22.5	0
11/21/2006	10:00 PM	1.3	N	0	0
11/21/2006	10:10 PM	1.3	N	0	0
11/21/2006	10:20 PM	1.8	N	0	0
11/21/2006	10:30 PM	1.3	N	0	0
11/21/2006	10:40 PM	1.3	NNW	337.5	0
11/21/2006	10:50 PM	1.8	N	0	0
11/21/2006	11:00 PM	1.8	N	0	0
11/21/2006	11:10 PM	1.3	N	0	0

11/21/2006	11:20 PM	1.3	N	0	0
11/21/2006	11:30 PM	1.3	N	0	0
11/21/2006	11:40 PM	0.9	NNW	337.5	0
11/21/2006	11:50 PM	1.3	N	0	0
11/22/2006	12:00 AM	0.9	NNW	337.5	0
11/22/2006	12:10 AM	1.3	NNW	337.5	0
11/22/2006	12:20 AM	1.3	N	0	0
11/22/2006	12:30 AM	1.3	NNW	337.5	0
11/22/2006	12:40 AM	2.2	NW	315	0
11/22/2006	12:50 AM	2.7	NNW	337.5	0
11/22/2006	1:00 AM	3.1	NW	315	0
11/22/2006	1:10 AM	3.6	WNW	292.5	0
11/22/2006	1:20 AM	4	WNW	292.5	0
11/22/2006	1:30 AM	4	WNW	292.5	0
11/22/2006	1:40 AM	4	WNW	292.5	0
11/22/2006	1:50 AM	4	WNW	292.5	0
11/22/2006	2:00 AM	4	WNW	292.5	0
11/22/2006	2:10 AM	4	WNW	292.5	0
11/22/2006	2:20 AM	4.5	WNW	292.5	0
11/22/2006	2:30 AM	3.6	WNW	292.5	0
11/22/2006	2:40 AM	4	WNW	292.5	0
11/22/2006	2:50 AM	4.5	W	270	0
11/22/2006	3:00 AM	3.1	W	270	0
11/22/2006	3:10 AM	3.6	WNW	292.5	0
11/22/2006	3:20 AM	4.5	WNW	292.5	0
11/22/2006	3:30 AM	4.5	W	270	0
11/22/2006	3:40 AM	4.5	W	270	0
11/22/2006	3:50 AM	4	WNW	292.5	0
11/22/2006	4:00 AM	4	WNW	292.5	0
11/22/2006	4:10 AM	4	WNW	292.5	0
11/22/2006	4:20 AM	4.9	WNW	292.5	0
11/22/2006	4:30 AM	4.5	W	270	0
11/22/2006	4:40 AM	4	W	270	0
11/22/2006	4:50 AM	4	WNW	292.5	0
11/22/2006	5:00 AM	4	W	270	0
11/22/2006	5:10 AM	4	W	270	0
11/22/2006	5:20 AM	4.5	W	270	0
11/22/2006	5:30 AM	3.6	WNW	292.5	0
11/22/2006	5:40 AM	3.6	WNW	292.5	0
11/22/2006	5:50 AM	4	WNW	292.5	0
11/22/2006	6:00 AM	3.6	WNW	292.5	0
11/22/2006	6:10 AM	4	WNW	292.5	0
11/22/2006	6:20 AM	3.6	WNW	292.5	0
11/22/2006	6:30 AM	4.5	WNW	292.5	0
11/22/2006	6:40 AM	4.5	WNW	292.5	0
11/22/2006	6:50 AM	4.5	WNW	292.5	0
11/22/2006	7:00 AM	4	WNW	292.5	0
11/22/2006	7:10 AM	3.6	WNW	292.5	0
11/22/2006	7:20 AM	3.6	WNW	292.5	0
11/22/2006	7:30 AM	3.1	NW	315	0
11/22/2006	7:40 AM	2.7	NW	315	0
11/22/2006	7:50 AM	4	NW	315	0

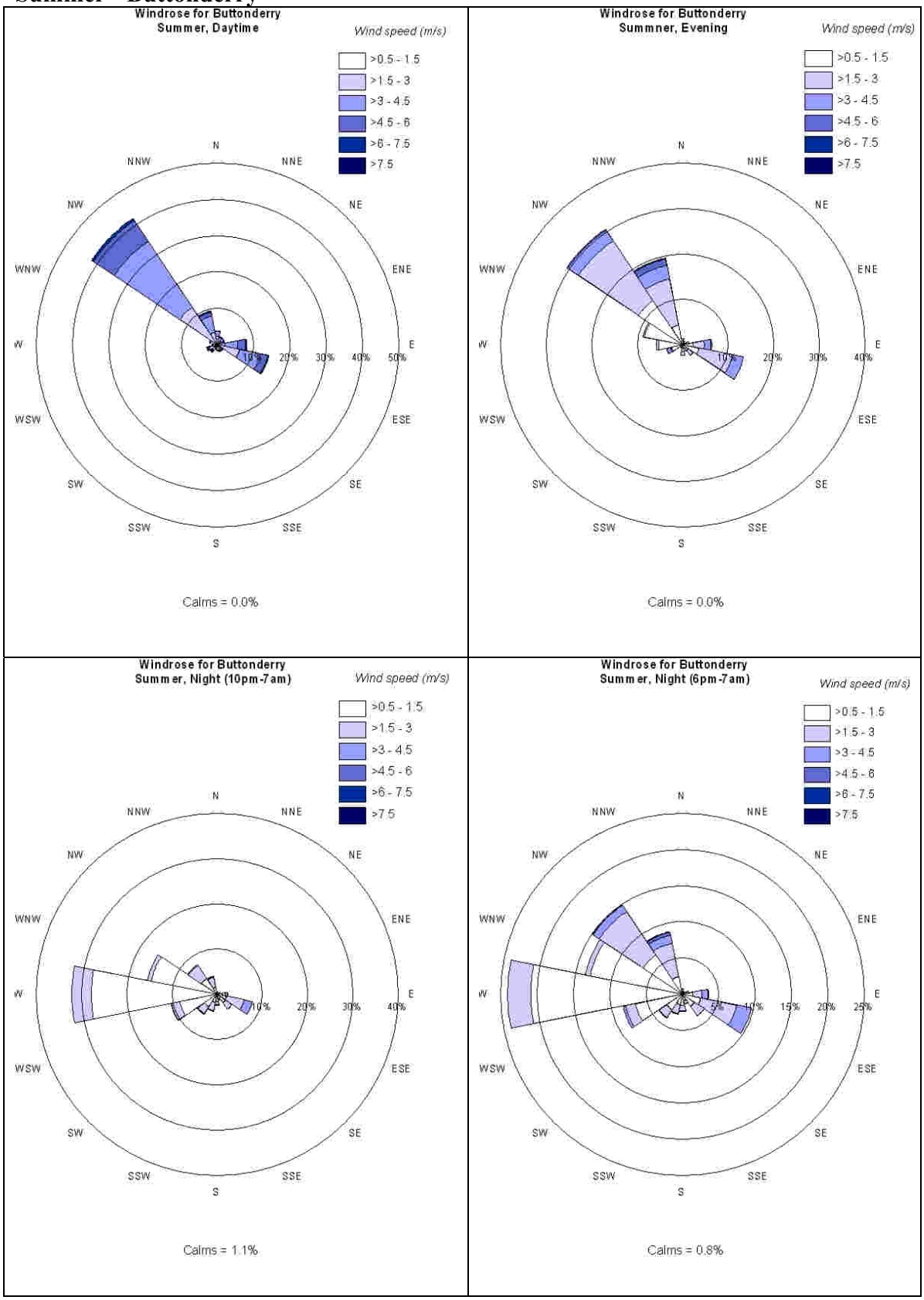
11/22/2006	8:00 AM	3.1	NW	315	0
11/22/2006	8:10 AM	3.6	NW	315	0
11/22/2006	8:20 AM	3.6	NW	315	0
11/22/2006	8:30 AM	3.6	NW	315	0
11/22/2006	8:40 AM	4.5	NW	315	0
11/22/2006	8:50 AM	4.9	NW	315	0
11/22/2006	9:00 AM	4	WNW	292.5	0
11/22/2006	9:10 AM	4.9	WNW	292.5	0
11/22/2006	9:20 AM	5.8	WNW	292.5	0
11/22/2006	9:30 AM	5.4	WNW	292.5	0
11/22/2006	9:40 AM	5.8	WNW	292.5	0
11/22/2006	9:50 AM	5.4	WNW	292.5	0
11/22/2006	10:00 AM	5.8	WNW	292.5	0
11/22/2006	10:10 AM	5.8	WNW	292.5	0
11/22/2006	10:20 AM	5.4	WNW	292.5	0
11/22/2006	10:30 AM	6.3	WNW	292.5	0
11/22/2006	10:40 AM	6.3	WNW	292.5	0
11/22/2006	10:50 AM	6.3	WNW	292.5	0
11/22/2006	11:00 AM	6.7	WNW	292.5	0
11/22/2006	11:10 AM	6.7	WNW	292.5	0
11/22/2006	11:20 AM	6.7	WNW	292.5	0
11/22/2006	11:30 AM	4.9	WNW	292.5	0
11/22/2006	11:40 AM	4.9	NW	315	0

