Technical Paper

D1

Noise Impact Assessment - Event

NOISE IMPACT ASSESSMENT REPORT
PREPARED FOR
NORTH BYRON PARKLANDS

Prepared for: North Byron Parklands

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CONTENTS PAGE

TABLES PAGE

FIGURES PAGE

ATTACHMENTS

EXECUTIVE SUMMARY

A noise impact assessment report has been prepared in respect of a concurrent Concept Plan and Project Application Environmental Assessment Report (EA) for the North Byron Parklands (Parklands) project on behalf of Billinudgel Property Trust (Billinudgel Property Pty Ltd).

The noise impact assessment has contained all the elements that enable the community, the proponents and the regulatory authorities to be aware of the noise management strategies available for such a significant project.

The noise impact assessment has involved one on one community consultation during placing of the noise loggers and during attended monitoring.

The nearest residents have been visited and the purpose of the noise assessment discussed.

As a result of discussions with a resident at Yelgun, the noise modelling has included wind in the direction of the site towards all immediate and distant residences considered to capture the music noise receiving areas. The noise predictions are therefore worst case. This approach demonstrates the fairness and removal of any bias in undertaking the noise impact assessment.

A wide coverage of the rural residences has therefore being conducted. Residents who have allowed noise logging have requested a hard copy of the noise impact assessment when the EA is lodged.

Equally important to the assessment of the rural-residential noise environment has been the assessment of the potential for ecological noise disturbance.

Fortunately the authors are able to draw on past experience monitoring ecological noise levels at sensitive areas albeit within a quiet area of Sydney Olympic Park at Newington Armoury.

An ecological monitoring programme would be undertaken based on this experience as part of the Noise Management Strategy proposed for the Site's activities.

The report discusses the appropriateness of noise criteria to be applied to the various activities that are proposed.

The Site has several immediate residences that are in conflict with the proposed development. Experience at other major greenfield sites has shown that this is to be expected and respected.

The Site proposes to hold a limited number of major events in a year with typically 12 days in total being required (in a year). A major event would be similar to Australia's foremost multiple day music event Splendour in the Grass.

This event is unique in that patrons are able to camp on site and enjoy a range of entertainment and social activities without having to find transport or drive from the site. Splendour in the Grass provides a unique format that is appreciated by the younger members of society and typically is able to attract 30,000 – 35,000 patrons. The major event acoustically assessed for this noise impact assessment is the stage and venue layout typical to Splendour in the Grass.

There are however numerous strategies available to provide protection of a reasonable acoustic amenity especially past the official night time period of 10.00pm.

These strategies have been in place across many projects that have been approved by the Local Council's, Department of Planning and in several instances are licensed by the Department of Environment, Climate Change and Water (DECCW). Hence the projects are in the public domain.

The use of any outdoor venue for music requires a reasonable and fair compromise between what is a reasonable level of noise for an event and the level of the music needed for patrons.

These two aspects are partially in conflict however a noise management strategy is able to assist the community in accepting the potential intrusion.

This is based on first hand experience. It has also been found that there will be a resident or pocket of residents who will be annoyed by any level of music that is audible.

The noise criteria required for outdoor music venues varies significantly from the traditional background +5 dB(A) noise applied to noise generating activities from commercial and industrial activities.

A review of noise criteria applied in the UK and across Australia has been undertaken and provided in detail in the report. The noise criteria recommended by many consent authorities recognise the need for higher residential noise levels than the traditional background +5 dB(A).

From our experience the noise criteria recommended are in agreement with the noise levels found to be reasonable for outdoor concert venues. There will be disagreement with some residents and the noise management strategy provides practical solutions to this situation.

The project proposes a range of venues. Each of these has been assessed for potential noise impact. A range of noise control solutions have also been provided where exceedances of the music industry acoustic criteria are predicted.

The noise control strategies have reduced the number of residences where music noise levels will be exceeded to one (1) during a major concert equivalent to Splendour in the Grass.

The Site provides numerous advantages for the holding of such an event. The noise exceedances of the music industry acoustic criteria applied in the UK and across Australia is unable to be met at this one (1) residence directly opposite the site. A strategy to address reasonable solutions to this situation has been developed.

In conclusion the noise impact assessment has found that the music industry acoustic criteria will be readily satisfied at the majority of the rural residences. The music levels will alter the lifestyle of the nearest affected residents being in Jones Road and the conflict with their lifestyle is unable to be completely resolved. A similar situation existed with other major projects the Principal Consultant of Benbow Environmental has assessed. A similar change has no doubt been accepted by the presence of the Pacific Highway.

The proposed development with the noise management strategy is able to be in harmony with the acoustic environment of the majority of rural residences within the immediate vicinity of the site.

The number of large scale events needs to be kept in context. It is proposed that 12 days per year would be occupied by these events. This, from the author's experience is not significant.

The acoustic designs of the smaller venues that will clearly be more frequent are able to achieve reasonable music noise levels.

Approval of the project is requested.

1. INTRODUCTION

This report is prepared in respect of a concurrent Concept Plan and Project Application Environmental Assessment report (EA) for the North Byron Parklands (Parklands) project. This EA has been prepared on behalf of Billinudgel Property Trust (Billinudgel Property Pty. Ltd.).

The project is to establish a world class sustainable cultural events site within an enhanced ecological setting.

Cultural events involving music, arts, food, leisure and technology are proposed at the Parklands located at Tweed Valley Way/Jones Road, Yelgun.

The Noise Impact Assessment examines the noise level criteria, predicts the level of noise at the nearest potentially affected sensitive receivers and details the noise monitoring that has been undertaken in the absence of these events.

Continuous noise monitoring has been undertaken throughout the residential precincts using two measuring techniques:

- Attended noise monitoring; and
- Unattended noise monitoring at seven (7) reference locations chosen to cover the nearest most potentially affected noise sensitive locations in the residential areas.

For the purpose of this assessment, several site layouts have been assumed in the predictive modelling process. These assumed site configurations are presented in the Attachments section of this report for information purposes only. Further sample site layouts of minor events and events at 100% capacity have been provided as a general guide.

The site layouts detail minor events with a single stage to a larger event with multiple stages. The potential noise impacts due to these proposed site layouts are predicted and analysed.

Suitable noise mitigation strategies are then evaluated in order to minimise any adverse noise impacts to the local community. These strategies examine all technically feasible and reasonable means available from our experience in developing noise management plans for outdoor music venues.

During the preparation of the noise assessment report, consultation has taken place with the immediate residents on at least two occasions. As each resident is potentially affected by different background noise levels and music noise levels, individual consultation is preferred.

In devising appropriate noise criteria research was undertaken of criteria adopted in Australia and in the UK.

There is a general recognition that outdoor music venues need levels of noise for patrons that result in noise levels in a range typically experienced by residence near to roadways. Therefore to provide a successful music venue and assist residents with the change in noise levels that are to be expected, a set of acoustic design objectives need to be developed. These would be presented in a noise management strategy finalised during the assessment of the development application.

2. EVENT INFORMATION

The cultural events will involve music, arts, food, leisure and technology and comprise a range of events from music festivals, field days, expos, gymkhanas and other gatherings of people. Music events would vary in their hours of operation. Typically, music with live bands (main music source) would operate between 11am and midnight with quieter music (secondary music sources) operating at other times.

The events, while being primarily musical, will include a range of ancillary activities such as provision of food and refreshments with some events involving camping. The proposed event categories are described as follows:

- Minor event – less than 300 patrons;
- Small event – 300 patrons to 3000 patrons;
- Moderate event – 3000 patrons to 10,000 patrons; and
- 100% capacity event – greater than 10,000 patrons.

There are several scenarios that were considered and these are summarised below. Example site layouts are presented in Attachment 3 of this report.

The modelling scenarios range from 'Minor' to '100% Capacity'. For each scenario there are different configurations. These are described below.

What changes occur are:

- the number of patrons attending the event;
- the number of campers;
- the number of days the event may be presented;
- the number of stages provided; and
- the location and orientation of the stage.

The approach of considering a large number of possible scenarios enabled the proponent's team to be in a position to consider all reasonable and technically feasible means of managing potential noise levels.

Noise modelling was undertaken for each scenario.

Table 2-1: Minor (300 patrons max)		
Scenario	Configuration	Number
Minor – Example A	Event capacity Campers Number of stages Multiple days Hours: Noon to 11pm 11pm to 3am	300 300 1
Minor – Example B	Event capacity Campers Number of stages Multiple days Hours: Noon to 11pm 11pm to 3am	300 300 1
Minor – Example C	Event capacity No camping Number of stages Multiple days Hours: Noon to 11pm 11pm to 3am	300 1
Minor – Example D	Event capacity Campers Number of stages Multiple days Hours: Noon to 11pm 11pm to 3am	300 300 1

The Small event scenarios have an increase in the number of patrons and campers.

Table 2-2: Small (3,000 patrons max)

Scenario	Configuration	Number
Small – Example A	Event capacity Campers Number of stages Multiple days Hours: Noon to 11pm 11pm to 3am	3,000 3,000 1
Small – Example B	Event capacity No camping Number of stages Single day Hours: Noon to 11pm 11pm to 3am	3,000 1
Small – Example C	Event capacity Campers Number of stages Multiple days Hours: Noon to 11pm 11pm to 3am	3,000 3,000 1
Small – Example D	Event capacity Campers Multiple stages Multiple days Hours: Noon to 11pm 11pm to 3am	3,000 1,500

The Moderate event scenarios have an increase in the number of patrons and campers.

Table 2-3: Moderate (10,000 patrons max)		
Scenario	Configuration	Number
Moderate – Example A	Event capacity Campers Multiple stages Multiple days Hours: Noon to 11pm 11pm to 3am	10,000 10,000
Moderate – Example A	Event capacity Campers Multiple stages Multiple days Hours: Noon to 11pm 11pm to 3am	10,000 10,000
Moderate – Example A	Event capacity Campers Multiple stages Multiple days Hours: Noon to 11pm 11pm to 3am	10,000 10,000

The 30% Capacity Field Day scenario is a single day agricultural exhibition and trade show.

Table 2-4: 30% Capacity		
Scenario	Configuration	Number
30% Capacity Example Field Day	Event capacity No stages Single day Hours: Noon to 11pm	15,000

The 40% Capacity scenarios have an increase in the number of patrons and campers.

Table 2-5: 40% Capacity

Scenario	Configuration	Number
40% Capacity Example A	Event capacity Campers Multiple stages Multiple days Hours: Noon to 11pm 11pm to 3am	20,000 20,000
40% Capacity Example B	Event capacity No camping Single stage Single day Hours: Noon to 11pm 11pm to 3am	20,000
40% Capacity Example C	Event capacity Campers Multiple stages Multiple days Hours: Noon to 11pm 11pm to 3am	20,000 20,000

Initially it would be expected that the '70% Capacity' event would be the only event of this size conducted.

Table 2-6: 70% Capacity

Scenario	Configuration	Number
70% Capacity Example A	Event capacity Campers Multiple stages Multiple days Hours: Noon to 11pm 11pm to 3am	35,000 25,000
70% Capacity Example B	Event capacity Campers Multiple stages Multiple days Hours: Noon to 11pm 11pm to 3am	35,000 25,000

The 100% Capacity scenarios are the major events. It is expected that up to three of these could occur in a year in future. The development would therefore require at least 12 days a year when a major event would occur with main stages operating till midnight. Flexibility in the number of major events in the future would be expected provided the outcomes learnt from three major events a year are reasonable as evaluated by the consent authority.

Table 2-7: 100% Capacity

Scenario	Configuration	Number
100% Capacity Example A	Event capacity Campers Multiple stages Multiple days Hours: Noon to midnight for main stages, bars and cafes Private staff bar till 4am Staggered start and finish 11pm to 3am Chai Tea Tent: 24 hour	50,000 25,000
100% Capacity Example B	Event capacity Campers Multiple stages Multiple days Hours: Noon to midnight for main stages, bars and cafes. Private staff bar till 4am Staggered start and finish 11pm to 3am Chai Tea Tent: 24 hour	50,000 25,000
100% Capacity Example C	Event capacity No camping Multiple stages Single day Hours: Noon to midnight for main stages, bars and cafes. Private staff bar till 4am Staggered start and finish 11pm to 3am Chai Tea Tent: 24 hour	50,000

2.1 Site Locality

The proposed site is at the North Byron Parklands located at Tweed Valley Way/Jones Road, Yelgun. Figure 2-1 shows the land that is the subject of the application and Figure 2-2 presents the residential receiver locations.

There are five groups of residences considered for this noise impact assessment.

Group 1 Yelgun

These are residences to the south west of the freeway that separates these residences from the 'Parklands' site. The residences are represented by Receivers R01, R02, R03 and R04. These residences do not have direct line of sight to the music venues. Receivers R03 and R04 have line of sight to the car parking site proposed for main venues.

This Group of receivers experience noise generated by the traffic flow on the Pacific Highway as the main noise source. Receivers R03 and R04 are on elevated locations hence traffic noise will be a dominant noise source.

Photographic descriptions of these locations follow:

Photograph 2.1: Receiver R03

This location was used for noise logging.

Detailed discussions of the methodology used in the noise modelling were held and led to the request to model with a wind from the venue in the direction of each residence. This was undertaken.

Noise sources in this area are the Pacific Highway which is in line of sight to the residence.

Photograph 2.2: Receiver R04

This receiver is closer to the highway and was also used for noise logging.

Group 2

These are residences along Jones Road. There are four residences currently along this road which generally follows a ridge line that separates the Billinudgel Natural Reserve from the Parklands site.

Discussions were held with three of the residents.

Of the receivers R05, R12 and R13 have been selected for the noise impact assessment. These receivers are exposed to varying levels of noise from the highway.

R12 and R13 having greater separation distances from the highway and experience reduced contribution from traffic noise. These residences are surrounded by heavy vegetation cover and natural noise sources will dominant their acoustic environment.

R05 is one of the closest receivers to the 'Parklands' site and also to the freeway. This is reflected in the noise logging data obtained at this residence.

The residents at R12 and R13 have raised many issues in our discussions and not all are related to noise disturbance expected from the music venues.

Other issues raised were:

- Security;
- Risk of the peat being set alight;
- Cultural conflict with the aboriginal heritage of this area;
- Ecological conflict;
- Lifestyle changes; and
- Undesirable negatives associated with concerts.

Photograph 2.3: Residence R12

Photograph 2.4A: Residence R05

This residence will be exposed to high music noise levels due to its position adjacent to the roadway that overlooks the 'Parklands' site. This situation is clearly understood by all parties and consultation with the residents is ongoing.

Photograph 2.4B: The site is immediately adjacent.

Group 3 Northwest

This Group of receivers are to the immediate north west of the ‘Parklands’ site and the majority are on the east side of the highway.

Receivers in this Group consist of R06, R07, R17 and R18.

Receiver R18 is a future home site, unoccupied with commanding views over the ‘Parklands’ site and the surrounding area. The receiver R17 similarly has commanding views over the adjacent land (including ‘Parklands’.

Receivers R06 and R07 have topographical shielding that will reduce noise levels propagated from the Pacific Highway and also the ‘Parklands’ site.

Photograph 2.5A: Receiver 17 has commanding views of the area.

Photograph 2.6A:

Group 4 Wooyung Road

These are the receivers located along a ridge line that follows Wooyung Road. The receivers used for the noise impact assessment were R08, R09, R10 and R11. Other receivers were also inspected to examine their locations respective to ‘Parklands’.

Noise logging was undertaken at receivers R08 and R10.

This Group of receivers are sufficiently removed from the highway that other noise sources dominate their acoustic environment e.g. local traffic, local farming activities and naturally occurring noise sources.

The receivers at R08 have topographical features preventing direct line of sight. Receivers R09 to R11 have direct line of site to the northern perimeter of the ‘Parklands’ site. There is no direct line of sight to the stages, there is shielding provided by vegetation and varying degrees of topographical differences.

Photograph 2.6B: The residence does not have direct line of sight to the site.

Photograph 2.7: Significant topographic shielding exists which supports the advantages the site provides.

Group 5

These are distant residences R14 and R15 to the south east of the 'Parklands' site. Attended noise logging was undertaken.

The location for 'Parklands' has many advantages for the proposed uses. Further discussion of these factors will be presented in a later section of this report.

During placement of noise loggers an opportunity for consultation with residents was provided. Their comments and concerns (in some cases) have been considered in the detail presented in the noise impact assessment to assist their understanding of how this assessment was conducted.

The effect of wind increasing the noise levels was considered for each residence rather than undertake the assessment for neutral weather conditions.

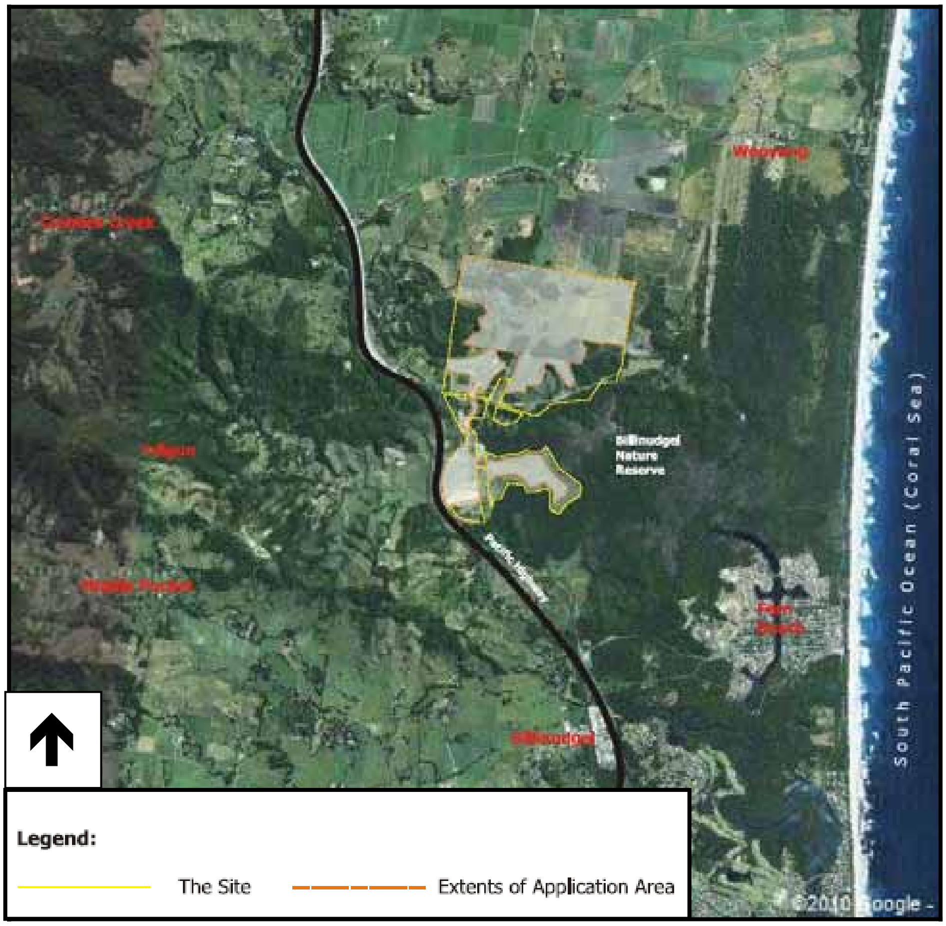
The NSW Industrial Noise Policy (INP) provides guidance on when noise enhancing meteorological (weather) conditions are used. Based on the meteorological data available from the nearest Bureau of Meteorology Station, noise enhancing conditions do not need to be considered in the design of noise controls.

However, during discussions with residents we gave the commitment to include the effects of the potential for noise enhancing winds so that the noise impact assessment was conservative.

The nearest most potentially affected residential receivers are R5, R12, R13 and R18.

Example site configurations are presented in Attachment 3 of this report.

Figure 2-1: Site Locality



This ‘Parklands’ site is shown in the figure above.

The two large land holdings are separated by Jones Road. The site being adjacent to the Pacific Highway has a source of traffic-generated high background levels that will aid in the noise management issues associated with an outdoor concert facility. The proposed site has many advantages for the proposed use.

The following Figure 2-2 shows the locations of the receivers used in the noise impact assessment R1-R17.

2.2 Ecological Noise Monitoring

The three ecological noise monitoring locations are shown on Figure 2-3. A detailed discussion of the management of ecological noise is provided in the report in Section 4. The ecological values of the land holdings on the site and on adjoining land holdings is shown on the following figure provided by ‘Parklands’ management. This is our Figure 2-4.

This figure and advice from the project’s ecologist were used to select the three ecological noise monitoring sites. These sites would be recommended to be used in the initial monitoring of concerts held at ‘Parklands’ assuming development consent is granted.

Figure 2-2: Site Locality and Residential Receiver Locations

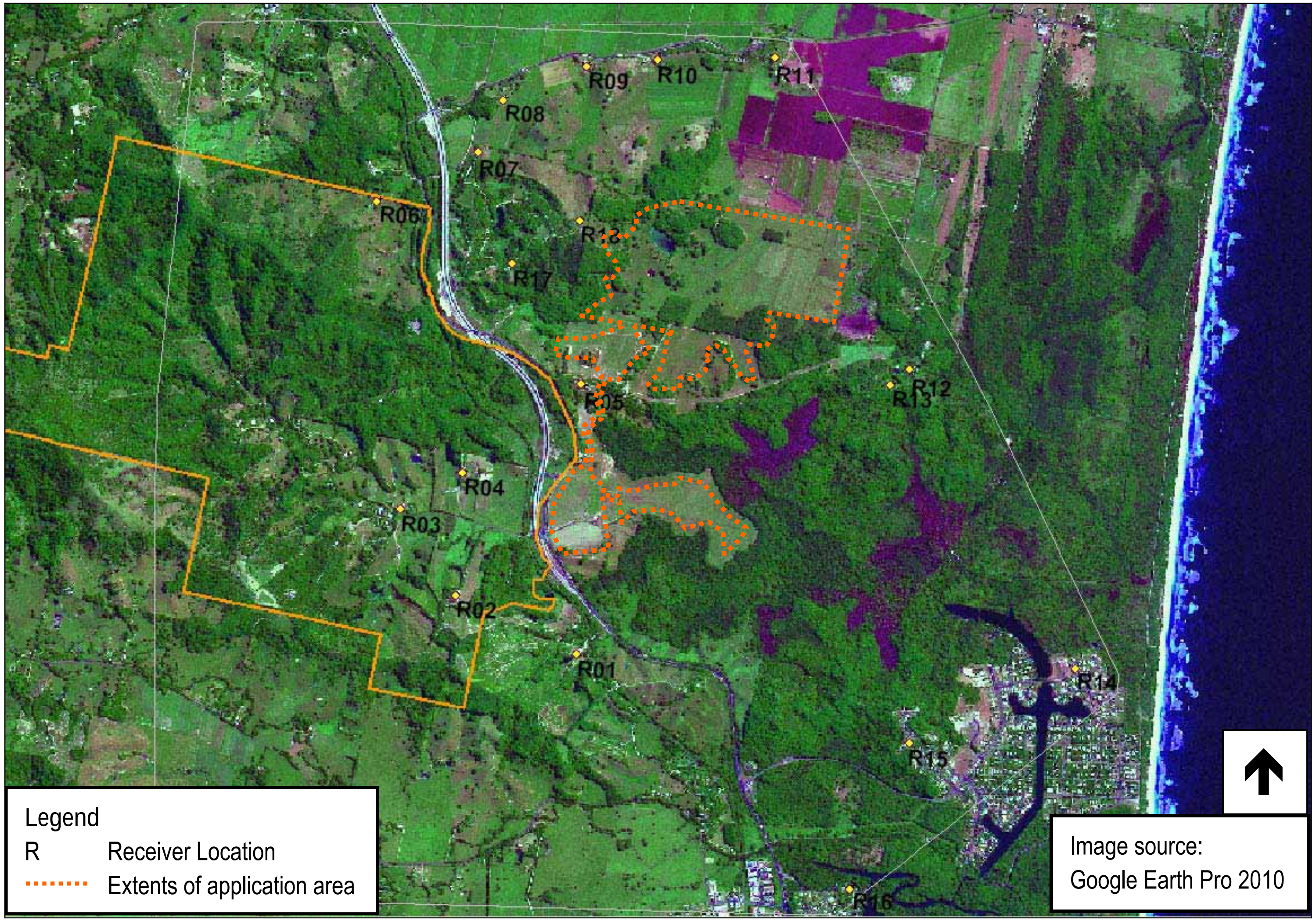
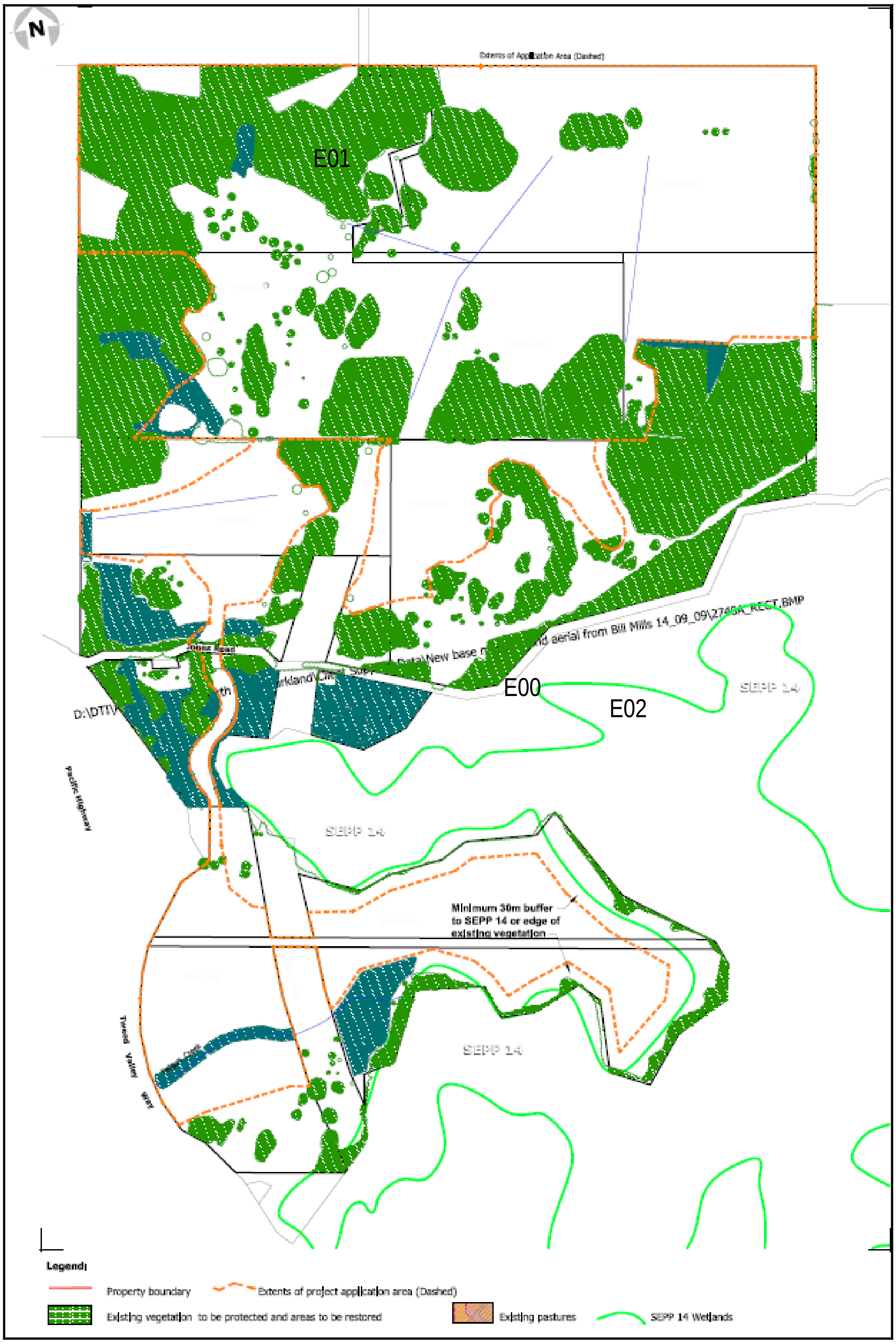
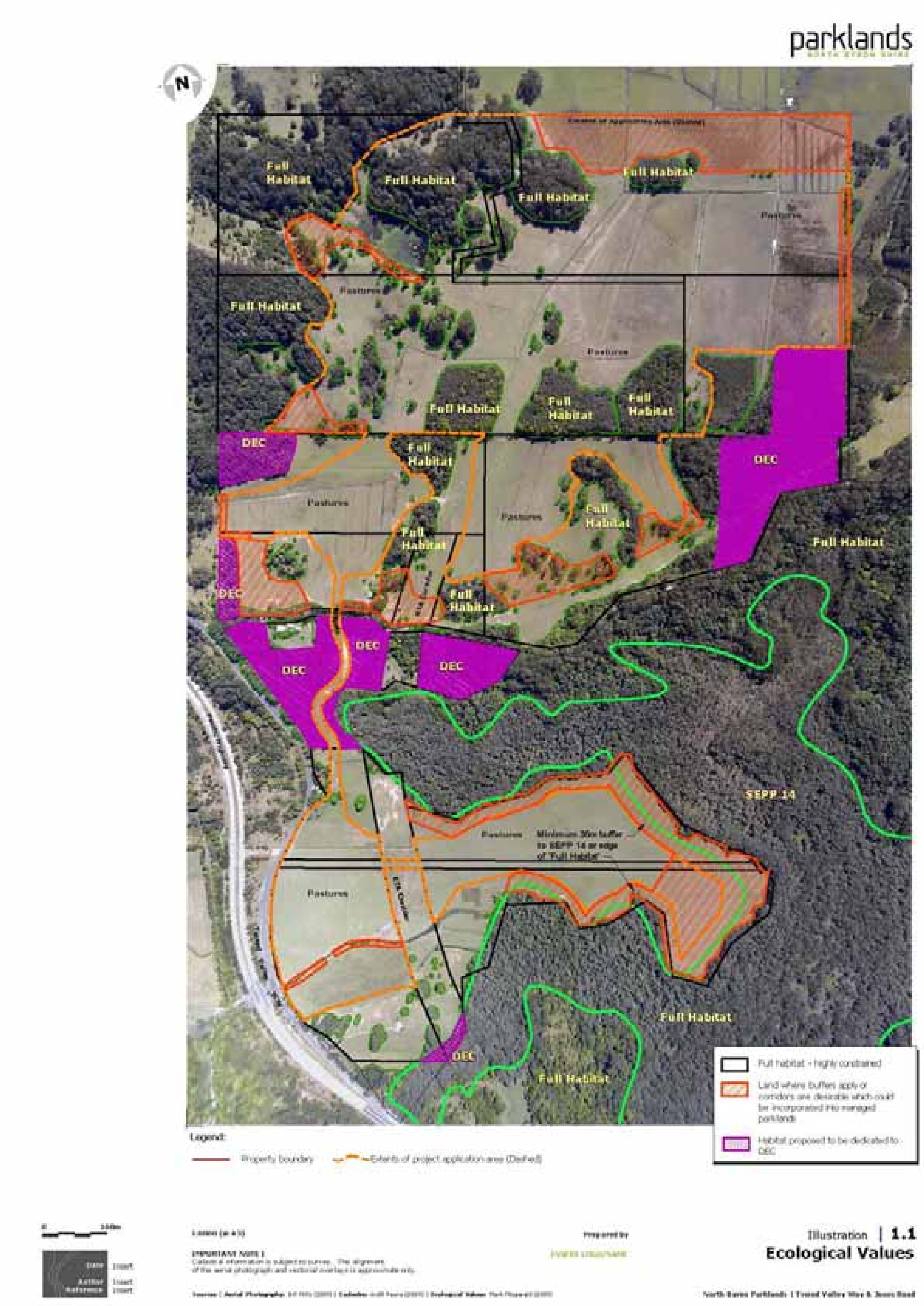


Figure 2-3: Ecological Monitoring Locations



E00	Ecological monitoring location (short-term attended)
E01	Ecological monitoring location 1 (long-term unattended)
E02	Ecological monitoring location 2 (long-term unattended)

Figure 2-4: Ecological Values



3. EXISTING AMBIENT NOISE ENVIRONMENT

Environmental noise is monitored using two techniques – unattended and attended monitoring.

Unattended monitoring was conducted using two instrument types:

- ARL Data Loggers Type 2 – These are Type 2 noise loggers.
- SVAN Precision Sound Level Meters Type 1 – These are Type 1 noise meters.

These loggers were calibrated before and after the measurement periods. Weather conditions that include rain or wind events exceeding guidelines provided in the NSW INP were removed from the data logger results presented in the results in the following tables. Data logger graphs are presented in Attachment 5.

Long term unattended monitoring was unable to identify the sources of the noise. Short term unattended monitoring uses sound recording and is able to identify the contribution from specific sources of noise. Attended monitoring is able to identify all sources. During the noise management of outdoor music events the use is also made of both types of noise monitoring. Short-term attended and long-term unattended ambient noise levels were measured at the residential receiver locations detailed below.

The residential noise monitoring locations used were shown in the Photographic Section presented in Section 2.

Repeated visits to the study area were required due to the frequent occurrence of adverse weather conditions, i.e. wet days and excessive winds. The background noise monitoring is useful as it shows the trends in noise levels during different times of the day.

The results from the monitoring assist in determining the acoustic criteria that are reasonable to consider given the likelihood of noise from outdoor venues exceeding the background levels from varying amounts at different times of the day/evening /night that the events would be expected to require to make the venue financially viable.

3.1 LONG-TERM UNATTENDED MONITORING

Long-term unattended noise monitoring was undertaken from 10 February to 1 March 2010. The loggers were strategically placed at the residential boundaries of R03, R04, R05, R07, R09, R11, R12 as shown in Figure 2-2 with two (2) additional loggers placed at ecological locations E01 and E02 as shown in Figure 2-3.

The tabulated background noise levels presented below have been used to analyse the existing ambient noise environment at the receiver locations as well as to derive conservative project-specific noise limits. Daily noise logger graphs have been included in the Attachment section.

Where logging data is unavailable due to inclement weather, further long-term noise monitoring will be undertaken at the receiver locations such as 237 Jones Road (R12).

Table 3-1: Long-term Unattended Monitoring Data - Measured Noise Levels (210 Wooyung Road)

	Average L_1			Average L_{10}			ABL (L_{90})			L_{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
10/02/2010	74	60	54	67	56	50	56	40	40	65	62	55
11/02/2010	-	59	50	-	56	47	-	42	41	-	61	46
12/02/2010	-	-	48	-	-	45	-	-	40	-	-	46
13/02/2010	-	-	49	-	-	46	-	-	39	-	-	48
14/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
15/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
16/02/2010	-	-	53	-	-	49	-	-	39	-	-	54
17/02/2010	-	-	54	-	-	49	-	-	41	-	-	52
18/02/2010	-	62	-	-	56	-	-	41	-	-	58	-
19/02/2010	-	58	-	-	54	-	-	39	-	-	60	-
20/02/2010	-	61	51	-	59	47	-	40	37	-	61	53
21/02/2010	66	61	47	59	59	44	38	40	38	60	63	48
22/02/2010	-	60	45	-	54	41	-	38	37	-	62	42
23/02/2010	67	61	47	60	56	43	35	39	36	59	62	48
24/02/2010	-	57	-	-	51	-	-	38	-	-	59	-
25/02/2010	-	-	48	-	-	44	-	-	38	-	-	46
26/02/2010	59	-	-	51	-	-	37	-	-	49	-	-
Average	67	60	50	59	56	46	*	*	*	*	*	*
Median	*	*	*	*	*	*	37	40	39	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	61	61	51

"-" indicates periods of inclement weather whereby, as per the INP, this data is to be removed from the data set

* indicates not applicable

Table 3-2: Long-term Unattended Monitoring Data - Measured Noise Levels (1 Jones Road)

	Average L_1			Average L_{10}			ABL (L_{90})			L_{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
10/02/2010	-	62	58	-	56	54	-	44	42	-	55	51
11/02/2010	-	57	58	-	54	54	-	43	41	-	52	51
12/02/2010	-	-	57	-	-	52	-	-	39	-	-	50
13/02/2010	-	-	53	-	-	48	-	-	37	-	-	47
14/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
15/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
16/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
17/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
18/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
19/02/2010	-	59	-	-	56	-	-	47	-	-	53	-
20/02/2010	-	59	-	-	54	-	-	42	-	-	58	-
21/02/2010	57	56	56	51	52	51	42	43	40	51	50	48
22/02/2010	-	56	58	-	52	53	-	41	38	-	49	50
23/02/2010	57	56	57	52	53	53	40	42	40	50	50	50
24/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
25/02/2010	-	-	58	-	-	54	-	-	39	-	-	50
26/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
27/02/2010	-	62	-	-	55	-	-	41	-	-	55	-
28/02/2010	-	59	54	55	54	50	43	43	42	63	53	48
Average	59	58	56	53	54	52	*	*	*	*	*	*
Median	*	*	*	*	*	*	42	43	40	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	59	54	50

"-" indicates periods of inclement weather whereby, as per the INP, this data is to be removed from the data set

* indicates not applicable

Table 3-3: Long-term Unattended Monitoring Data - Measured Noise Levels (44 Yelgun Road)

	Average L_1			Average L_{10}			ABL (L_{90})			L_{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
11/02/2010	-	61	58	-	56	55	-	46	48	-	56	52
12/02/2010	-	-	59	-	-	55	-	-	47	-	-	53
13/02/2010	-	-	57	-	-	53	-	-	44	-	-	51
14/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
15/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
16/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
17/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
18/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
19/02/2010	-	62	-	-	56	-	-	47	-	-	58	-
20/02/2010	-	61	-	-	55	-	-	46	-	-	55	-
21/02/2010	61	61	57	54	56	52	44	45	45	53	56	51
22/02/2010	-	59	57	-	53	52	-	43	44	-	53	50
23/02/2010	59	60	57	53	55	52	44	43	43	52	53	50
24/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
25/02/2010	-	-	57	-	-	52	-	-	42	-	-	51
26/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
27/02/2010	-	57	-	-	48	-	-	37	-	-	49	-
28/02/2010	55	52	48	47	46	42	35	39	34	48	49	44
1/03/2010	-	-	-	-	-	-	-	-	-	-	-	-
Average	58	59	56	52	53	52	*	*	*	*	*	*
Median	*	*	*	*	*	*	44	44	44	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	52	55	51

"-" indicates periods of inclement weather whereby, as per the INP, this data is to be removed from the data set

* indicates not applicable

Table 3-4: Long-term Unattended Monitoring Data - Measured Noise Levels (237 Jones Road)

	Average L_1			Average L_{10}			ABL (L_{90})			L_{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
10/02/2010	-	59	52	-	55	49	-	41	42	-	56	48
11/02/2010	-	57	54	-	52	48	-	38	41	-	52	47
12/02/2010	-	-	51	-	-	47	-	-	40	-	-	46
13/02/2010	-	-	52	-	-	48	-	-	39	-	-	46
14/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
15/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
16/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
17/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
18/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
19/02/2010	-	55	-	-	51	-	-	36	-	-	49	-
20/02/2010	-	55	-	-	49	-	-	36	-	-	54	-
21/02/2010	55	54	53	45	48	50	34	34	42	48	48	51
22/02/2010	-	51	50	-	47	47	-	36	40	-	47	46
23/02/2010	58	54	49	49	48	46	36	35	38	54	47	45
24/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
Average	56	55	51	47	50	48	*	*	*	*	*	*
Median	*	*	*	*	*	*	35	36	40	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	52	52	48

"-" indicates periods of inclement weather whereby, as per the INP, this data is to be removed from the data set

* indicates not applicable

Table 3-5: Long-term Unattended Monitoring Data - Measured Noise Levels (237 Jones Road)

	Average L_1			Average L_{10}			ABL (L_{90})			L_{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
06/07/2010	51	44	41	41	39	36	32	32	30	42	37	34
07/07/2010	58	-	43	50	-	35	33	-	28	50	-	36
08/07/2010	-	-	-	-	-	-	-	-	-	-	-	-
09/07/2010	-	45	-	-	39	-	-	34	-	-	38	-
10/07/2010	-	47	45	-	45	37	-	36	33	-	43	38
11/07/2010	54	47	44	44	42	39	31	35	31	45	40	39
12/07/2010	-	43	43	-	39	40	-	33	34	-	38	40
13/07/2010	-	-	44	-	-	39	-	-	34	-	-	39
14/07/2010	-	47	-	-	42	-	-	34	-	-	42	-
15/07/2010	-	46	45	-	39	38	-	32	30	-	39	40
16/07/2010	-	43	40	-	38	35	-	33	29	-	37	35
17/07/2010	-	40	41	-	34	35	-	31	31	-	34	34
18/07/2010	54	44	42	43	42	35	30	37	30	44	40	35
19/07/2010	-	41	-	-	36	-	-	30	-	-	36	-
20/07/2010	-	41	-	-	34	-	-	30	-	-	34	-
21/07/2010	-	42	40	-	36	35	-	31	30	-	36	33
22/07/2010	-	-	-	-	-	-	-	-	-	-	-	-
Average	54	44	42	45	39	37	*	*	*	*	*	*
Median	*	*	*	*	*	*	31	33	30	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	46	39	37

"-" indicates periods of inclement weather whereby, as per the INP, this data is to be removed from the data set

* indicates not applicable

Explanatory note: Table 3-5 above presents the latest unattended noise logging data carried out at 237 Jones Road (R12) between 6 July and 22 July 2010. It has been noted that the night time L90 values when the previous unattended monitoring was carried out at this location, i.e. February 2010, were affected by high levels of insect activity during this warmer month. Night time attended monitoring at this location on 8 May 2010 confirms insect noise levels around 51-53dB(A) as well as bird sounds at 50-55dB(A). During the colder month of July, night time L90 values seem to have decreased possibly due to less insect and bird activity and therefore ambient background levels at this location are deemed to rely on seasonal changes.