ATTACHMENT 4: LOCAL METEOROLOGY CONDITIONS

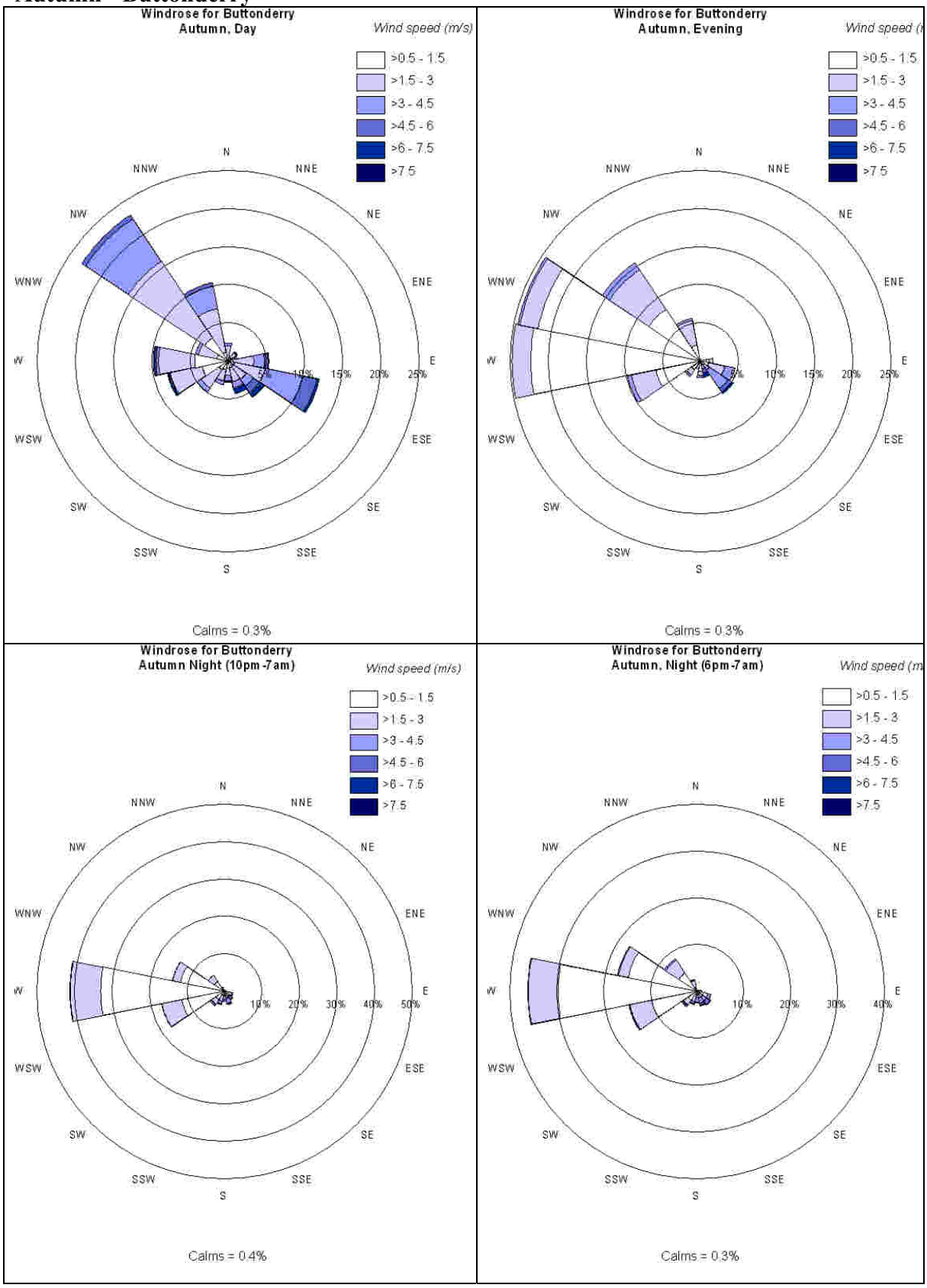
Spring –Buttonderry



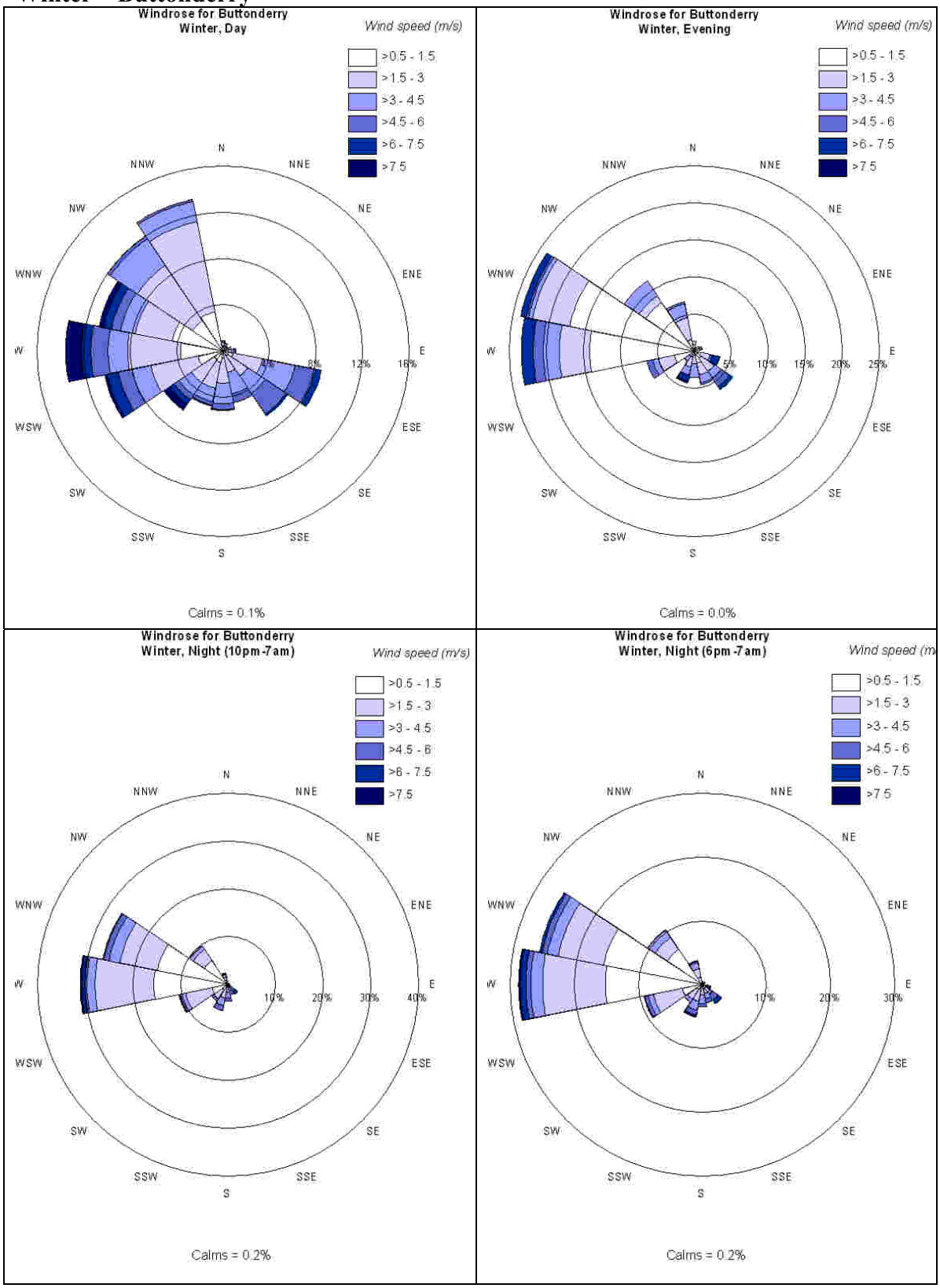
Summer - Buttonderry



Autumn - Buttonderry



Winter – Buttonderry



ALL PASQUILL STABILITY CLASSES (BUTTONDERRY)

Wind Speed Class (m/s)

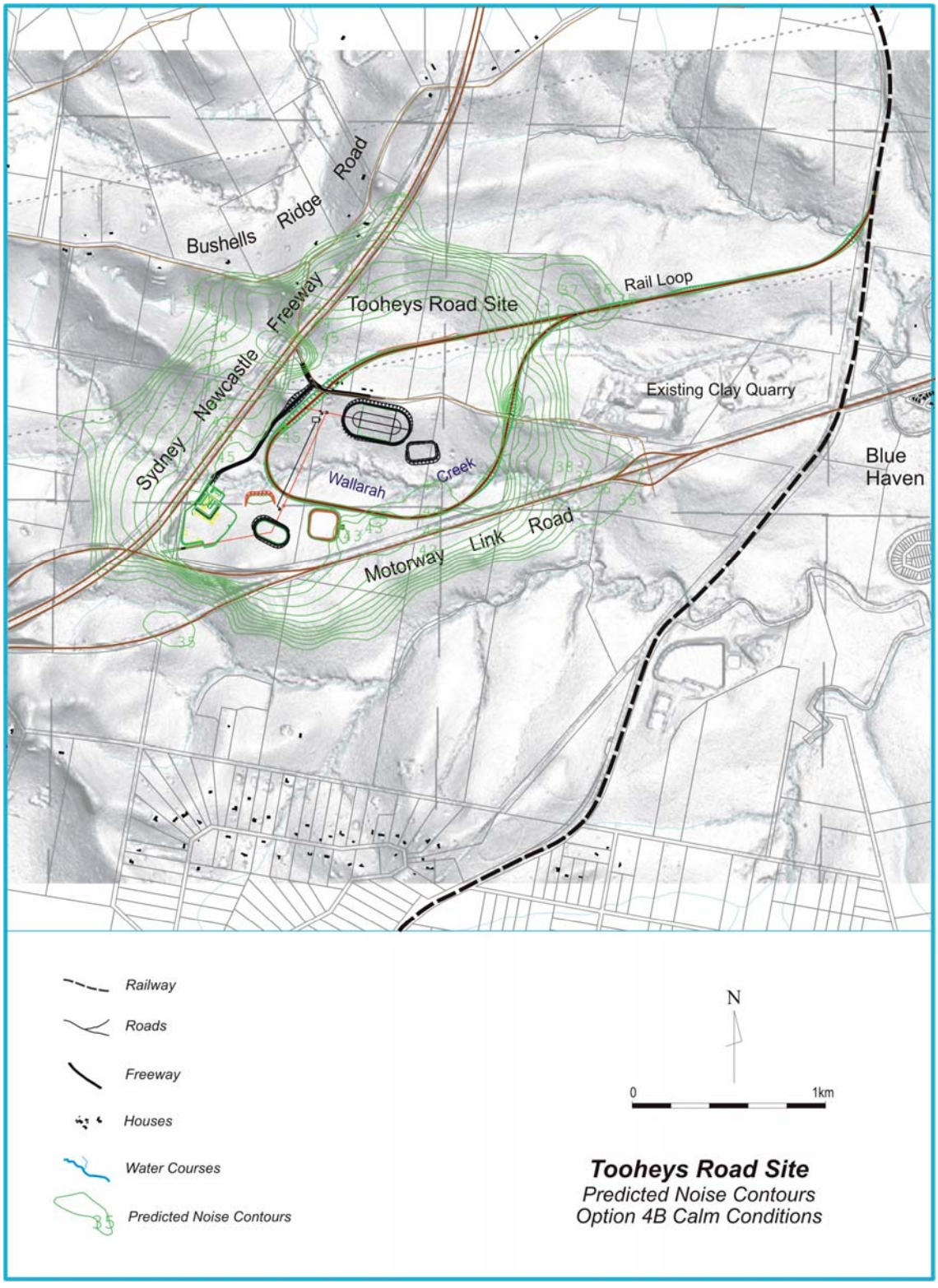
WIND SECTOR	0.50 TO 1.50	1.50 TO 3.00	3.00 TO 4.50	4.50 TO 6.00	6.00 TO 7.50	7.50 TO 9.00	9.00 TO 10.50	GREATER THAN 10.50	TOTAL
NNE	0.002415	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.002415
NE	0.002415	0.001208	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.003623
ENE	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
E	0.001208	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.001208
ESE	0.000000	0.000000	0.000000	0.001208	0.002415	0.000000	0.000000	0.000000	0.003623
SE	0.003623	0.002415	0.001208	0.009662	0.007246	0.000000	0.000000	0.000000	0.024155
SSE	0.003623	0.002415	0.007246	0.008454	0.000000	0.000000	0.000000	0.000000	0.021739
S	0.002415	0.013285	0.012077	0.007246	0.000000	0.000000	0.000000	0.000000	0.035024
SSW	0.004831	0.024155	0.015700	0.010870	0.000000	0.000000	0.000000	0.000000	0.055556
SW	0.013285	0.022947	0.004831	0.000000	0.000000	0.000000	0.000000	0.000000	0.041063
WSW	0.033816	0.056763	0.008454	0.003623	0.001208	0.001208	0.000000	0.000000	0.105072
W	0.155797	0.123188	0.016908	0.004831	0.006039	0.003623	0.000000	0.000000	0.310386
WNW	0.150966	0.080918	0.022947	0.010870	0.002415	0.000000	0.000000	0.000000	0.268116
NW	0.060386	0.027778	0.008454	0.001208	0.000000	0.000000	0.000000	0.000000	0.097826
NNW	0.009662	0.006039	0.006039	0.002415	0.001208	0.000000	0.000000	0.000000	0.025362
N	0.001208	0.001208	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.002415
CALM									0.002415
TOTAL	0.445652	0.362319	0.103865	0.060386	0.020531	0.004831	0.000000	0.000000	1.000000

MEAN WIND SPEED (m/s) = 2.16
NUMBER OF OBSERVATIONS = 828

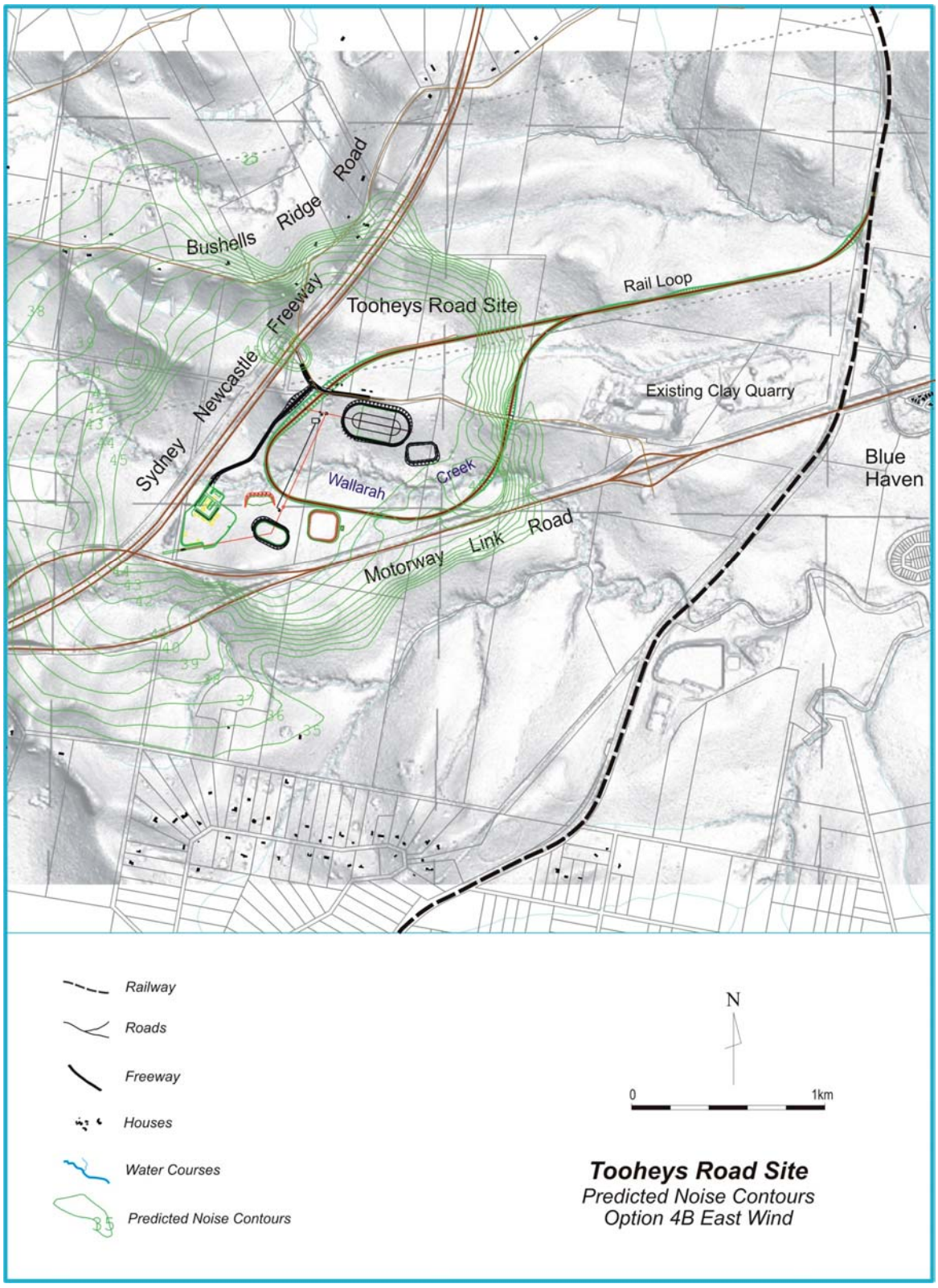
FREQUENCY OF OCCURENCE OF STABILITY CLASSES