Table 3-6: Long-term Unattended Monitoring Data - Measured Noise Levels (84 Yelgun Road)

	Average L_1			Average L_{10}			ABL (L_{90})			L_{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
11/02/2010	-	61	58	-	56	55	-	47	45	-	56	51
12/02/2010	-	-	59	-	-	55	-	-	44	-	-	52
13/02/2010	-	-	57	-	-	52	-	-	43	-	-	52
14/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
15/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
16/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
17/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
18/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
19/02/2010	-	61	-	-	57	-	-	48	-	-	55	-
20/02/2010	-	61	-	-	57	-	-	48	-	-	54	-
21/02/2010	60	59	58	56	55	56	45	47	47	54	53	54
22/02/2010	-	59	59	-	56	55	-	45	44	-	53	55
23/02/2010	60	60	60	56	57	57	45	46	44	53	54	57
24/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
25/02/2010	-	-	58	-	-	55	-	-	43	-	-	53
26/02/2010	-	-	-	-	-	-	-	-	-	-	-	-
27/02/2010	-	63	-	-	58	-	-	48	-	-	67	-
28/02/2010	60	61	57	55	57	52	45	47	45	53	59	51
Average	60	61	58	56	57	55	*	*	*	*	*	*
Median	*	*	*	*	*	*	45	47	44	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	54	60	54

"-" indicates periods of inclement weather whereby, as per the INP, this data is to be removed from the data set

* indicates not applicable

Table 3-7: Long-term Unattended Monitoring Data - Measured Noise Levels (21 Tweed Valley Way)

	Average L_1			Average L_{10}			ABL (L_{90})			L_{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
27/03/2010	66	56	48	50	46	40	35	35	37	56	56	42
28/03/2010	63	56	46	50	46	41	34	35	35	55	56	45
29/03/2010	65	56	46	53	50	42	34	39	36	60	56	42
30/03/2010	64	54	46	53	48	41	36	36	37	55	54	42
31/03/2010	63	64	48	55	59	43	34	46	35	77	56	49
1/04/2010	64	62	60	57	58	55	48	48	37	56	56	52
2/04/2010	63	60	59	56	54	53	48	40	35	63	56	54
3/04/2010	61	59	56	55	55	51	45	44	37	57	54	49
4/04/2010	61	63	56	55	56	51	46	49	37	61	58	50
5/04/2010	61	73	61	55	57	52	47	47	35	54	68	64
6/04/2010	60	61	58	55	58	53	46	45	38	53	55	50
7/04/2010	62	62	59	57	58	55	48	47	35	55	56	52
8/04/2010	63	65	61	58	60	56	48	45	34	63	61	58
9/04/2010	62	63	59	56	58	54	46	42	35	56	77	50
10/04/2010	62	62	60	56	55	53	47	43	34	54	60	58
11/04/2010	59	60	56	53	56	50	42	43	35	51	55	51
12/04/2010	58	-	57	54	-	51	44	-	34	52	-	48
Average	62	61	55	55	55	49	*	*	*	*	*	*
Median	*	*	*	*	*	*	46	44	35	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	65	66	55

"-" indicates periods of inclement weather whereby, as per the INP, this data is to be removed from the data set

* indicates not applicable

Table 3-8: Long-term Unattended Monitoring Data - Measured Noise Levels (Near Dam onsite – E02)

	Average L_1			Average L_{10}			ABL (L_{90})			L_{eq}		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
27/03/2010	65	52	52	47	48	49	38	41	44	62	49	47
28/03/2010	54	52	55	44	46	49	36	39	39	54	53	58
29/03/2010	51	51	52	41	47	47	33	40	39	52	58	49
30/03/2010	50	49	51	43	45	47	34	40	39	46	45	48
31/03/2010	51	56	50	42	48	46	34	40	38	44	48	46
1/04/2010	51	52	51	44	47	47	36	40	39	44	53	47
2/04/2010	53	53	52	46	47	48	39	39	39	54	53	54
3/04/2010	50	56	51	45	47	48	38	41	39	45	56	51
4/04/2010	53	52	55	48	46	49	39	40	39	48	53	52
5/04/2010	51	50	50	46	46	46	39	40	37	47	45	46
6/04/2010	49	51	51	42	45	47	32	38	37	43	45	45
7/04/2010	49	49	48	40	44	44	32	38	34	41	44	44
8/04/2010	50	49	47	42	46	43	32	39	35	41	46	45
9/04/2010	50	48	51	43	45	47	33	39	41	42	44	47
10/04/2010	49	48	49	40	45	45	32	38	38	40	45	45
11/04/2010	47	49	49	39	45	45	32	38	38	39	44	45
12/04/2010	48	-	49	43	-	46	35	-	40	41	-	45
Average	51	51	51	43	46	47	*	*	*	*	*	*
Median	*	*	*	*	*	*	34	39	39	*	*	*
Logarithmic Average	*	*	*	*	*	*	*	*	*	52	51	50

"-" indicates periods of inclement weather whereby, as per the INP, this data is to be removed from the data set
* indicates not applicable

3.2 SHORT-TERM ATTENDED MONITORING

Short-term attended noise monitoring was conducted from 15 March to 16 March 2010 at strategic receiver locations consistent with the long-term unattended monitoring with additional monitoring undertaken at a representative ecological monitoring location marked as E00 in Figure 2-3.

The measured background noise levels are shown in the following tables and have been used to further characterise the existing ambient noise environment at the aforementioned locations.

Table 3-9: Ambient Noise Levels - 111 Balemo Drive, Ocean Shores (R16)

Date	Time	L_{A90} dB(A)	L_{A1} dB(A)	L_{A10} dB(A)	L_{Aeq} dB(A)	Main Noise Sources
Monday 15 March 2010	11.00am - 11.15am	41	52	46	44	Birds 46dB(A), 49-53dB(A), 65dB(A), Insects 44-48dB(A), Foliage in the wind 45-50dB(A)
	9.27pm - 9.42pm	51	56	55	53	Increased insect activity
	10.21pm	-	-	-	-	Measurement could not be undertaken due to heavy rain

Note: "-" indicates periods of inclement weather

Table 3-10: Ambient Noise Levels - 26 Flinders Way, North Ocean Shores (R15)

Date	Time	L_{A90} dB(A)	L_{A1} dB(A)	L_{A10} dB(A)	L_{Aeq} dB(A)	Main Noise Sources
Monday 15 March 2010	11.34am -11.49am	38	46	42	41	Birds 39-43dB(A), 46-49dB(A), 57dB(A), Insects 36-39dB(A), Foliage in the wind 41-45dB(A)
	9.53pm - 10.08pm	39	46	43	42	Increased insect activity
	10.39pm	-	-	-	-	Measurement could not be undertaken due to heavy rain

Note: "-" indicates periods of inclement weather

Table 3-11: Ambient Noise Levels - 84 Yelgun Road, Yelgun (R03)

Date	Time	L_{A90} dB(A)	L_{A1} dB(A)	L_{A10} dB(A)	L_{Aeq} dB(A)	Main Noise Sources
Monday 15 March 2010	3.23pm - 3.38pm	49	58	55	53	Constant traffic (Pacific Hwy) 50-57dB(A)
	8.57pm - 9.12pm	49	55	52	51	Constant traffic (Pacific Hwy) 50-57dB(A)
	10.59pm	-	-	-	-	Measurement could not be undertaken due to strong winds and rain

Note: "-" indicates periods of inclement weather

Table 3-12: Ambient Noise Levels - 44 Yelgun Road, Yelgun (R04)

Date	Time	L_{A90} dB(A)	L_{A1} dB(A)	L_{A10} dB(A)	L_{Aeq} dB(A)	Main Noise Sources
Monday 15 March 2010	3.49pm - 4.04pm	49	61	55	53	Constant traffic (Pacific Hwy) 53-58dB(A), 61-63dB(A)
	8.02pm - 8.17pm	50	61	55	53	Constant traffic (Pacific Hwy) 53-56dB(A), 58-62dB(A)
	11.21pm	-	-	-	-	Measurement could not be undertaken due to strong winds and rain

Note: "-" indicates periods of inclement weather

Table 3-13: Ambient Noise Levels - 1 Jones Road, Yelgun (R05)

Date	Time	L_{A90} dB(A)	L_{A1} dB(A)	L_{A10} dB(A)	L_{Aeq} dB(A)	Main Noise Sources
Tuesday 16 March 2010	1.08pm - 1.23pm	54	64	61	58	Constant traffic (Pacific Hwy) 55-56dB(A), 58-64 dB(A), Birds 63dB(A), Insects 57, 64-65
Saturday 8 May 2010	6.08am - 6.23am	55	64	61	57	Constant traffic (Pacific Hwy) 55dB(A), Birds 56-61dB(A), Insects 57-58dB(A)

Table 3-14: Ambient Noise Levels - 237 Jones Road, Yelgun (R12)						
Date	Time	L_{A90} dB(A)	L_{A1} dB(A)	L_{A10} dB(A)	L_{Aeq} dB(A)	Main Noise Sources
Tuesday 16 March 2010	1.32pm - 1.47pm	47	64	55	54	Insects 52-53dB(A) Birds 51-57dB(A)
Saturday 8 May 2010	6.38am – 6.53am	46	64	55	53	Insects 51-53dB(A) Birds 50-55dB(A)

Table 3-15: Ambient Noise Levels - 144 Wooyung Road, Wooyung (R11)						
Date	Time	L_{A90} dB(A)	L_{A1} dB(A)	L_{A10} dB(A)	L_{Aeq} dB(A)	Main Noise Sources
Tuesday 16 March 2010	5.01pm - 5.16pm	45	61	52	51	Birds 53-54dB(A), 60-65dB(A), Insects 46dB(A)
Saturday 8 May 2010	7.01pm - 7.16pm	46	61	52	50	Birds 49-51dB(A) Insects 49dB(A)
Saturday 8 May 2010	10.09pm - 7.16pm	44	58	50	49	Birds 48-49dB(A) Insects 49-50dB(A)

Table 3-16: Ambient Noise Levels - 21 Tweed Valley Way, Yelgun (R07)						
Date	Time	L_{A90} dB(A)	L_{A1} dB(A)	L_{A10} dB(A)	L_{Aeq} dB(A)	Main Noise Sources
Tuesday 16 March 2010	3.12pm - 3.27pm	51	70	57	58	Traffic (Pacific Highway/Tweed Valley Way) 54-57dB(A), 60dB(A), Insects 60-71dB(A)

Table 3-17: Ambient Noise Levels - 38 Mia Court, Fern Beach (R14)						
Date	Time	L_{A90} dB(A)	L_{A1} dB(A)	L_{A10} dB(A)	L_{Aeq} dB(A)	Main Noise Sources
Tuesday 16 March 2010	1.46pm - 2.01pm	46	61	51	51	Birds 51-55dB(A), Traffic 68dB(A), Insects 58-62dB(A)

Table 3-18: Ambient Noise Levels – E00						
Date	Time	L_{A90} dB(A)	L_{A1} dB(A)	L_{A10} dB(A)	L_{Aeq} dB(A)	Main Noise Sources
Tuesday 16 March 2010	1.54pm -2.09pm	44	57	54	50	Insects 46dB(A), Birds 46-55dB(A), 59-64dB(A)

Table 3-19: Ambient Noise Levels – E01						
Date	Time	L_{A90} dB(A)	L_{A1} dB(A)	L_{A10} dB(A)	L_{Aeq} dB(A)	Main Noise Sources
Saturday 8 May 2010	5.40am - 5.55am	37	50	40	40	Insects 36-38dB(A) Birds 44-53dB(A)
Saturday 8 May 2010	11.49am - 12.04pm	37	51	45	42	Birds 47-53dB(A)

Table 3-20: Ambient Noise Levels – E02						
Date	Time	L_{A90} dB(A)	L_{A1} dB(A)	L_{A10} dB(A)	L_{Aeq} dB(A)	Main Noise Sources
Saturday 8 May 2010	12.24pm - 12.39pm	39	47	44	42	Birds and fauna 46dB(A)
Saturday 8 May 2010	6.10pm - 6.25pm	40	48	45	42	Traffic - Pacific Hwy 42dB(A) Insects 43dB(A)

Table 3-21: Ambient Noise Levels - 210 Wooyung Road (R09)						
Date	Time	L_{A90} dB(A)	L_{A1} dB(A)	L_{A10} dB(A)	L_{Aeq} dB(A)	Main Noise Sources
Tuesday 16 March 2010	2.32pm - 2.47pm	50	65	59	56	Insects 63-66dB(A), Birds 52-59dB(A), Traffic (Wooyung Rd) 56-58dB(A), 62-63dB(A)

3.3 COMPARISON OF UNATTENDED AND ATTENDED MONITORING

Table 3-22: Summary of Noise Monitoring Program

Location	Period	Unattended		Attended	
		L_{Aeq}	L_{A90}	L_{Aeq}	L_{A90}
R03 84 Yelgun Road Yelgun	Day	54	45	53	49
	Evening	60	47	51	49
	Night	54	44	-	-
R04 44 Yelgun Road Yelgun	Day	52	44	53	49
	Evening	55	44	53	50
	Night	51	44	-	-
R05 1 Jones Road Yelgun	Day	59	42	58	54
	Evening	54	43	58	54
	Night	50	40	57	55
R07 21 Tweed Valley Way Yelgun	Day	-	44	58	51
	Evening	56	44	58	51
	Night	48	40	57	50
R09 210 Wooyung Road Wooyung	Day	61	37	56	50
	Evening	61	40	56	50
	Night	51	39	55	49
R11 144 Wooyung Road Wooyung	Day	*	*	51	45
	Evening	*	*	50	46
	Night	*	*	49	44
R12 237 Jones Road Yelgun	Day	52	35	54	47
	Evening	52	36	54	47
	Night	48	40	53	46
R14 38 Mia Court Fern Beach	Day	N/A	N/A	51	46
	Evening	N/A	N/A	51	46
	Night	N/A	N/A	50	45
R15 26 Flinders Way North Ocean Shores	Day	N/A	N/A	41	38
	Evening	N/A	N/A	42	39
	Night	N/A	N/A	41	38
R16 111 Balemo Drive Ocean Shores	Day	N/A	N/A	44	41
	Evening	N/A	N/A	53	51
	Night	N/A	N/A	-	41
E00 Ecological Location	Day	N/A	N/A	50	44
	Evening	N/A	N/A	50	44

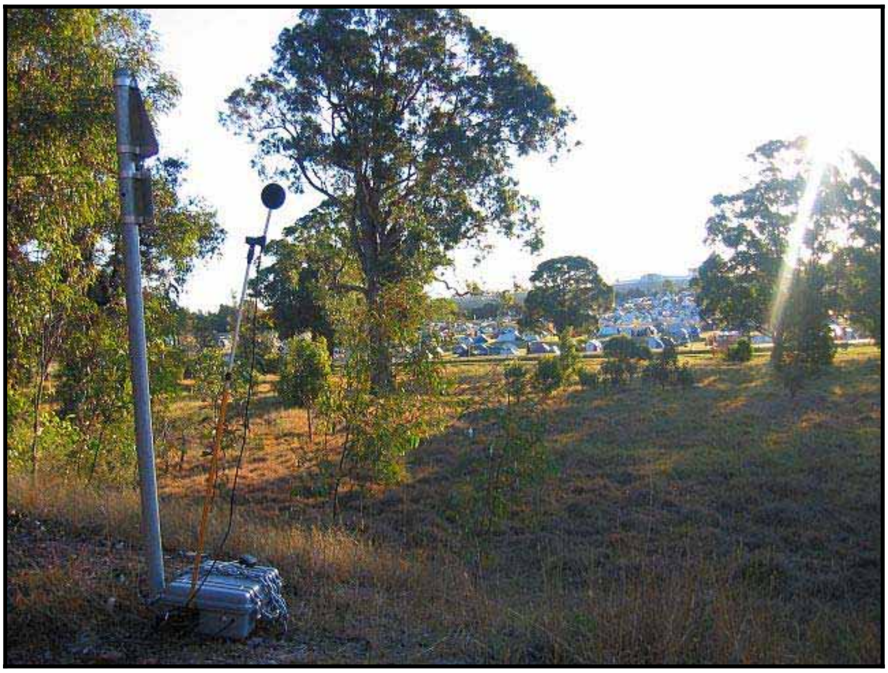
Table 3-22: Summary of Noise Monitoring Program					
Location	Period	Unattended		Attended	
		L_{Aeq}	L_{A90}	L_{Aeq}	L_{A90}
	Night	N/A	N/A	49	43
E01 Ecological Location	Day	TBA	TBA	42	37
	Evening	TBA	TBA	42	37
	Night	TBA	TBA	40	37
E02 Ecological Location	Day	TBA	TBA	42	39
	Evening	TBA	TBA	42	40
	Night	TBA	TBA	41	39

"-" indicates periods of inclement weather
* indicates unavailable data due to damaged equipment
Conservative data extrapolated/interpolated from existing measured values
N/A indicates monitoring was not undertaken
TBA To be advised – awaiting noise logging data
Bold font indicates the lower background noise levels when the unattended and attended measured data are compared. These lower levels have been applied in setting the rating background levels (RBL) for this assessment.

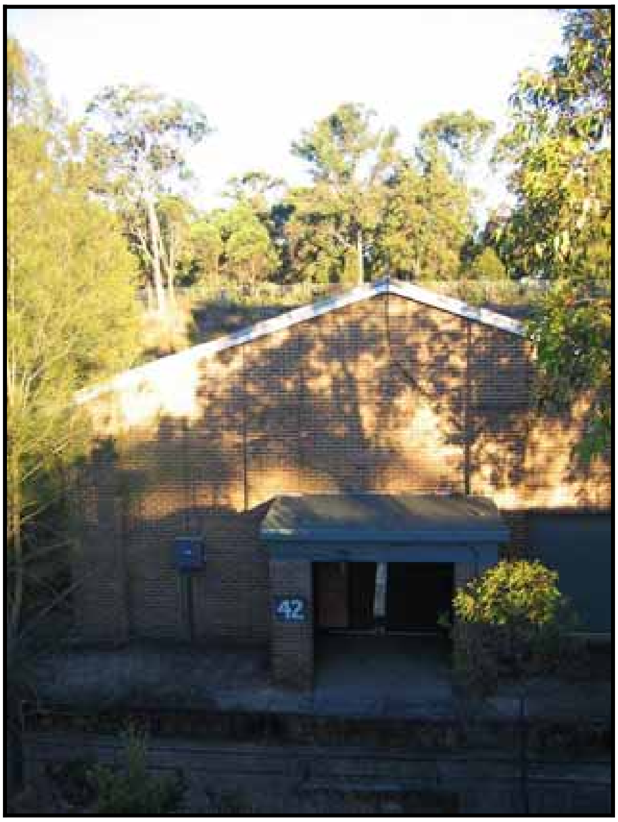
Photograph 3.1: Ecological areas are gaining in our understanding.

Photograph 3.2: Experience gained from Newington where a 3-day concert-camper event was held was used to gain pioneering information on the sensitivity of ecological areas to concert and crowd noise.

Photograph 3.3: Noise logging via Type 1 Precision sound level meters with 1/3rd octave band analysis showed the spectrums of noise that were found to have caused no auditory disturbance to a bat nursery.



Photograph 3.4: The bat nursery.



Photograph 3.5: A sensitive wet land was intensively studied using noise logging before and during the event. Even though a stage was nearby there was no detectable alteration to the behaviours of bird life. There are reasons for ensuring this is the outcome using a gradual increase in music noise levels, an absence of high impulsive noise sources and monitoring noise and behaviour of fauna to learn.

Photograph 3.6: Bird behaviour during the event was “sublime”.

4. RELEVANT POLICIES, CODES OF PRACTICE AND NOISE CONTROLS FOR OUTDOOR CONCERTS

The following section details the findings of reviews of practices overseas, across Australia and in NSW that will assist in the development of reasonable criteria for the proposed operation of the event site. Criteria sourced from several documents have been considered as part of this study due to the wide range of stakeholders involved in the proposed development.

There were many sources of information that have been examined.

- Policies in place in the UK.
- Policies in place in various states in Australia.
- Open air concerts noise limits applied at a range of venues in rural residential areas.
- Noise limits applied through Protection Notices by DECCW.
- Lessons learnt from managing open air concerts at the following events:
  - Great Escape held at Cockatoo Island.
  - Great Escape held at Newington.
  - A Day on the Green concerts held at Bowral, Pokolbin and the Yarra Valley (Victoria).
  - Shore Thing New Year's Eve concerts at Bondi.

Each of these sources of information is now examined. The guiding principles from the review of these sources of information relating to noise guidelines and Codes or Practice would assist in the development of a Noise Management Plan for this proposed event site.

The period from 11.00pm to 03.00am will be sensitive and sleep disturbance may be an issue. Sleep disturbance requires specific attention to detailed noise management of the quality of the music.

The community will need a lot of assistance during the sleep sensitive period to accept the intrusion. There will potentially be many residents who would usually complain. A strong pre-event one on one consultation program is recommended.

A three day concert was held at Cockatoo Island with one complaint being received on the third day of the venue. Reason for limited complaints – consultation and noise management strategies in use.

4.1 Policies Researched from the UK

A Code of Practice on Environmental Noise Control of Concerts was developed under the following legislation:

- Environmental Protection Act 1990 (England and Wales); and
- Control of Pollution Act (Scotland).

The Code of Practice was developed by a working party that consisted of specialists experienced with the environmental noise issues arising from open air concerts.

The authors of the Code of Practice believed that compliance with the guidelines would enable "*successful concerts to be held whilst keeping to a minimum the disturbance caused by noise".*

The authors also recognised that full compliance may not eliminate all complaints and that local factors may affect the likelihood of complaints.

The experience of the Principal Consultant (BE) has been that over time, outdoor concerts with the necessary extent of community consultation prior and during the event can lead to between zero complaints and up to 5 complaints. Concerts that do not have community consultation on a personal level and with direct contact during the concert usually have many complaints, frequently more than 50.

The Code of Practice developed by the Noise Council established Music Noise Levels (MNL) that should not exceed the guidelines shown in the following table. These noise levels were to be applied at 1m from the façade of any noise sensitive premises between the hours 9.00am to 11pm. Other guidelines extend the night time period to midnight and earlier hours, e.g. 3am.

Photograph 4.1: Crowd participation immediately adjacent to a stage requires that high noise source levels are produced.

Photograph 4.2: Speaker arrays are critical to provide sufficient music noise levels for patrons to participate in the event.

Photograph 4.3: Consultation throughout music events, prior to during and after the events is critical in a successful noise management plan.

Photograph 4.4: Sensitive residential areas are able to adjust to the music with limited intrusion being experienced by considering the control of bass rhythms and beats.

Photograph 4.5: Dominant bass rhythm causes significant disturbance to residents.

Table 4-1: Reproduced Table from The Code of Practice		
Concerts days per calendar year, per venue	Venue Category	Guideline
1-3 (days)	Urban Stadia or Arenas	The MNL[1] should not exceed 75 dB(A) over a 15 minute period
1-3 (days)	Other Urban or Rural Venues	The MNL[1] should not exceed 65 dB(A) over a 15 minute period
4-12 (days)	All Venues	The MNL[1] should not exceed the background noise level[2] by more than 15 dB(A) over a 15 minute period.

Note: 1: MNL – Music Noise Level (our note)
2: Determined by the arithmetic average of the hourly L_{A90} noise levels measured over the last 4 hours of the proposed music event or over the entire period of the proposed music event if scheduled to last for less than 4 hours.

Notes 4, 6 and 7 to this table are particularly relevant:

> *"4. For those venues where more than three events per year are expected, the frequency and scheduling of the events will affect the level of disturbance. In particular, additional disturbance can arise if events occur on more than three consecutive days without a reduction in the permitted MNL.*
>
> *6. Account should be taken of the noise impact of other events at a venue. It may be appropriate to reduce the permitted noise from a concert if the other events are noisy.*
>
> *7. For venues where just one event has been held on one day in any one year, it has been found possible to adopt a higher limit value without causing an unacceptable level of disturbance."*

Note 5 relate to indoor venues and is therefore not relevant.

Our experience at the New Year's Shore Thing event which is "*one day in any one year*" and is obviously a special occasion, has a limit of L_{Amax} 75 dB(A) and L_{Cmax} 95 dB(C).

Zero complaints were received during 2009 New Year's Eve and 2008 New Year's Eve and two complaints for the 2007 New Year's Eve; maximum number of complaints over the past four New Year's Eve – three.

Photograph 4.6: The stage layout for the three DJ's. The tilt of the speakers are similar to past Events.

Photograph 4.7: The Event creates its own atmosphere.

The last two concerts have experienced zero complaints due to a large combination of factors that would be used in developing a Noise Management Plan for the proposed facility.

The Shore Thing concert extends through to 3.00am. The Code of Practice deals with events that extend past 11.00pm. The audibility of the event within a noise sensitive premises with windows open is used as the guideline.

Our experience indicates that for this proposed facility, a 10 dB(A) reduction be allowed for noise reduction of the residential structure with windows slightly opened (5%) for ventilation.

A noise limit of 45 dB(A) past midnight external to the residence would equate to 35 dB(A) internal and this would not be expected to cause noise disturbance if the music from the event were to be free of annoying characteristics. This approach was successful at three Great Escapes which were conducted over 3 days and had limited music events past midnight through to 2.00am.

The Code of Practice raises the issue of low frequency noise. This is adequately addressed in our Noise Management Plan by adopting the lessons learnt by the NSW EPA. Several Protection Notices applied by NSW EPA adopt control of L_{Amax} and $L_{Cmax.}$ This approach has been used to the great benefit of the residential community.

Control of the bass beat within a very short period of time has proven to be critical to protecting the residential community from unnecessary annoyance. This factor was developed from noise auditing of four all-night concerts held at the Royal Agricultural Showground, the fourth concert having zero complaints as a result of the techniques that were developed.

The Code of Practice provided the following procedure to be adopted as it was developed over several years.

Planning

> *"Determine the sound propagation characteristics between the proposed venue and those living nearby who might be affected by noise, and carry out an appropriate background noise survey.*
> *Check the viability of the event against the relevant guideline levels. Research shows that the music level in the audience by the mixer position* (what we call front of house) *at pop concerts is typically 100 dB(A) and that levels below 95 dB(A) will be unlikely to provide satisfactory entertainment for the audience."*

Our front of house levels will be 103-108 dB(A) for main events at the main stages and 95-100 dB(A) for smaller stages.

Benbow Environmental has undertaken the background noise surveys. Benbow Environmental has developed a sophisticated noise model for the proposed event site. Planning for the proposed events has been undertaken using a rigorous evaluation of all available options for minimising the level of noise generated at residential premises.

The Code of Practice then examines actions to take before and during the event.

Before the Event

- Advertise a complaints hotline for residents to be able to communicate any concerns during the event;
- Carry out sound tests; and
- Calibrate the front of house and delay speaker system that can prevail at the monitoring positions.

During the Event

- Operate an attended complaints telephone number. This will enable an immediate response to any complaints received and the noise consultant to judge whether or not adjustments to the music level is needed;
- Establish a communication network between all those involved;
- Carry out noise monitoring within the venue at the noise monitoring position and at sample (reference) locations outside the venue throughout the event;
- The noise consultant and sound engineer (at the front of house) need to be in regular communication and be aware of occasions of marginal compliance at the receiver locations; and
- Be proactive with your residential community.

After the Event

The Code of Practice did not offer guidelines for after the event. The lessons learnt from noise management of concerts are that there is great value to provide a report of the noise monitoring program and the findings. This would include unattended noise logging at a set of residential reference monitoring locations and two ecological areas.

Specifically for the proposed events site and based on experience at sensitive ecological areas, ecological noise monitoring would be recommended using unattended and attended noise monitoring. Results of the attended monitoring at on site and the residential reference locations would be provided for analysis.

The effectiveness of the concert noise levels controls would be evaluated and lessons learnt discussed to examine any worthwhile improvements. The noise management plan would then be updated to take account of the lessons learnt and continue being proactive.

4.2 Policies Researched from WA

There were three documents reviewed:

- Guide to Outdoor Concerts and Large Public Events
  Town of Cottesloe
  Environmental Health Services, September 2005

- Environmental Protection (Noise) Regulation 1997 – Reg 18

- Concerts at the WACA Ground
  City of Perth Policy Manual

Each of these documents is examined.

4.2.1 Town of Cottesloe

The document explains that:

> *"The purpose of the guidelines is to provide promoters of outdoor concerts and large public events with clear guidance in relation to the planning, building and environmental health requirements for such events."*

The document used a classification system for venues to establish a category number, entry fees, liquor licence and number of patrons. The Council approval for an event is necessary.

In assessing applications the Council guide lists the following as being taken into consideration:

- Cultural benefit to the community;
- Likely impact on residents and the environment;
- Reputation of the Promoter;
- Day, time and duration of the event;
- The number of similar events held at the venue or nearby venues within the past 12 month period;
- The style of music;
- Participation of community groups and families in the event; and
- The presence or absence of alcohol.

As the guide relates to the use of Council's facilities and application fees are involved, there are many administrative aspects to the guide which do not relate to noise management and are therefore not discussed.

Matters relating to noise management are:

> *"Clause 7.6 Complaint Procedure*
>
> *A procedure to receive and address complaints is to be provided 30 days prior to the event. The procedure shall include a dedicated mobile phone number that is available to receive calls up to 8 hours prior to the commencement of the event and at least 1 hour after the closure of the event. All complaints are to be recorded with the caller's name, address, phone number, time of call, nature of complaint and action taken. This information is to be made available to the PEHO at any time during and within 24 hours of the closure event. (PEHO: Principal Environmental Health Officer). "*
>
> *Clause 8.13 Noise Control*
>
> *8.13.1 Where an event is likely to result in excessive noise an application must be made to the CEO of the Town to stage a Regulation 18 "approved non-complying event" under the provisions of the Environmental Protection (Noise) Regulations 1997. Such application shall be made no later than 60 days prior to the proposed event and shall be accompanied by the additional fee of $500. The Town's approval of such events may be subject to approval from the Department of Environment (DoE).*

8.13.2 Where approval is given for a non-complying event under the above regulations, the Town will engage an acoustic consultant to prepare a Noise Management Plan that includes all relevant information as required by the PEHO and noise contour maps.
The Promoter is required to pay all costs associated with the preparation of the plan and any proposed noise monitoring undertaken during the event.

8.13.3 The Promoter shall control noise to ensure compliance with the Environmental Protection (Noise) Regulations 1997 at all times. Alternatively, if approval has been given for a "non-complying" event under the above regulations, the Promoter is to ensure compliance with the conditions of approval.

8.13.4 Where the provisions of the approval require the attendance of the Town's Authorised Noise Person, the Promoter shall pay for their attendance at a rate of not less than $75.00 per hour or part thereof including travelling time. These fees shall be paid no later than days after the event.

8.13.5 The Town will not approve "non-complying" events that exceed 8 hours.

8.13.6 Events that finish after 11pm will not be approved unless for New Year's Eve or where special circumstances apply."

A risk management table is presented. In addition to noise the requirements included the following:

- *Comply with any approvals issued in relation to the venue/event.*
- *Set up a complaint line for neighbours within the radius required by the Town.*
- *Notify each resident within the required radius of the main stage area at least 30 days prior to the event.*
- *Verification of notification to be forwarded to the Town 14 days before event.*

4.2.2 Environmental Protection (Noise) Regulations 1997 – Reg 18

Clause 18(8) is of most relevance to this discussion:

"(8) It is a condition imposed on the conduct of every event approved under sub regulation (2) that, if the Chief Executive Officer determines that noise received as a result of the event –

(a) at any noise sensitive premises is likely to exceed 65dB(A) L_{ASlow} between 0700 hours and 1900 hours on any day or 60dB(A) L_{ASlow} between 1900 hours on any day and 0700 hours on the following day'; or
(b) at any other premises is likely to exceed 75dB(A) L_{ASlow} at any time.

The person to whom the approval is granted is to pay to the Chief Executive Officer, within the time specified by the Chief Executive Officer, a noise monitoring fee specified by the Chief Executive Officer"

4.2.3 Concerts at the WACA Ground

The 65dB L_{Aeq} noise limit is applied.

Each event should have a limit of between 102dB(A) and 105dB(A) at the sound desk unless otherwise specified in the planning approval granted by the East Perth Redevelopment Authority.

The Policy in Clause 16 recommended the following details be provided:

"16. For each event, the WACA or the promoter should provide details of the:-
- *16.1 recommended sound levels at specified locations as supplied by an acoustic consultant,*
- *16.2 details of the proposed sound monitoring to be undertaken for each event;*
- *16.3 specific dates of each event when dates are finalised,*
- *16.4 times of event, gates opening and total performance times,*
- *16.5 specified times of sound checks,*
- *16.6 stage layout and relevant noise contour maps, and*
- *16.7 any other relevant information required by the City."*

Where a noise exemption was requested the following additional requirements would also be met:

"17. Approval for each noise exemption will be subject to:-
- *17.1 a notice, detailing the times of the concerts, practice sessions and sound checks being distributed to all residents and businesses in the manner specified in Clause 9 of this Policy;*
- *17.2 a complaint service, for persons wishing to register complaints concerning noise emissions from the concerts, and being answered at all times by an operator, being established and advised to all residents and businesses within the specified area;*
- *17.3 the complaint service being operational throughout the concerts, practice sessions and sound checks;*
- *17.4 payment of a fee to the City to cover the cost of sound level monitoring of the concerts under Budget Item "Preventive Services – Registration/Licensing & Control"*

There is a common use of noise limits in the range 60-75 dB(A) for outdoor concerts. These limits will also be found in other criteria found from our research.

4.3 OUTDOOR CONCERT NOISE - ACT

Environment Protection Policy
Environment ACT February 2001

This document provides a very pertinent discussion that is reproduced in its entirety.

> *"Open-air entertainment, including amplified concerts has social and cultural value. However the amplification of voice and instrumental music, together with applause and other audience response, can result in excessive and even offensive noise at neighbouring or nearby premises, particularly where these are residential premises.*
>
> *While a number of steps can be taken to reduce the adverse impact of concert noise, such as the location of the stage, direction of the speakers and the reduction in low-frequency (bass) sounds, the noise levels may still be considered as intrusive. Noise in excess of the zone noise standard can be expected at outdoor concert venues capable of providing the facilities required for such significant community events within the ACT.*
>
> *This Policy has been developed to balance the need to provide adequate protection to the amenity of neighbouring residents from outdoor concert noise with the rights of the broader community to enjoy significant events in accordance with the objects of the Environment Protection Act 1997 (the Act).*
>
> *A number of concert venues with sufficient facilities and infrastructure necessary to conduct significant outdoor concerts exist within the ACT. A broader approach is required to ensure a balance between community expectations and protection of environmental standards."*

The Policy identified a number of measures to limit Adverse Environmental Impact.

> *"A number of factors contribute to the degree of adverse impact on residential areas from noise emitted during outdoor concert events:*
>
> - *the level and nature of the noise;*
> - *the number of events each year;*
> - *the time at which the event takes place;*
> - *the spread of events during the year; and*
> - *the amount of warning ("prior notification") provided to residents about upcoming events.*
>
> *The Policy deals with each of these factors. The proposed measures have been developed to provide certainty both to people undertaking outdoor concerts in venues capable of holding more than 2,000 persons and to the people affected by the noise from such activities. The conditions described below will be applied only to events which generate noise in excess of the zone noise standard at the compliance location. There are no restrictions on events which do not exceed the zone noise standard as defined in the Act and Regulations."*

The Policy examines the level of noise by establishing a trigger level of 50 dB(A). The descriptor L_{A10T} is used.

The noise trigger being set at 50 dB(A) would indicate the recognition of a minimum noise level that can be achieved from outdoor venues.

An upper limit of 65 dB(A) (L_{A10T}) was set based on a 15 minute minimum period.

Outdoor concerts are required to finish by 11.00pm.

New Year's Eve events are permitted to operate without environmental authorisations at a 60 dB(A) (L_{A10T}) noise level till 12.30am and with an environmental authorisation for noise between 60 dB(A) and 65 dB(A), finish time of 12.30am was imposed on both types of events, i.e. unauthorised and authorised.

The Policy managed the number of events per year by allocating a certain number of event credits each year. This is an interesting noise managing tool and the philosophy of limiting the noise levels of minor events at the proposed facility has a similar outcome.

In the Policy, event credits are needed for any event which generates noise above the noise trigger level at the compliance locations.

The Policy requires that a number of event credits may be needed to hold an event depending upon the event's duration and the noise level generated.

The purpose of the noise events is summarised in the following paragraphs from Section 4.2 of the Policy.

The application of 50 dB(A) as a trigger level and the upper limit of 65 dB(A) (L_{A10T}) provides support for the noise criteria developed in the documents researched pertinent to outdoor concerts.

The criteria in NSW is now examined.

4.4 NOISE CRITERIA IN NSW

NSW State laws and regulations under the Protection of the Environment Operations Act 1997 (POEO Act) do not set guidelines for community events and do not have jurisdiction over the Event. Nonetheless, State laws, regulations and precedents have been used in setting noise criteria for the event. The relevant aspects of the NSW EPA's Industrial Noise Policy (INP) and a summary of Prevention Notices issued in accordance with Section 96 of the POEO Act for other events in NSW are set out below.

The Industrial Noise Policy has been applied to transportation related to the Event as detailed below.

4.4.1 Industrial Noise Criteria

The NSW Industrial Noise Policy (INP) was developed by the NSW DECC (formerly EPA) primarily for the assessment of noise emissions from industrial sites regulated by the NSW DECC. However, the policy can also be used by Department of Planning and local government to assist in their assessment of potential noise issues.

An important point to note in the policy is presented in Section 1.4.1. This section states:

> *"The industrial noise source criteria set down in Section 2 are best regarded as planning tools. They are not mandatory, and an application for a noise-producing development is not determined purely on the basis of compliance or otherwise with the noise criteria. Numerous other factors need to be taken into account in the determination. These factors include economic consequences, other environmental effects and the social worth of the development."*

The policy sets out two criteria that are used to assess potential site related noise impacts. The first criterion aims at controlling intrusive noise impacts in the short-term for residences. This criterion is therefore called the intrusive criterion.

The second criterion aims at maintaining a suitable amenity for particular land uses including residences in the long-term. This criterion is called the amenity criterion. The amenity criterion is not relevant for noise assessment of this event.

4.4.1.1 Intrusive Criterion

The intrusive criterion can be summarised as:

$$L_{Aeq,(15minute)} \leq \text{rating background level} + 5\ \text{dB(A)}$$

Where the $L_{Aeq,(15minute)}$ is the predicted or measured L_{Aeq} from the site over a fifteen minute interval at the receiver. The rating background level is the existing background noise level at the receiver and has been determined for this project in Section 5.