A : 0.0%
B : 0.0%
C : 0.0%
D : 40.1%
E : 27.7%
F : 32.2%

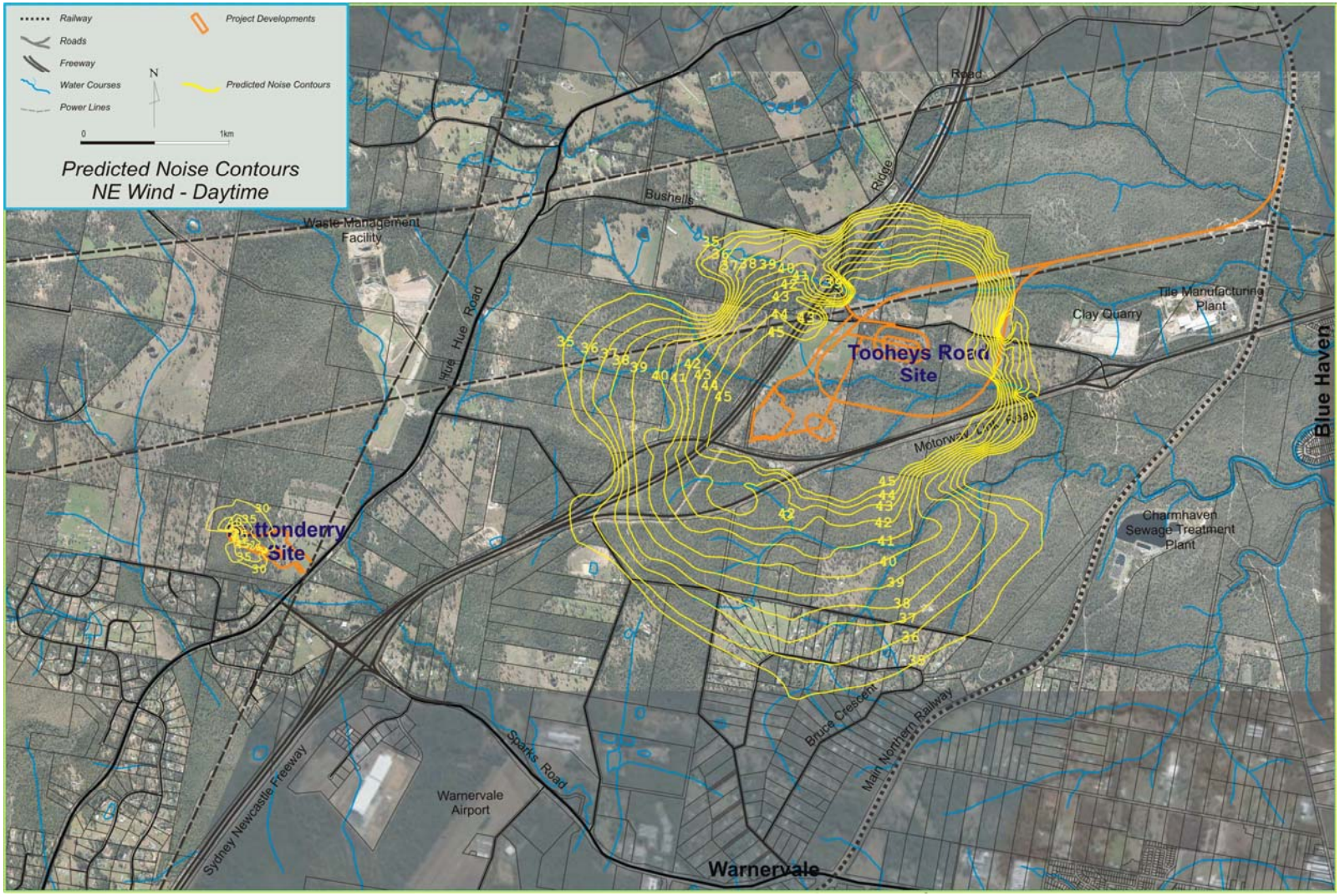
ATTACHMENT 5: TOOHEYS ROAD OPERATIONAL (CALM)



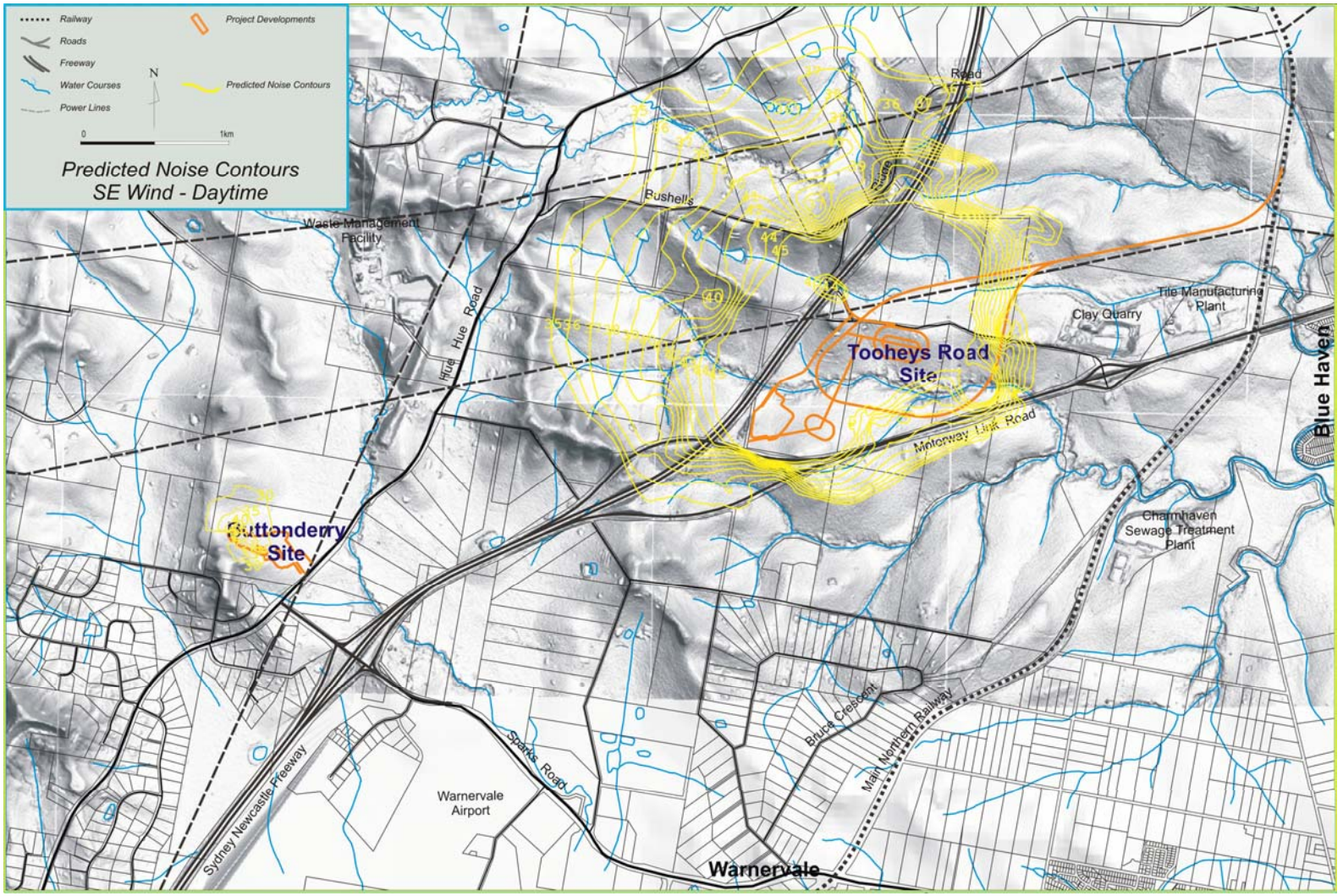
ATTACHMENT 6: TOOHEYS ROAD OPERATIONAL (EAST WIND)