4.4.1.2 Sleep Disturbance Criteria

The emission of high noise levels for an instant or very short time period may cause sleep disturbance to residents. Chapter 19 of the Environmental Noise Control Manual (ENCM, originally developed by NSW SPCC) states:

> *"Noise control should be applied with the general intent to protect people from sleep arousal. To achieve this, the L_1 level of any specific noise source should not exceed the background noise level (L_{90}) by more than 15 dB(A) when measured outside the bedroom window."*

The manual is now superseded, but the sleep disturbance criterion is considered to be a valid guideline.

From this guideline, it can be said that sleep disturbance is probable when a sudden increase in the noise level above the existing background level occurs. Generally, this is when the L1 noise parameter is 15 dB(A) above the L90 noise level with the L90 noise level representative of the 15-minute period preceding a 'high noise' event (the potentially 'waking' event).

The sleep disturbance trigger period as ascertained by the in-depth research in this section of the report is after 11pm and accordingly, the Sleep Disturbance period considered in this assessment is between 12pm-3am (the 'Night' period) after which events would cease. It is then necessary to assess the background noise level preceding the high noise event applicable to the Sleep Disturbance (Night) period in order to derive the Project-Specific Sleep Disturbance Criteria. There is the potential to use a white noise generated that includes both white noise and the ecological sounds of the bushland to increase the night time background levels and reduce the potential intrusion from the music past 10pm. This variation on the use of white noise is supported by the use of this technique at the Royal Agricultural Showground all night parties and also recently at an event held at Cockatoo Island.

The Sleep Disturbance Criteria refers to "peak noise levels for an instant or very short time period" whereas the general nature of the noise applicable to the proposed events is quasi steady-state with continuous crowd and entertainment noise sources. Assuming a continuous activity of quasi-steady crowd noise, steady-state onsite equipment noise, and quasi-steady music levels (as well as announcements in between), it is reasonable to assume that such activities will have affected the background noise levels at each receiver location during the period preceding a high noise event or in this case, before 11.00pm.

Therefore, it is recommended to adopt a more suited set of background noise levels based on the predicted equivalent continuous A-weighted sound pressure level (L_{Aeq}). In considering the continuous steady state and quasi steady noise sources expected from an outdoor event venue of this nature, the background noise levels (L_{90}) are expected to be up to 10dB(A) below the predicted L_{Aeq} levels at each identified receiver location. This methodology would provide underestimated L90 levels and therefore the adopted background noise levels would be conservative.

The Sleep Disturbance Criteria would then be an L_{A1} noise level of 15 dB(A) above the adopted background noise levels at each receiver location. If the background noise levels at the nearest potentially affected residences are artificially increased using sounds similar to what is naturally occurring but at a higher level, this would assist in minimising the potential for sleep disturbance during the 10pm – midnight period and afterwards.

The recommended Sleep Disturbance Criteria derived from the adopted background noise levels are presented under "Attachment 6 – Stage Contribution Tables" of this report and have been used to calculate the required noise level reductions during the relevant Sleep Disturbance (Night time) period shown in Table 6-1.

The above criterion is a guideline and not a "pass" or "fail" noise limit. The adopted L_{A90} + 15dB(A) guideline applies outside sleeping areas.

An internal noise limit can also be considered as an alternative to applying an external noise level as part of a management plan. This approach has been included in studies for minimising sleep disturbance when night time truck movements associated with a specific industry is needed in an area. The internal noise limit of 45 dB(A) is applied. On the basis that a partly open window will provide a 10dB(A) noise reduction, an external noise level of 55 dB(A) is applied as the guideline to be achieved during night time.

Unreasonable disturbance needs to be achieved by limiting bass or low frequency tones from being clearly audible within the premises.

During the 12pm-2am period during the major events, the noise management plan would place emphasis on adopting the following guidelines:

- Music noise level outside facades of bedrooms 55dB(A); and
- Low frequency end of the music not clearly audible inside the sleeping areas of the receiver.

Experience at venues that have included providing entertainment into the early hours of the morning and included internal noise logging, provide support for adopting a combination of noise levels – external and internal.

Low frequency noise within a residence has been described as being a *"subjectively unpleasant phenomenon vaguely and variously described by different individuals. Not unexpectedly, some persons appear to suffer much more disturbance than the majority, amounting to actual distress."*[1]

This early reference text (37 years ago) has been applied in developing the noise management plans applied to the many "all night" and 3am finishing time concerts managed by Benbow Environmental with successful outcomes for all parties.

There are other strategies available to minimise sleep disturbance and these are discussed in Section 6 of the report.

4.4.2 Noise Criteria for Event

Several large community events have been issued with prevention notices concerning noise under Section 96 of the POEO Act. All notices refer to amplified sound from the venues. The notices are summarised below.

4.4.2.1 Sydney Cricket and Sports Ground Trust

The notice for the Sydney Cricket and Sports Ground Trust categorises events:

- Concert – No more than four per year permitted. Noise level limits for rehearsals, sound tests and concerts not to exceed 70 dB L_{Amax} and 90 dB L_{Cmax} for the SCG and 80 dB L_{Amax} and 100 dB L_{Cmax} for the SFS at any residence. Rehearsals and sound tests are limited to between 1000 hours and 1900 hours and concerts are limited to between 1000 hours and 2230 hours. The monitoring required for these events includes an accredited acoustical consultant with direct contact to a person or persons authorised to reduce the sound level of the event.

- Sporting Events – Limited to between 0800 hours and 2230 hours. Noise level limit of 60 dB L_{Amax} for State and final events and 55 dB L_{Amax} for other events at any residence. One representative event at the SGC and one at the SFS must be monitored each year by an accredited acoustical consultant.

[1] '*Noise and Man*' by William Burns 1973

4.4.2.2 Royal Botanic Gardens and Domain Trust

The notice for the Royal Botanic Gardens and Domain Trust categorises events:

- Category 1 Event – outdoor cinematic event with capacity for between 200 and 2,000 people, limited to between 1900 hours and 2400 hours. Noise limits of the lesser of 55 dB L_{Amax} and the background (L_{A90}) level + 5 dB at any residence. The monitoring required for these events includes an accredited acoustical consultant with direct contact to a person or persons authorised to reduce the sound level of the event.

- Category 2 Event – any commercial outdoor entertainment activity with capacity for 2,000 to 10,000 people, limited to between 1000 hours and 2300 hours. Noise limits of 55 dB L_{Amax} and 70 dB L_{Cmax} at any residence. The monitoring required for these events includes an accredited acoustical consultant with direct contact to a person or persons authorised to reduce the sound level of the event.

- Category 3 Event – any outdoor entertainment activity with capacity for more than 10,000 people, limited to between 1000 hours and 2300 hours. Noise limits of 70 dB L_{Amax} and 90 dB L_{Cmax} at any residence. The monitoring required for these events includes an accredited acoustical consultant with direct contact to a person or persons authorised to reduce the sound level of the event.

4.4.2.3 Centennial Park and Moore Park Trust

The notice for the Centennial Park and Moore Park Trust categorises events:

- Category 1 Event – any event using sound amplification with a capacity of less than 1500 people. L_{A10} noise limit of background (L_{A90}) level + 5 dB at any residence. The monitoring required for these events must ensure that the noise limit is met.

- Category 2 Event – any event using sound amplification with a capacity of more between 1500 and 5000 people, except musical concerts or cinematic screening and theatrical performances at the Belvedere Amphitheatre. L_{A10} noise limits of background (L_{A90}) level + 5 dB at any residence between 1000hours and 2300 hours and background level (L_{A90}) outside these hours. The monitoring required for these events must ensure that the noise limit is met.

- Category 3 Event – any musical concert using sound amplification with capacity for more than 5,000 people. The number of concerts is limited to 8 days per year and no more than 4 consecutively. Concerts limited to between 1000 hours and 2230 hours, rehearsals and sound tests limited to between 1000 hours and 2300 hours. Noise limits of 65 dB L_{Amax} and 85 dB L_{Cmax} at any residence. There is an allowance of 5 dB for a single five-minute period during the first fifteen minutes of the performance of each band or act. The monitoring required for these events requires an accredited acoustical consultant monitoring at the most affected locations.

- Category 4 Event - any cinematic screening and theatrical performances at the Belvedere Amphitheatre using sound amplification. Limited to a combined total of 26 weeks per year on a maximum of six days per week. Limited to between 1000 hours and 2300 hours. L_{Amax} limit of between 48 dB and 55 dB depending on location. The first sound test and screening of each season of screenings must be monitored by an accredited acoustical consultant to ensure compliance.

4.4.3 Recommended Noise Limits for Bondi Christmas and New Year's Eve Concerts

4.4.3.1 Noise Criteria for Entertainment

The precedents set by the DECCW summarised in Section 4.6 of this report are for other established entertainment venues where they are not permitted to operate after 23:00 hours, but more than one event can be held each year.

The more important events in the prevention notices use the L_{Amax} and L_{Cmax} descriptors as the two criteria to be met by the events. The L_{Cmax} limit is to ensure that annoying low frequency content, which may not affect the L_{Amax} sound level, is also controlled.

Taking into consideration the one-off nature of the events, the significance of the celebration for the community, the Prevention Notices summarised above and the needs of neighbours, the criteria for concerts at the Sydney Football Stadium are considered to be appropriate.

The Prevention Notice for the Sydney Cricket and Sports Ground Trust permits up to four concerts per year and sets noise limits of 80 dB L_{Amax} and 100 dB $L_{Cmax.}$

It should be noted that the recommended noise limits do not guarantee that no complaints will be received. They are a compromise between community expectation and the viability of the events.

4.4.3.1.1 Christmas Day Events - Bondi Pavillion

This is a part of the Sober Santa events at Bondi Beach.

Noise limits of 55 dB L_{Amax} and 70 dB L_{Cmax} at residential premises have previously been recommended as appropriate for the Pavilion event on Christmas Evening. There is frequently difficulty in achieving the 55 dB(A) L_{Amax} limit and maintaining the music at a level sufficient for patrons. The limit for the last year's event was recommended to be increased to 58 dB(A) L_{Amax} but maintain the L_{Cmax} at 70 dB(A).

The L_{Cmax} limit is to ensure that annoying low frequency content, which may not affect the L_{Amax} sound level, is also controlled.

4.4.3.1.2 Bondi Beach Event

The Prevention Notice for the Sydney Cricket and Sports Ground Trust is used as the basis for recommended noise limits.

Noise limits of 80 dB L_{Amax} and 100 dB L_{Cmax} at the apartments and high rise premises in the commercial zone are recommended. The recommended limit for the residential areas is 75 dB L_{Amax} and 95 dB L_{Cmax}.

The L_{Cmax} limit is to ensure that annoying low frequency content, which may not affect the L_{Amax} sound level, is also controlled.

4.5 ECOLOGICAL NOISE MANAGEMENT CRITERIA

The management of the potential impact of ecological noise is at present an inexact science due to the limited number of studies that have been undertaken pertinent to outdoor concerts.

However initiatives were implemented at the Sydney Olympic Park during two 3-day concert events – The Great Escape held at Newington on the grounds of the heritage site known as The Newington Armoury.

An ecological acoustic study was conducted before, during and after the The Great Escape 2006 Music Event. A further similar study was conducted during the following year's The Great Escape. The study involved a team comprising a Sydney Olympic Park Authority Ecologist, Epacris Environmental Consultants and Acoustic Consultants employed by the promoter but reporting to SOPA.

The acoustic study involved unattended noise logging at four sensitive ecological areas. It also involved attended noise monitoring at these areas during the main events.

There were four particularly sensitive ecological areas:

- A nesting colony of bats;
- Wharf pond;
- Wanngal wetland; and
- Wanngal woodland.

A detailed report – Reference 16024 Ecological Acoustic Study (November 2006) – was prepared.

The site location and aerial photograph are provided in Attachment 8.

These studies found no measurable relationship between the noise levels that occurred and disturbance to the species inhabiting the sensitive ecological areas.

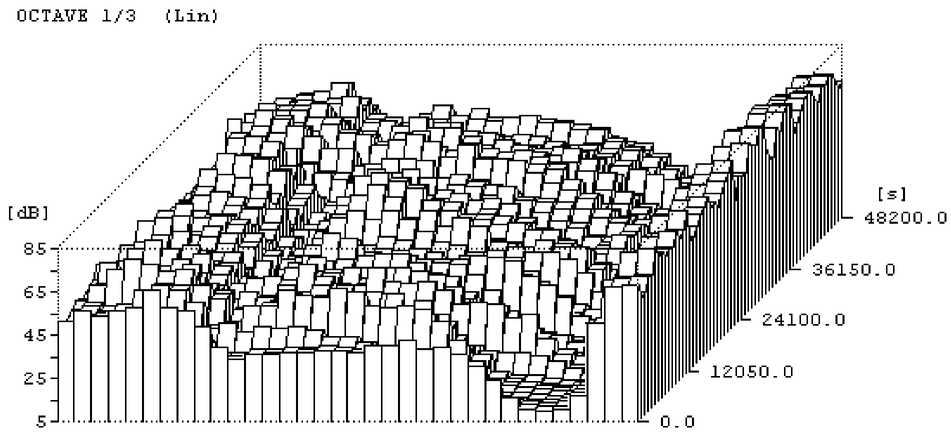
Typical music noise levels generated were the following:

- Nesting bat colony:

	Day time	Night time
L_{A10}'s	55-59 dB(A)	48-51 dB(A)
L_{Aeq}'s	58-61 dB(A)	55 dB(A)

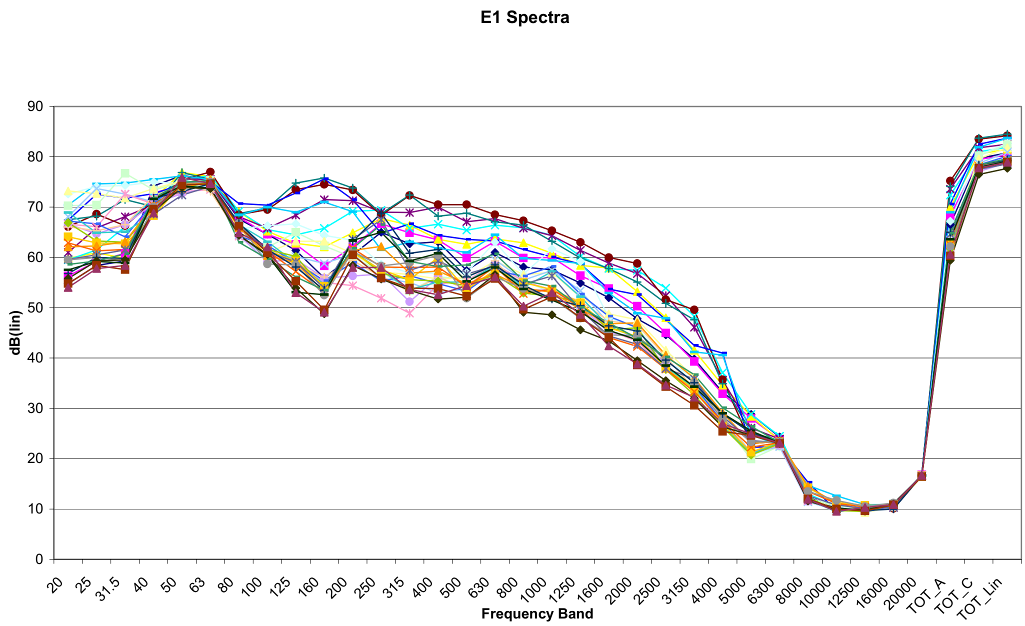
The following spectra were measured.

Figure 4-1: Location E1 Spectra (Sunday 9.00pm)



An hour and fifteen minutes of spectra (20 Hz to 20 kHz and overall dB(A), dB(C) and dB(lin) with an averaging time of 5 seconds taken on Sunday night at around 9 pm at monitoring site E1.

Figure 4-2: Location E1 Spectra (Sunday – during a louder period)



Thirty spectra from monitoring site E1 on Sunday night during one of the louder periods. The graph indicates that the vast majority of the sound occurs in frequencies below 1 or 2 kHz. There is very little sound over 8 kHz.

- Wharf Pond:

	Day time	Night time
L_{A10}'s	55-59 dB(A)	48-51 dB(A)
L_{Aeq}'s	58-61 dB(A)	55 dB(A)

The music generated maximum noise levels at the Pond of up to 80dB(A). Although the music fluctuated by 14-26dB(A) there was no visible evidence of disturbance to the bird life which continued to feed and reside in the Pond.

Studies of the effects of military noise wildlife (*"Effects of Military Noise on Wildlife"*[2]) provided an extensive discussion of military noise effects. This has little direct correlation to music from outdoor concerts. The literature review established that noise associated with blasting, infrasound and an intermittent sudden onset of disturbance had the most observable effects.

The gradual onset of music is an approach that has been adopted at several concerts following discussions with residents and would be part of the noise management plan recommended for 'Parklands' as it would also assist in providing a best practice guideline for the ecologically sensitive areas.

[2] A literature review by Ronald P Larklin, Centre of Wildlife Ecology, Illinois Natural History Survey (date unknown)

By including in the noise management plan ecological noise monitoring, best practice guidelines would be further improved.

4.6 RECOMMENDED NOISE LIMITS

In recommending the noise limits at the Parklands' noise sensitive premises, the following event categories have been considered:

- Minor event – less than 300 patrons;
- Small event – 300 patrons to 3000 patrons;
- Moderate event – 3000 patrons to 10,000 patrons; and
- Major event – greater than 10,000 patrons.

The criteria are set based on the absence of annoying characteristics such as tones, impulses, undulating noise levels. From the in-depth research regarding outdoor event noise criteria presented under Section 4.1 to Section 4.4 above, the following noise-related factors can be deduced:

- To consider the time at which the event takes place, the UK's Noise Council et al. considers the time threshold (before sleep disturbance is considered to become an issue) is 11.00pm. Specific measures are available that could apply from 10pm to midnight and then after midnight to reduce the sensitivity for sleep disturbance. Consequently, the period after 11.00pm will be sensitive and sleep disturbance may be an issue. The design noise criteria recommended in the Table 4.1 (Section 4.1) has therefore considered the period 'after 12.00pm' as a general guideline to apply the noise limits.

- The number of event days per year is outlined in Table 4-1 (refer to Section 4.1). In general, 1-3 event days per year are more readily accepted by the community and therefore more stringent design noise criteria are recommended for 4-12 event days per year with 12 major event days per year being the upper recommended limit until the consent authority considers further events of a major nature could be held.

The rating background levels (RBL) which are the representative background noise levels of the surveyed area, have been derived from Table 3-22 (values presented in bold) and appropriately applied to the design criteria shown in Table 5-3 to Table 5-8 below.

Table 4-2: Acoustic Criteria

Event Scenario	Design Factors	Recommended Design Noise Criteria at Receiver Locations			
		Until 11pm		After 11pm	
Minor Less than 300 patrons	1-4 event days per year (L_{Aeq})	RBL+10		RBL+ 5	
	> 5 event days per year (L_{Aeq})	RBL+ 5		RBL	
	Sleep Disturbance (L_{Amax})	N/A		L_{A90} + 15 dB(A)	
Small 300 to 3,000 patrons	1-4 event days per year (L_{Aeq})	RBL+ 15		RBL+ 10	
	Sleep Disturbance (L_{Amax})	N/A		L_{A90} + 15 dB(A)	
Moderate 3,000 to 10,000 patrons	1-4 event days per year (L_{Aeq})	65dB L_{Aeq}	90dB L_{cmax}	60dB LAeq	80dB L_{cmax}
	Sleep Disturbance (L_{Amax})	N/A	N/A	L_{A90} + 15 dB(A)	N/A
Major Greater than 10,000 patrons		Until 12am		After 12am	
	12 event days per year (L_{Aeq})	65dB LAeq	95dB L_{cmax}	60dB LAeq	80dB L_{cmax}
	Sleep Disturbance (L_{Amax})	N/A	N/A	L_{A90} + 15 dB(A)	N/A
Field Days	1-3 event days per year (L_{Aeq})	Until 10pm 65 dBL_{Aeq}	Until 10pm 95 dBL_{Cmax}	After 10pm RBL + 10	

N/A Not applicable

5. NOISE MODELLING

Noise emissions from the proposed operations were modelled using the Concawe algorithm of SoundPLAN V7.0. This model is recognised by the DECCW (NSW EPA) for modelling environmental noise emissions and has been used by Benbow Environmental on many projects achieving highly accurate and repeatable results.

The sample site layout drawings assumed for the predictive noise modelling process are provided in the Attachments section of this report.

Any potential exceedances of tabulated results under the Day, Night and Sleep Disturbance assessment criteria have been presented in Section 5.4.

Each receiver location has been analysed individually as the background noise levels (presented here as the Rating Background Level – RBL) vary according to its locality.

The Design Criteria as well as the predictive modelling results for Day and Night are shown in dB L_{Aeq}. As discussed in Section 4.4.1.2 above, the Design Criteria for Sleep Disturbance here is that the resulting L_{max} (in lieu of the L_1) does not exceed the background noise level at each receiver by 15 dB. As such, the predictive modelling results for Sleep Disturbance are presented in dB L_{Amax}.

The meteorological considerations presented in Section 5.2 of this report as per the NSW INP indicate the following:

1. Temperature inversion - F-class stability inversions are not present for at least 30% of the total night time during winter when assessed over a 5-year period and therefore the subject area is deemed not to be substantially affected by temperature inversions.

2. Light winds - when assessing for the occurrence of light winds, breezes with wind speeds between 0.0m/s and 3.0m/s do not occur for 30% of the time or more in any assessment period in any season and therefore the subject area is deemed not to be substantially affected by light winds.

Based on the aforementioned results for the two (2) noise enhancing meteorological factors, we can conclude that there is no need for the predictive noise model to apply any noise enhancing meteorological factors in the modelling process. However, light winds of 3 m/s from source to receiver (a noise enhancing meteorological condition) has been applied to the predictive noise model in order to assess under a worst-case scenario. Consequently, the modelling results are deemed to be conservative and therefore, it should be duly noted that any potential exceedances shown here may be considered as a mere precaution and not an 'exceedance' in its entirety.

Further to the potential 'exceedances' presented in Section 5.2, the remaining results marked as 'marginal' refer to any potential exceedances at or less than 3 dB(A) as a 3 dB change in any direction is generally considered to be barely perceptible by the human auditory system.

For the purpose of this assessment, it has been assumed that events will generally commence around 12 noon and finish around 3.00am.

5.1 SCENARIOS

Model scenarios were configured to provide a realistic assessment of potential event noise emissions. Each sample model configuration was used to calculate noise levels at the nearest potentially affected receivers under the proposed maximum operations. It should be noted that the below crowd configurations have been applied for modelling purposes only and does not provide a definitive crowd capacity at each stage area.

The scenarios considered are listed in Table 5-1 below.

Table 5-1: Modelled Noise Scenarios Considered – Proposed Operations

Scenario	Description	Sources Included	Speaker system orientation
Maximum Daytime Operations - 12pm-11pm *(assuming all events commence at 12pm)*			
Minor E.g.1	Live music – 1 stage 300 patrons 300 campers	1 speaker system 300 event crowd 300 campers	South
Minor E.g.2	Live music – 1 stage 300 patrons 300 campers	1 speaker system 300 event crowd 300 campers	North
Minor E.g.3	Live music – 1 stage 300 patrons	1 speaker system 300 event crowd	South-east
Minor E.g.4	Live music – 1 stage 300 patrons 300 campers	1 speaker system 300 event crowd 300 campers	West
Small E.g.1	Live music – 1 stage 3,000 patrons 3,000 campers	1 speaker system 3,000 event crowd 3,000 campers	East
Small E.g.2	Live music – 1 stage 3,000 patrons	1 speaker system 3,000 event crowd	North-west
Small E.g.3	Live music – 1 stage 3,000 patrons 2,000 campers	1 speaker system 3,000 event crowd 2,000 campers	East

Table 5-1: Modelled Noise Scenarios Considered – Proposed Operations

Scenario	Description	Sources Included	Speaker system orientation
Maximum Daytime Operations - 12pm-11pm *(assuming all events commence at 12pm)*			
Small E.g.4	Live music – 4 stages 3,000 patrons 1,500 campers	4 speaker systems Stage 1 – 500 patrons Stage 2 – 1,000 patrons Stage 3 - 500 patrons Stage 4 – 1,000 patrons 1,500 campers	North, east, south, west
Moderate E.g.1	Live music – 3 stages 10,000 patrons 10,000 campers	3 speaker systems Stage 1 – 4,000 patrons Stage 2 – 3,000 patrons Stage 3 – 3,000 patrons 10,000 campers	North-east, north-west
Moderate E.g.2	Live music – 2 stages 10,000 patrons 10,000 campers	2 speaker systems Stage 1 – 5,000 patrons Stage 2 – 5,000 patrons 10,000 campers	North, south
Moderate E.g.3	Live music – 3 stages 10,000 patrons 10,000 campers	3 speaker systems Stage 1 – 4,000 patrons Stage 2 – 4,000 patrons Stage 3 – 2,000 patrons 10,000 campers	South-east, south, south-west
30% Capacity E.g.1	Exhibition 15,000 patrons	15,000 event crowd	N/A
40% Capacity E.g.1	Live music – 4 stages 20,000 patrons 20,000 campers	4 speaker systems Stage 1 - 7,000 patrons Stage 2 – 8,000 patrons Stage 3 – 2,000 patrons Stage 4 – 3,000 patrons 20,000 campers	North-east, north-west
40% Capacity E.g.2	Live music – 1 stage 20,000 patrons	1 speaker system 20,000 event crowd	West
40% Capacity E.g.3	Live music – 4 stages 20,000 patrons 10,000 campers	4 speaker systems Stage 1 – 7,000 patrons Stage 2 – 8,000 patrons Stage 3 – 2,000 patrons Stage 4 – 3,000 patrons	North-east, south, north-west

Table 5-1: Modelled Noise Scenarios Considered – Proposed Operations

Scenario	Description	Sources Included	Speaker system orientation
Maximum Daytime Operations - 12pm-11pm *(assuming all events commence at 12pm)*			
70% Capacity E.g.1	Live music – 4 stages 35,000 patrons 25,000 campers	4 speaker systems Stage 1 – 10,000 patrons Stage 2 – 10,000 patrons Stage 3 – 5,000 patrons Stage 4 – 10,000 patrons	East, north-east, north-west
70% Capacity E.g.2	Live music – 5 stages 35,000 patrons 25,000 campers	4 speaker systems Stage 1 – 10,000 patrons Stage 2 – 7,000 patrons Stage 3 – 10,000 patrons Stage 4 – 3,000 patrons Stage 5 – 5,000 patrons	North-east, south, south-east, south-west, west
100% Capacity E.g.1	Live music – 7 stages 50,000 patrons 25,000 campers	7 speaker systems Stage 1 - 10,000 patrons Stage 2 – 8,000 patrons Stage 3 – 10,000 patrons Stage 4 – 4,000 patrons Stage 5 - 2,000 patrons Stage 6 – 6,000 patrons Stage 7 – 10,000 patrons 25,000 campers	North-east, east, south-east, west, north-west
100% Capacity E.g.2	Live music – 5 stages 50,000 patrons 25,000 campers	5 speaker systems Stage 1 – 10,000 patrons Stage 2 – 8,000 patrons Stage 3 – 12,000 patrons Stage 4 – 8,000 patrons Stage 5 – 12,000 patrons 25,000 campers	North, east, south-east, south-west, north-west
100% Capacity E.g.3	Live music – 7 stages 50,000 patrons	7 speaker systems Stage 1 – 8,000 patrons Stage 2 – 10,000 patrons Stage 3 – 10,000 patrons Stage 4 – 7,000 patrons Stage 5 – 2,000 patrons Stage 6 – 3,000 patrons Stage 7 – 10,000 patrons	North-east, east, south-east, west, north-west
Maximum Night time Operations – 12am-3am (assuming all events finish at 3am)			
A1 – F3	Recorded music	As listed above	As listed above
Sleep Disturbance (12am-3am)			
A1 – F3	Recorded music	As listed above	As listed above

5.2 Meteorological Conditions

As per the NSW INP, it is recommended that noise-enhancing meteorological conditions such as temperature inversions and light winds are assessed for the subject area.

In respect to temperature inversions, the INP states that the assessment of impact is confined to the night noise assessment period (10pm-7am). It further states that an occurrence of 30% of the total night-time during winter (June, July and August) represents a significant noise impact.

Accordingly, a long-term temperature inversion assessment was undertaken based on data provided by the Bureau of Meteorology's Coolangatta weather station. This was the only available data located closest to the subject site.

The results show that F-class stability inversions are not present for at least 30% of the total night time during winter with a mere 15.1% occurrence of F-class stability inversions within the locality representing the subject area when assessed over a 5-year period. In the presence of missing meteorological data, F-class inversion has been applied and hence the resulting 15.1% occurrence is conservative.

Similarly, the NSW INP states that wind is considered to be a feature where source-to-receiver wind speeds of 3m/s or below occur for 30% of the time or more in any assessment period (day, evening, and night) in any season.

As such, a predominant wind analysis of the area was carried out and is presented in Attachment 5 of this report. The wind rose plots show winds with wind speeds between 0.0m/s and 3.0m/s as follows.

- Spring:
  - Daytime (7am to 6pm) – Less than 2% in any direction;
  - Evening (6pm to 10pm) – Less than 2% in any direction;
  - Night (10pm to 7am) - 4% southerly, 17% south-westerly, 4% westerly, and 3% north-westerly;
- Summer:
  - Daytime (7am to 6pm) – 2% southerly and south-westerly winds;
  - Evening (6pm to 10pm) – all winds are ≥ 3.0m/s;
  - Night (10pm to 7am) - 8% southerly, 17% south-westerly, and 3% westerly;
- Autumn:
  - Daytime (7am to 6pm) – 4% southerly and 3% south-westerly winds;
  - Evening (6pm to 10pm) – 3% southerly and 10% south-westerly winds;
  - Night (10pm to 7am) – 9% southerly, and 24% south-westerly;
- Winter:
  - Daytime (7am to 6pm) – 4% southerly and 7% south-westerly winds;
  - Evening (6pm to 10pm) – 3% southerly, 14% south-westerly and 5% westerly winds; and
  - Night (10pm to 7am) – 8% southerly, 28% south-westerly, and 7% westerly.

It can be seen from the predominant wind analysis above that winds with wind speeds between 0.0m/s and 3.0m/s do not occur for 30% of the time or more in any assessment period in any season and therefore the subject area is deemed not to be affected by light winds.

However, the latter noise enhancing meteorological condition, i.e. 3 m/s wind from source to receiver, has been applied to each predictive modelling scenario in order to allow for an adequate worst-case assessment.

5.3 NOISE SOURCES

The octave band sound power levels for the sources identified have been measured by environmental engineers from Benbow Environmental at similar facilities. The results are presented in Table 5-2 below. The data has been used to model noise emissions from the site at the nearest potentially affected sensitive receivers.

Table 5-2: Noise Source Data Adopted Sound Power Levels (dB(A))

Descriptor	Lw dB(A)	1/1 Linear Weighted Octave Band Centre Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
MAIN NOISE SOURCES									
Music PA 12pm – 12am									
L_{Amax}	137.0	117.6	122.8	116.3	126.9	125.9	128.3	117.0	113.2
Music PA 12am – 3am (Additional stage/s)									
L_{Amax}	120.0	100.6	105.8	99.3	109.9	108.9	111.3	100.0	96.2
AUXILIARY NOISE SOURCES									
Mobile Lighting Tower									
L_{Aeq}	97.9	71.7	87.0	83.9	78.4	87.2	85.3	82.8	83.5
Generator 250kVA (Main stage/s)									
L_{Aeq}	110.0	83.8	99.1	96.0	90.5	99.3	97.4	94.9	95.6
Generator 125kVA (Temporary offices)									
L_{Aeq}	107.0	80.8	96.1	93.0	87.5	96.3	94.4	91.9	92.6
Generator 100kVA (Artist communal)									
L_{Aeq}	106.0	79.8	95.1	92.0	86.5	95.3	93.4	90.9	91.6
Generator 100kVA (VIP communal)									
L_{Aeq}	106.0	79.8	95.1	92.0	86.5	95.3	93.4	90.9	91.6
Generator 150kVA (Restaurant)									
L_{Aeq}	108.0	81.8	97.1	94.0	88.5	97.3	95.4	92.9	93.6
Generator 125kVA (Food van)									
L_{Aeq}	107.0	80.8	96.1	93.0	87.5	96.3	94.4	91.9	92.6
Generator 50kVA (Food vending)									
L_{Aeq}	103.0	76.8	92.1	89.0	83.5	92.3	90.4	87.9	88.6
Generator 50kVA (Bar)									
L_{Aeq}	103.0	76.8	92.1	89.0	83.5	92.3	90.4	87.9	88.6

Table 5-2: Noise Source Data Adopted Sound Power Levels (dB(A))

Descriptor	Lw dB(A)	1/1 Linear Weighted Octave Band Centre Frequency (Hz) 63	125	250	500	1000	2000	4000	8000
Generator 50kVA (Merchandise)									
L_{Aeq}	103.0	76.8	92.1	89.0	83.5	92.3	90.4	87.9	88.6
Generator 50kVA (Staff catering)									
L_{Aeq}	103.0	76.8	92.1	89.0	83.5	92.3	90.4	87.9	88.6
Event Crowd (300 patrons)									
L_{Amax}	80.9	64.1	64.0	73.4	74.0	75.5	73.5	69.8	64.6
Event Crowd (3,000 patrons)									
L_{Amax}	90.9	74.1	74.0	83.4	84.0	85.5	83.5	79.8	74.6
Event Crowd (10,000 patrons)									
L_{Amax}	96.2	79.4	79.3	88.7	89.3	90.8	88.8	85.1	79.9
Event Crowd (15,000 patrons)									
L_{Amax}	97.9	81.1	81.0	90.4	91.0	92.5	90.5	86.8	81.6
Event Crowd (20,000 patrons)									
L_{Amax}	99.2	82.4	82.3	91.7	92.3	93.8	91.8	88.1	82.9
Event Crowd (35,000 patrons)									
L_{Amax}	101.6	84.8	84.7	94.1	94.7	96.2	94.2	90.5	85.3
Event Crowd (50,000 patrons)									
L_{Amax}	103.2	86.4	86.3	95.7	96.3	97.8	95.8	92.1	86.9
Campers (300 campers)									
L_{Amax}	80.8	59.6	66.2	65.0	73.4	75.7	76.6	69.2	49.0
Campers (1,500 campers)									
L_{Amax}	87.8	66.7	73.2	72.0	80.4	82.7	83.6	76.2	56.0
Campers (2,000 campers)									
L_{Amax}	89.0	67.9	74.4	73.2	81.6	83.9	84.8	77.4	57.2
Campers (3,000 campers)									
L_{Amax}	90.8	69.6	76.2	75.0	83.4	85.7	86.6	79.2	59.0
Campers (10,000 campers)									
L_{Amax}	96.0	74.9	81.4	80.2	88.6	90.9	91.8	84.4	64.2
Campers (20,000 campers)									
L_{Amax}	99.0	77.9	84.4	83.2	91.6	93.9	94.8	87.4	67.2
Campers (25,000 campers)									
L_{Amax}	100.0	78.9	85.4	84.2	92.6	94.9	95.8	88.4	68.2

5.4 MODELLED RESULTS – NO CONTROLS

The predicted noise levels are based on the stage locations provided and with No Controls in place.

The results are presented for the 18 receivers adopted for the noise impact assessment. The results are first presented for the time periods 12pm-11pm and 12pm-12am for 1-3 day major event. These results are in Table 5-3.

The results are then presented for the time periods through to 3am. These results are in Table 5-4, Table 5-6 and Table 5-7 then provide the predicted noise levels with the auxiliary noise sources included and with no controls in place.

The most potentially affected receivers are R05, R10, R11, R12, R13, R17 and R18 (future house site).

Section 6 re-examines the predicted noise levels with a number of controls in place.

Sample site configurations have been assumed for the purpose of modelling only and to obtain meaningful results in the NSW EPA-recognised SoundPLAN v7.0.

A noise enhancing meteorological condition has been applied to all scenarios, viz. 3m/s wind from source to receiver in order to adequately assess under a worst-case scenario. This precautionary approach provides a suitably conservative assessment of the potential noise impact for the Parklands and its surrounding areas.

Table 5-3: Modelled Noise Impacts – Music PAs Only - NO CONTROLS (3m/s wind from source to receiver) Day (12pm-12am for 1-3 day major event per year)

	Receiver Location																	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
Approx. 300 patrons Design Criteria: RBL+10	54	55	55	54	52	54	54	54	47	47	55	45	45	56	48	51	52	52
Minor Example A	43.6	43.9	44.7	42.4	56.7	28.5	33.6	36.3	31.3	52.7	52.8	52.8	52.8	39.4	40.1	36.5	54.4	59.2
Minor Example B	45.1	43.8	43.8	44.5	54.6	42.2	30.1	32.5	33.2	49.4	50.3	58.7	56.3	42.3	42.7	38.5	50.7	52.8
Minor Example C	42.1	42.2	43.2	40.7	54.6	30.2	28.2	29.1	31.2	42.7	55.2	51.9	51.8	38.4	38.8	35.3	37.1	60.3
Minor Example D	46.6	46.4	46.8	46.6	60.5	44.1	30.6	31.1	38.4	49.4	49.3	53.5	45.3	40.4	41.8	38.1	54.7	49.7
Approx. 3,000 patrons Design Criteria: RBL+15	59	60	60	59	57	59	59	59	52	52	60	50	50	61	53	56	57	57
Small Example A	44.0	43.7	44.2	42.8	55.3	27.6	31.9	34.3	35.2	51.9	52.6	55.4	55.4	40.3	40.8	37.0	52.7	55.9
Small Example B	34.2	42.4	30.3	29.6	58.1	31.0	32.4	34.8	34.3	51.2	40.1	49.5	49.7	37.9	39.0	35.8	42.9	45.7
Small Example C	34.6	48.3	42.1	42.7	71.5	36.0	35.0	32.5	30.9	33.4	47.3	48.1	39.0	38.0	40.0	29.0	62.0	43.9
Small Example D	51.3	51.3	52.0	50.7	65.1	40.2	38.0	37.5	44.7	56.4	56.9	59.4	57.7	46.0	47.1	43.5	61.1	60.5
Approx. 10,000 patrons Design Criteria: 65 dB L_{Aeq}	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Moderate Example A	52.0	51.3	51.7	52.9	66.1	47.4	35.2	34.8	42.5	53.5	53.2	59.6	50.3	46.1	47.5	43.7	58.7	54.1
Moderate Example B	47.3	47.0	47.6	46.2	59.3	33.9	35.4	38.0	36.8	55.0	55.1	57.8	57.9	43.4	44.1	40.3	56.5	60.1
Moderate Example C	48.0	48.6	48.8	47.3	61.3	33.6	38.4	39.0	41.4	55.6	55.8	58.0	58.0	44.2	44.9	41.3	57.0	64.4
Approx. 15,000 patrons Design Criteria: RBL+15	59	60	60	59	57	59	59	59	52	52	60	50	50	61	53	56	57	57
30% Capacity Example A	41.7	41.3	42.0	39.7	53.2	24.2	28.1	29.6	31.1	49.9	50.0	51.4	51.9	37.6	38.3	34.5	50.8	54.7
Approx. 20,000 patrons Design Criteria: 65 dB L_{Aeq}	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
40% Capacity Example A	52.1	51.8	51.7	52.9	66.6	47.5	38.3	37.8	43.1	55.6	53.4	60.0	53.0	46.7	48.1	44.3	58.8	55.5
40% Capacity Example B	43.9	43.1	43.4	42.7	53.9	26.9	31.0	33.3	33.8	51.0	52.3	57.5	57.6	41.1	41.4	37.3	51.0	53.9
40% Capacity Example C	52.3	51.5	51.8	52.8	65.7	46.8	36.9	38.1	42.4	55.9	56.3	62.4	60.3	47.6	48.6	44.6	58.9	58.8

Table 5-3: Modelled Noise Impacts – Music PAs Only - NO CONTROLS (3m/s wind from source to receiver) Day (12pm-12am for 1-3 day major event per year)

	Receiver Location																	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
Approx. 35,000 patrons Design Criteria: 65 dB L_{Aeq}	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
70% Capacity Example A	53.6	53.1	53.3	52.8	64.8	47.7	38.0	39.1	44.3	57.0	57.0	61.3	58.1	49.2	50.1	46.8	59.4	58.1
70% Capacity Example A	54.8	54.8	55.3	54.2	66.8	43.0	41.6	42.1	45.6	58.9	59.1	62.3	60.8	50.5	51.4	48.2	61.6	64.3
Approx. 50,000 patrons Design Criteria: 65 dB LAeq	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
100% Capacity Example A	57.2	57.0	56.8	57.1	69.9	51.3	44.3	44.3	48.1	61.9	61.3	67.8	66.8	53.6	54.4	50.8	62.8	66.9
100% Capacity Example B	48.4	48.9	48.6	47.1	61.8	35.9	40.8	44.7	43.9	58.1	59.2	63.4	63.2	47.0	47.0	43.2	52.3	63.8
100% Capacity Example C	53.3	53.0	52.5	53.6	66.9	47.0	41.0	40.8	44.7	57.9	57.8	64.8	66.8	49.3	50.2	46.2	59.4	66.9

Potential exceedance

Under the worst-case 3m/s wind from source to receiver conditions, any potential exceedances expressed here should be noted as a mere precaution and not as an 'exceedance' as such.

Further analyses of the results have been provided under the "Modelled Noise Impacts - Maximum Operations" in Table 5-6 to Table 5-8 whereby all music PA systems as well as auxiliary noise sources as outlined in Table 5-2 have been carefully considered.

Table 5-4: Modelled Noise Impacts – Music PAs only - NO CONTROLS (3m/s wind from source to receiver) Night (12am-3am for 1-3 day major event per year)

Scenario Night (11pm-3am)	Receiver Location																	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
Approx. 300 patrons Design Criteria: RBL+5	49	50	50	49	47	49	49	49	42	42	50	40	40	51	43	46	47	47
Minor Example A	39.7	40.0	40.8	38.5	52.8	24.6	29.8	32.4	27.4	48.8	48.9	48.9	48.9	35.5	36.2	32.6	50.5	55.3
Minor Example B	41.2	39.9	39.9	40.6	50.7	38.3	26.2	28.6	29.3	45.5	46.4	54.8	52.4	38.4	38.9	34.6	46.8	48.9
Minor Example C	38.2	38.3	39.3	36.8	50.7	26.3	24.3	25.2	27.3	38.8	51.3	48.0	47.9	34.5	34.9	31.4	33.2	56.4
Minor Example D	42.7	42.4	42.9	42.7	56.6	40.2	26.7	27.2	34.5	45.5	45.4	49.6	41.4	36.5	37.9	34.3	50.8	45.8
Approx. 3,000 patrons Design Criteria: RBL+10	54	55	55	54	52	54	54	54	47	47	55	45	45	56	48	51	52	52
Small Example A	40.2	39.8	40.3	38.9	51.4	23.7	28.0	30.4	31.3	48.0	48.7	51.5	51.5	36.4	36.9	33.1	48.8	52.0
Small Example B	30.3	38.5	26.4	25.7	54.2	27.1	31.5	30.9	30.4	47.2	36.2	45.7	45.8	34.0	35.1	31.9	39.0	41.8
Small Example C	30.7	44.4	38.2	38.8	67.6	32.1	31.1	28.6	27.0	29.5	43.4	44.2	35.1	34.1	36.1	25.1	58.1	40.0
Small Example D	47.4	47.4	48.1	46.8	61.2	36.3	34.1	33.6	40.8	52.5	53.0	55.5	53.8	42.1	43.2	39.6	57.2	56.6
Approx. 10,000 patrons Design Criteria: 55 dB L_{Aeq}	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
Moderate Example A	48.1	47.4	47.8	49.0	62.2	43.5	31.3	30.9	38.6	49.6	49.3	55.7	46.4	42.2	43.6	39.8	54.8	50.2
Moderate Example B	43.4	43.1	43.7	42.3	55.4	30.0	31.5	34.1	32.9	51.1	51.2	53.9	54.0	39.5	40.2	36.4	52.6	56.2
Moderate Example C	44.1	44.7	44.9	43.4	57.4	29.7	34.5	35.1	37.5	51.7	51.9	54.1	54.1	40.3	41.0	37.4	53.1	60.5

Table 5-4: Modelled Noise Impacts – Music PAs only - NO CONTROLS (3m/s wind from source to receiver) Night (12am-3am for 1-3 day major event per year)

Scenario Night (11pm-3am)	Receiver Location																	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
Approx. 15,000 patrons Negligible music, if any Design Criteria: RBL+10	54	55	55	54	52	54	54	54	47	47	55	45	45	56	48	51	52	52
30% Capacity Example A	37.8	37.4	38.1	35.8	49.3	20.3	24.2	25.7	27.2	46.0	46.1	47.5	48.0	33.7	34.4	30.6	46.9	50.9
Approx. 20,000 patrons Design Criteria: 60 dB L_{Aeq}	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
40% Capacity Example A	48.2	47.9	47.8	49.0	62.7	43.6	34.4	33.9	39.2	51.7	49.5	56.1	49.1	42.8	44.2	40.4	54.9	51.6
40% Capacity Example B	40.0	39.2	39.5	38.8	50.0	23.0	27.1	29.4	29.9	47.1	48.4	53.6	53.7	37.2	37.5	33.4	47.1	50.0
40% Capacity Example C	48.4	47.6	47.9	48.9	61.8	42.9	33.0	34.2	38.5	52.0	52.4	58.5	56.4	43.7	44.7	40.7	55.0	54.9
Approx. 35,000 patrons Design Criteria: 60 dB L_{Aeq}	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
70% Capacity Example A	46.0	45.5	45.7	45.2	57.2	40.1	30.4	31.5	36.7	49.4	49.4	53.7	50.5	41.6	42.5	39.3	51.8	50.5
70% Capacity Example B	47.2	47.2	47.7	46.6	59.2	35.4	34.0	34.6	38.0	51.3	51.5	54.7	53.2	42.9	43.8	40.6	54.0	56.7
Approx. 43,000 patrons Design Criteria: 60 dB L_{Aeq}	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
100% Capacity Example A	44.5	44.4	45.1	45.1	59.3	38.4	33.6	33.5	37.5	49.8	49.4	57.0	55.3	40.7	41.4	37.5	51.3	56.2
100% Capacity Example B	44.5	45.1	44.7	43.2	57.9	32.0	36.9	40.8	40.0	54.2	55.3	59.5	59.3	43.1	43.1	39.3	48.4	59.9
100% Capacity Example C	49.4	49.1	48.6	49.7	63.0	43.1	37.1	36.9	40.8	54.0	53.9	60.9	59.9	45.4	46.3	42.3	55.5	60.0

Potential exceedance

Table 5-5: Modelled Noise Impacts – Music PAs only - NO CONTROLS (3m/s wind from source to receiver) Night (12am-3am for 1-3 day major event per year)

Scenario Night (11pm-3am)	Receiver Location																	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
Sleep Disturbance Design Criteria: RBL+15	59	60	60	59	57	59	59	59	52	52	60	50	50	61	56	59	57	57
Minor Example A	49.2	49.6	50.3	48.1	62.3	34.2	39.3	41.9	37.0	58.6	58.5	58.5	58.5	45.0	45.8	42.2	60.1	64.9
Minor Example B	50.8	49.5	49.5	50.2	60.3	48.1	35.7	38.1	38.9	55.0	55.9	64.5	62.3	48.0	48.4	44.1	56.4	58.6
Minor Example C	47.8	47.9	48.8	46.3	60.3	35.8	33.9	35.2	36.9	48.4	60.9	57.6	57.5	44.0	44.5	41.0	42.8	66.2
Minor Example D	52.2	52.0	52.5	52.4	66.2	51.2	36.2	36.8	44.1	55.0	55.0	59.1	51.0	46.1	47.5	43.8	60.3	55.5
Small Example A	49.7	49.3	49.8	48.5	61.0	33.3	37.6	39.9	40.8	57.6	58.3	61.0	61.1	46.0	46.5	42.7	58.3	61.5
Small Example B	40.5	50.1	36.1	35.6	65.2	36.7	41.0	40.4	40.2	58.6	46.1	55.3	55.3	43.5	44.6	41.4	48.5	51.9
Small Example C	40.2	54.1	48.0	49.0	77.4	41.6	40.7	38.1	36.6	39.1	53.0	53.8	44.7	43.6	45.7	34.6	67.7	49.7
Small Example D	51.7	51.7	52.4	51.5	66.4	41.7	38.1	38.4	45.2	57.8	57.4	59.6	59.6	45.8	47.2	43.6	61.3	63.0
Moderate Example A	53.9	53.6	54.1	55.5	69.9	50.9	37.4	36.4	45.3	54.9	54.7	62.7	53.3	48.0	49.0	44.8	61.0	57.8
Moderate Example B	50.5	49.8	50.3	49.5	62.2	38.3	39.0	41.6	41.5	58.5	58.4	61.7	61.8	46.7	47.4	43.4	59.9	64.2
Moderate Example C	50.1	49.7	50.2	48.8	62.5	35.3	40.7	41.6	47.1	58.6	58.5	60.3	60.4	45.8	46.6	42.9	59.9	67.6
30% Capacity Crowd Only	16.0	15.6	16.3	14.0	27.6	-1.5	2.4	4.0	5.4	24.2	24.3	25.8	26.3	11.9	12.6	8.8	25.2	29.2
40% Capacity Example A	53.8	53.7	54.1	55.5	69.9	51.0	41.1	40.6	45.3	59.0	54.7	62.7	55.3	48.0	49.0	44.8	61.0	57.9
40% Capacity Example B	49.7	48.8	49.1	48.4	59.6	32.6	36.7	39.0	39.5	56.7	58.1	63.2	63.3	46.8	47.1	43.0	56.7	59.6
40% Capacity Example C	54.0	53.7	54.1	55.7	70.0	50.1	37.8	40.3	45.2	58.0	58.4	64.4	64.0	48.1	49.1	44.9	61.0	61.8
70% Capacity Example A	55.1	55.1	55.4	55.0	68.3	52.1	39.1	42.0	47.2	58.6	59.3	62.6	62.5	50.4	51.2	47.7	61.2	61.3
70% Capacity Example B	55.1	55.0	55.4	55.0	68.1	44.5	41.4	43.2	47.0	59.6	59.3	63.1	62.8	49.3	50.4	47.4	61.3	66.1
100% Capacity Example A	50.3	50.5	50.9	51.0	65.6	46.5	37.8	38.1	45.0	53.6	54.1	61.6	61.1	45.1	45.9	42.6	57.3	62.3
100% Capacity Example B	51.0	51.5	51.8	49.6	62.4	37.6	42.1	50.1	48.1	61.2	62.0	65.8	65.5	50.0	49.5	45.0	56.2	64.5
100% Capacity Example C	54.0	53.7	54.1	55.7	70.0	50.0	41.1	40.5	47.1	58.9	58.4	66.0	66.1	48.2	49.2	45.0	60.9	67.5

Potential exceedance

Table 5-6: Modelled Noise Impacts – Maximum Operations (Music PAs and Auxiliary Noise Sources) - NO CONTROLS (3m/s wind from source to receiver) Day (12pm-12am for 1-3 day major event per year)

Scenario Day (12pm-11pm)	Receiver Location 01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	Potentially affected receiver locations
Approx. 300 patrons Design Criteria: RBL+10	54	55	55	54	52	54	54	54	47	47	55	45	45	56	48	51	52	52	
Minor Example A	47.9	48.2	48.9	46.4	59.9	32.4	37.0	39.7	34.9	56.2	56.4	56.3	56.4	44.0	44.7	41.5	57.8	62.2	R05, R10, R11 R12, R13, R17, R18. Marginal: R11(1.4dB)
Minor Example B	49.3	48.1	48.1	48.3	58.0	46.2	33.9	36.5	37.0	53.2	54.1	61.8	59.3	46.7	47.1	43.2	54.4	56.4	R05, R10, R12, R13, R18. Marginal: R17(2.4dB)
Minor Example C	42.3	42.4	43.3	40.8	54.7	30.3	28.6	29.2	31.4	42.9	55.3	52.1	51.9	38.6	39.0	35.5	37.3	60.3	R12, R13, R18. Marginal: R05 (2.7dB), R11 (0.3dB)
Minor Example D	51.4	51.2	51.6	51.0	64.4	48.1	34.9	35.3	42.8	53.9	53.7	57.5	48.8	45.6	46.9	43.6	58.9	52.9	R05, R10, R12, R13, R17, R18
Approx. 3,000 patrons Design Criteria: RBL+15	59	60	60	59	57	59	59	59	52	52	60	50	50	61	53	56	57	57	
Small Example A	48.6	48.3	48.7	47.0	59.0	31.8	35.8	38.1	38.8	55.8	56.4	58.9	59.1	45.1	45.6	42.1	56.5	59.5	R10, R12, R13. Marginal: R05(2.0dB), R18(2.5dB)
Small Example B	34.9	42.5	31.0	30.2	58.2	31.6	36.1	35.4	34.9	52.1	41.5	50.2	50.4	38.7	39.9	36.7	43.4	46.6	R10, R12, R13. Marginal: R05 (1.2dB)
Small Example C	38.9	52.5	46.1	46.2	73.7	39.8	38.7	36.4	35.1	37.6	51.8	52.7	43.3	43.4	45.2	34.4	65.2	46.7	R05, R12, R17
Small Example D	56.9	56.7	57.4	55.7	69.0	44.4	42.9	43.2	48.8	62.6	63.0	65.3	64.6	52.5	53.3	49.9	65.6	66.4	R05, R10, R12, R13, R17, R18. Marginal: R11(3.0dB), R15(0.3dB)
Approx. 10,000 patrons Design Criteria: 65 dB L_{Aeq}	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	
Moderate Example A	56.6	55.9	56.2	56.8	69.3	51.7	39.6	39.7	46.8	58.9	58.8	63.8	57.8	51.3	52.5	49.0	62.8	60.1	R05
Moderate Example B	50.0	49.6	50.1	49.0	61.9	37.6	37.0	39.4	38.8	57.0	57.3	60.7	60.6	46.1	46.8	43.0	58.6	61.6	None predicted
Moderate Example C	49.5	49.8	49.9	48.7	62.5	36.8	39.0	39.6	42.2	56.5	56.7	59.4	59.2	45.5	46.3	42.7	58.0	64.8	None predicted
Approx. 15,000 patrons Design Criteria: RBL+15	59	60	60	59	57	59	59	59	52	52	60	50	50	61	53	56	57	57	
30% Capacity Example A	41.8	41.4	42.1	39.8	53.2	24.3	28.2	29.8	31.3	49.9	50.1	51.5	51.9	37.7	38.4	34.6	50.9	54.8	Marginal: R12(1.5dB), R13(1.9dB)
Approx. 20,000 patrons Design Criteria: 65 dB L_{Aeq}	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	
40% Capacity Example A	53.0	53.0	52.6	53.6	67.6	47.9	40.9	40.4	44.3	58.1	55.5	61.4	57.2	48.2	49.5	45.8	59.6	57.9	Marginal: R05(2.6dB)
40% Capacity Example B	45.9	45.1	45.4	44.5	55.7	28.6	32.5	34.7	35.3	52.8	54.1	59.0	59.2	43.1	43.4	39.4	52.9	55.8	None predicted
40% Capacity Example C	56.2	55.4	55.7	56.3	68.4	50.8	40.4	41.7	46.1	59.5	59.8	65.4	63.2	51.8	52.7	49.1	62.2	62.1	R05. Marginal: R12(0.4dB)
Approx. 35,000 patrons Design Criteria: 65 dB L_{Aeq}	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	
70% Capacity Example A	52.8	52.6	52.5	53.4	67.1	47.1	40.8	40.7	44.9	58.5	56.9	62.0	59.4	48.2	49.3	45.5	60.0	59.5	Marginal: R05(2.1dB)
70% Capacity Example B	55.3	55.3	55.7	54.6	67.3	43.2	42.2	42.9	45.9	60.0	60.5	63.4	62.2	51.1	51.9	48.7	61.9	65.3	Marginal: R05(2.3dB), R18(0.3dB)
Approx. 50,000 patrons Design Criteria: 65 dB LAeq	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	
100% Capacity Example A	58.4	58.1	57.7	58.0	70.5	51.6	45.5	46.1	49.2	63.4	63.8	69.3	68.4	55.1	55.7	52.2	64.2	68.0	R05, R12, R13. Marginal: R18(3.0dB)
100% Capacity Example B	55.3	55.5	55.1	53.4	66.8	42.0	45.8	49.6	48.5	63.6	64.6	68.5	68.3	53.8	53.9	50.5	58.8	68.3	R12, R13, R18. Marginal: R05(1.8dB)
100% Capacity Example C	54.2	53.9	53.5	54.5	67.9	47.3	41.7	41.5	45.5	59.0	58.7	65.5	64.5	50.2	51.0	47.2	60.4	66.8	Marginal: R05(2.9dB), R12(0.5dB)

Potential exceedance

Under 'Day' maximum operations with all speaker systems and auxiliary noise sources operating, the following observations are presented from the predicted 'Day' noise modelling results above:

- For the proposed Minor events assuming approximately 300 patrons (for modelling purposes), the sample site configuration with the least potential noise impact at the receivers are (in order of least to most) Minor Example 3, 4, 2, 1.
- For the proposed Small events assuming approximately 3,000 patrons (for modelling purposes), the sample site configuration with the least potential noise impact at the receivers are (in order of least to most) Small Example 2, 3, 1, 4.
- For the proposed Moderate events assuming approximately 10,000 patrons (for modelling purposes), the sample site configuration with the least potential noise impact at the receivers are (in order of least to most) Moderate Example 2, 3, 1.
- For the proposed Major events assuming approximately 20,000 patrons (for modelling purposes), the sample site configuration with the least potential noise impact at the receivers are (in order of least to most) 40% Capacity Example 2, 1, 3.
- For the proposed Major events assuming approximately 35,000 patrons (for modelling purposes), the sample site configuration with the least potential noise impact at the receivers are (in order of least to most) 70% Capacity Example 1, 2.
- For the proposed Major events assuming approximately 50,000 patrons (for modelling purposes), the sample site configuration with the least potential noise impact at the receivers are (in order of least to most) 100% Capacity Example 3, 2, 1.

Table 5-7: Modelled Noise Impacts – Maximum Operations (Music PAs and Auxiliary Noise Sources) - NO CONTROLS (3m/s wind from source to receiver) Night (12am-3am for 1-3 day major event per year)

Scenario Night (11pm-3am)	Receiver Location																		Potentially affected receiver locations
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	
Approx. 300 patrons Design Criteria: RBL+5	49	50	50	49	47	49	49	49	42	42	50	40	40	51	43	46	47	47	
Minor Example A	40.1	40.4	41.2	39.0	53.2	25.1	30.2	32.7	28.8	49.0	49.3	49.3	49.2	35.9	36.6	33.1	50.7	55.6	R05, R10, R12, R13, R17, R18.
Minor Example B	45.6	44.6	44.7	45.1	54.8	42.4	30.5	33.0	33.6	49.6	50.5	58.1	55.7	43.1	43.4	39.6	50.9	52.8	R05, R10, R12, R13, R17, R18. Marginal: R11(0.5dB), R15(0.4dB)
Minor Example C	38.5	38.9	39.7	37.9	51.5	26.6	25.3	25.8	27.8	39.6	51.6	48.4	48.2	34.9	35.4	31.9	35.5	56.5	R05, R12, R13, R18. Marginal R11(1.6dB)
Minor Example D	48.5	48.4	48.8	48.2	61.8	44.4	32.0	32.3	39.9	51.0	50.8	54.5	45.7	42.7	44.0	40.7	56.1	49.5	R05, R10, R12, R13, R17. Marginal: R11(0.8dB), R15(1.0dB), R18(2.5dB)
Approx. 3,000 patrons Design Criteria: RBL+10	54	55	55	54	52	54	54	54	47	47	55	45	45	56	48	51	52	52	
Small Example A	45.0	44.8	45.3	43.8	55.7	28.5	32.4	34.6	35.3	52.3	52.8	55.3	55.4	41.6	42.1	38.6	53.0	56.0	R05, R10, R12, R13, R18. Marginal: R17(1.0dB)
Small Example B	31.5	39.1	30.8	33.3	54.8	28.0	32.4	31.8	31.4	48.4	39.1	46.6	46.7	35.1	36.2	33.0	40.6	43.7	Marginal: R05(2.8dB), R10(1.4dB), R12(1.6dB), R13(1.7dB)
Small Example C	35.4	48.9	42.7	43.2	70.0	36.3	35.1	32.9	31.6	35.5	48.3	49.2	40.3	39.9	41.7	31.1	61.5	43.5	R05, R12, R17
Small Example D	52.9	52.8	53.4	51.8	65.1	40.5	39.0	39.2	44.9	58.5	59.0	61.2	60.6	48.5	49.3	45.9	61.7	62.4	R05, R10, R11, R12, R13, R17, R18. Marginal: R15 (1.3dB)
Approx. 10,000 patrons Design Criteria: 55 dB L_{Aeq}	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	
Moderate Example A	53.1	52.5	52.8	53.2	65.7	47.9	36.6	37.1	43.2	56.3	56.5	60.8	56.7	48.1	49.2	45.7	59.5	58.3	R05, R12, R17, R18. Marginal: R10(1.3dB), R11(1.5dB), R13(1.7dB)
Moderate Example B	46.2	45.8	46.3	45.3	58.1	33.8	33.2	35.6	35.1	53.2	53.5	56.9	56.8	42.3	43.0	39.1	54.7	57.8	Marginal: R05(3.1dB), R12(1.9dB), R13(1.8dB), R18(2.8dB)
Moderate Example C	46.7	46.9	47.0	46.1	59.7	35.1	35.5	36.1	38.8	53.3	53.6	56.6	56.3	42.6	43.4	39.8	55.0	61.1	R05, R18. Marginal: R12(1.6dB), R13(1.3dB)
Approx. 15,000 patrons Negligible music, if any Design Criteria: RBL+10	54	55	55	54	52	54	54	54	47	47	55	45	45	56	48	51	52	52	
30% Capacity Example A	37.8	37.4	38.1	35.8	49.3	20.3	24.2	25.7	27.2	46.0	46.1	47.5	48.0	33.7	34.4	30.6	46.9	50.9	None predicted
Approx. 20,000 patrons Design Criteria: 60 dB L_{Aeq}	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	
40% Capacity Example A	49.4	49.4	49.1	50.0	63.9	44.0	37.3	36.9	40.6	54.9	53.0	58.3	55.1	44.8	46.0	42.3	56.0	55.3	R05
40% Capacity Example B	42.2	41.4	41.7	41.1	52.4	25.2	28.9	31.1	31.7	49.0	50.3	55.2	55.4	39.4	39.7	35.7	49.2	52.1	None predicted
40% Capacity Example C	52.3	51.5	51.8	52.4	64.5	46.9	36.5	37.8	42.2	55.6	56.0	61.5	59.3	47.9	48.8	45.2	58.3	58.2	R05. Marginal: R12(1.5dB)
Approx. 35,000 patrons Design Criteria: 60 dB L_{Aeq}	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	
70% Capacity Example A	45.4	45.2	45.1	46.0	59.7	39.7	33.5	33.5	37.5	51.1	49.5	54.6	52.0	40.8	41.9	38.1	52.6	52.2	None predicted
70% Capacity Example B	49.0	49.0	49.2	48.1	60.8	36.2	36.5	37.6	39.3	55.1	56.2	58.2	57.7	45.2	45.8	42.5	54.9	60.6	Marginal: R05(0.8dB), R18(0.6dB)
Approx. 50,000 patrons Design Criteria: 60 dB L_{Aeq}	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	
100% Capacity Example A	48.6	48.0	48.3	46.7	58.0	33.7	36.4	39.8	38.0	57.2	59.2	61.8	61.9	46.8	46.8	43.1	55.5	58.7	Marginal: R12(1.8dB), R13(1.9dB)
100% Capacity Example B	46.3	45.9	46.3	45.3	58.2	34.5	31.8	33.5	36.0	51.8	52.1	55.2	54.6	42.1	42.9	39.4	53.8	55.0	None predicted
100% Capacity Example C	50.4	50.1	49.6	50.7	64.1	43.4	37.9	37.7	41.7	55.1	54.9	61.6	60.7	46.3	47.2	43.3	56.6	60.9	R05. Marginal: R12(1.6dB), R13(0.7dB), R18(0.9dB)

Under maximum 'Night' operations with all speaker systems and auxiliary noise sources operating, the following observations are presented from the predicted 'Night' noise modelling results above:

- For the proposed Minor events assuming approximately 300 patrons (for modelling purposes), the sample site configuration with the least potential noise impact at the receivers are (in order of least to most) Minor Example 3, 4, 2, 1.
- For the proposed Small events assuming approximately 3,000 patrons (for modelling purposes), the sample site configuration with the least potential noise impact at the receivers are (in order of least to most) Small Example 2, 3, 1, 4.
- For the proposed Moderate events assuming approximately 10,000 patrons (for modelling purposes), the sample site configuration with the least potential noise impact at the receivers are (in order of least to most) Moderate Example 2, 3, 1.
- For the proposed Major events assuming approximately 20,000 patrons (for modelling purposes), the sample site configuration with the least potential noise impact at the receivers are (in order of least to most) 40% Capacity Example 2, 1, 3.
- For the proposed Major events assuming approximately 35,000 patrons (for modelling purposes), the sample site configuration with the least potential noise impact at the receivers are (in order of least to most) 70% Capacity Example 1, 2.
- For the proposed Major events assuming approximately 50,000 patrons (for modelling purposes), the sample site configuration with the least potential noise impact at the receivers are (in order of least to most) 100% Capacity Example 3, 2, 1.

Table 5-8: Modelled Noise Impacts – Maximum Operations (Music PAs and Auxiliary Noise Sources) - NO CONTROLS (3m/s wind from source to receiver) Night (12am-3am for 1-3 day major event per year)

Scenario	Receiver Location																		
Night (11pm-3am)	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	Potentially affected receiver locations
Sleep Disturbance Design Criteria: RBL+15	59	60	60	59	57	59	59	59	52	52	60	50	50	61	56	59	57	57	
Minor Example A	49.2	49.6	50.3	48.1	62.3	34.2	39.3	41.9	37.0	58.6	58.5	58.5	58.5	45.0	45.8	42.2	60.1	64.9	R05, R10, R12, R13, R17, R18
Minor Example B	50.8	49.5	49.5	50.2	60.3	48.1	35.7	38.1	38.9	55.0	55.9	64.5	62.3	48.0	48.4	44.1	56.4	58.6	R05, R10, R12, R13, R18
Minor Example C	47.8	47.9	48.8	46.3	60.3	35.8	33.9	35.2	36.9	48.4	60.9	57.6	57.5	44.0	44.5	41.0	42.8	66.2	R05, R11, R12, R13, R18
Minor Example D	52.2	52.0	52.5	52.4	66.2	51.2	36.2	36.8	44.1	55.0	55.0	59.1	51.0	46.1	47.5	43.8	60.3	55.5	R05, R10, R12, R13, R17
Small Example A	49.7	49.3	49.8	48.5	61.0	33.3	37.6	39.9	40.8	57.6	58.3	61.0	61.1	46.0	46.5	42.7	58.3	61.5	R05, R10, R12, R13, R17, R18
Small Example B	40.5	50.1	36.1	35.6	65.2	36.7	41.0	40.4	40.2	58.6	46.1	55.3	55.3	43.5	44.6	41.4	48.5	51.9	R05, R10, R12, R13
Small Example C	40.2	54.1	48.0	49.0	77.4	41.6	40.7	38.1	36.6	39.1	53.0	53.8	44.7	43.6	45.7	34.6	67.7	49.7	R05, R12, R17
Small Example D	51.7	51.7	52.4	51.5	66.4	41.7	38.1	38.4	45.2	57.8	57.4	59.6	59.6	45.8	47.2	43.6	61.3	63.0	R05, R10, R12, R13, R17, R18
Moderate Example A	53.9	53.6	54.1	55.5	69.9	50.9	37.4	36.4	45.3	54.9	54.7	62.7	53.3	48.0	49.0	44.8	61.0	57.8	R05, R10, R12, R13, R17, R18
Moderate Example B	50.5	49.8	50.3	49.5	62.2	38.3	39.0	41.6	41.5	58.5	58.4	61.7	61.8	46.7	47.4	43.4	59.9	64.2	R05, R10, R12, R13, R17, R18
Moderate Example C	50.1	49.7	50.2	48.8	62.5	35.3	40.7	41.6	47.1	58.6	58.5	60.3	60.4	45.8	46.6	42.9	59.9	67.6	R05, R10, R12, R13, R17, R18
30% Capacity Example A	16.0	15.6	16.3	14.0	27.6	-1.5	2.4	4.0	5.4	24.2	24.3	25.8	26.3	11.9	12.6	8.8	25.2	29.2	None predicted
40% Capacity Example A	53.8	53.7	54.1	55.5	69.9	51.0	41.1	40.6	45.3	59.0	54.7	62.7	55.3	48.0	49.0	44.8	61.0	57.9	R05, R10, R12, R13, R17, R18
40% Capacity Example B	49.7	48.8	49.1	48.4	59.6	32.6	36.7	39.0	39.5	56.7	58.1	63.2	63.3	46.8	47.1	43.0	56.7	59.6	R05, R10, R12, R13, R17, R18
40% Capacity Example C	54.0	53.7	54.1	55.7	70.0	50.1	37.8	40.3	45.2	58.0	58.4	64.4	64.0	48.1	49.1	44.9	61.0	61.8	R05, R10, R12, R13, R17, R18
70% Capacity Example A	55.1	55.1	55.4	55.0	68.3	52.1	39.1	42.0	47.2	58.6	59.3	62.6	62.5	50.4	51.2	47.7	61.2	61.3	R05, R10, R12, R13, R17, R18
70% Capacity Example B	55.1	55.0	55.4	55.0	68.1	44.5	41.4	43.2	47.0	59.6	59.3	63.1	62.8	49.3	50.4	47.4	61.3	66.1	R05, R10, R12, R13, R17, R18
100% Capacity Example A	50.3	50.5	50.9	51.0	65.6	46.5	37.8	38.1	45.0	53.6	54.1	61.6	61.1	45.1	45.9	42.6	57.3	62.3	R05, R10, R12, R13, R17, R18
100% Capacity Example B	51.0	51.5	51.8	49.6	62.4	37.6	42.1	50.1	48.1	61.2	62.0	65.8	65.5	50.0	49.5	45.0	56.2	64.5	R05, R10, R11, R12, R13, R18
100% Capacity Example C	54.0	53.7	54.1	55.7	70.0	50.0	41.1	40.5	47.1	58.9	58.4	66.0	66.1	48.2	49.2	45.0	60.9	67.5	R05, R10, R12, R13, R17, R18

The sleep disturbance criteria for each receiver location are presented in Attachment 5 of this report in accordance with the methodology discussed in Section 4.4.1.2 above.

Overall, sleep disturbance impacts should be minimal as the predicted exceedances are the results of the noise-enhancing, worst-case 3m/s wind from source to receiver meteorological conditions and the results are therefore veritably conservative.

5.4.1 Summary

A comparative analysis of the predictive noise modelling results under the "Music PAs Only" and the "Maximum Operations" scenarios have found that the most potentially affected receivers are predicted to be R05, R10, R11, R12, R13, R17 and R18.

In response to these findings, the precautionary noise mitigation measures (recommended under Section 6.2) focus on such receiver locations. If the precautionary approach is met at the most potentially affected receivers by means of noise abatement, it could then be assumed that the predicted noise levels at the remaining receiver locations will subsequently be reduced.

6. NOISE MANAGEMENT AND MITIGATION MEASURES

A number of management and mitigation measures would need to be implemented to reduce the potential for noise impacts. These include extensive consultation, venue specific mitigation measures, event noise management plan, monitoring prior and during the event and a complaints policy. These are discussed in more detail below.

There are a number of noise mitigation measures that are available and the application of these has been considered in detail. Certain of the mitigation measures do not relate to noise and were discussed during consultation with residents in Jones Road.

On the assumption that the development proceeds providing a security guard of the choosing of the resident was seen as an important requirement.

In regards to noise mitigation, the following measures have been evaluated:

- Community Based Noise Management Plan During the Major Events
  The details are provided in the document provided in the Attachments. The details of this approach were discussed on a one on one basis with four of the residents along Jones Road.

- Orientation of the Stages
  Diagrams are provided to illustrate how orientation of the stages can be used to reduce the music levels. In addition, use of noise barriers around the sides and rear of the speaker arrays has been designed to further reduce noise spill towards residences. Further, the use of a proprietary designed sub woofer noise enclosure along with speakers that have active noise cancellation to the rear of the speaker boxes (sub woofers) would be utilised. There are numerous combinations of speakers available which have a noise footprint that benefits the orientation of certain stages. These aspects are illustrated further in this section of the report and detailed in the Attachments.

- White/Ecological Noise Generators
  A part of the noise management of night time hours when music would be audible, generation of white noise combined with ecological sounds would reduce sleep disturbance effects.

- Acoustic Insulation
  Benbow Environmental have extensive experience in resolving night time noise intrusion from major projects by working with residents to provide them with satisfactory acoustic treatment of their residences. The three most potentially affected residences in Jones Road all lend themselves to architecturally appealing treatments that during night time would achieve a low level of music inside the residences so that sleep disturbance issues would not arise.

6.1 COMMUNITY CONSULTATION

An extensive consultation program would be undertaken prior to any event with a range of stakeholders including the:

- Police;
- Residents in the surrounding residential areas; and
- Council.

Consultation regarding the events would also include State Government agencies which may potentially receive complaints in relation to the event, including the local NSW Police, NSW EPA Pollution Line and Local Government complaints line. These agencies would be briefed on the Event details, Noise Management Strategy and the Complaints Policy.

The event organisers have developed the complaints policy for the events over many years of holding similar sized events.

6.2 MITIGATION MEASURES

The predictive noise modelling results have assumed a FOH noise level of 103 dB(A) at approximately 20m from its corresponding stage. From this, the required noise level reduction at each contributing stage/s have been calculated based on a recommended noise limit of 65 dBL_{Aeq} during 07.00am to 12.00am and 55dBL_{Aeq} after 12.00am for one major event per year, otherwise 11pm.

Where the contributing stage/s are not directly or partially facing the potentially affected receivers, flexible noise barriers are recommended to be placed around the scaffolding or any support structure of the main speaker array systems in order to better direct the event sound towards the dedicated audience area/s and hence minimise the sound "spill" from the venue. For the purpose of this application, flexible barriers with a substantial weight are recommended.

The flexible barriers are recommended to be placed on either sides of the scaffolding or similar support structure of the main speaker systems as well as the rear and top of such a support structure as shown in Figure 6-1.

The flexible noise barriers are recommended in addition to the steerable speaker array and subwoofer systems designed to minimise sound emission at the rear of the speaker systems thereby better focussing the sound to the dedicated audience area.

Architectural treatments have been recommended for receiver locations potentially affected during the night time, i.e. from 10.00pm onwards, as it is expected that windows and balcony doors would be open during the daytime. Therefore, architectural treatments would not be a feasible solution for receiver locations potentially affected during the daytime period.

As part of a holistic noise mitigation approach, a specially designed subwoofer enclosure is also proposed in order to better direct the bass frequencies towards the audience area. Benbow Environmental will provide details on the proposed design of this enclosure. This measure may be useful for all event sizes as bass is the precursor of complaints.

Another element to this holistic approach is generation of white noise combined with ecological sounds at the residential locations to temporarily raise the background noise levels in order to reduce the potential sleep disturbance impacts. This rationale has been detailed in Section 4.4.1.2 of this report.

This body of ameliorative measures are expected to decrease the predicted noise levels at the residences as shown in Table 6-2 to Table 6-4 with the exception of residences partially or directly facing the stages in which case a reorientation of the contributing stages have been recommended in Table 6-1.

Table 6-1 also shows the level reduction required at each stage at the potentially affected receiver locations and the suitable noise control measures relevant to that stage and scenario (for modelling purposes). However, the noise control measures presented in this table are recommended to be supplemented by the holistic approach afore-explained as a precautionary approach to achieve acceptable noise levels at these residences.

6.3 Speaker Arrays and Subwoofer Systems (The Affects of)

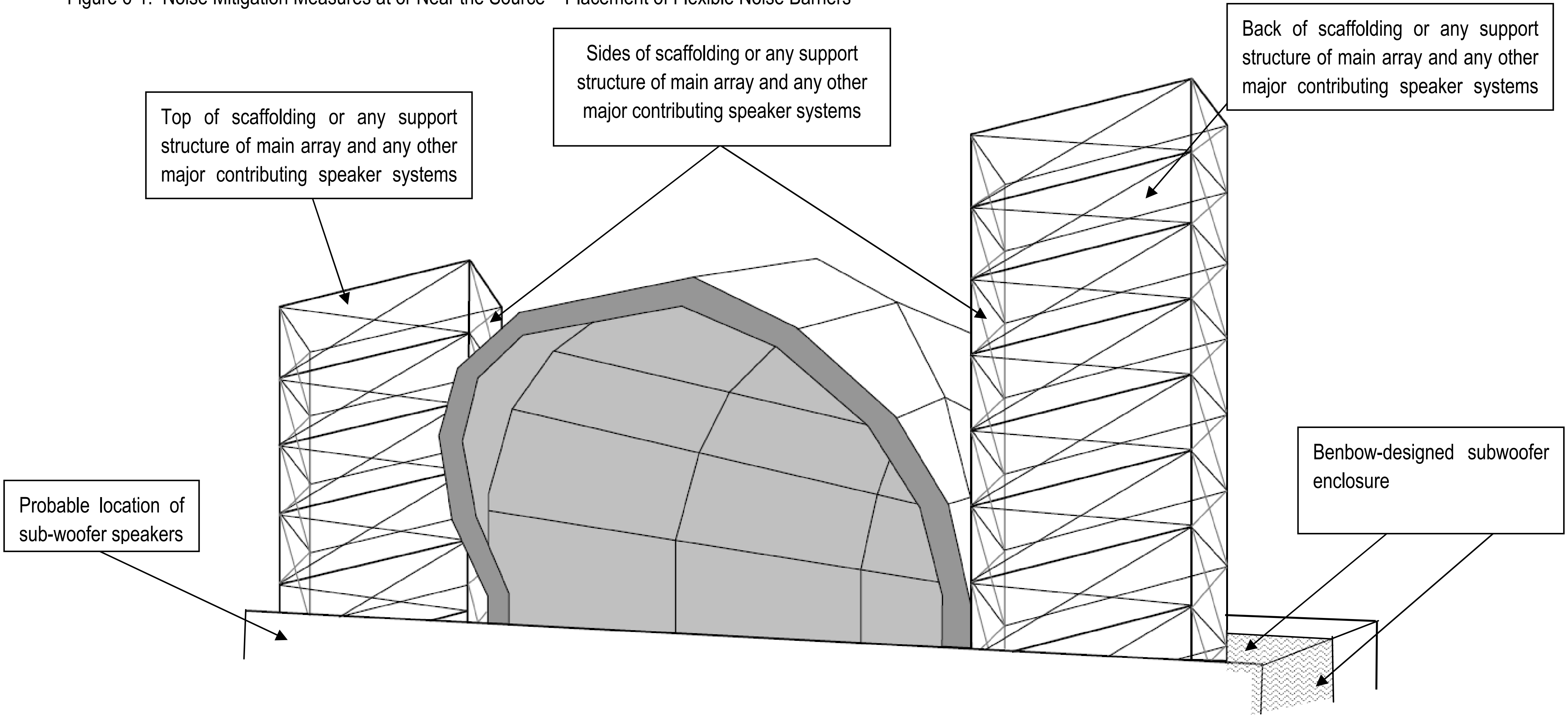
A 90-degree horizontal dispersion angle has been assumed for the speaker array systems which are typical directive speak array systems steered towards the audience area and hence minimising spillage to the local community. Although at certain frequencies, the horizontal and vertical sound dispersion angles may vary (also according to the type of speaker array system), this is generally assumed.