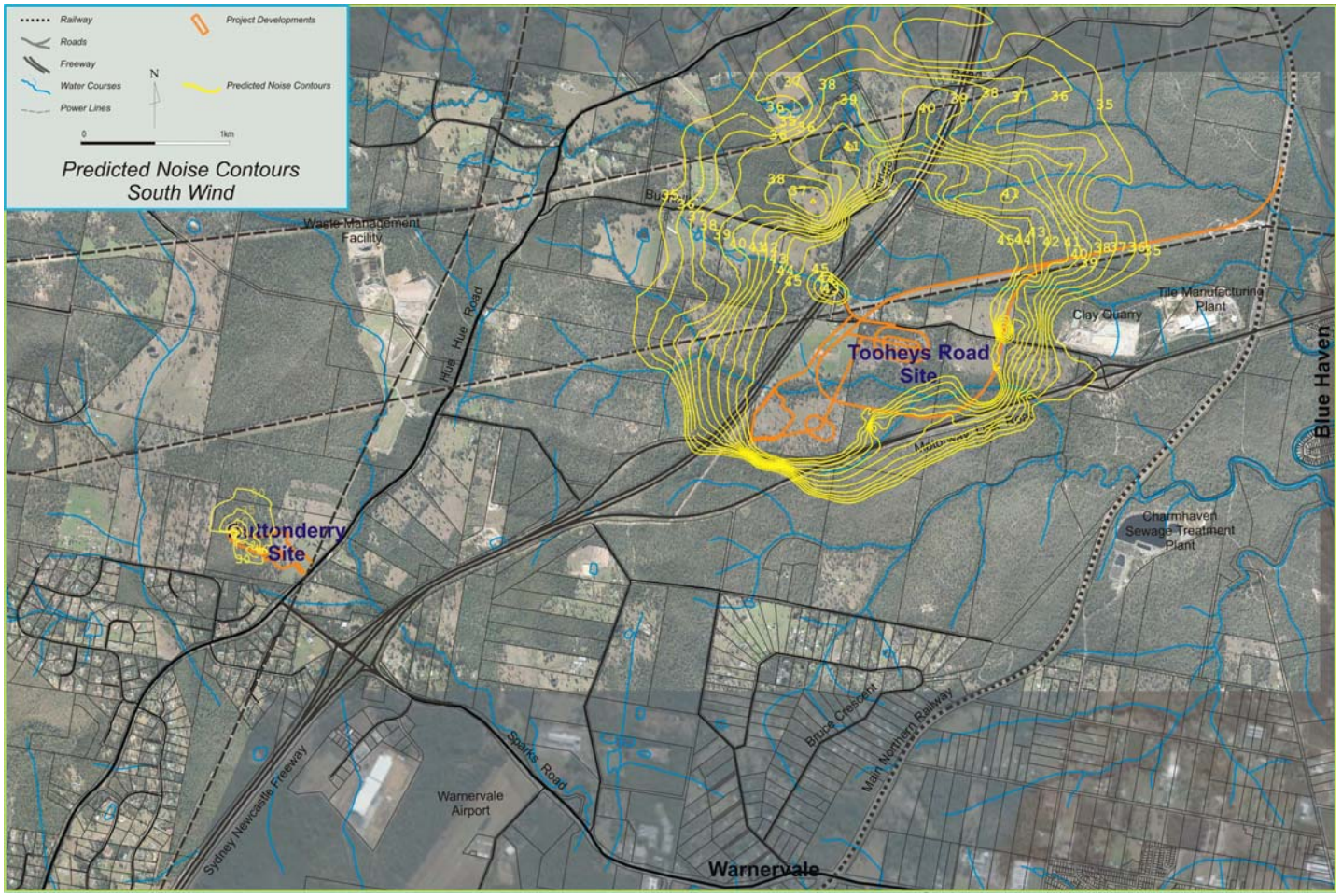
ATTACHMENT 7: TOOHEYS ROAD OPERATIONAL (NORTH-EAST WIND)



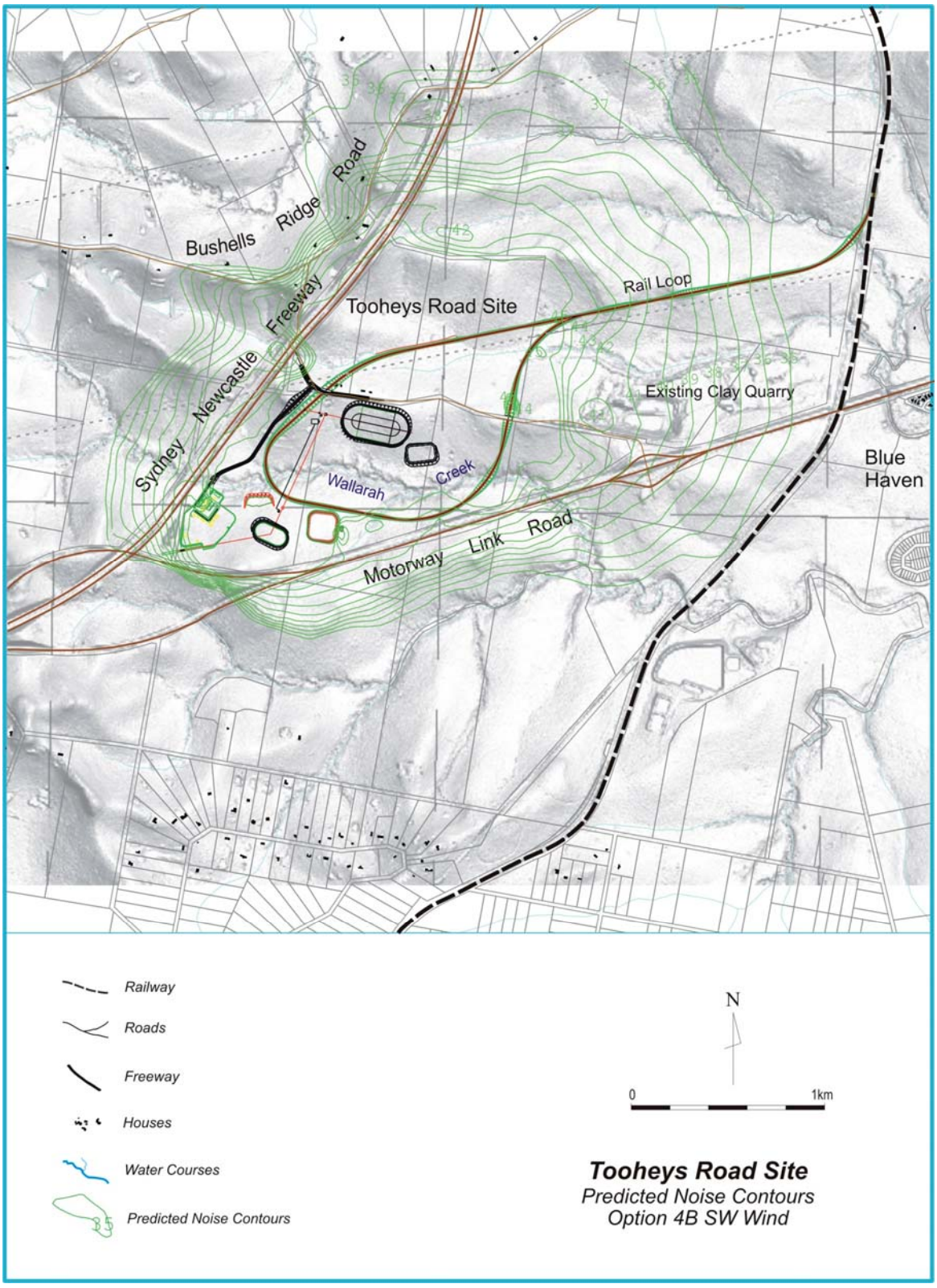
ATTACHMENT 8: TOOHEYS ROAD OPERATIONAL (SOUTH-EAST WIND)