Speaker arrays generally emit sound levels for the upper six (6) octaves of the audio spectrum. When a speaker array system is oriented towards a certain direction, it is assumed that this system will disperse the sound in the horizontal axis by 90 degrees. This would mean that when the stages are oriented directly or partially towards the residence/s, receivers within this dispersion area due to the speaker systems would potentially be affected. Accordingly, alternative ameliorative measure/s would need to be considered in order to minimise the potential noise impact at these nearby residences.

The presence of bass frequencies is the precursor of complaints, especially in outdoor applications. During a typical open air concert, bass tones are usually in 50Hz, 63Hz, 80Hz, 100Hz, 125Hz and 160Hz frequency bands of which two of these frequency bands dominate in concert music. Therefore, resonance-free sub-woofers with true cardioid polar characteristics are recommended and have been assumed in this assessment. An overall figure of 15-20dB is usually provided by system manufacturers when referring to the sound rejection at the rear of their systems. Common cardioid (or directive) subwoofer systems have been included in the Attachment 7 of this report for information purposes.

The horizontal coverage of the subwoofer systems has been assumed to be 180-degree wide and receiver locations within this critical area would benefit from the Benbow Environmental – designed subwoofer enclosure.

Figure 6-1: Noise Mitigation Measures at or Near the Source – Placement of Flexible Noise Barriers



Note: The flexible noise barriers are recommended to be used in conjunction with directive array speaker systems 'steered' towards the audience area. In particular, cardioid subwoofer systems or 'steerable bass bins' are recommended in order to maximise noise level rejection especially at the rear of the systems and hence minimising 'spillage'.

6.4 Noise Management Strategy

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
Minor A	R05	1	-5/-6/-6	N/A	Recommended (for night time)
	R10	1	-6/-7/-7	Recommended	N/A
	R12	1	-8/-9/-9	Recommended	Not required
	R13	1	-8/-9/-9	Recommended	Not required
	R17	1	-3/-4/-3	Recommended	Not required
	R18	1	-8/-9/-8	Recommended	Not required
Minor B	R05	1	-3/-4/-3	Recommended	Not required
	R10	1	-3/-4/-3	N/A	N/A
	R12	1	-14/-15/-15	Recommended	Recommended
	R13	1	-12/-12/-12	Recommended	Recommended
	R18	1	-1/-2/-2	Recommended	Not required
Comment	Reorientation of stage 1 to south-west recommended				
Minor C	R05	1	-3/-4/-3	Recommended	Not required
	R11	1	0/-1/-4	Recommended	Not required
	R12	1	-7/-8/-11	N/A	Recommended (for night time)
	R13	1	-7/-8/-11	N/A	Recommended (for night time)
	R18	1	-8/-9/-9	Recommended	Not required

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
Comment	Reorientation of stage 1 to south-west recommended				
Minor D	R05	1	-9/-10/-9	N/A	Recommended (for night time)
	R10	1	-3/-4/-6	Recommended	Not required
	R12	1	-9/-10/-12	Recommended	Recommended
	R17	1	-3/-4/-3	Recommended	Not required
Small A	R05	1	-0/-0/-4	Recommended	Not required
	R10	1	-0/-0/-6	Recommended	Not required
	R12	1	-6/-7/-14	N/A	Recommended (for night time)
	R13	1	-6/-7/-14	N/A	Recommended (for night time)
	R18	1	-0/-0/-5	Recommended	Not required
Small B	R05	1	-1/-2/-8	Recommended	Not required
	R10	1	-0/-0/-7	N/A	N/A
	R12	1	-0/-0/-5	Recommended	Not required
	R13	1	-0/-0/-5	Recommended	Not required
Comment	Reorientation of stage 1 to south-west recommended				
Small C	R05	1	-15/-16/-20	Recommended	Recommended (for night time)
	R12	1	-0/-0/-4	N/A	N/A
	R17	1	-5/-6/-11	Recommended	Not required
Small D	R05	1 (East)	-3/-5/-7	Recommended	Not required
		2 (South)	-12/-12/-8	N/A	Recommended (for night time)

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
		3 (North-west)	-10/-10/-10	Recommended	Not required
		4 (North)	-14/-14/-12	Recommended	Not required
	R10	1 (East)	-0/-0/-8	Recommended	Not required
		2 (South)	-8/-10/-16	Recommended	Not required
		3 (North-west)	-3/-5/-14	N/A	N/A
		4 (North)	-8/-10/-14	N/A	N/A
Comment	Reorientation of stage 3 to south-east and stage 4 to south-west recommended				
	R12	1 (East)	-5/-6/-16	N/A	Recommended (for night time)
		2 (South)	-14/-14/-19	Recommended	Recommended (for night time)
		3 (North-west)	-10/-12/-19	Recommended	Recommended (for night time)
		4 (North)	-14/-14/-19	Recommended	Recommended (for night time)
	R13	1 (East)	-4/-6/-14	N/A	Recommended (for night time)
		2 (South)	-14/-14/-19	Recommended	Recommended (for night time)
		3 (North-west)	-8/-8/-18	Recommended	Recommended (for night time)
		4 (North)	-12/-13/-18	Recommended	Recommended (for night time)
	R17	1 (East)	-0/-0/-4	Recommended	Not required
		2 (South)	-6/-10/-10	Recommended	Not required
		3 (North-west)	-6/-10/-10	Recommended	Not required
		4 (North)	-8/-12/-12	Recommended	Not required
	R18	1 (East)	-0/-3/-4	Recommended	Not required
		2 (South)	-8/-8/-6	Recommended	Not required

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
		3 (North-west)	-3/-2/-2	N/A	N/A
		4 (North)	-3/-3/-0	Recommended	Not required
Moderate A	R05	1 (North-east)	-0/-6/-13	Recommended	Not required
		2 (North-west)	-3/-10/-16	Recommended	Recommended (for night time)
		3 (North-west)	-3/-12/-18	Recommended	Recommended (for night time)
	R10	1 (North-east)	-0/-0/-2	N/A	N/A
		2 (North-west)	-0/-0/-3	N/A	N/A
		3 (North-west)	-0/-0/-2	N/A	N/A
	Comment	Reorientation of stage 1 to east, stages 2 and 3 to south-west recommended			
	R12	1 (North-east)	-0/-0/-8	Recommended	Not required
		2 (North-west)	-0/-0/-10	Recommended	Not required
		3 (North-west)	-0/-0/-14	Recommended	Not required
	R13	1 (North-east)	-0/-0/-0	Recommended	Not required
		2 (North-west)	-0/-0/-3	Recommended	Not required
		3 (North-west)	-0/-0/-3	Recommended	Not required
	R17	1 (North-east)	-0/-0/-4	Recommended	Not required
		2 (North-west)	-0/-0/-3	N/A	N/A
		3 (North-west)	-0/-0/-0	N/A	N/A
Moderate B	R05	1 (South)	-0/-0/-5	N/A	Recommended (for night time)
		2 (North)	-0/-0/-5	Recommended	Not required
	R10	1 (South)	-0/-0/-7	Recommended	Not required

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
		2 (North)	-0/-0/-5	N/A	N/A
	Comment	Reorientation of stage 2 to south-east recommended			
	R12	1 (South)	-0/-0/-9	Recommended	Not required
		2 (North)	-0/-0/-12	Recommended	Not required
	R13	1 (South)	-0/-0/-9	Recommended	Not required
		2 (North)	-0/-0/-12	Recommended	Not required
	R17	1 (South)	-0/-0/-3	Recommended	Not required
		2 (North)	-0/-0/-2	Recommended	Not required
	R18	1 (South)	-0/-2/-7	Recommended	Not required
		2 (North)	-0/-0/-4	Recommended	Not required
Moderate C	R05	1 (South-east)	-0/-0/-6	Recommended	Not required
		2 (South)	-0/-6/-6	N/A	Recommended (for night time)
		3 (South-west)	-0/-3/-5	N/A	Recommended (for night time)
	R10	1 (South-east)	-0/-0/-0	Not required	Not required
		2 (South)	-0/-0/-8	Recommended	Not required
		3 (South-west)	-0/-0/-6	Recommended	Not required
	R12	1 (South-east)	-0/-0/-7	N/A	Recommended (for night time)
		2 (South)	-0/-0/-9	Recommended	Recommended (for night time)
		3 (South-west)	-0/-0/-12	Recommended	Recommended (for night time)
	R13	1 (South-east)	-0/-0/-7	N/A	Recommended (for night time)
		2 (South)	-0/-0/-9	Recommended	Recommended (for night time)

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
		3 (South-west)	-0/-0/-12	Recommended	Recommended (for night time)
		1 (South-east)	-0/-0/-0	Not required	Not required
		2 (South)	-0/-0/-3	Recommended	Not required
	R17	3 (South-west)	-0/-0/-3	N/A	N/A
	Comment	Reorientation of stage 3 to south recommended			
		1 (South-east)	-0/-3/-11	Recommended	Not required
		2 (South)	-0/-12/-7	Recommended	Not required
	R18	3 (South-west)	-0/-15/-5	Recommended	Not required
	Comment	Reorientation of stage 3 to south recommended			
30% Capacity	None	Crowd noise only			
40% Capacity A	R05	1 (North-west)	-0/-0/-8	Recommended	Not required
	R05	2 (North-east)	-3/-6/-13	Recommended	Recommended (for night time)
	R05	3 (North-west)	-0/-0/-9	Recommended	Recommended (for night time)
	R05	4 (North-west)	-0/-0/-6	Recommended	Not required
	R10	1 (North-west)	-0/-0/-7	N/A	N/A
	R10	2 (North-east)	-0/-0/-0	N/A	N/A
	R10	3 (North-west)	-0/-0/-0	N/A	N/A
	R10	4 (North-west)	-0/-0/-0	N/A	N/A
	R12	1 (North-west)	-0/-0/-5	Recommended	Recommended (for night time)

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
	R12	2 (North-east)	-0/-0/-8	Recommended	Recommended (for night time)
	R12	3 (North-west)	-0/-0/-10	Recommended	Recommended (for night time)
	R12	4 (North-west)	-0/-0/-13	Recommended	Recommended (for night time)
	R13	1 (North-west)	-0/-0/-5	Recommended	Recommended (for night time)
	R13	2 (North-east)	-0/-0/-0	Recommended	Not required
	R13	3 (North-west)	-0/-0/-2	Recommended	Not required
	R13	4 (North-west)	-0/-0/-3	Recommended	Recommended (for night time)
	R17	1 (North-west)	-0/-0/-0	Recommended	Not required
	R17	2 (North-east)	-0/-0/-4	Recommended	Not required
	R17	3 (North-west)	-0/-0/-3	N/A	N/A
	R17	4 (North-west)	-0/-0/-0	N/A	N/A
40% Capacity B	R05	1	-0/-0/-3	N/A	Recommended (for night time)
	R10	1	-0/-0/-5	Recommended	Not required
	R12	1	-0/-0/-13	Recommended	Recommended (for night time)
	R13	1	-0/-0/-13	Recommended	Recommended (for night time)
	R18	1	-0/-0/-3	N/A	N/A
Comment	Reorientation of stage 1 to east recommended				
40% Capacity C	R05	1 (North-east)	-1/-3/-13	Recommended	Recommended (for night time)
		2 (South-west)	-0/-0/-4	N/A	Recommended (for night time)

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
		3 (North)	-0/-0/-3	Recommended	Recommended (for night time)
		4 (North-west)	-0/-0/-6	Recommended	Recommended (for night time)
	R10	1 (North-east)	-0/-0/-2	N/A	N/A
		2 (South-west)	-0/-0/-6	Recommended	Not required
		3 (North)	-0/-0/-3	N/A	N/A
		4 (North-west)	-0/-0/-2	N/A	N/A
	R12	1 (North-east)	-0/-0/-8	Recommended	Recommended (for night time)
		2 (South-west)	-0/-0/-12	Recommended	Recommended (for night time)
		3 (North)	-0/-0/-14	Recommended	Recommended (for night time)
		4 (North-west)	-0/-0/-13	Recommended	Recommended (for night time)
	R13	1 (North-east)	-0/-0/-0	Recommended	Not required
		2 (South-west)	-0/-0/-12	Recommended	Recommended (for night time)
		3 (North)	-0/-0/-14	Recommended	Recommended (for night time)
		4 (North-west)	-0/-0/-5	Recommended	Recommended (for night time)
	R17	1 (North-east)	-0/-0/-4	Recommended	Not required
		2 (South-west)	-0/-0/-1	Recommended	Not required
		3 (North)	-0/-0/-0	Not required	Not required
		4 (North-west)	-0/-0/-0	Not required	Not required
	R18	1 (North-east)	-0/-0/-0	Not required	Not required
		2 (South-west)	-0/-0/-5	Recommended	Not required
		3 (North)	-0/-0/-2	Recommended	Not required

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
		4 (North-west)	-0/-0/-2	N/A	N/A
70% Capacity A	R05	1 (North-west)	-0/-0/-7	Recommended	Recommended (for night time)
		2 (East)	-0/-0/-4	Recommended	Recommended (for night time)
		3 (North-west)	-0/-0/-9	Recommended	Recommended (for night time)
		4 (North-east)	-0/-0/-12	Recommended	Recommended (for night time)
	R10	1 (North-west)	-0/-0/-8	N/A	N/A
		2 (East)	-0/-0/-7	N/A (due to Stage 1)	N/A (due to Stage 1)
		3 (North-west)	-0/-0/-5	N/A (due to Stage 1)	N/A (due to Stage 1)
		4 (North-east)	-0/-0/-4	N/A (due to Stage 1)	N/A (due to Stage 1)
	R12	1 (North-west)	-0/-0/-6	Recommended	Recommended (for night time)
		2 (East)	-0/-0/-13	N/A	Recommended (for night time)
		3 (North-west)	-0/-0/-13	Recommended	Recommended (for night time)
		4 (North-east)	-0/-0/-9	Recommended	Recommended (for night time)
	R13	1 (North-west)	-0/-0/-6	Recommended	Recommended (for night time)
		2 (East)	-0/-0/-13	N/A	Recommended (for night time)
		3 (North-west)	-0/-0/-5	Recommended	Recommended (for night time)
		4 (North-east)	-0/-0/-0	Recommended	Not required
	R17	1 (North-west)	-0/-0/-0	Recommended	Not required
		2 (East)	-0/-0/-1	Recommended	Not required
		3 (North-west)	-0/-0/-2	N/A	N/A
		4 (North-east)	-0/-0/-4	Recommended	Not required

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
	R18	1 (North-west)	-0/-0/-1	N/A	N/A
		2 (East)	-0/-0/-4	Recommended	Not required
		3 (North-west)	-0/-0/-2	N/A	N/A
		4 (North-east)	-0/-0/-4	Recommended	Not required
70% Capacity B	R05	1 (South-east)	-0/-0/-5	Recommended	Not required
		2 (South)	-0/-0/-6	N/A	Recommended (for night time)
		3 (West)	-0/-0/-3	N/A	Recommended (for night time)
		4 (West)	-3/-0/-9	N/A	Recommended (for night time)
		5 (North-east)	-3/-0/-11	Recommended	Recommended (for night time)
	R10	1 (South-east)	-0/-0/-0	Not required	Not required
		2 (South)	-0/-0/-8	Recommended	Not required
		3 (West)	-0/-0/-6	N/A	N/A
		4 (West)	-0/-0/-5	Recommended	Not required
		5 (North-east)	-0/-0/-4	N/A	N/A
Comment	Reorientation of stages 3 and 5 to south recommended				
	R12	1 (South-east)	-0/-0/-8	N/A	Recommended (for night time)
		2 (South)	-0/-0/-10	Recommended	Recommended (for night time)
		3 (West)	-0/-0/-13	Recommended	Recommended (for night time)
		4 (West)	-0/-0/-10	Recommended	Recommended (for night time)
		5 (North-east)	-0/-0/-9	Recommended	Recommended (for night time)
	R13	1 (South-east)	-0/-0/-8	N/A	Recommended (for night time)

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
		2 (South)	-0/-0/-10	Recommended	Recommended (for night time)
		3 (West)	-0/-0/-13	Recommended	Recommended (for night time)
		4 (West)	-0/-0/-10	Recommended	Recommended (for night time)
		5 (North-east)	-0/-0/-9	Recommended	Recommended (for night time)
		1 (South-east)	-0/-0/-0	Not required	Not required
		2 (South)	-0/-0/-3	Recommended	Not required
		3 (West)	-0/-0/-2	N/A	N/A
		4 (West)	-0/-0/-4	N/A	N/A
	R17	5 (North-east)	-0/-0/-4	Recommended	Not required
Comment	Reorientation of stages 3 and 5 to south recommended				
		1 (South-east)	-0/-0/-9	Recommended	Not required
		2 (South)	-0/-0/-6	Recommended	Not required
		3 (West)	-0/-0/-5	N/A	N/A
		4 (West)	-0/-0/-0	N/A	N/A
	R18	5 (North-east)	-0/-0/-0	N/A	N/A
Comment	Reorientation of stage 3 to south recommended				
100% Capacity 1	R05	1 (North-west)	-0/-0/-4	Recommended	Not required
		2 (South-east)	-0/-0/-2	Recommended	Not required
		3 (East)	-0/-0/-0	Not required	Not required
		4 (West)	-2/-0/-0	N/A	N/A
		5 (North)	-8/-0/-0	Recommended	Not required

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
		6 (North-west)	-8/-0/-2	Recommended	Not required
		7 (North-east)	-12/-0/-9	Recommended	Recommended (for night time)
		1 (North-west)	-0/-0/-0	N/A	N/A
		2 (South-east)	-0/-0/-0	Not required	Not required
		3 (East)	-0/-0/-2	Recommended	Not required
		4 (West)	-0/-0/-0	N/A	N/A
		5 (North)	-0/-0/-0	N/A	N/A
		6 (North-west)	-0/-0/-0	N/A	N/A
	R10	7 (North-east)	-0/-0/-0	N/A	N/A
		1 (North-west)	-3/-0/-1	Recommended	Not required
		2 (South-east)	-0/-0/-3	N/A	Recommended (for night time)
		3 (East)	-0/-0/-7	N/A	Recommended (for night time)
		4 (West)	-3/-0/-12	Recommended	Recommended (for night time)
		5 (North)	-4/-0/-10	Recommended	Recommended (for night time)
		6 (North-west)	-4/-0/-8	Recommended	Recommended (for night time)
	R12	7 (North-east)	-0/-0/-4	Recommended	Recommended (for night time)
	R13	1 (North-west)	-0/-0/-1	Recommended	Not required
		2 (South-east)	-0/-0/-2	N/A	Not required
		3 (East)	-0/-0/-6	N/A	Recommended (for night time)
		4 (West)	-5/-0/-11	Recommended	Recommended (for night time)
		5 (North)	-0/-0/-7	Recommended	Recommended (for night time)

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
		6 (North-west)	-0/-0/-1	Recommended	Not required
		7 (North-east)	-0/-0/-0	Not required	Not required
		1 (North-west)	-0/-0/-0	N/A	N/A
		2 (South-east)	-3/-0/-5	Recommended	Not required
		3 (East)	-0/-0/-0	Not required	Not required
		4 (West)	-0/-0/-0	Not required	Not required
		5 (North)	-0/-0/-0	Not required	Not required
		6 (North-west)	-0/-0/-0	Not required	Not required
	R18	7 (North-east)	-0/-0/-0	Not required	Not required
		1 (North-west)	-0/-0/-6	Recommended	Not required
		2 (South-east)	-0/-0/-6	N/A	Recommended (for night time)
100% Capacity B		3 (North)	-0/-0/-3	Recommended	Not required
		4 (East)	-0/-0/-0	Not required	Not required
	R05	5 (South)	-0/-0/-0	Not required	Not required
		1 (North-west)	-0/-0/-9	N/A	N/A
		2 (South-east)	-0/-0/-0	Not required	Not required
		3 (North)	-0/-0/-7	N/A	N/A
		4 (East)	-0/-0/-6	Recommended	Not required
	R10	5 (South)	-0/-0/-4	Recommended	Not required
Comment	Reorientation of stage 1 to south recommended				
	R11	1 (North-west)	-0/-0/-0	Not required	Not required

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
		2 (South-east)	-0/-0/-0	Not required	Not required
		3 (North)	-0/-0/-2	N/A	N/A
		4 (East)	-0/-0/-0	Not required	Not required
		5 (South)	-0/-0/-0	Not required	Not required
Comment	Reorientation of stage 3 to south recommended				
		1 (North-west)	-0/-0/-5	Recommended	Not required
		2 (South-east)	-0/-0/-7	N/A	Recommended (for night time)
		3 (North)	-0/-0/-10	Recommended	Recommended (for night time)
		4 (East)	-0/-0/-13	N/A	Recommended (for night time)
	R12	5 (South)	-0/-0/-16	N/A	Recommended (for night time)
		1 (North-west)	-0/-0/-5	Recommended	Not required
		2 (South-east)	-0/-0/-7	N/A	Recommended (for night time)
		3 (North)	-0/-0/-10	Recommended	Recommended (for night time)
		4 (East)	-0/-0/-13	N/A	Recommended (for night time)
	R13	5 (South)	-0/-0/-16	N/A	Recommended (for night time)
		1 (North-west)	-0/-0/-0	N/A	N/A
		2 (South-east)	-0/-0/-8	Recommended	Not feasible
		3 (North)	-0/-0/-6	Recommended	Not feasible
		4 (East)	-0/-0/-2	Recommended	Not required
	R18	5 (South)	-0/-0/-0	Not required	Not required
100%	R05	1 (North-west)	-2/-3/-8	Recommended	Not required

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
Capacity		2 (South-east)	-2/-3/-8	N/A	Recommended (for night time)
		3 (East)	-2/-3/-5	Recommended	Not required
		4 (West)	-4/-3/-1	N/A	Recommended (for night time)
		5 (North)	-8/-6/-3	Recommended	Not required
		6 (North-west)	-6/-3/-6	Recommended	Recommended (for night time)
		7 (North-east)	-6/-3/-13	Recommended	Recommended (for night time)
		1 (North-west)	-0/-0/-7	N/A	N/A
		2 (South-east)	-0/-0/-0	Not required	Not required
		3 (East)	-0/-0/-7	Recommended	Not required
		4 (West)	-0/-0/-4	Recommended	Not required
		5 (North)	-0/-0/-3	N/A	N/A
		6 (North-west)	-0/-0/-2	N/A	N/A
	R10	7 (North-east)	-0/-0/-2	N/A	N/A
Comment	Reorientation of stages 1 and 6 to south-west and stages 5 and 7 to south recommended				
		1 (North-west)	-0/-0/-5	Recommended	Not required
		2 (South-east)	-0/-0/-7	N/A	Recommended (for night time)
		3 (East)	-0/-0/-11	N/A	Recommended (for night time)
		4 (West)	-10/-3/-16	Recommended	Recommended (for night time)
		5 (North)	-8/-3/-14	Recommended	Recommended (for night time)
		6 (North-west)	-0/-0/-13	Recommended	Recommended (for night time)
	R12	7 (North-east)	-0/-0/-8	Recommended	Recommended (for night time)

Table 6-1: Options for meeting the required sound level reduction at the contributing stage/s during the Day, Night and Sleep Disturbance periods

Scenario	Affected Receiver/s	Stage/s requiring noise mitigation	Required Reduction dB(A) SPL Day/Night/Sleep*	Measure 1: Flexible Noise Barrier at the Venue	Measure 2: Double Glazing or Retrofit Secondary Glazing at the Residence
	R13	1 (North-west)	-0/-0/-5	Recommended	Not required
		2 (South-east)	-0/-0/-7	N/A	Recommended (for night time)
		3 (East)	-0/-0/-11	N/A	Recommended (for night time)
		4 (West)	-5/-0/-16	Recommended	Recommended (for night time)
		5 (North)	-0/-0/-14	Recommended	Recommended (for night time)
		6 (North-west)	-0/-0/-3	Recommended	Recommended (for night time)
		7 (North-east)	-0/-0/-0	Not required	Not required
	R17	1 (North-west)	-0/-0/-0	N/A	N/A
		2 (South-east)	-0/-0/-0	N/A	N/A
		3 (East)	-0/-0/-1	Recommended	Not required
		4 (West)	-0/-0/-0	Not required	Not required
		5 (North)	-0/-0/-0	Not required	Not required
		6 (North-west)	-0/-0/-0	Not required	Not required
		7 (North-east)	-0/-0/-4	Recommended	Not required
	R18	1 (North-west)	-0/-0/-0	N/A	N/A
		2 (South-east)	-4/-0/-11	Recommended	Not required
		3 (East)	-0/-0/-5	Recommended	Not required
		4 (West)	-0/-0/-2	N/A	N/A
		5 (North)	-0/-0/-2	Recommended	Not required
		6 (North-west)	-0/-0/-1	N/A	N/A
		7 (North-east)	-0/-0/-0	Not required	Not required

Measure 1	There are various flexible noise barriers available such as Pyrotek's Wavebar, Quadzero and Flex Acoustics' Aqflex Bass Absorber. Source: http://www.pyrotek.info/documents/datasheets/1013_quadzero_english_a4.pdf http://www.pyrotek.info/documents/datasheets/1062_Wavebar_English_A4.pdf http://www.flexacoustics.com/filer/Pdf%20artikler%20mv/AqFix%20presentation2.pdf Place flexible noise barrier on the sides, back and top of the scaffolding or support structure of the main array speaker systems as well as any speaker systems significantly contributing to the overall noise such as delays, fill speakers etc. Place a double layer of flexible noise barrier on either sides and the rear of the stage.
Solution 2	Treat the 'weak' areas of the potentially affected dwellings by architecturally treating their glazing areas with replacing the existing glazing areas with double glazing systems or retrofitting a secondary glazing system. Verandahs can be suitably provided with French doors so that additional music noise reduction would be available during night time.
N/A	Not applicable due to contributing stage/s either or partially facing affected receiver/s.
*	Sleep Disturbance Criteria derived for each receiver location from the methodology discussed in Section 4.4.1.2.
-	Not required

6.5 MODELLED RESULTS – NOISE CONTROLS

Table 6-2: Modelled Noise Impacts – Music PAs Only - NOISE CONTROLS (3m/s wind from source to receiver) Day (12pm-12am)

	Receiver Location																	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
Approx. 300 patrons Design Criteria: RBL+10	54	55	55	54	52	54	54	54	47	47	55	45	45	56	48	51	52	52
Minor Example A	43.6	43.9	44.7	42.4	56.7	28.5	33.6	36.3	31.3	46.7	52.8	44.8	44.8	39.4	40.1	36.5	51.5	51.2
Minor Example B	45.1	43.8	43.8	44.5	51.6	42.2	30.1	32.5	33.2	49.4	50.3	44.8	44.3	42.3	42.7	38.5	50.7	51.8
Minor Example C	42.1	42.2	43.2	40.7	51.6	30.2	28.2	29.1	31.2	42.7	55.2	51.9	51.8	38.4	38.8	35.3	37.1	52.3
Minor Example D	46.6	46.4	46.8	46.6	60.5	44.1	30.6	31.1	38.4	46.4	49.3	44.5	45.3	40.4	41.8	38.1	51.7	49.7
Approx. 3,000 patrons Design Criteria: RBL+15	59	60	60	59	57	59	59	59	52	52	60	50	50	61	53	56	57	57
Small Example A	44.0	43.7	44.2	42.8	55.3	27.6	31.9	34.3	35.2	51.9	52.6	55.4	55.4	40.3	40.8	37.0	52.7	55.9
Small Example B	34.2	42.4	30.3	29.6	57.1	31.0	32.4	34.8	34.3	51.2	40.1	49.5	49.7	37.9	39.0	35.8	42.9	45.7
Small Example C	34.6	48.3	42.1	42.7	56.4	36.0	35.0	32.5	30.9	33.4	47.3	48.1	39.0	38.0	40.0	29.0	57.0	43.9
Small Example D	51.3	51.3	52.0	50.7	60.1	40.2	38.0	37.5	44.7	54.7	56.9	53.9	53.7	46.0	47.1	43.5	57.3	57.9
Approx. 10,000 patrons Design Criteria: 65 dB L_{Aeq}	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Moderate Example A	52.0	51.3	51.7	52.9	65.2	47.4	35.2	34.8	42.5	53.5	53.2	59.6	50.3	46.1	47.5	43.7	58.7	54.1
Moderate Example B	47.3	47.0	47.6	46.2	59.3	33.9	35.4	38.0	36.8	55.0	55.1	57.8	57.9	43.4	44.1	40.3	56.5	60.1
Moderate Example C	48.0	48.6	48.8	47.3	61.3	33.6	38.4	39.0	41.4	55.6	55.8	58.0	58.0	44.2	44.9	41.3	57.0	64.4
Approx. 15,000 patrons Design Criteria: RBL+15	59	60	60	59	57	59	59	59	52	52	60	50	50	61	53	56	57	57
30% Capacity Example A	41.7	41.3	42.0	39.7	53.2	24.2	28.1	29.6	31.1	49.9	50.0	51.4	51.9	37.6	38.3	34.5	50.8	54.7
Approx. 20,000 patrons Design Criteria: 65 dB L_{Aeq}	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
40% Capacity Example A	52.1	51.8	51.7	52.9	65.1	47.5	38.3	37.8	43.1	55.6	53.4	60.0	53.0	46.7	48.1	44.3	58.8	55.5

Table 6-2: Modelled Noise Impacts – Music PAs Only - NOISE CONTROLS (3m/s wind from source to receiver) Day (12pm-12am)

	Receiver Location																	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
40% Capacity Example B	43.9	43.1	43.4	42.7	53.9	26.9	31.0	33.3	33.8	51.0	52.3	57.5	57.6	41.1	41.4	37.3	51.0	53.9
40% Capacity Example C	52.3	51.5	51.8	52.8	65.0	46.8	36.9	38.1	42.4	55.9	56.3	62.4	60.3	47.6	48.6	44.6	58.9	58.8
Approx. 35,000 patrons Design Criteria: 65 dB L_{Aeq}	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
70% Capacity Example A	53.6	53.1	53.3	52.8	64.8	47.7	38.0	39.1	44.3	57.0	57.0	61.3	58.1	49.2	50.1	46.8	59.4	58.1
70% Capacity Example A	54.8	54.8	55.3	54.2	65.0	43.0	41.6	42.1	45.6	58.9	59.1	62.3	60.8	50.5	51.4	48.2	61.6	64.3
Approx. 50,000 patrons Design Criteria: 65 dB LAeq	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
100% Capacity Example A	57.2	57.0	56.8	57.1	65.6	51.3	44.3	44.3	48.1	61.9	61.3	65.2	65.2	53.6	54.4	50.8	62.8	65.3
100% Capacity Example B	48.4	48.9	48.6	47.1	61.8	35.9	40.8	44.7	43.9	58.1	59.2	63.4	63.2	47.0	47.0	43.2	52.3	63.8
100% Capacity Example C	53.3	53.0	52.5	53.6	66.1	47.0	41.0	40.8	44.7	57.9	57.8	64.8	65.2	49.3	50.2	46.2	59.4	64.9

Potential exceedance

Table 6-3: Modelled Noise Impacts – Music PAs only - NOISE CONTROLS (3m/s wind from source to receiver) Night (12am-3am)

	Receiver Location																	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
Approx. 300 patrons Design Criteria: RBL+5	49	50	50	49	47	49	49	49	42	42	50	40	40	51	43	46	47	47
Minor Example A	39.7	40.0	40.8	38.5	47.0	24.6	29.8	32.4	27.4	42.0	48.9	39.9	39.9	35.5	36.2	32.6	46.5	46.3
Minor Example B	41.2	39.9	39.9	40.6	46.7	38.3	26.2	28.6	29.3	45.5	46.4	39.8	40.4	38.4	38.9	34.6	46.8	46.9
Minor Example C	38.2	38.3	39.3	36.8	46.7	26.3	24.3	25.2	27.3	38.8	50.3	40.0	39.9	34.5	34.9	31.4	33.2	47.4
Minor Example D	42.7	42.4	42.9	42.7	46.6	40.2	26.7	27.2	34.5	41.5	45.4	39.6	41.4	36.5	37.9	34.3	46.8	45.8
Approx. 3,000 patrons Design Criteria: RBL+10	54	55	55	54	52	54	54	54	47	47	55	45	45	56	48	51	52	52
Small Example A	40.2	39.8	40.3	38.9	51.4	23.7	28.0	30.4	31.3	48.0	48.7	44.5	44.5	36.4	36.9	33.1	48.8	52.0
Small Example B	30.3	38.5	26.4	25.7	52.2	27.1	31.5	30.9	30.4	47.2	36.2	45.7	45.8	34.0	35.1	31.9	39.0	41.8
Small Example C	30.7	44.4	38.2	38.8	51.6	32.1	31.1	28.6	27.0	29.5	43.4	44.2	35.1	34.1	36.1	25.1	52.1	40.0
Small Example D	47.4	47.4	48.1	46.8	52.0	36.3	34.1	33.6	40.8	50.7	53.0	45.3	45.0	42.1	43.2	39.6	52.3	52.8
Approx. 10,000 patrons Design Criteria: 55 dB L_{Aeq}	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55	55
Moderate Example A	48.1	47.4	47.8	49.0	55.0	43.5	31.3	30.9	38.6	49.6	49.3	55.7	46.4	42.2	43.6	39.8	54.8	50.2
Moderate Example B	43.4	43.1	43.7	42.3	55.4	30.0	31.5	34.1	32.9	51.1	51.2	53.9	54.0	39.5	40.2	36.4	52.6	55.0
Moderate Example C	44.1	44.7	44.9	43.4	55.1	29.7	34.5	35.1	37.5	51.7	51.9	54.1	54.1	40.3	41.0	37.4	53.1	55.3
Approx. 15,000 patrons Negligible music, if any Design Criteria: RBL+10	54	55	55	54	52	54	54	54	47	47	55	45	45	56	48	51	52	52
30% Capacity Example A	37.8	37.4	38.1	35.8	49.3	20.3	24.2	25.7	27.2	46.0	46.1	47.5	48.0	33.7	34.4	30.6	46.9	50.9
Approx. 20,000 patrons Design Criteria: 60 dB L_{Aeq}	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
40% Capacity Example A	48.2	47.9	47.8	49.0	60.3	43.6	34.4	33.9	39.2	51.7	49.5	56.1	49.1	42.8	44.2	40.4	54.9	51.6

Table 6-3: Modelled Noise Impacts – Music PAs only - NOISE CONTROLS (3m/s wind from source to receiver) Night (12am-3am)

	Receiver Location																	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
40% Capacity Example B	40.0	39.2	39.5	38.8	50.0	23.0	27.1	29.4	29.9	47.1	48.4	53.6	53.7	37.2	37.5	33.4	47.1	50.0
40% Capacity Example C	48.4	47.6	47.9	48.9	59.9	42.9	33.0	34.2	38.5	52.0	52.4	58.5	56.4	43.7	44.7	40.7	55.0	54.9
Approx. 35,000 patrons Design Criteria: 60 dB L_{Aeq}	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
70% Capacity Example A	46.0	45.5	45.7	45.2	57.2	40.1	30.4	31.5	36.7	49.4	49.4	53.7	50.5	41.6	42.5	39.3	51.8	50.5
70% Capacity Example B	47.2	47.2	47.7	46.6	59.2	35.4	34.0	34.6	38.0	51.3	51.5	54.7	53.2	42.9	43.8	40.6	54.0	56.7
Approx. 50,000 patrons Design Criteria: 60 dB L_{Aeq}	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
100% Capacity Example A	44.5	44.4	45.1	45.1	59.3	38.4	33.6	33.5	37.5	49.8	49.4	57.0	55.3	40.7	41.4	37.5	51.3	56.2
100% Capacity Example B	44.5	45.1	44.7	43.2	57.9	32.0	36.9	40.8	40.0	54.2	55.3	59.5	59.3	43.1	43.1	39.3	48.4	59.9
100% Capacity Example C	49.4	49.1	48.6	49.7	59.9	43.1	37.1	36.9	40.8	54.0	53.9	59.4	59.9	45.4	46.3	42.3	55.5	60.0

Potential exceedance

Table 6-4: Modelled Noise Impacts – Music PAs only - NOISE CONTROLS (3m/s wind from source to receiver) Night (12am-3am)

	Receiver Location																	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
Sleep Disturbance Design Criteria: RBL+15	59	60	60	59	57	59	59	59	52	52	60	50	50	61	56	59	57	57
Minor Example A	49.2	49.6	50.3	48.1	56.4	34.2	39.3	41.9	37.0	51.6	58.5	49.5	49.5	45.0	45.8	42.2	57.1	56.9
Minor Example B	50.8	49.5	49.5	50.2	57.3	48.1	35.7	38.1	38.9	55.0	55.9	49.5	50.3	48.0	48.4	44.1	56.4	56.6
Minor Example C	47.8	47.9	48.8	46.3	57.3	35.8	33.9	35.2	36.9	48.4	59.8	49.5	49.4	44.0	44.5	41.0	42.8	57.2
Minor Example D	52.2	52.0	52.5	52.4	57.2	51.2	36.2	36.8	44.1	52.0	55.0	50.1	51.0	46.1	47.5	43.8	57.3	55.5
Small Example A	49.7	49.3	49.8	48.5	57.0	33.3	37.6	39.9	40.8	51.6	58.3	50.0	50.1	46.0	46.5	42.7	58.3	56.5
Small Example B	40.5	50.1	36.1	35.6	57.2	36.7	41.0	40.4	40.2	58.6	46.1	50.3	50.3	43.5	44.6	41.4	48.5	51.9
Small Example C	40.2	54.1	48.0	49.0	57.4	41.6	40.7	38.1	36.6	39.1	53.0	53.8	44.7	43.6	45.7	34.6	56.7	49.7
Small Example D	51.7	51.7	52.4	51.5	57.3	41.7	38.1	38.4	45.2	62.0	57.4	49.9	49.9	45.8	47.2	43.6	56.9	58.4
Moderate Example A	53.9	53.6	54.1	55.5	56.9	50.9	37.4	36.4	45.3	54.9	54.7	49.9	50.3	48.0	49.0	44.8	59.8	57.8
Moderate Example B	50.5	49.8	50.3	49.5	57.2	38.3	39.0	41.6	41.5	56.7	58.4	50.2	50.2	46.7	47.4	43.4	56.9	57.2
Moderate Example C	50.1	49.7	50.2	48.8	56.9	35.3	40.7	41.6	47.1	51.7	58.5	49.9	49.9	45.8	46.6	42.9	59.1	57.3
30% Capacity Crowd Only	16.0	15.6	16.3	14.0	27.6	-1.5	2.4	4.0	5.4	24.2	24.3	25.8	26.3	11.9	12.6	8.8	25.2	29.2
40% Capacity Example A	53.8	53.7	54.1	55.5	57.2	51.0	41.1	40.6	45.3	59.0	54.7	50.2	50.4	48.0	49.0	44.8	59.7	57.9
40% Capacity Example B	49.7	48.8	49.1	48.4	56.6	32.6	36.7	39.0	39.5	51.7	58.1	50.2	50.3	46.8	47.1	43.0	56.7	59.6
40% Capacity Example C	54.0	53.7	54.1	55.7	57.3	50.1	37.8	40.3	45.2	55.1	58.4	50.4	50.0	48.1	49.1	44.9	57.4	57.8
70% Capacity Example A	55.1	55.1	55.4	55.0	56.8	52.1	39.1	42.0	47.2	51.8	59.3	49.8	49.4	50.4	51.2	47.7	58.2	57.9
70% Capacity Example B	55.1	55.0	55.4	55.0	57.4	44.5	41.4	43.2	47.0	57.9	59.3	50.3	50.2	49.3	50.4	47.4	61.3	61.8
100% Capacity Example A	50.3	50.5	50.9	51.0	56.6	46.5	37.8	38.1	45.0	51.6	54.1	50.1	50.1	45.1	45.9	42.6	57.3	57.3
100% Capacity Example B	51.0	51.5	51.8	49.6	57.1	37.6	42.1	50.1	48.1	61.2	62.0	50.3	50.3	50.0	49.5	45.0	56.2	57.0
100% Capacity Example C	54.0	53.7	54.1	55.7	57.3	50.0	41.1	40.5	47.1	58.9	58.4	50.4	50.3	48.2	49.2	45.0	57.2	56.9

6.6 MONITORING PROGRAM

Due to the wide surrounding residential catchment areas, an extensive monitoring program is recommended to ensure the noise criteria for the proposed event is met. An independent firm of noise consultants shall undertake the monitoring program.