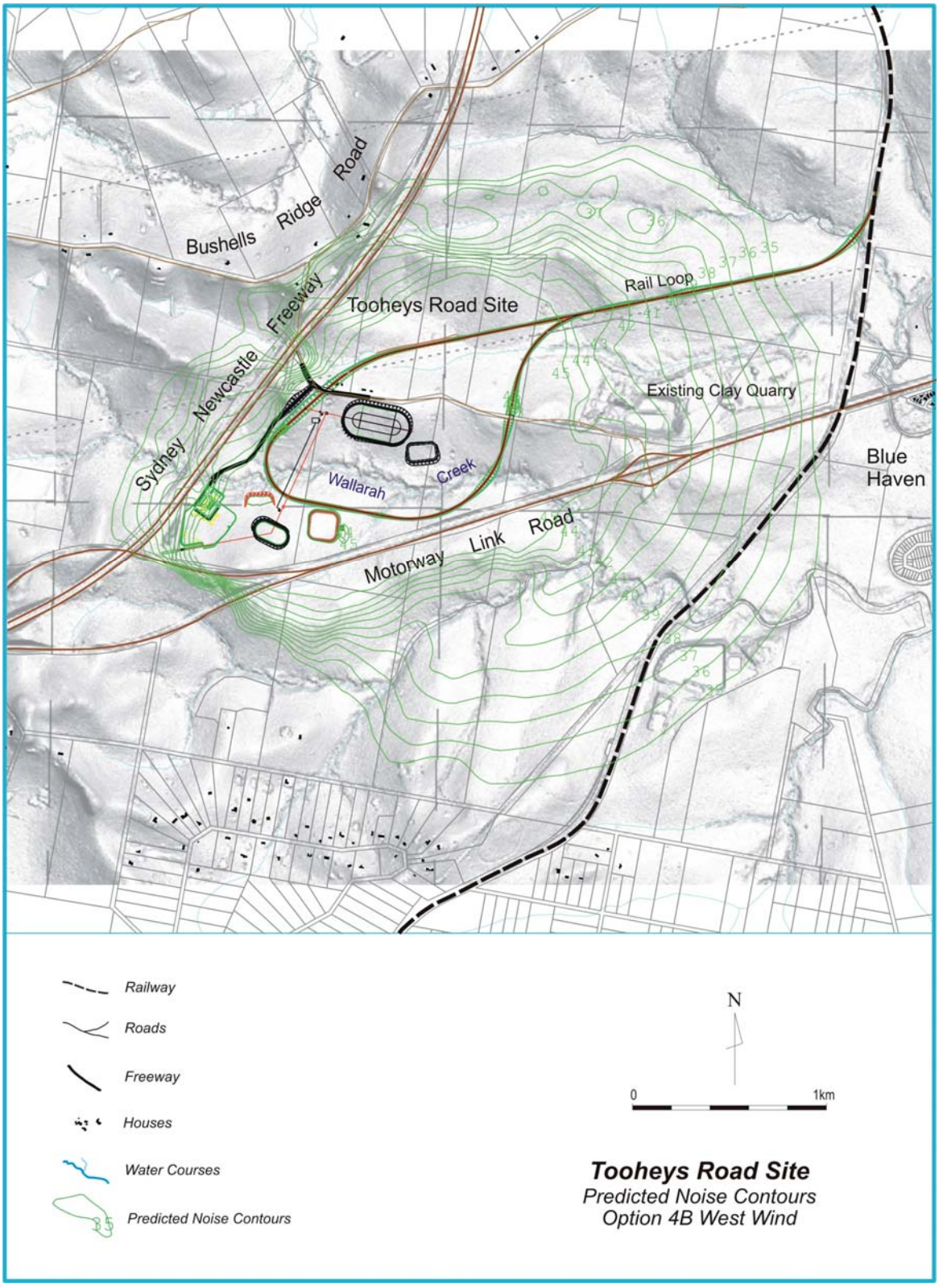
ATTACHMENT 9: TOOHEYS ROAD OPERATIONAL (SOUTH WIND)



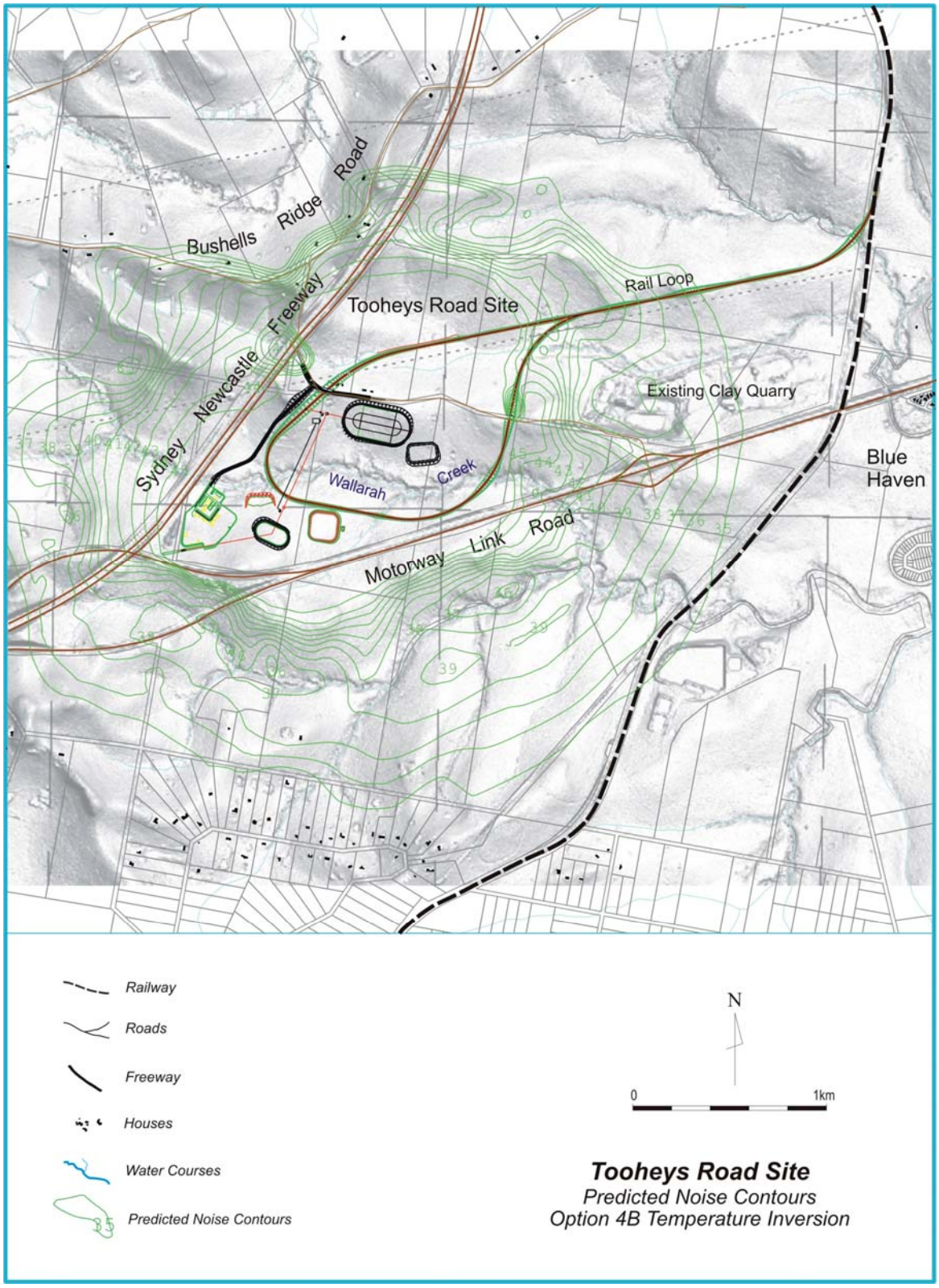
ATTACHMENT 10: TOOHEYS ROAD OPERATIONAL (SOUTH-WEST WIND)