Two phases of the monitoring program are recommended:

- Sound check monitoring; and
- Event monitoring.

During the event, ongoing noise monitoring shall occur. Both attended and unattended noise monitoring shall be undertaken throughout the residential catchment areas to assess not only the potential impact of the events, but the overall potential impact of the events for future planning purposes.

The independent noise consultants shall be in radio and mobile phone contact with Production Managers, Production Assistants and Stage Managers throughout events. This shall ensure that noise measurements in residential areas that exceed the criteria initiate a response at the noise source – enabling sound levels to be adjusted at the venue.

The monitoring program will enable any changing conditions to be responded to expediently to enable a successful event both on and off the site.

Extensive monitoring undertaken during the proposed events will assist the promoter in assessing the impacts of such events.

7. CONCLUSION

NSW State laws and regulations under the Protection of the Environment Operations Act 1997 (POEO Act) do not set guidelines for community events. Nonetheless, State laws, regulations and precedents have been used in setting noise criteria for the event. The relevant aspects of the NSW EPA's Industrial Noise Policy and a pre-approved Council noise limits at other venues, have been referenced

The noise modelling for the proposed events at the North Byron Parklands shows that the recommended design noise criteria may not be met at all times at all receiver locations. This worst-case assessment has considered a 3m/s wind from source to receiver which is a noise enhancing meteorological condition considered not to be a feature of this locale. Considering this precautionary approach, this assessment presents veritable conservative predicted noise levels.

The sample scenarios assumed for the purpose of this assessment provide a meaningful analysis. Actual event noise levels and the corresponding spectra may differ for each performance and therefore, the scenarios applied to this assessment would be further assessed prior to the first of each event by preparing a noise management plan to show how the noise criteria would be satisfied. For major events, as each one may differ from year to year, a noise management plan that ensures criteria will be satisfied is required.

Should the actual levels exceed the recommended design criteria, the recommended noise monitoring rationale as discussed within the body of this report, as well as the venue control procedures will be able to effectively manage noise levels during the events to assist the local community.

The noise impact assessment has provided a detailed acoustical evaluation of the existing acoustic environment. The assessment has proposed a number of best practice mitigation measures that can be applied so that nearest potentially affected residents during major events has satisfactory night time noise levels.

This concludes the report.

Anita Joh	Brandon Burrell	R T Benbow
Acoustical Engineer	Acoustical Engineer	Principal Consultant

8. LIMITATIONS

Our services for this project are carried out in accordance with our current professional standards for site assessment investigations. No guarantees are either expressed or implied.

This report has been prepared solely for the use by the North Byron Parklands, as per our agreement for providing environmental assessment services. Although all due care has been taken in the preparation of this study, no warranty is given, nor liability accepted (except that required by law) in relation to the information contained within this document.

North Byron Parklands is entitled to rely upon the findings in the report within the scope of work described in this report. No responsibility is accepted for the use of any part of the report in any other context or for any other purpose.

Opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions.

ATTACHMENTS

Attachment 1: Glossary of Noise Terminology

GLOSSARY

Environmental noise is generally measured over time periods. Statistical descriptors are then used to quantify the measured noise levels. These descriptors are used throughout the report and are defined below:

- L_{A1}

  The L_{A1} is the sound pressure level exceeded for 1% of the measurement period. This descriptor provides an indication of the average peak noise level.

- L_{A10}

  The L_{A10} is the sound pressure level exceeded for 10% of the measurement period.

- L_{Aeq}

  The L_{Aeq} represents the equivalent continuous (energy average) A-weighted sound pressure level over the measurement period.

- L_{A90}

  The L_{A90} is the sound pressure level exceeded for 90% of the measurement period. The L_{A90} is often referred to as the "background noise level".

The NSW Industrial Noise Policy sets out noise criteria for varying receiver types and time periods. The definitions for these terms provided in the INP are as follows:

- Rural

  An area with an acoustical environment that is dominated by natural sounds, having little or no road traffic. Such areas may include:
  - 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 zoning map (Local Environmental Plan (LEP) or other planning instrument).

- lin-weighting

  An un-weighted sound, all frequencies treated equally, often used as input into noise models.

- L_{Amax}

  The maximum A-weighted sound pressure level with the "fast" time constant.

- L_{Cmax}

  The maximum C-weighted sound pressure level with the "fast" time constant.

- A-weighting

  A frequency weighting applied to sound to approximate human hearing response.

- C-weighting

  A frequency weighting that takes account of low frequency sound.

- 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 (18:00 – 22:00); and/or
  - evening ambient noise 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.

- 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 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 industrial uses.

- Urban / industrial interface

  An area as defined for 'urban' above that is in close proximity to industrial premises and that extends out to a point where the existing industrial noise from the source has fallen by 5 dB(A). Beyond this region the amenity criteria for the urban category applies. This category may be used only for existing situations.

- Commercial

  An area defined as business zone, except neighbourhood business zone, on an LEP.

- Industrial

  An area defined as an industrial zone on an LEP. For isolated residences within an industrial zone, the industrial amenity criteria would usually apply.

- Time of day

  - Day is the period from 7am to 6pm Monday to Saturday, or 8am to 6pm on Sundays and public holidays;
  - Evening is the period from 6pm to 10pm;
  - Night is the remaining periods.

Attachment 2: Equipment Calibration Certificates

Acoustic Research Laboratories
Proprietary Limited A.B.N. 47 050 100 804
Noise and Vibration Monitoring Instrumentation for Industry and the Environment

Sound Level Meter Test Report

Report Number : 10023

Date of Test : 18/01/2010

Report Issue Date : 19/01/2010

Equipment Tested/ Model Number: **ARL Environmental Noise Logger**

Instrument Serial Number: 194438

Client Name : Benbow Environmental
13 Daking Street
North Parramatta NSW 2151

Contact Name : Ilco Naumoski

Tested by : Michelle Youssef

Approved Signatory :

Date : **19 January 2010**

NATA
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Acoustic Research Laboratories
Proprietary Limited A.B.N. 47 050 100 804
Noise and Vibration Monitoring Instrumentation for Industry and the Environment

Sound Level Meter Test Report

Report Number : 09054

Date of Test : 16/02/2009

Report Issue Date : 17/02/2009

Equipment Tested: **ARL Noise Logger**

Model Number: EL-215

Serial Number: 194702

Company Name : Benbow Environmental

13 Daking Street

North Parramatta NSW 2151

Contact Name : Ilco Naumoski

Tested by : Nicolas Larue

Approved Signatory :

Ken Williams

Date : **17 February 2009**

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www.acousticresearch.com.au

Acoustic Research Laboratories
Proprietary Limited A.B.N. 47 050 100 804
Noise and Vibration Monitoring Instrumentation for Industry and the Environment

Sound Level Meter Test Report

Report Number : 08354

Date of Test : 24/09/2008

Report Issue Date : 26/09/2008

Equipment Tested: **ARL Noise Logger**

Model Number: EL-215

Serial Number: 194682

Company Name : Benbow Environmental
13 Daking Street
North Parramatta NSW 2151

Contact Name : Peter Eisenhuth

Tested by : Morgan Rae

Approved Signatory :

Ken Williams

Date : **26 September 2008**

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Noise and Vibration Monitoring Instrumentation for Industry and the Environment

Sound Level Meter Test Report

Report Number : 08359

Date of Test : 01/10/2008

Report Issue Date : 02/10/2008

Equipment Tested: **ARL Noise Logger**

Model Number: EL-215

Serial Number: 194593

Company Name : Benbow Environmental
13 Daking Street
North Parramatta NSW 2151

Contact Name : Peter Eisenhuth

Tested by : Morgan Rae

Approved Signatory :

Ken Williams

Date : **2 October 2008**

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Acoustic Research Laboratories
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Noise and Vibration Monitoring Instrumentation for Industry and the Environment

Sound Level Meter Test Report

Report Number : 08469

Date of Test :	09/12/2008
Report Issue Date :	12/12/2008
Equipment Tested:	**ARL Noise Logger**
Model Number:	EL-215
Serial Number:	194552
Company Name :	Benbow Environmental
	13 Daking Street
	North Parramatta NSW 2151
Contact Name :	Peter Eisenhuth
Tested by :	Nicolas Larue
Approved Signatory :	
	Ken Williams
Date :	**12 December 2008**

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Proprietary Limited A.B.N. 47 050 100 804
Noise and Vibration Monitoring Instrumentation for Industry and the Environment

Sound Level Meter Test Report

Report Number : 08181.doc

Date of Test : 02/06/2008

Report Issue Date : 03/06/2008

Equipment Tested: **ARL Noise Logger**

Model Number: EL-215

Serial Number: 194540

Company Name : Benbow Environmental
13 Daking Street
North Parramatta NSW 2151

Contact Name : Peter Eisenhuth

Tested by : Morgan Rae

Approved Signatory :

Ken Williams

Date : **3 June 2008**

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Attachment 3: Example Site Plans for General Minor and Major Events

(Source: S J Connelly CCP Pty Ltd)

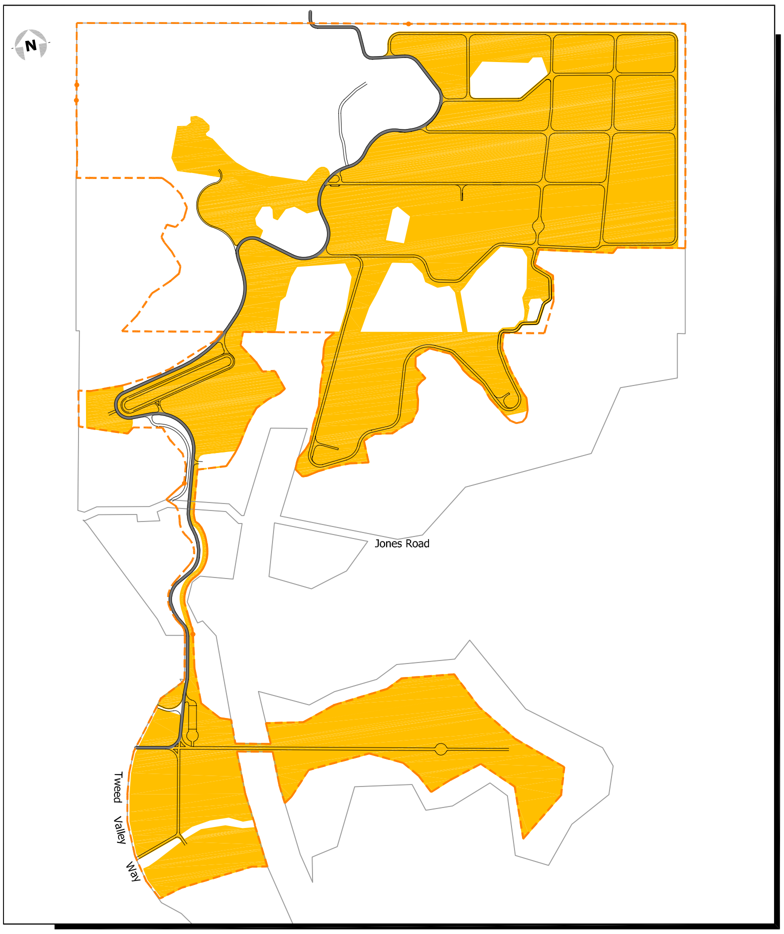
PROPOSED EVENT USAGE AREA

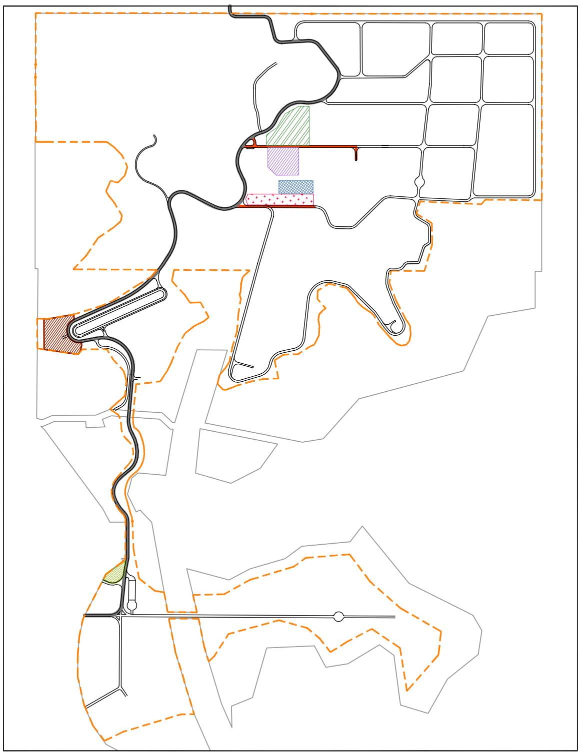
The Proposed Event Usage Area shows all of the parts of the "Application Area" that are proposed to be used for a 'minor' event.

The Example Event Structure plans below illustrate how specific facilities and infrastructure might be located within this area.

A typical 'minor' event might include a Scout or Guides camp, corporate function or a special interest group event.

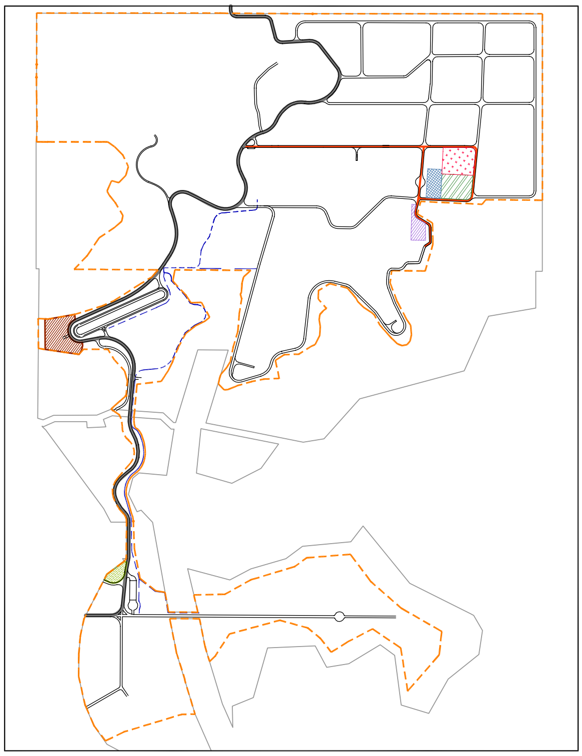
Proposed Event Usage Area
(95.19 Hectares)





Performance or show space: 0.77 Ha **Camping:** 1.18 Ha
Carparking: 0.42 Ha **Emergency Assembly Area:** 0.7 Ha

EXAMPLE EVENT LAYOUT 1



Performance or show space: 0.33 Ha **Camping:** 0.72 Ha
Carparking: 0.4 Ha **Emergency Assembly Area:** 0.83 Ha

EXAMPLE EVENT LAYOUT 2

Legend:

- The Site
- Extents of Application Area (Dashed)
- Resource Centre
- Gatehouse
- Performance Area
- Camping
- Carparking
- Emergency Assembly Area
- Spine Road (7m wide)
- Active Event Access Lane (6m wide)

0 160m

1:8000 (@ A3)

Date	05.05.10
Author	SDR
Reference	09_120

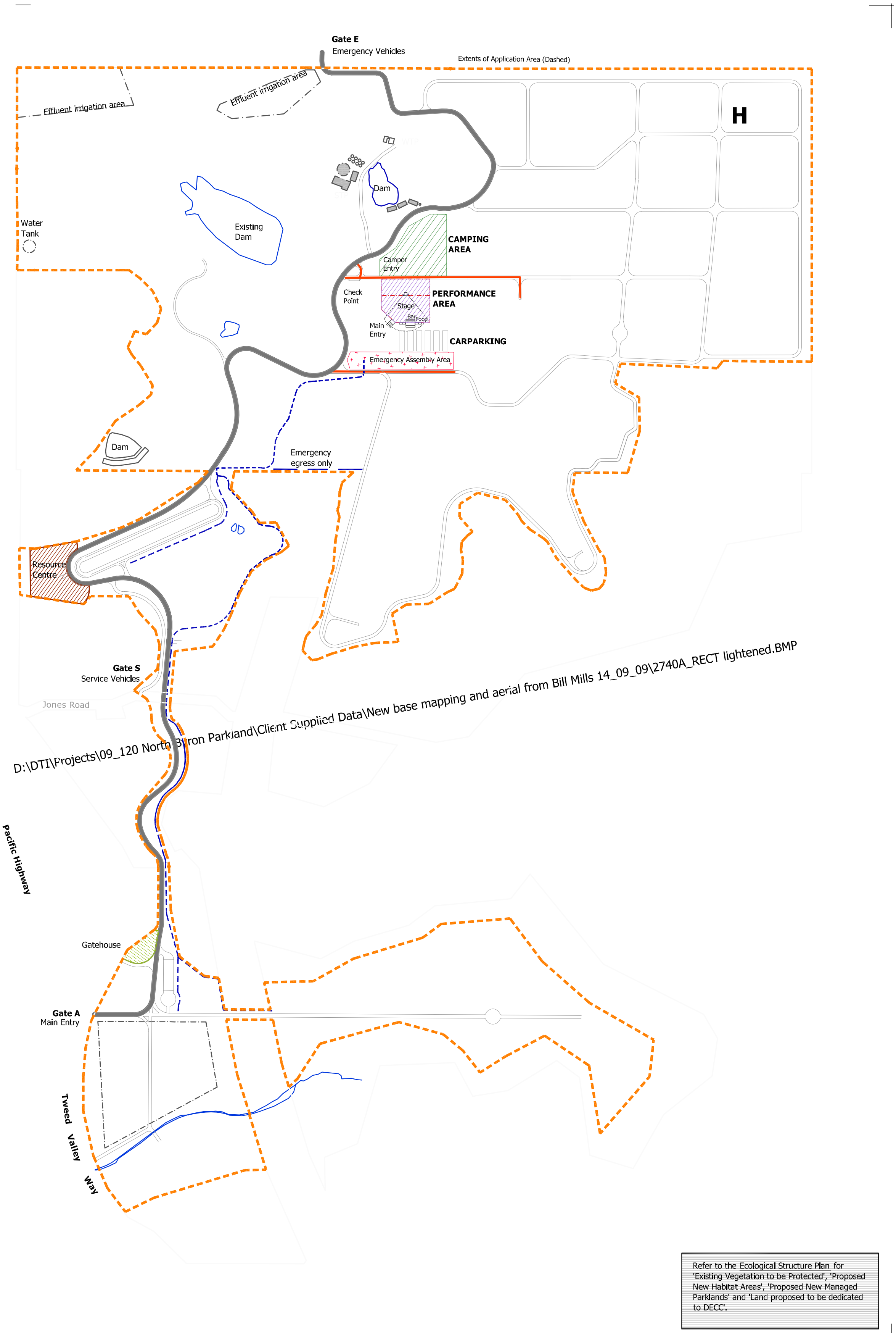
IMPORTANT NOTE |
Cadastral information is subject to survey. The alignment of the aerial photograph and vectorial overlays is approximate only. This plan is conceptual only and subject to detailed survey and design.

Sources | **Aerial Photography:** Bill Mills (2009) | **Cadastre:** Ardill Payne (2009) |

Prepared by
design team ink

Illustration | **1.1**
Minor Event Structure Plan

North Byron Parklands | **Tweed Valley Way & Jones Road**



Legend:

The Site	Extents of Application Area (Dashed)
Camping	Emergency Assembly Area
Performance Area	Gatehouse
Spine Road (7m wide)	Active Event Access Lane (6m wide)
Main Pedestrian Route	Temporary Fencing

0 160m

1:8000 (@ A3)

IMPORTANT NOTE |
Cadastral information is subject to survey. The alignment of the aerial photograph and vectorial overlays is approximate only. This plan is conceptual only and subject to detailed survey and design.

Sources | Aerial Photography: Bill Mills (2009) **| Cadastre:** Ardill Payne (2009) **|**

Date	05.05.10
Author	SDR
Reference	09_120

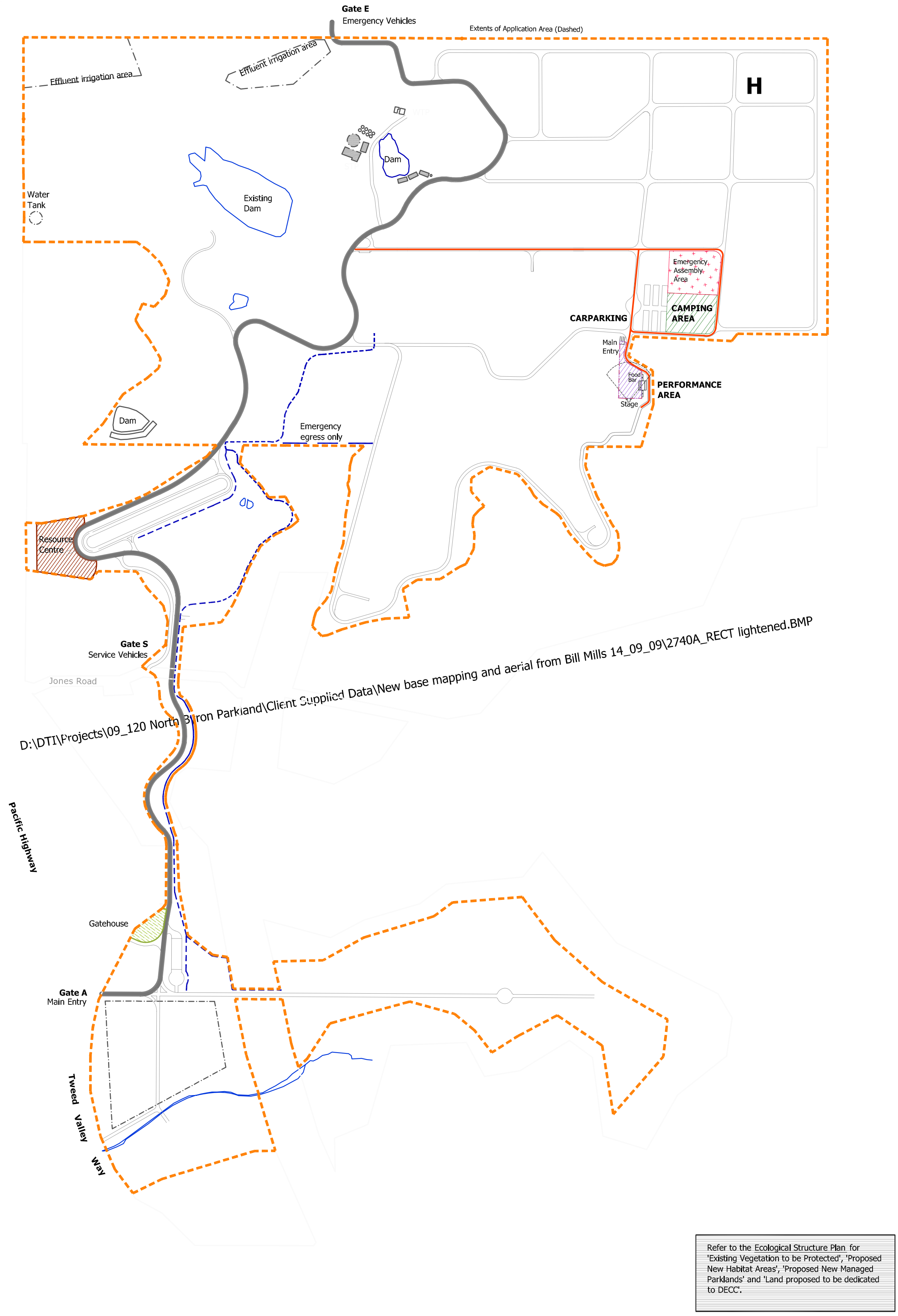
Prepared by

design team ink

Illustration | **1.1**

Minor Event
Example Event Layout 1

North Byron Parklands | Tweed Valley Way & Jones Road



Legend:

The Site | Extents of Application Area (Dashed) | Camping | Emergency Assembly Area

Performance Area | Gatehouse

Spine Road (7m wide) | Active Event Access Lane (6m wide) | Main Pedestrian Route | Temporary Fencing

0 160m

1:8000 (@ A3)

Date 05.05.10

Author SDR

Reference 09_120

IMPORTANT NOTE |
Cadastral information is subject to survey. The alignment of the aerial photograph and vectorial overlays is approximate only. This plan is conceptual only and subject to detailed survey and design.

Sources | Aerial Photography: Bill Mills (2009) | **Cadastre:** Ardill Payne (2009) |

Prepared by

design team ink

Illustration | **1.1**

Minor Event
Example Event Layout 2

North Byron Parklands | Tweed Valley Way & Jones Road

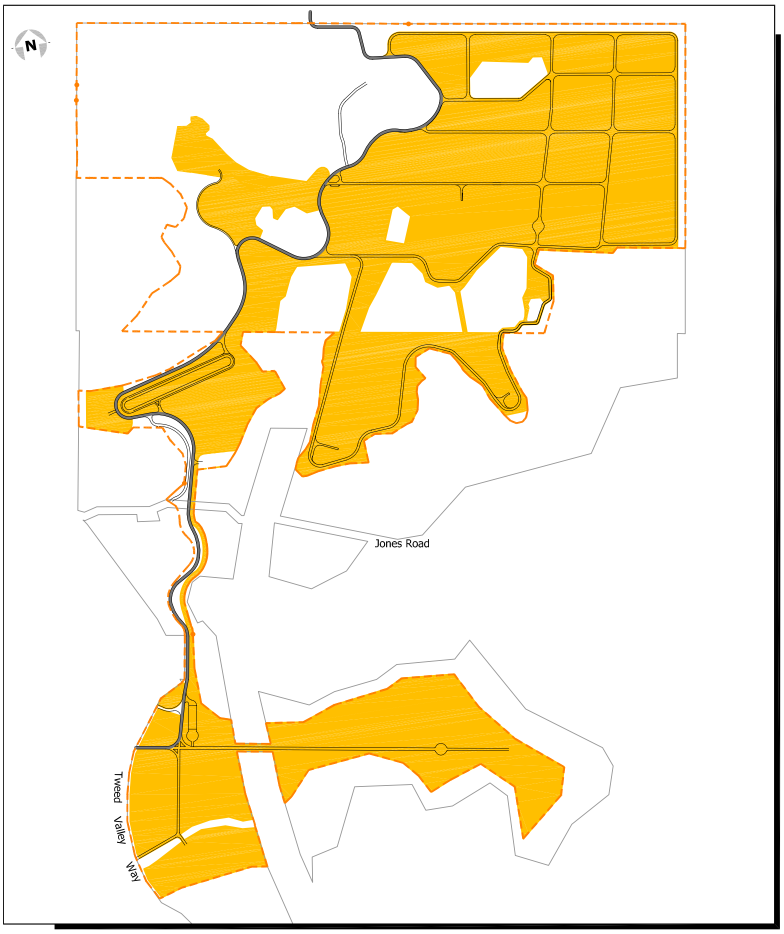
PROPOSED EVENT USAGE AREA

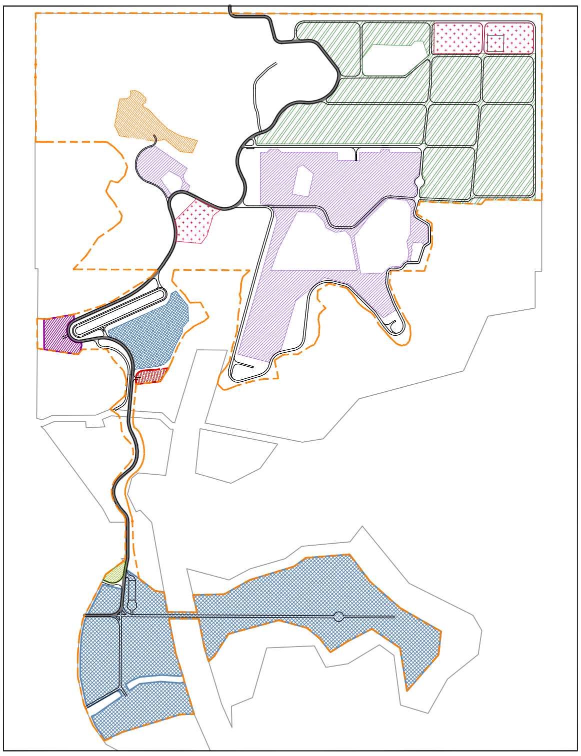
The Proposed Event Usage Area shows all of the parts of the "Application Area" that are proposed to be used for a 'very large' event.

The Example Event Structure plans below illustrate how specific facilities and infrastructure might be located within this area.

A typical 'very large' event might include a music festival, agricultural show or arts or cultural festival.

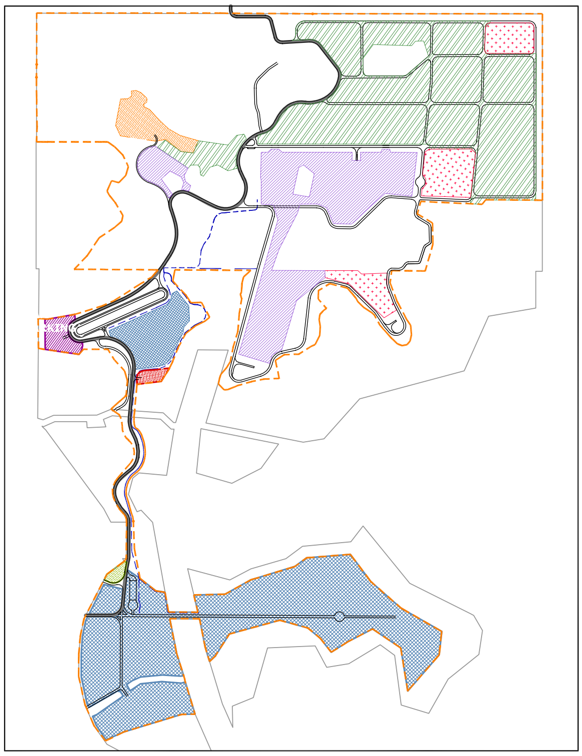
Proposed Event Usage Area
(95.19 Hectares)





Performance or show space: 16.57 Ha Camping: 29.69 Ha
Carparking: 28.17 Ha Emergency Assembly Area: 4 Ha

EXAMPLE EVENT LAYOUT 1



Performance or show space: 13.42 Ha Camping: 28.76 Ha
Carparking: 28.17 Ha Emergency Assembly Area: 5.07 Ha

EXAMPLE EVENT LAYOUT 2

Legend:

The Site
Extents of Application Area (Dashed)
Conference Centre
Cultural Centre/Administration
Gatehouse
Performance Area
Camping
Carparking
Emergency assembly area
Spine Road (7m wide)
Event access lane (6m wide)

0 160m

1:8000 (@ A3)

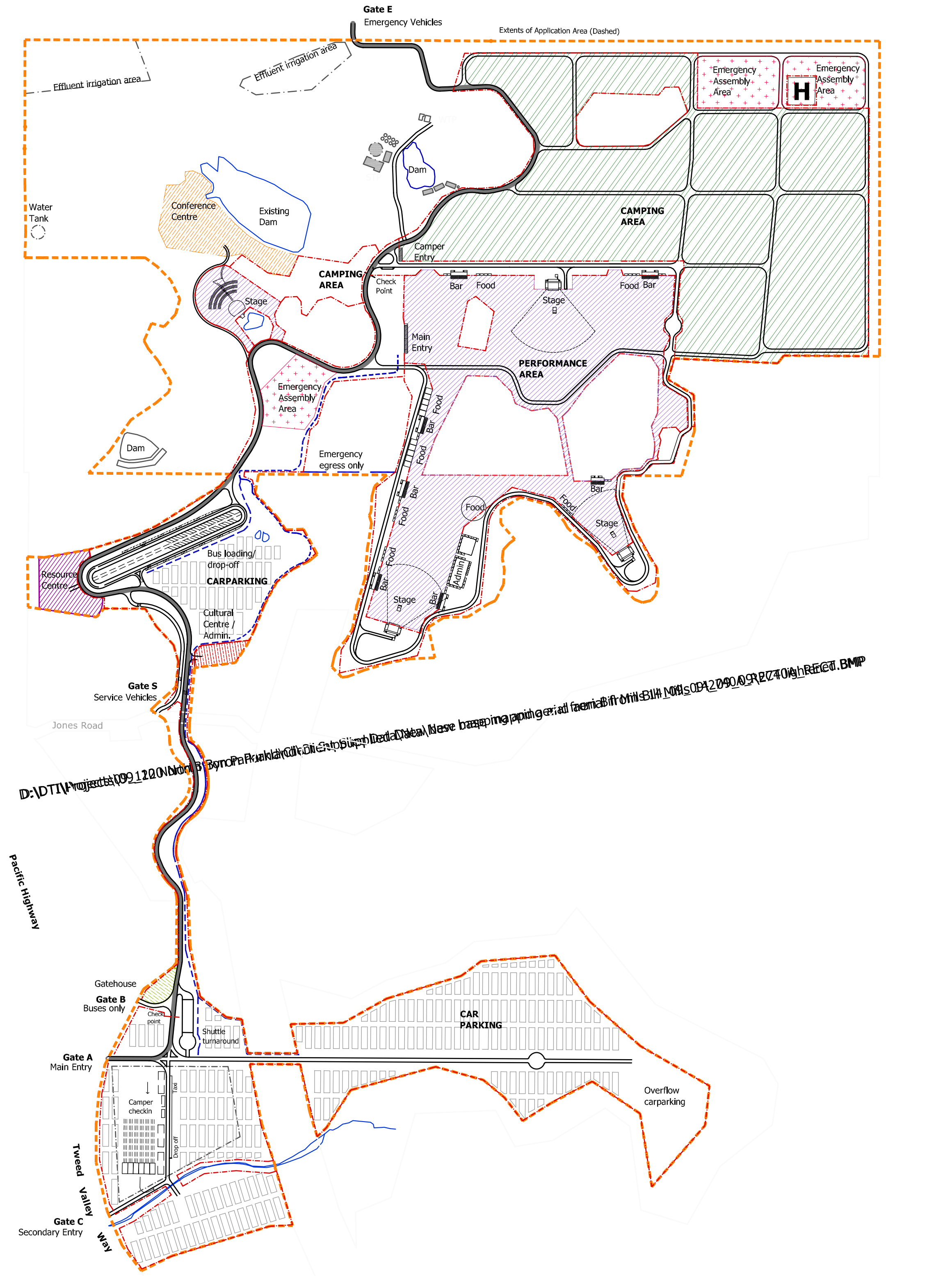
IMPORTANT NOTE |
Cadastral information is subject to survey. The alignment of the aerial photograph and vectorial overlays is approximate only. This plan is conceptual only and subject to detailed survey and design.

Sources | Aerial Photography: Bill Mills (2009) | Cadastre: Ardill Payne (2009) |

Prepared by
design team ink

Date 05.05.10
Author SDR
Reference 09_120

Illustration | 1.1
Very Large Event Structure Plan



Refer to the Ecological Structure Plan for 'Existing Vegetation to be Protected', 'Proposed New Habitat Areas', 'Proposed New Managed Parklands' and 'Land proposed to be dedicated to DECC'.

Legend:

The Site
Extents of Application Area (Dashed)
Camping
Emergency Assembly Area
Performance Area
Conference Centre Uses
Cultural Centre/Administration Uses
Gatehouse
Spine Road (7m wide)
Active Event Access Lane (6m wide)
Main Pedestrian Route
Temporary Fencing

0 160m

1:8000 (@ A3)

Prepared by

design team ink

Date 05.05.10
Author SDR
Reference 09_120

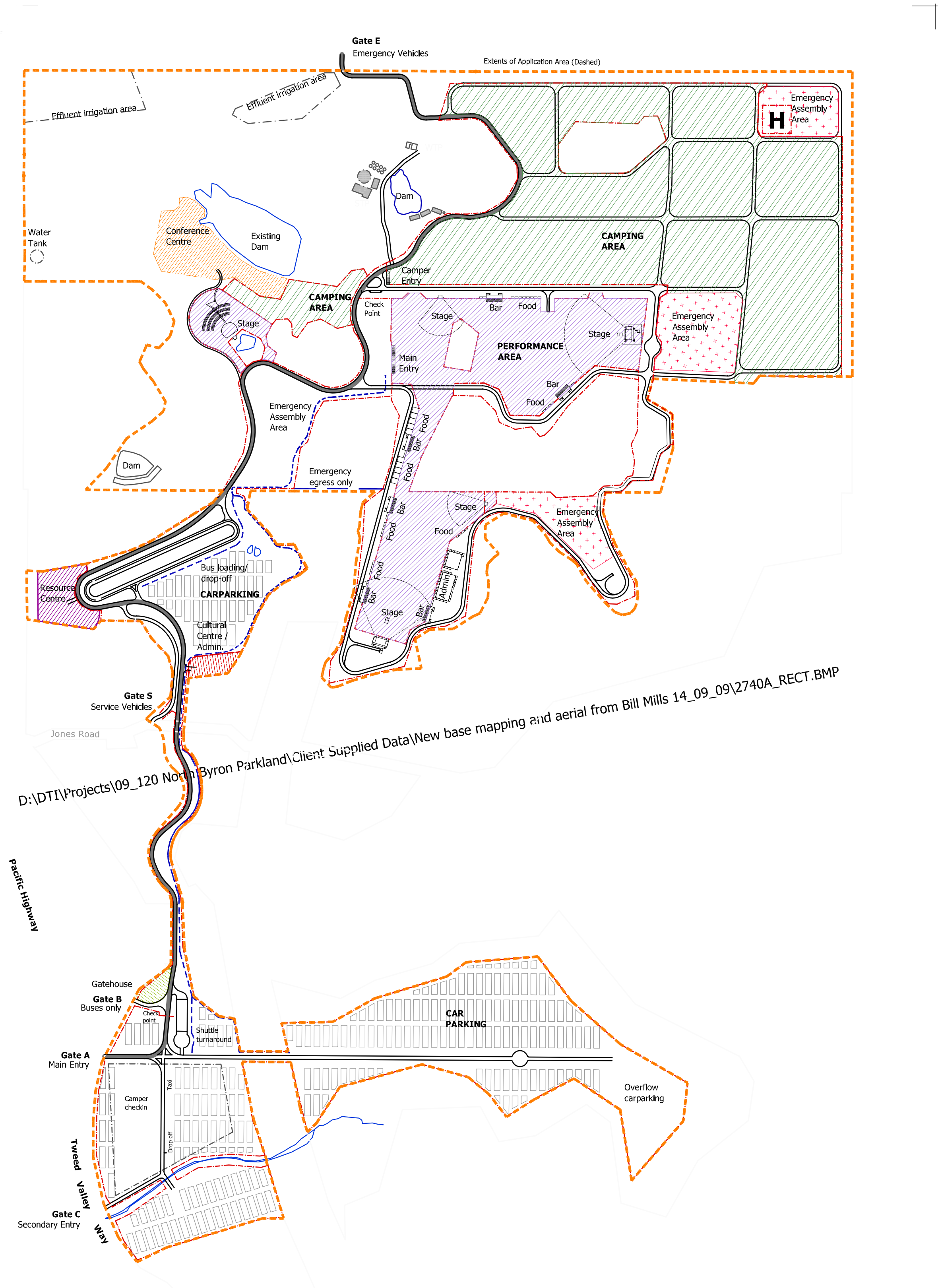
IMPORTANT NOTE |
Cadastral information is subject to survey. The alignment of the aerial photograph and vectorial overlays is approximate only. This plan is conceptual only and subject to detailed survey and design.

Sources | **Aerial Photography:** Bill Mills (2009) | **Cadastre:** Ardill Payne (2009) |

Illustration | **1.1**

Very Large Event Example Event Layout 1

North Byron Parklands | **Tweed Valley Way & Jones Road**



Refer to the Ecological Structure Plan for 'Existing Vegetation to be Protected', 'Proposed New Habitat Areas', 'Proposed New Managed Parklands' and 'Land proposed to be dedicated to DECC'.