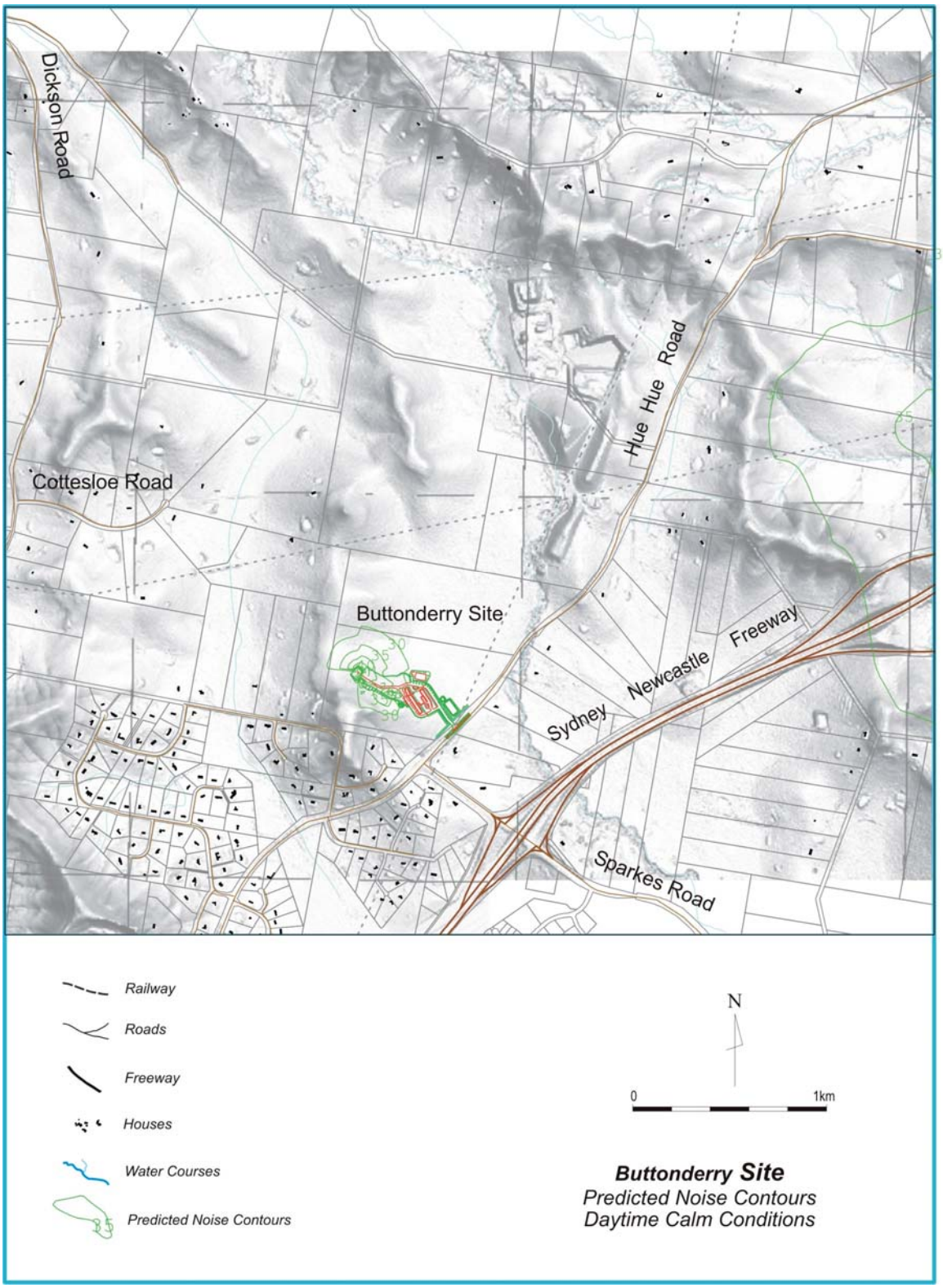
ATTACHMENT 11: TOOHEYS ROAD OPERATIONAL (WEST WIND)



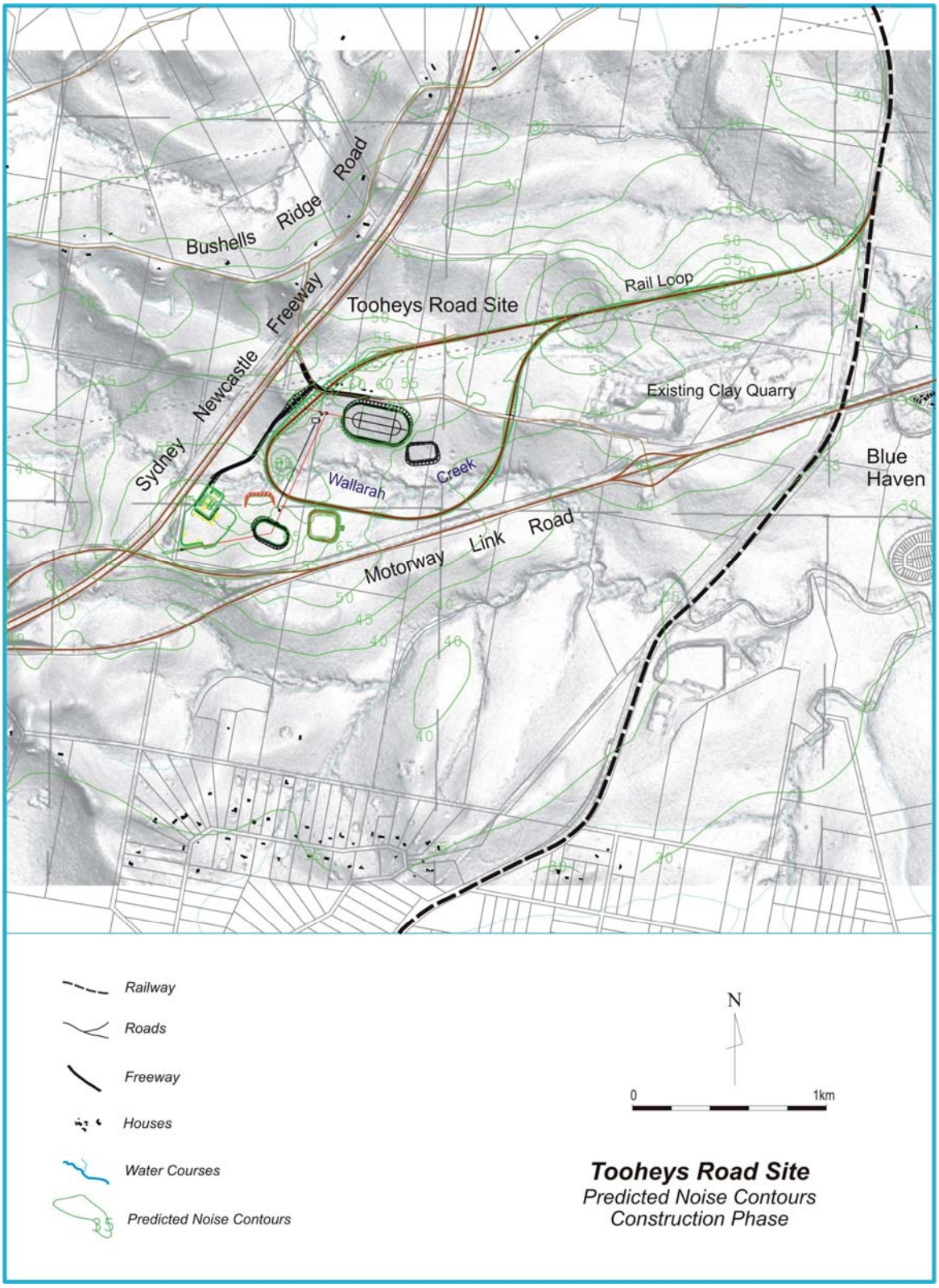
ATTACHMENT 12: TOOHEYS ROAD OPERATIONAL (TEMP. INVERSION)



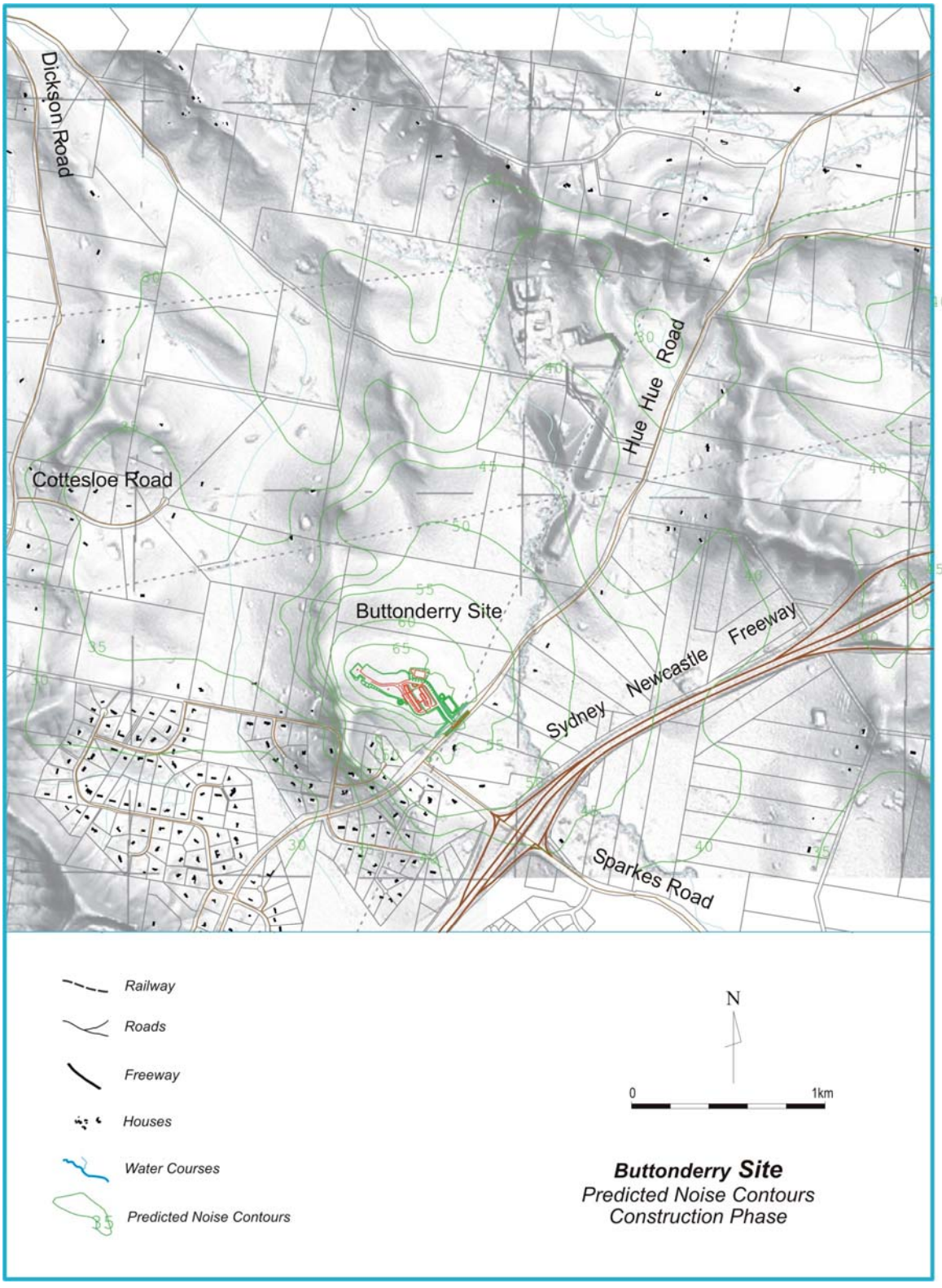
ATTACHMENT 13: BUTTONDERRY OPERATIONAL NOISE (CALM)



ATTACHMENT 14: TOOHEYS ROAD CONSTRUCTION



ATTACHMENT 15: BUTTONDERRY SITE CONSTRUCTION



ATTACHMENT 16: TERMS AND DEFINITIONS

A-Weighted: See dB(A)

Adverse weather: Weather effects that enhance noise (that is, wind and temperature inversion) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more that 30% of the nights in winter).

Ambient noise: The all-encompassing noise associated within a given environment. It is the composite of sounds from many sources, both near and far.

Assessment background level (ABL): The single figure background level representing each assessment period-day, evening and night (that is, three assessment background levels are determined for each 24-h period of the monitoring period). Its determination is by the tenth percentile method.

Assessment period: The period in a day over which assessments are made: day (0700-0800h), evening (1800 to 2200h) or night (2200 to 0700h).

Background Noise: The underlying level of noise present in the ambient noise, excluding the noise source under extraneous noise is removed. This is described using the L_{A90} descriptor.

Cumulative noise level: Refers to the total level of noise from all sources.

Day: The period between 0700 and 1800hrs (Monday-Saturday) and 0800-1800 (Sunday and Public Holidays).

dB: Abbreviation for decibel-a unit of sound measurement. Given sound pressure to a reference pressure.

dB(A): Unit used to measure "A-weighted" sound pressure levels. A-weighting is an adjustment made to sound level measurement to approximate the response of the human ear.

A change of 1dB(A) or dB(A) in the level of a sound is difficult to detect, whilst a 3dB(A) to 5dB(A) change corresponds to a small but noticeable change in loudness. A 10dB(A) change corresponds to an approximate doubling or halving in loudness.

The table below lists examples of typical noise levels.

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120 110	Heavy rock concert Grinding on steel	Very noisy
100 90	Loud car hone at 3m Construction site with pneumatic hammering	Noisy
80 70	Kerbside of busy street Loud radio or TV	Loud
60 50	Department store General Office	Moderate to quiet
40 30	Inside private office Inside bedroom	Quiet to very quite
20	Unoccupied recording studio	Almost silent

Default parameters: In assessing meteorological enhancement of noise, refers to set values for weather parameters, such as wind speeds and temperature gradients, to be used in predicting source noise levels.

Equivalent Continuous Noise Levels: The level of noise equivalent to the energy average of noise levels occurring over a measurement period.

Evening: Refers to the period between 1800-2200hrs.

Extraneous Noise: Noise resulting from activities that are not typical of the area. Atypical activities may include construction, and traffic generated by holiday periods and by special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous.

Feasible and reasonable measures: Feasibility relates to engineering considerations and what is practical to build; reasonableness relates to the application of judgement in arriving at a decision, taking into account the following factors:

- noise mitigation benefits (amount of noise reduction provided, number of people protected)
- cost of mitigation (cost of mitigation versus benefits provided)
- community views (aesthetic impacts and community wishes)
- noise levels for affected land uses (existing and future levels, and changes in noise levels).

Fluctuating Noise: Noise that varies continuously and to an appreciable extent over the period of observation.

Greenfield site: Undeveloped land.

Impulsive Noise: Noise having a high peak of short duration, or a sequence of such peaks. A sequence of such peaks. A sequence of such impulses in rapid succession is termed 'repetitive impulsive noise'.

Intrusive Noise: refers to noise that intrudes above the background level by more than 5 decibels.

L_{A90}: The A-weighted sound pressure level that is exceeded for 90% of the time over which a given sound is measured. This is considered to represent the background noise.

L_{Aeq}: The equivalent continuous noise level – the level of noise equivalent to the energy average of noise levels occurring over a measurement period.

Long-term annoyance: Prolonged annoyance over months and years.

Median: The middle value in a number of values sorted in ascending or descending order. Hence, for an odd number of values, the value of the median is simply the middle value. If there is an even number of values the median is the arithmetic average of the two middle values.

Meteorological conditions: wind and temperature inversion conditions.

Most-affected locations(s): Locations that experience (or will experience) offensive noise from the noise source under consideration. In determining these locations, one needs to consider existing background levels, exact noise source locations(s), distance from source (or proposed source) to receiver, and any shielding between source and receiver.

Negotiated agreement: An agreement involving the negotiation of an achievable noise limit in cases where the project specific noise levels cannot be met. The agreement is negotiated between the proponent and the EPA or the proponent and the community. Such an agreement is reached through balancing the merits of a development, the feasibility and reasonableness of available mitigation measures and the noise impacts produced.

Night: The period between 2200 and 0700 (Monday-Saturday) and 2200-0800 (Sunday and Public Holidays)

Noise criteria: The general set of non-mandatory noise level targets for protecting against intrusive noise (for example, background noise plus 5dB) and loss of amenity (for example, noise levels for various land uses).

Non-mandatory: With reference to the proposed policy, means not required by legislation. The proposed policy specifies criteria to be strived for, but the legislation does not make these criteria compulsory. However, the policy will be used as a guide to setting statutory (legally enforceable) limits for licences and consents.

Performed-based goals: Goals specified in terms of the outcomes/performance to be achieved, but not in terms of the means of achieving them.

Rating Background Level (RBL): the overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period (as opposed to over each 24-h period used for the assessment background level). This is the level used for assessment purposed. It is defined as the median value of:

- all the day assessment background levels over the monitoring period for the day
- all the evening assessment background levels over the monitoring period for the evening; or
- all the night assessment background levels over the monitoring period for the night.

Receiver: The noise-sensitive land at which noise from a development can be heard.

Stationary noise sources: Sources that do not generally move from place to place, eg. industrial or commercial sources. In general, these include:

Individual stationary sources such as:

- heating, ventilating and air conditioning (HVAC) equipment,
- rotating machinery,
- impacting mechanical sources,
- other mechanical equipment and machinery such as conveyors.

Mobile sources confined to particular location such as draglines and haul trucks.

Facilities, usually comprising many sources of sound, including:

- industrial premises,
- extractive industries,
- commercial premises,
- warehousing facilities,
- maintenance and repair facilities.

(In this case, the stationary source is understood to encompass all the activities taking place within the property boundary of the facility).

Temperature inversion: An atmospheric condition where temperature increases with height above the ground.