Legend:

- The Site
- Extents of Application Area (Dashed)
- Camping
- Emergency Assembly Area
- Performance Area
- Conference Centre Uses
- Cultural Centre/Administration Uses
- Gatehouse
- Spine Road (7m wide)
- Active Event Access Lane (6m wide)
- Main Pedestrian Route
- Temporary Fencing

0 160m

1:8000 (@ A3)

Date	05.05.10
Author	SDR
Reference	09_120

IMPORTANT NOTE |
Cadastral information is subject to survey. The alignment of the aerial photograph and vectorial overlays is approximate only. This plan is conceptual only and subject to detailed survey and design.

Sources | Aerial Photography: Bill Mills (2009) **| Cadastre:** Ardill Payne (2009) **|**

Prepared by

design team ink

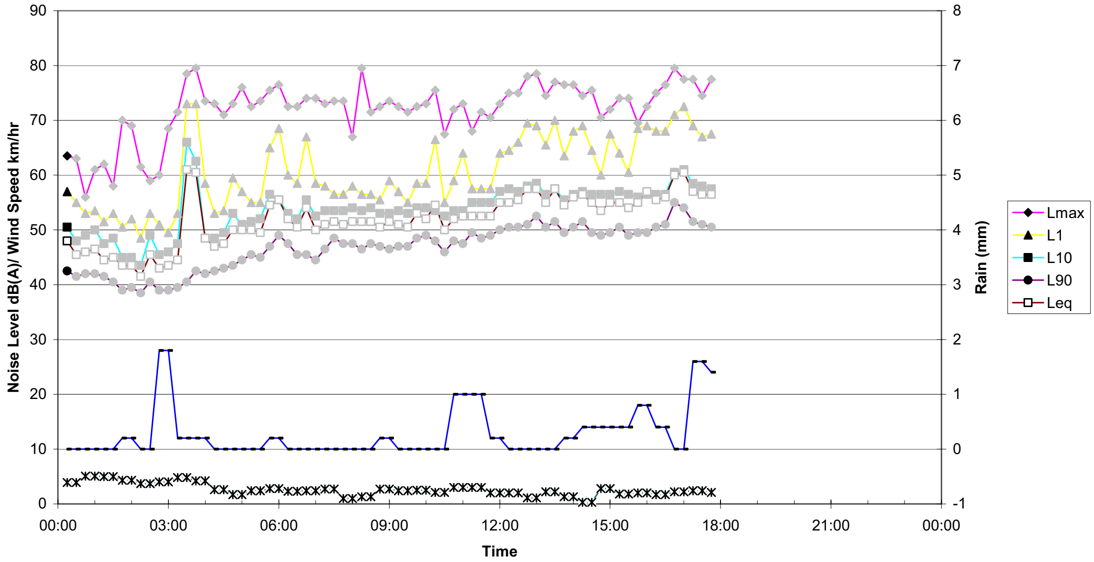
Illustration | **1.1**

Very Large Event Example Event Layout 2

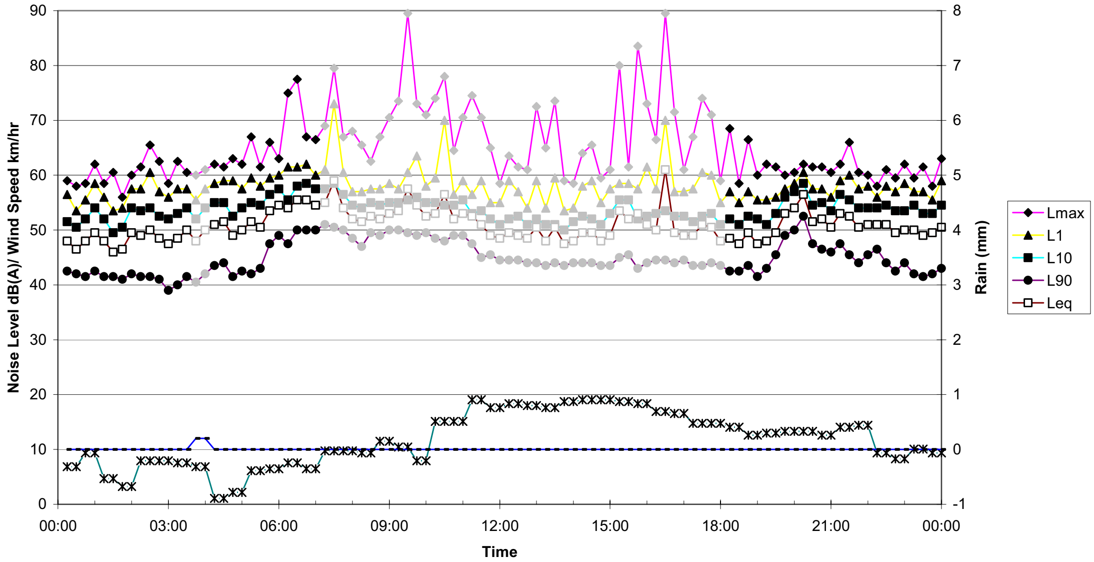
North Byron Parklands | Tweed Valley Way & Jones Road

Attachment 4: Long-term Unattended Logger Graphs

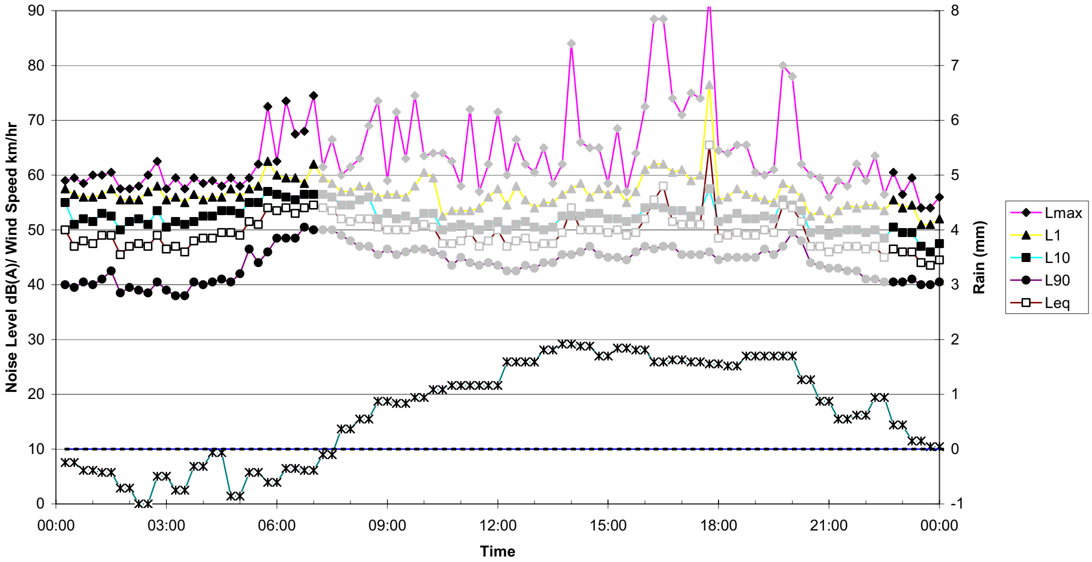
Measured Noise Levels
1 Jones Road - Monday 01/03/2010



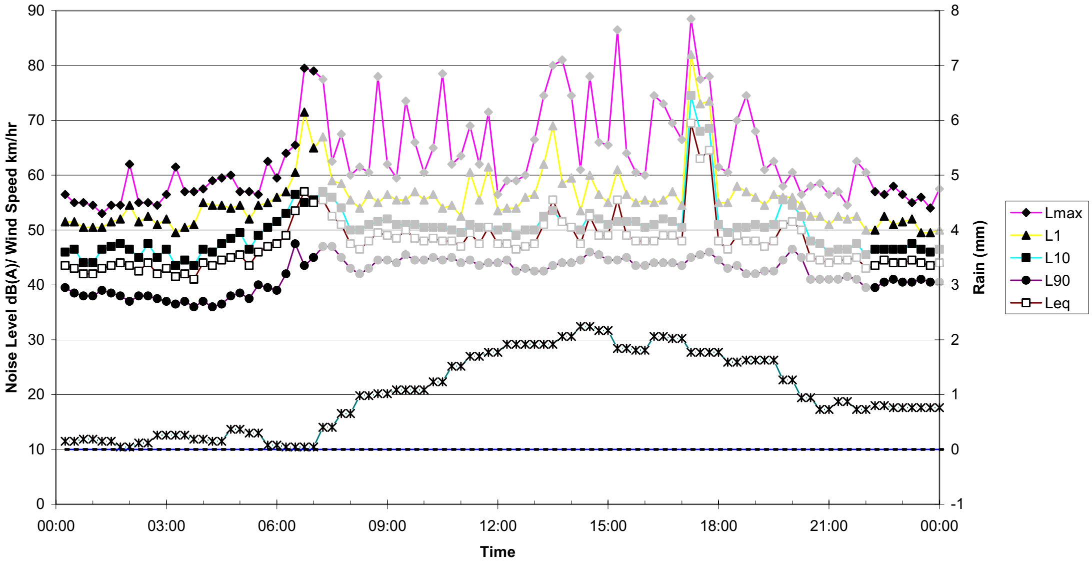
Measured Noise Levels
1 Jones Road - Thursday 11/02/2010

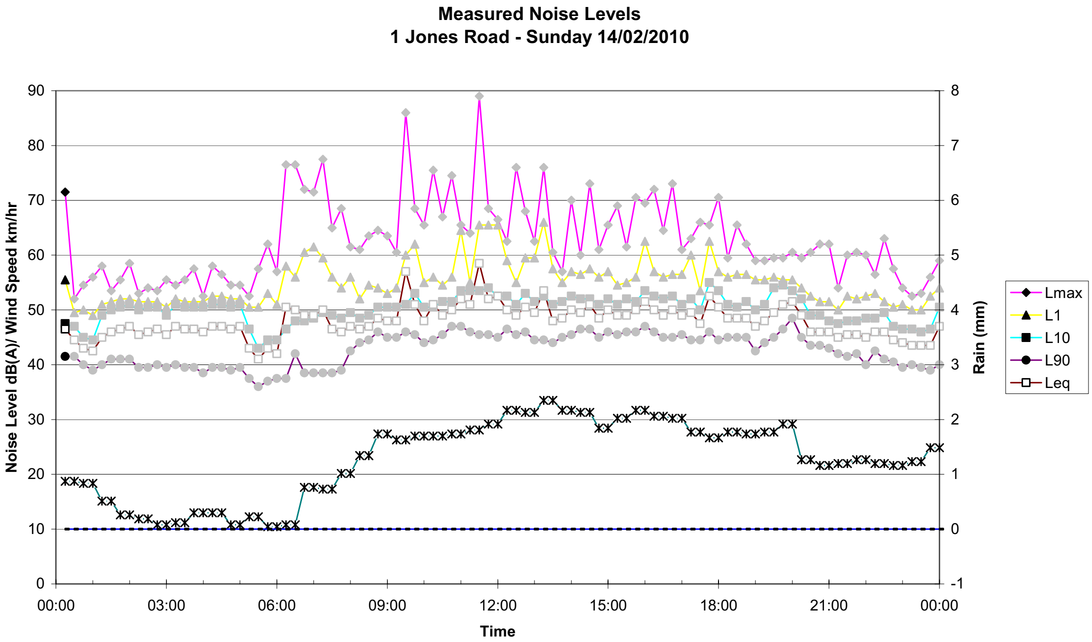


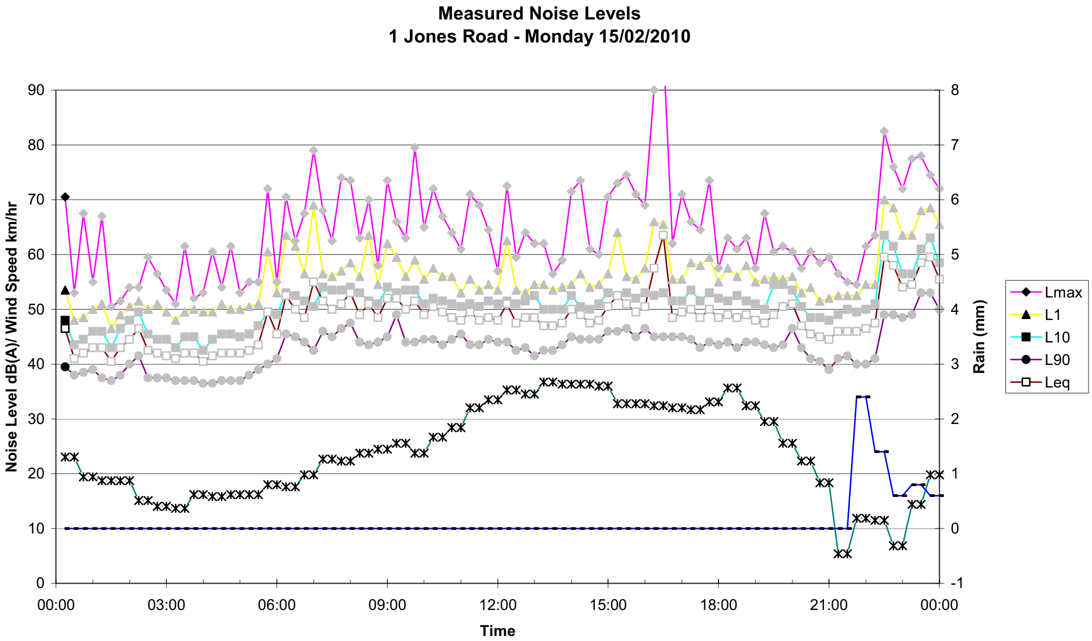
Measured Noise Levels
1 Jones Road - Friday 12/02/2010

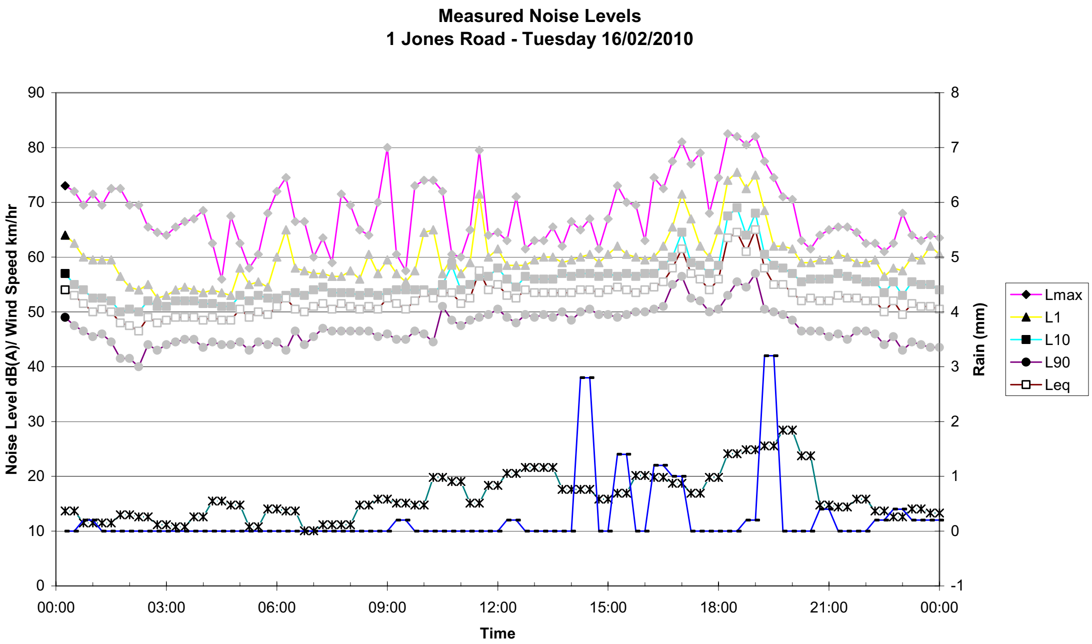


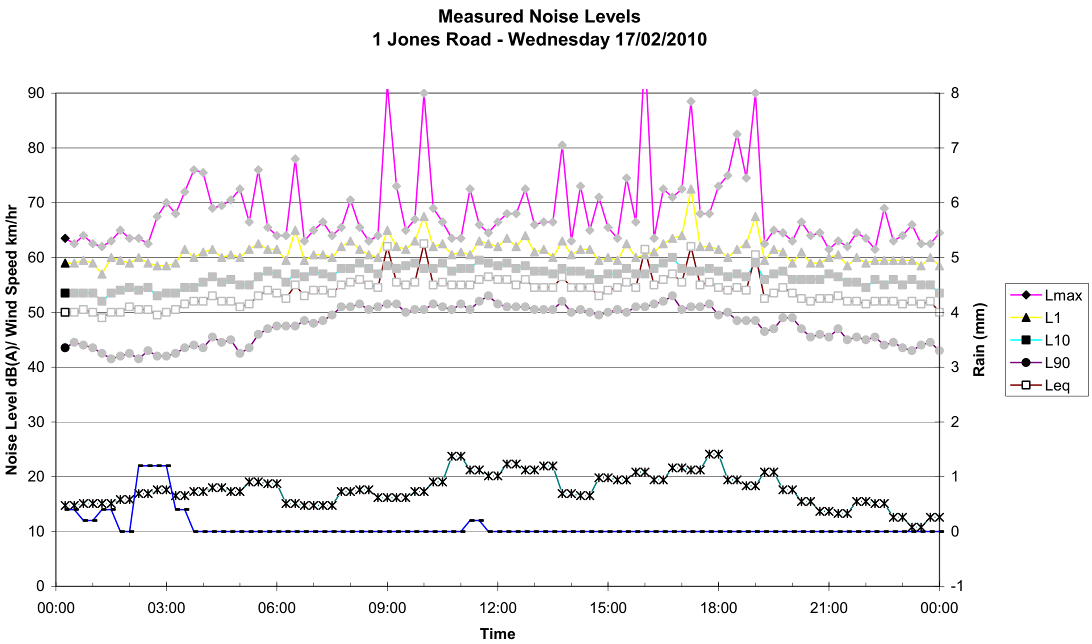
Measured Noise Levels
1 Jones Road - Saturday 13/02/2010



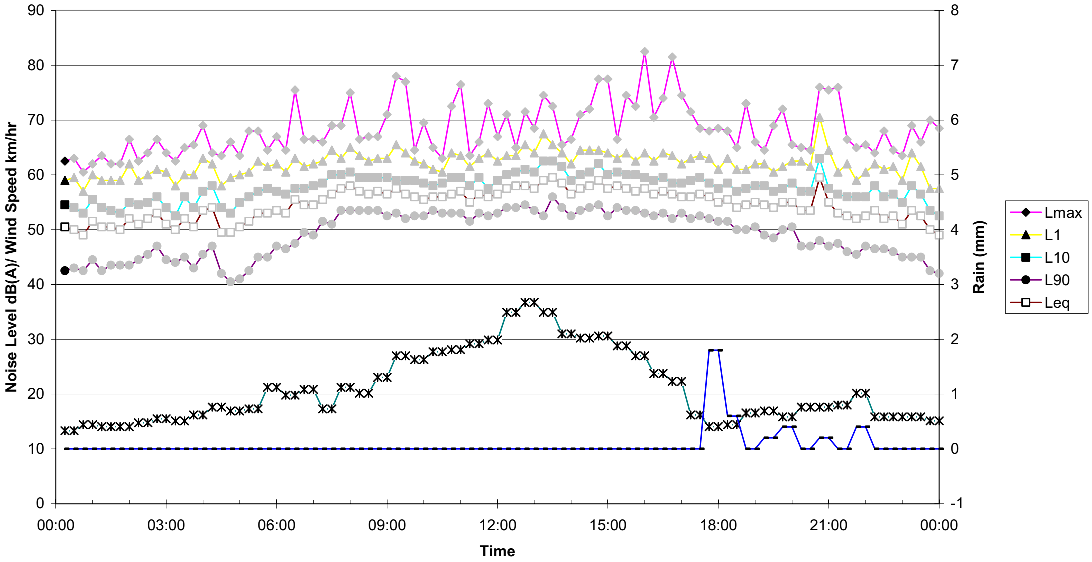

Measured Noise Levels
1 Jones Road - Sunday 14/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq


Measured Noise Levels
1 Jones Road - Monday 15/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

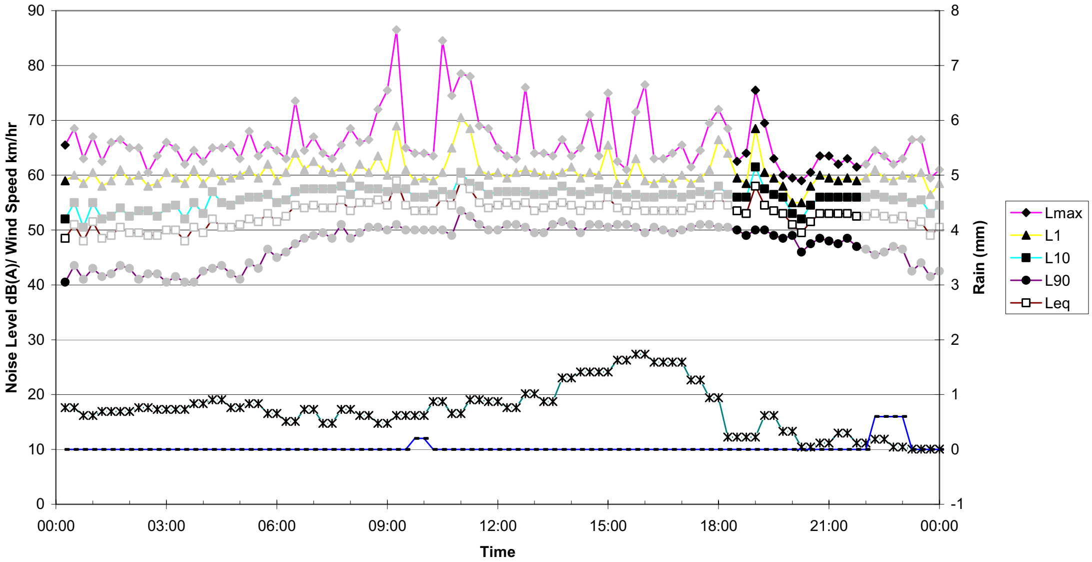

Measured Noise Levels
1 Jones Road - Tuesday 16/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq
90
80
70
60
50
40
30
20
10
0
8
7
6
5
4
3
2
1
0
-1
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00

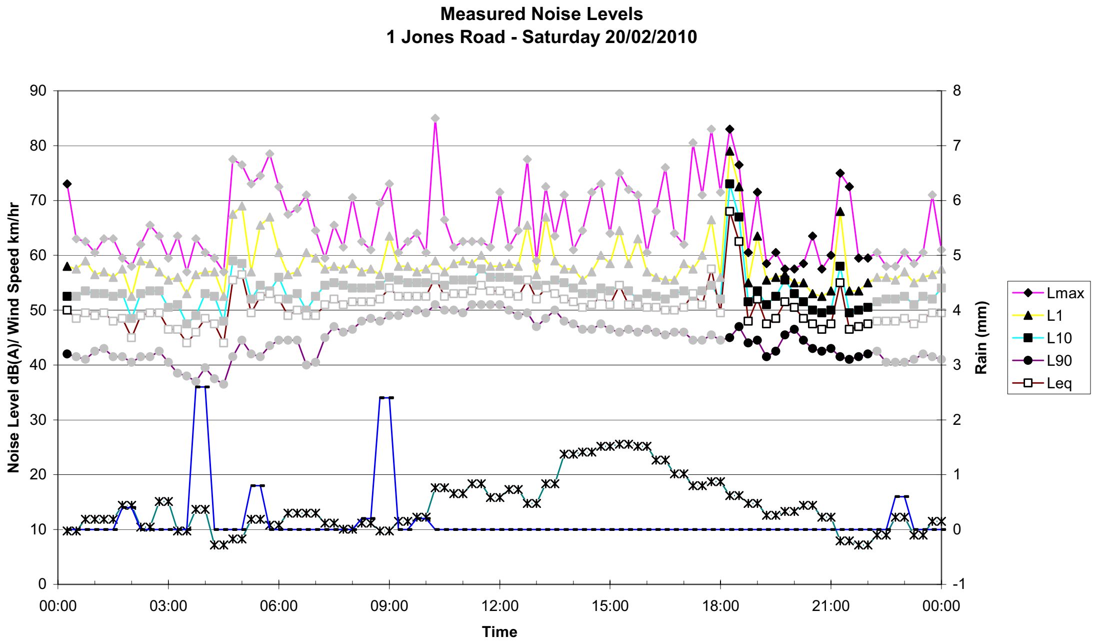

Measured Noise Levels
1 Jones Road - Wednesday 17/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq
90
80
70
60
50
40
30
20
10
0
8
7
6
5
4
3
2
1
0
-1
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00

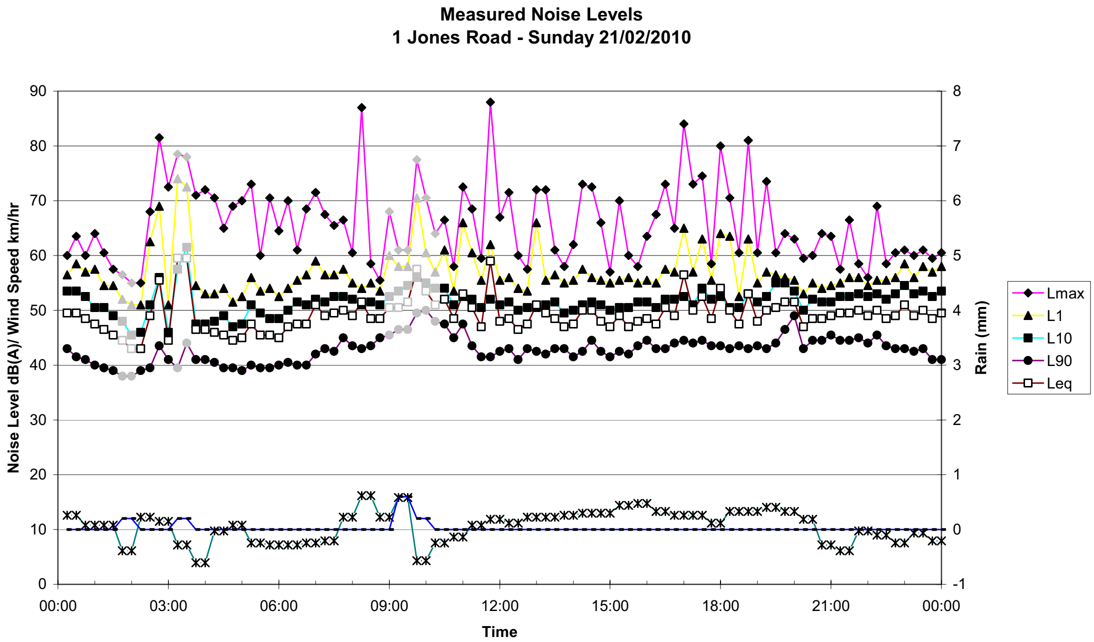
Measured Noise Levels
1 Jones Road - Thursday 18/02/2010



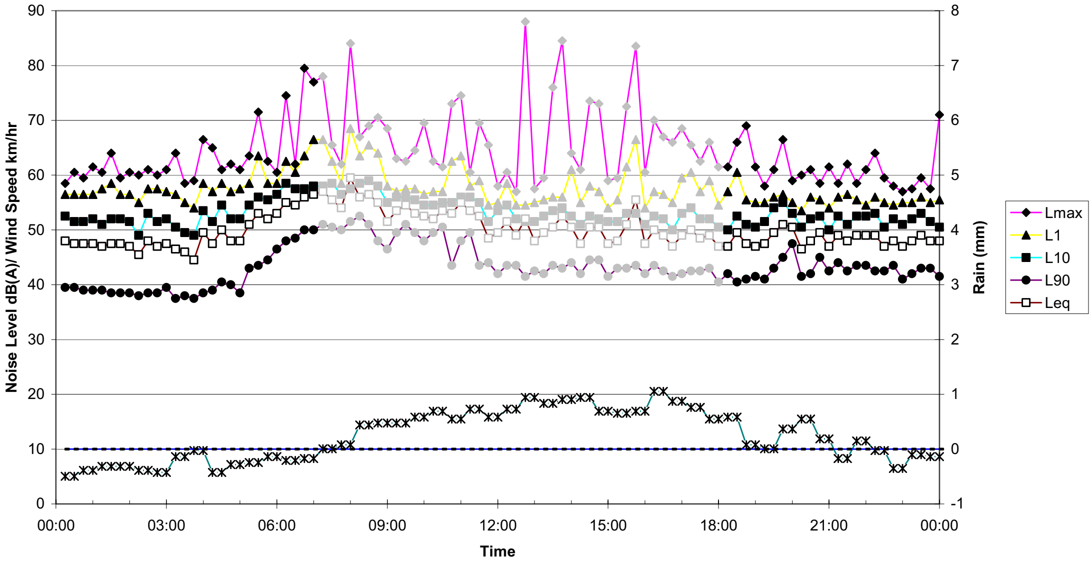
Measured Noise Levels
1 Jones Road - Friday 19/02/2010



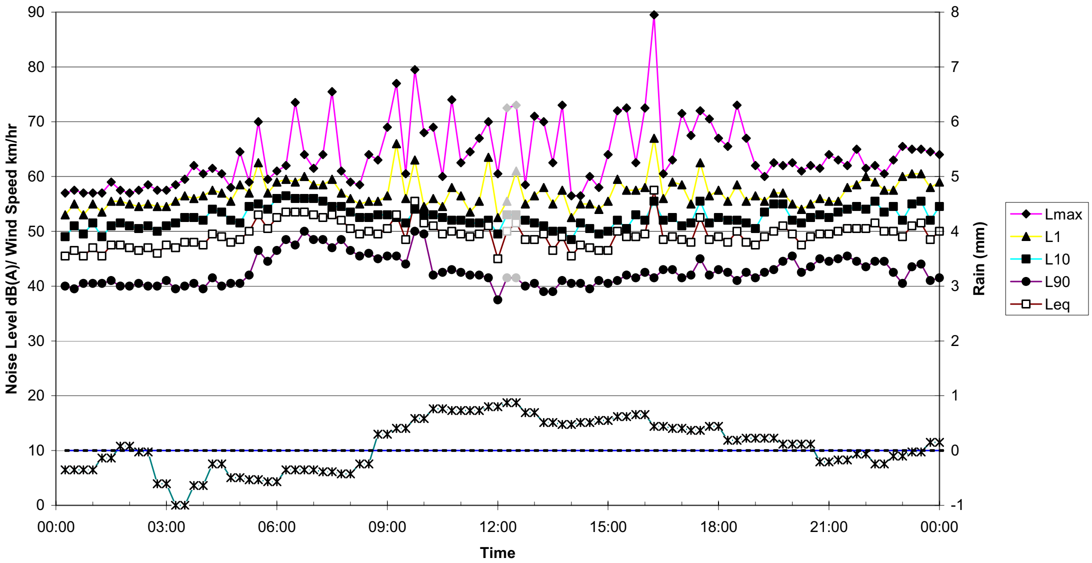

Measured Noise Levels
1 Jones Road - Saturday 20/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

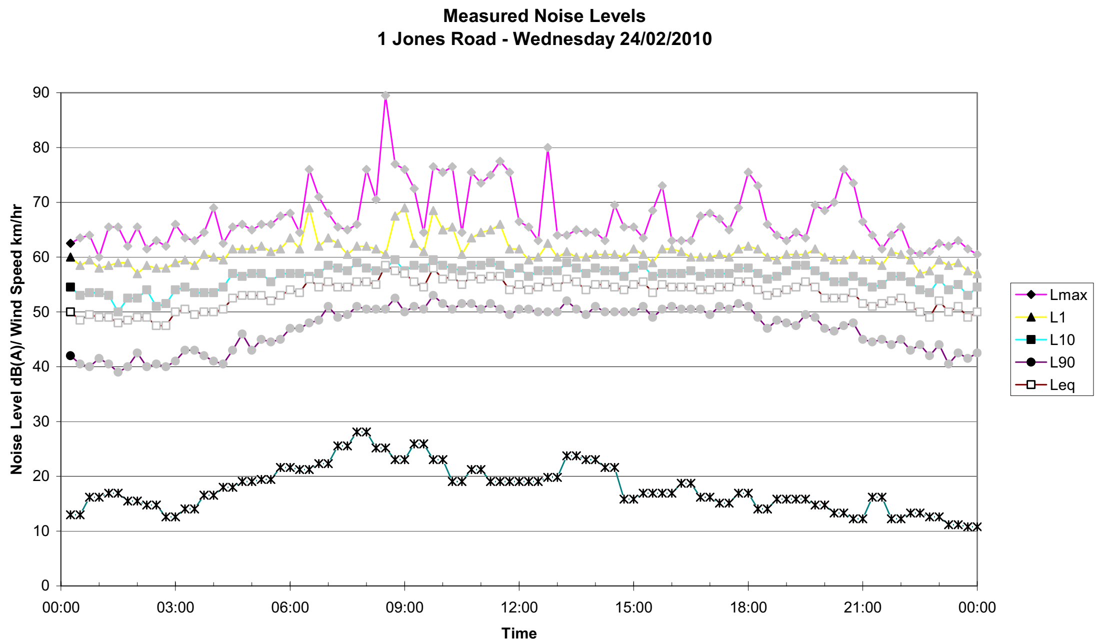

Measured Noise Levels
1 Jones Road - Sunday 21/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

Measured Noise Levels
1 Jones Road - Monday 22/02/2010

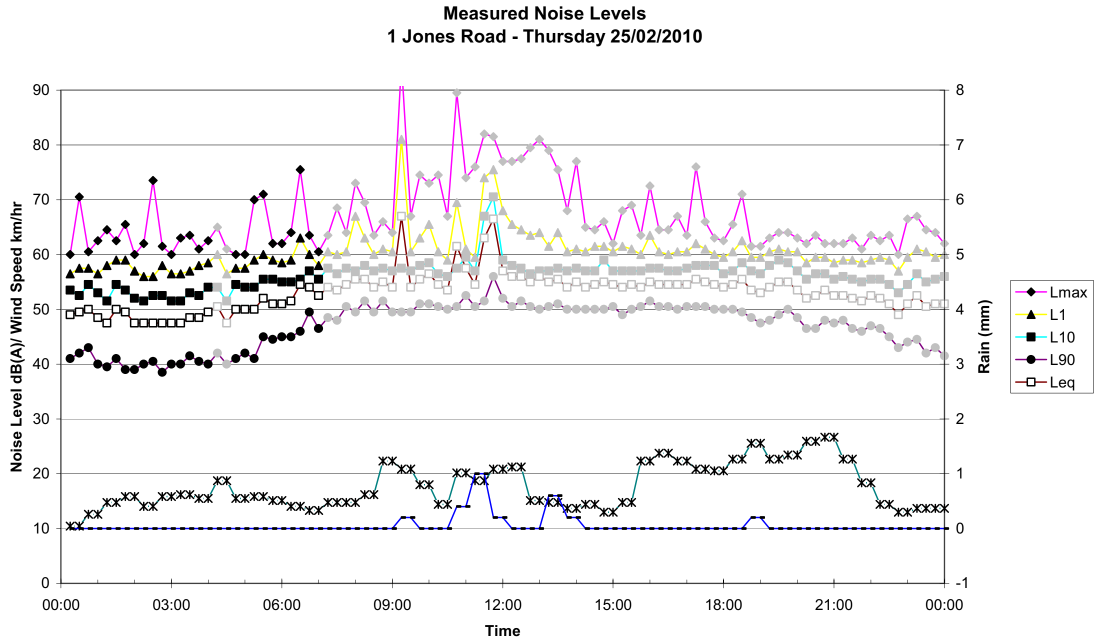


Measured Noise Levels
1 Jones Road - Tuesday 23/02/2010



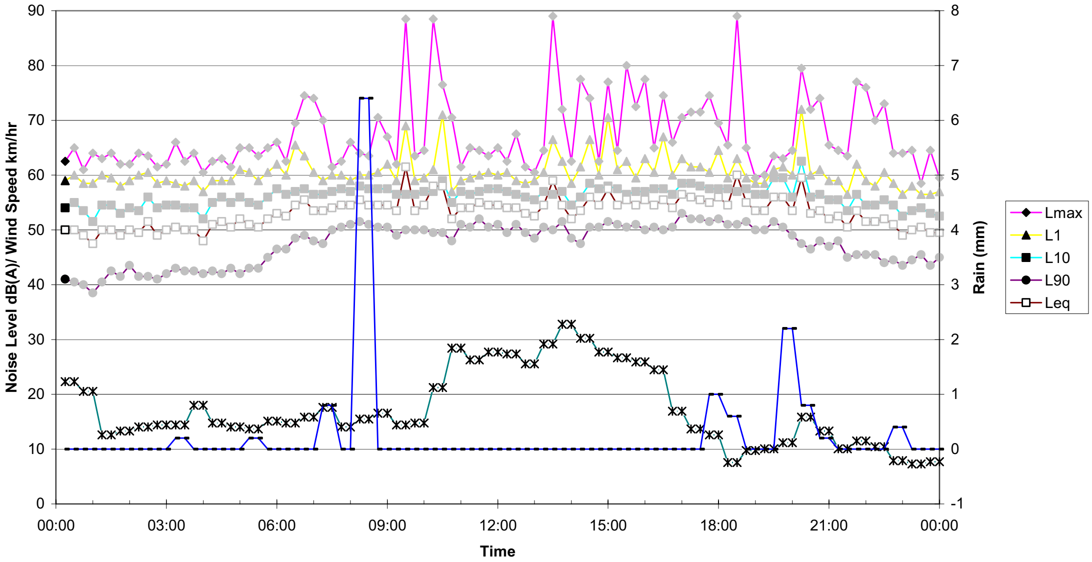


Measured Noise Levels
1 Jones Road - Wednesday 24/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Time
Lmax
L1
L10
L90
Leq

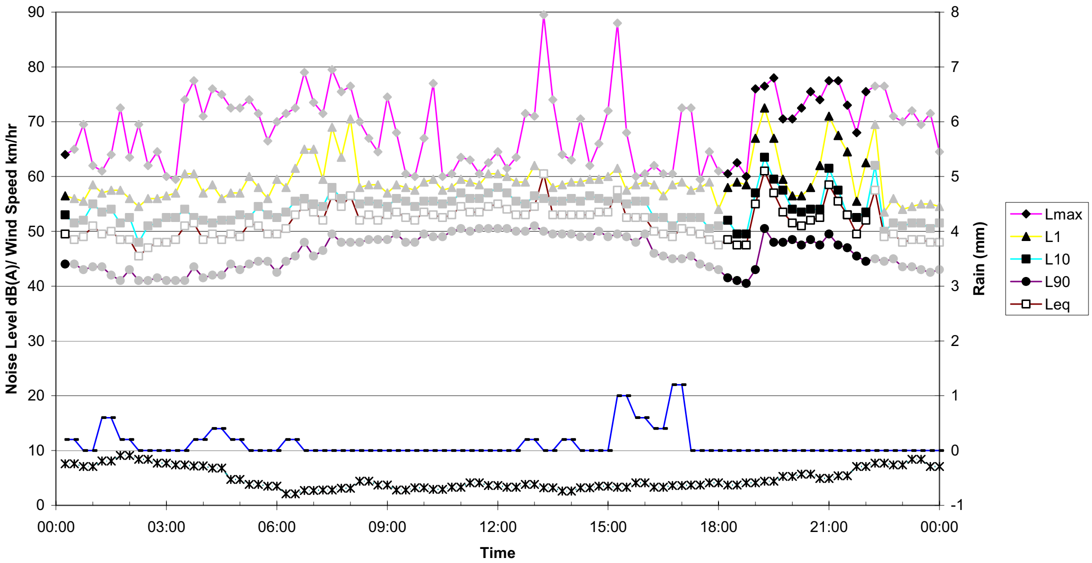


Measured Noise Levels
1 Jones Road - Thursday 25/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

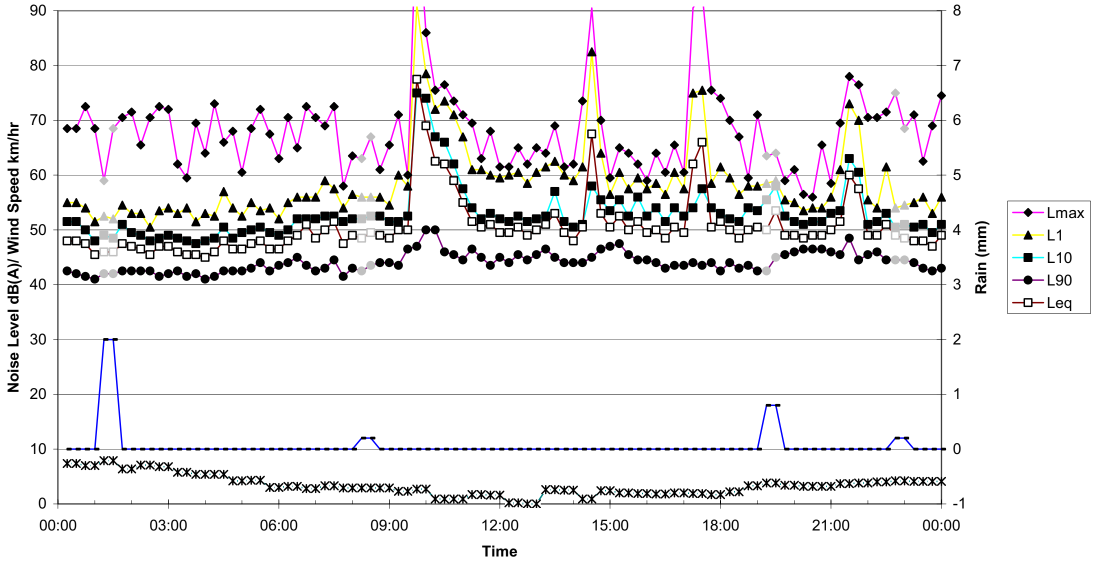
Measured Noise Levels
1 Jones Road - Friday 26/02/2010



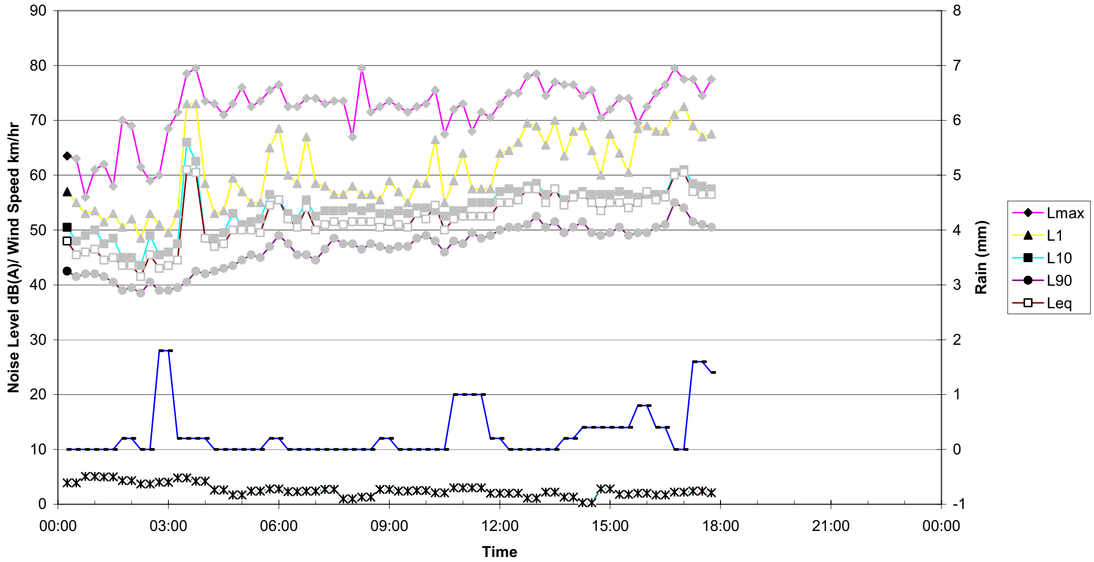
Measured Noise Levels
1 Jones Road - Saturday 27/02/2010



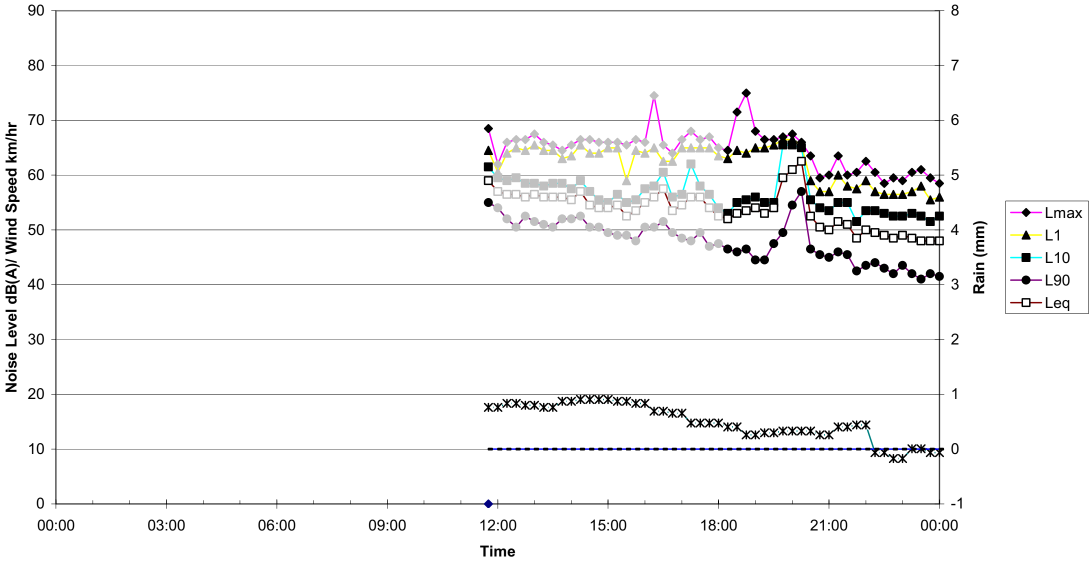
Measured Noise Levels
1 Jones Road - Sunday 28/02/2010



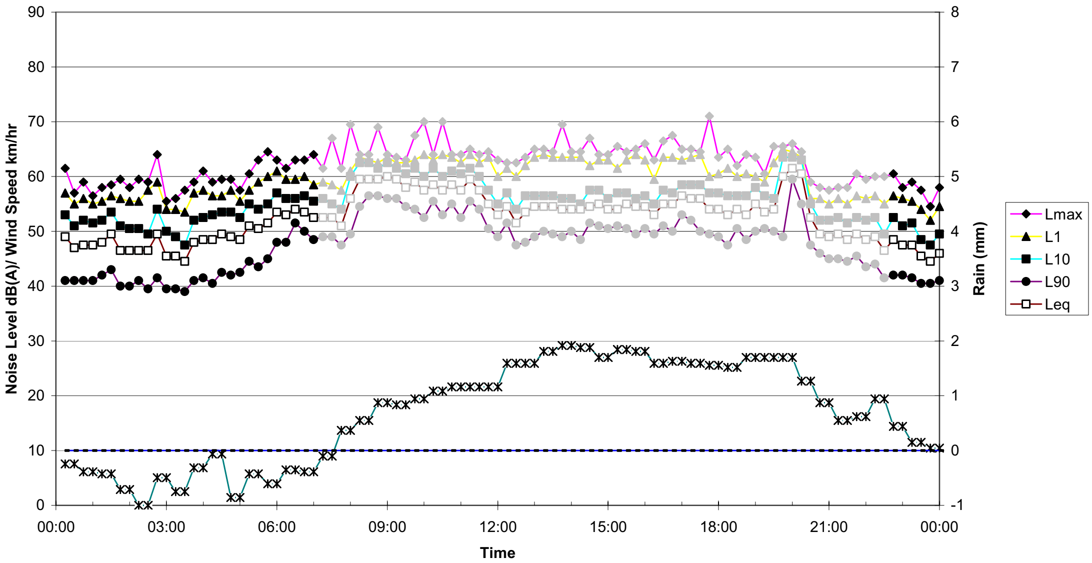
Measured Noise Levels
1 Jones Road - Monday 01/03/2010



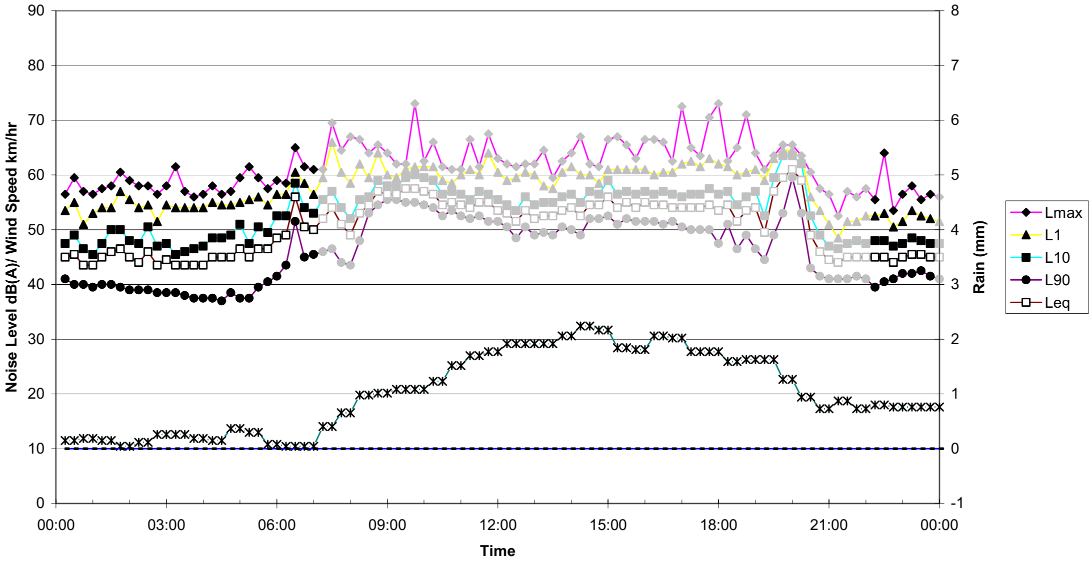
Measured Noise Levels
21 Tweed Valley Way - Thursday 11/02/2010



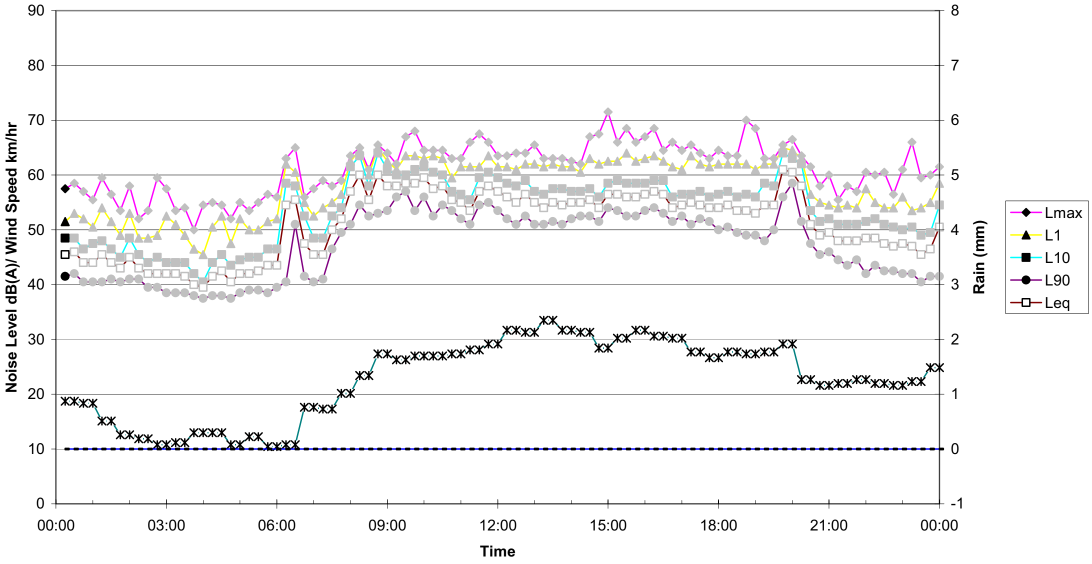
Measured Noise Levels
21 Tweed Valley Way - Friday 12/02/2010

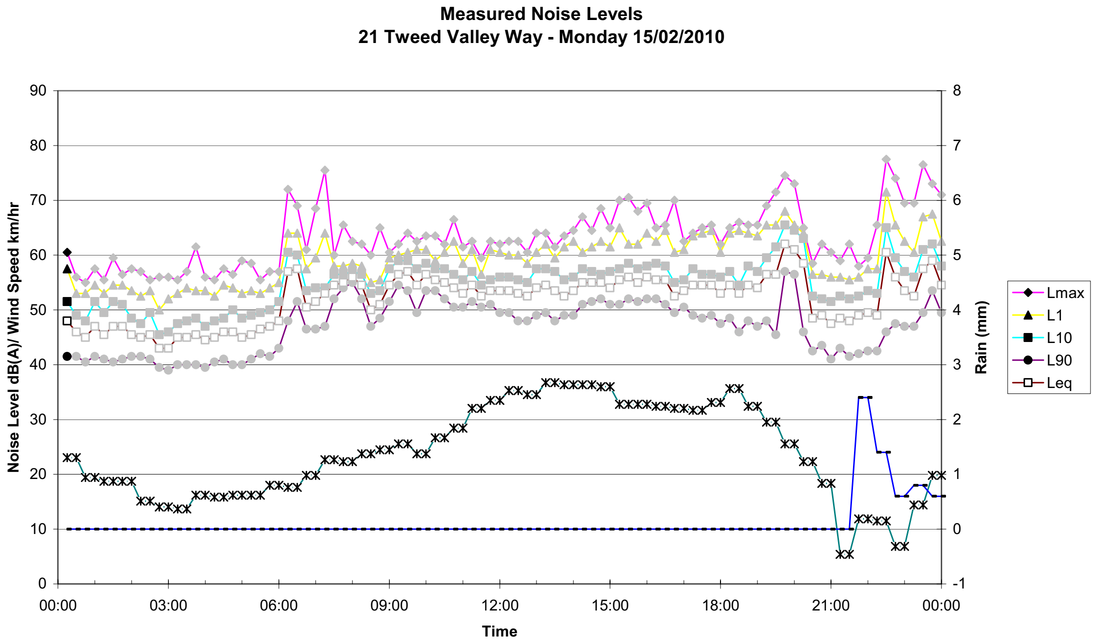


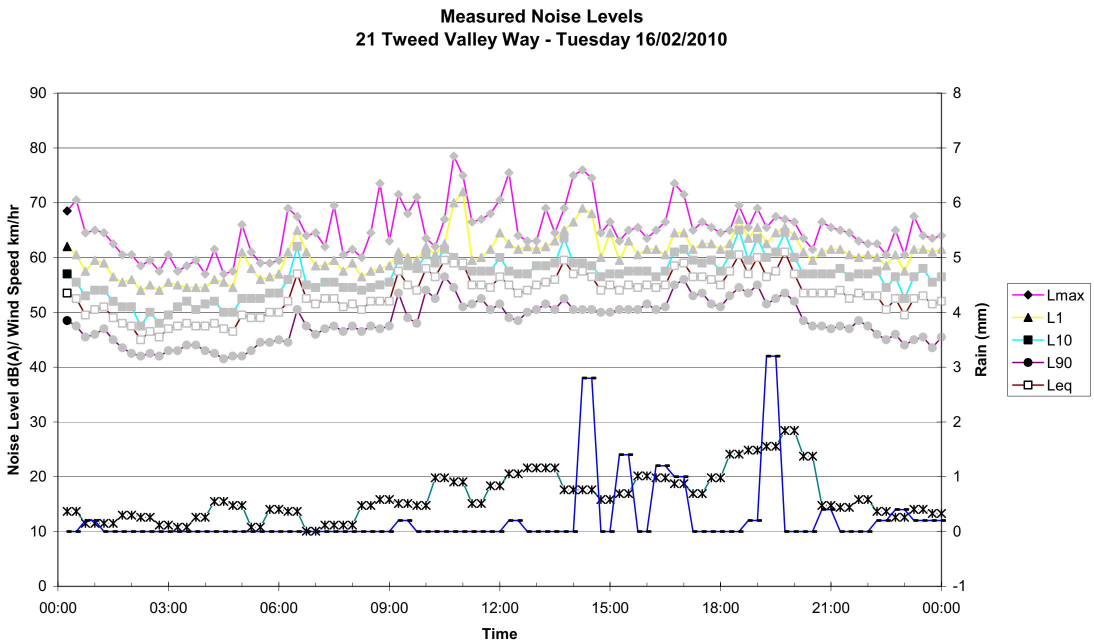
Measured Noise Levels
21 Tweed Valley Way - Saturday 13/02/2010



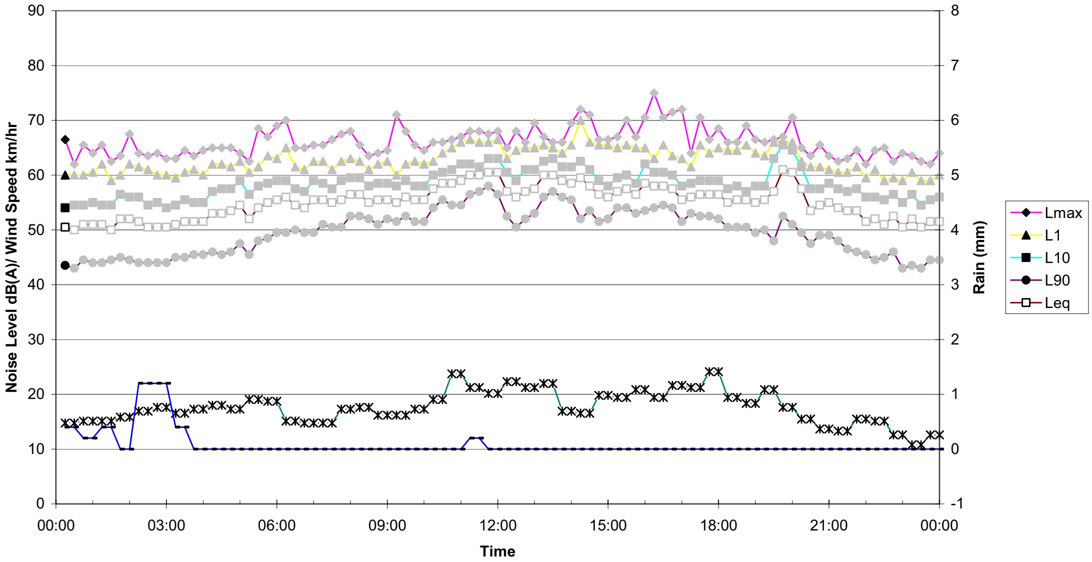
Measured Noise Levels
21 Tweed Valley Way - Sunday 14/02/2010



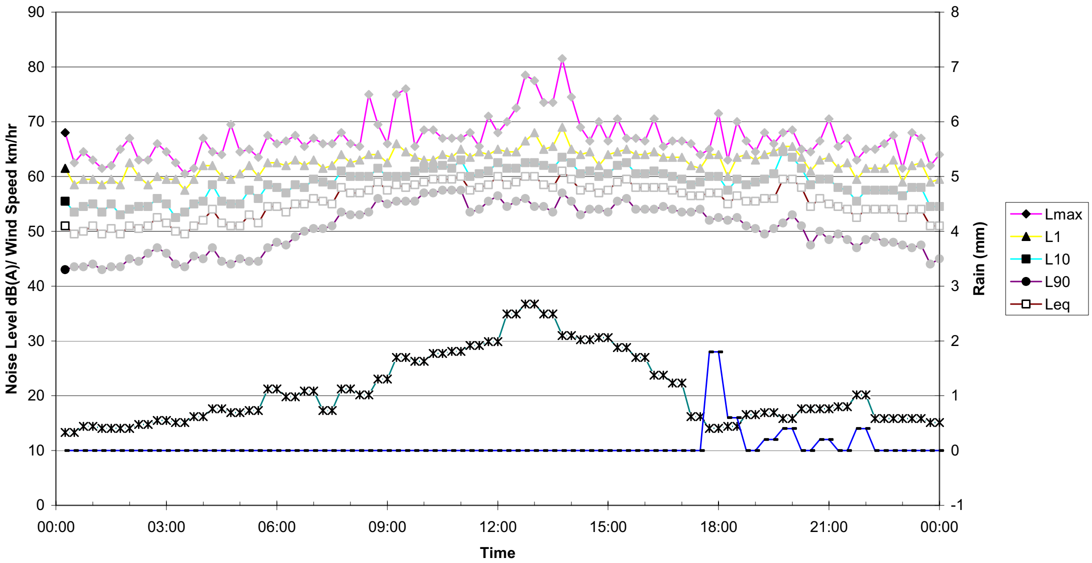

Measured Noise Levels
21 Tweed Valley Way - Monday 15/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq
90
80
70
60
50
40
30
20
10
0
8
7
6
5
4
3
2
1
0
-1
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00

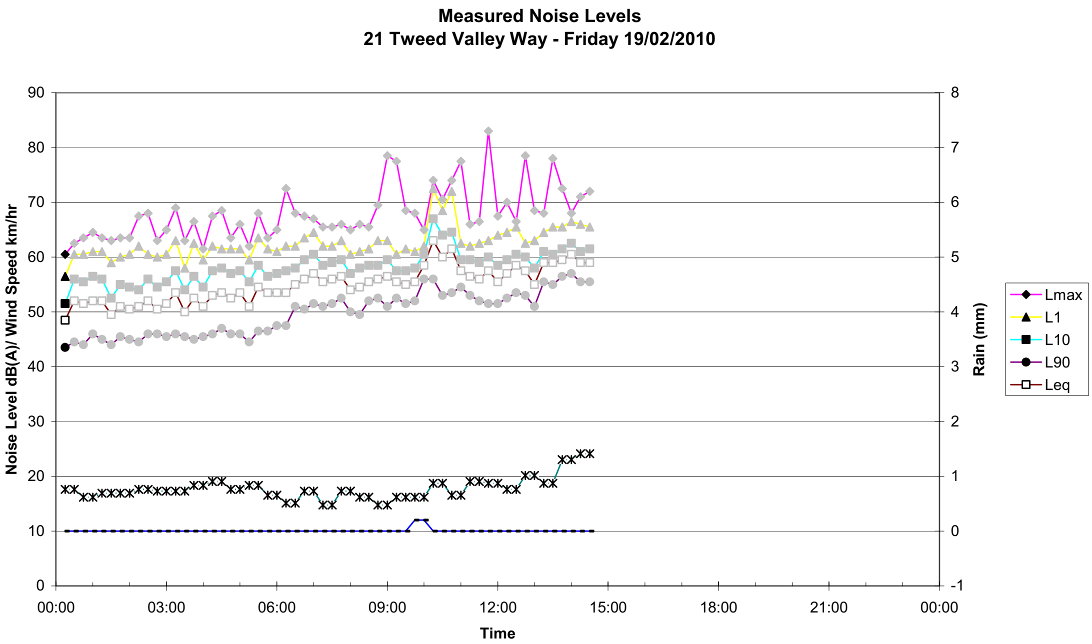

Measured Noise Levels
21 Tweed Valley Way - Tuesday 16/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq
90
80
70
60
50
40
30
20
10
0
8
7
6
5
4
3
2
1
0
-1
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00

Measured Noise Levels
21 Tweed Valley Way - Wednesday 17/02/2010



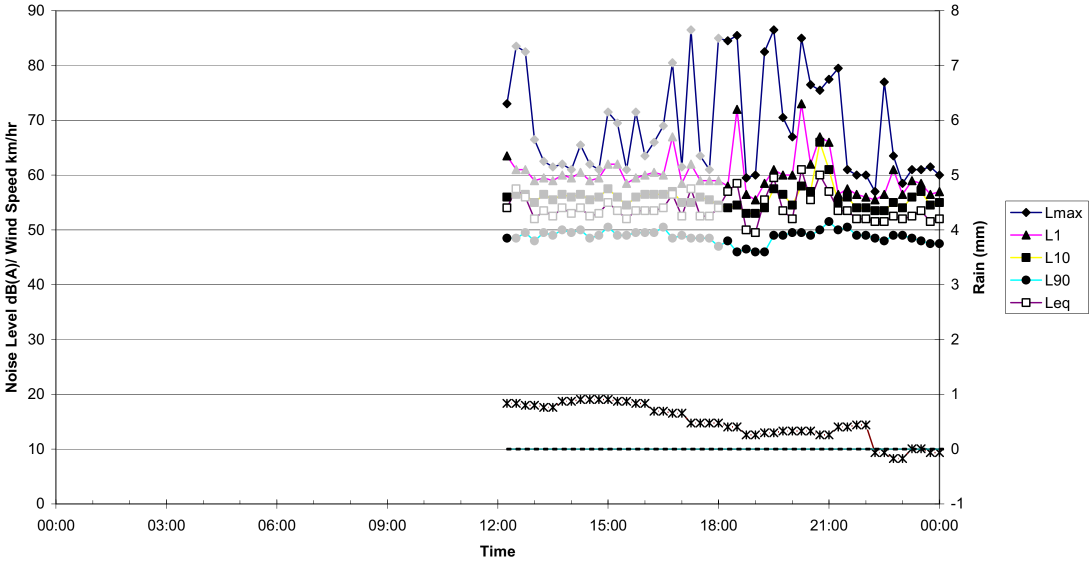
Measured Noise Levels
21 Tweed Valley Way - Thursday 18/02/2010



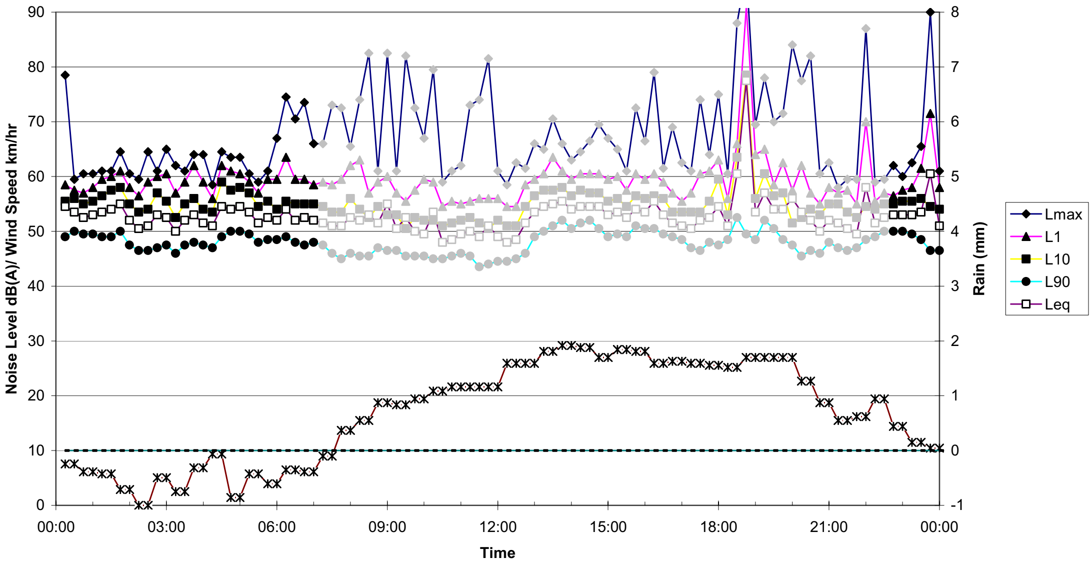


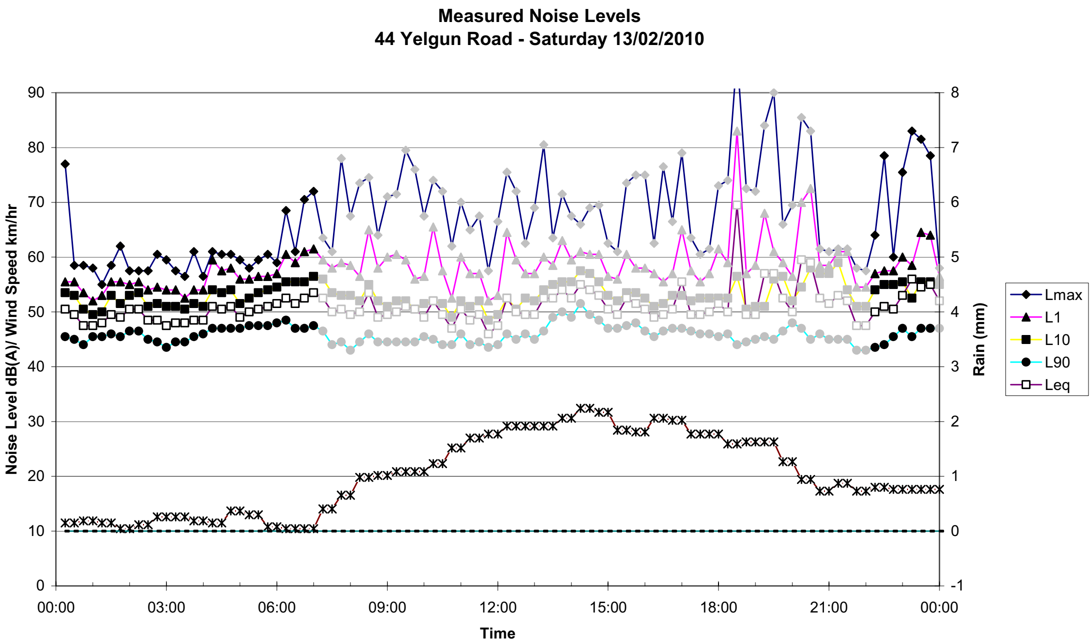
Measured Noise Levels
21 Tweed Valley Way - Friday 19/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
90
80
70
60
50
40
30
20
10
0
8
7
6
5
4
3
2
1
0
-1
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Lmax
L1
L10
L90
Leq

Measured Noise Levels
44 Yelgun Road - Thursday 11/02/2010

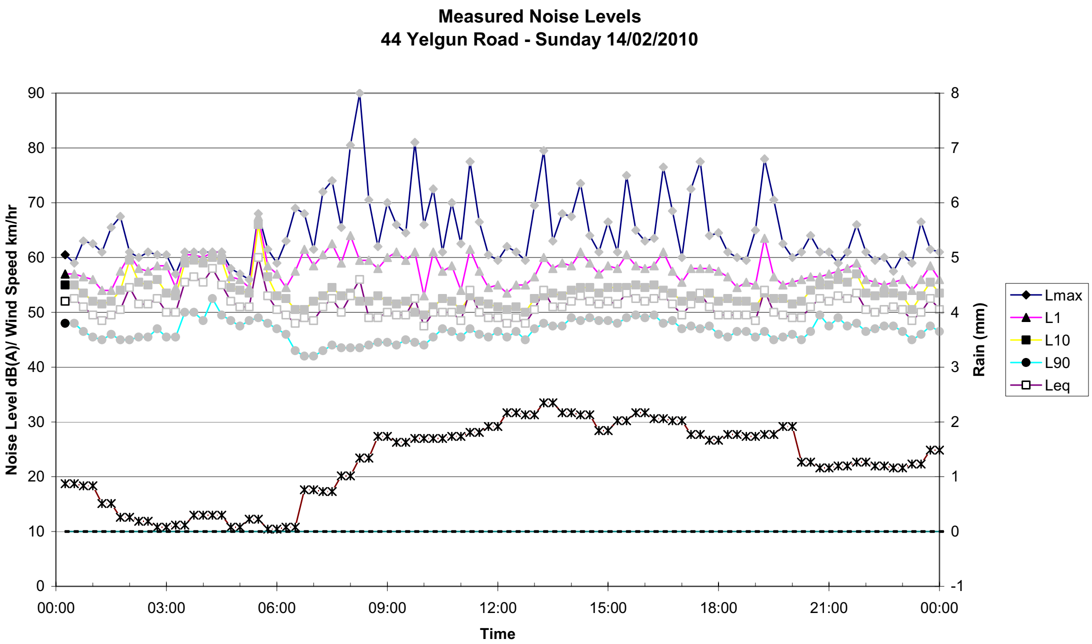


Measured Noise Levels
44 Yelgun Road - Friday 12/02/2010



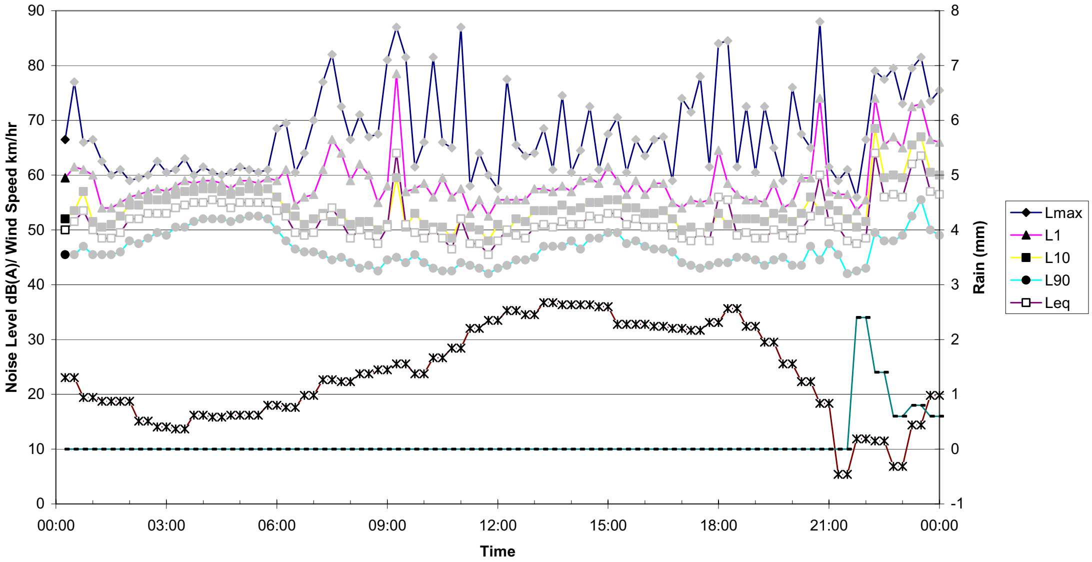


Measured Noise Levels
44 Yelgun Road - Saturday 13/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

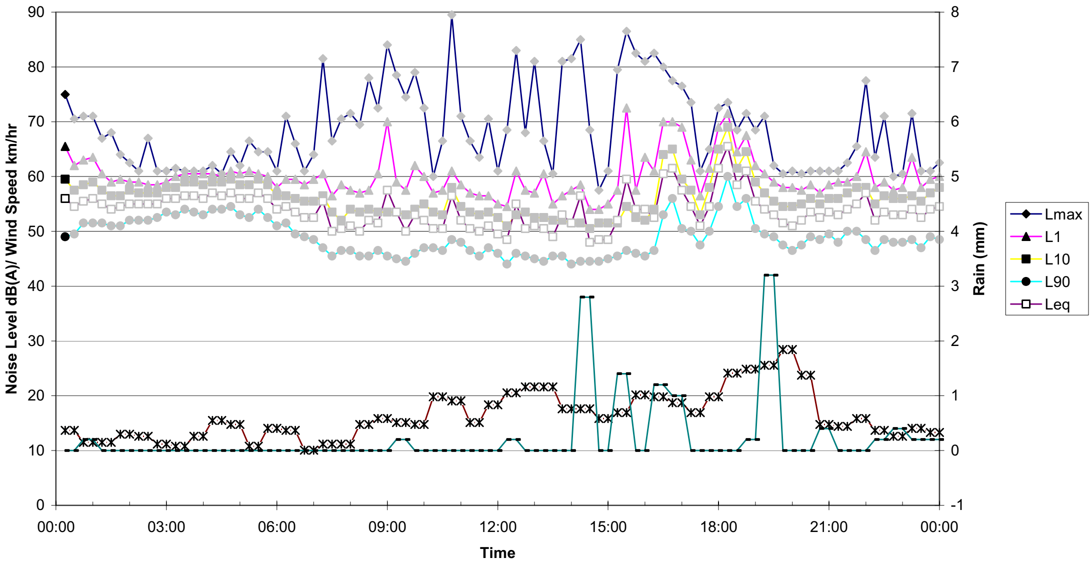


Measured Noise Levels
44 Yelgun Road - Sunday 14/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

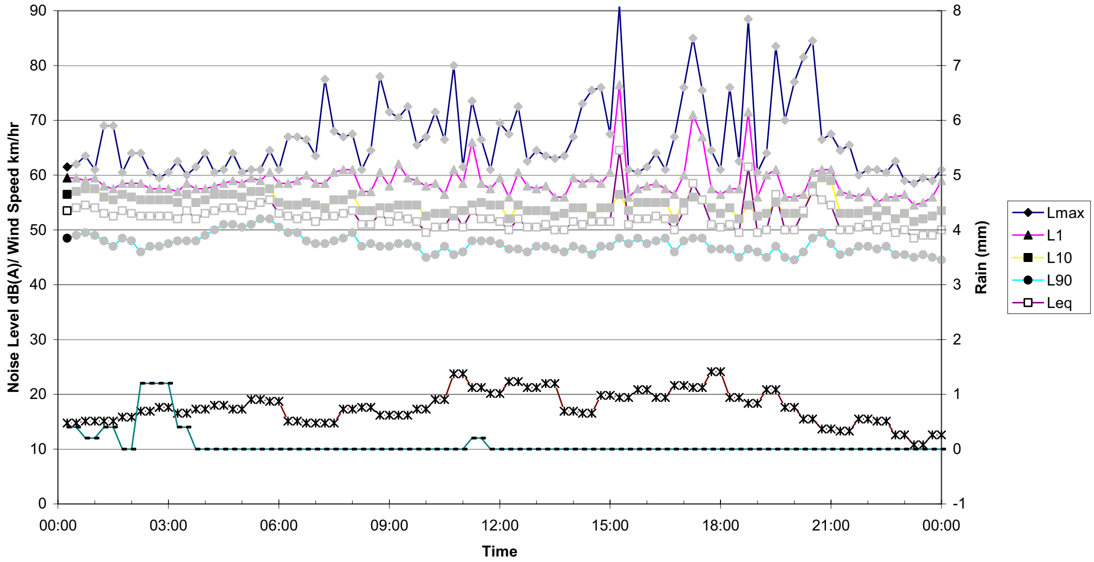
Measured Noise Levels
44 Yelgun Road - Monday 15/02/2010



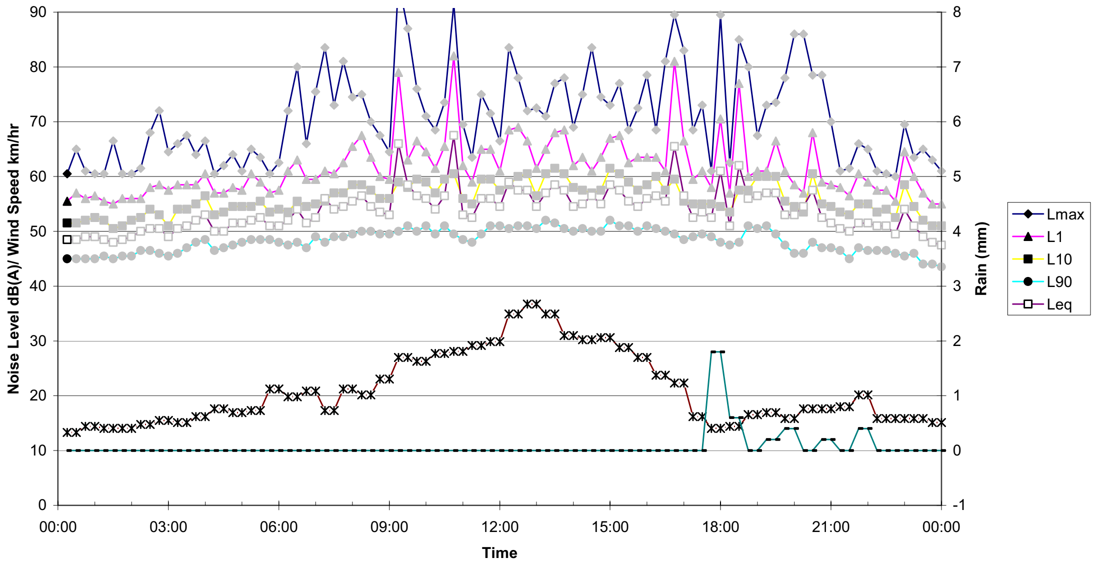
Measured Noise Levels
44 Yelgun Road - Tuesday 16/02/2010



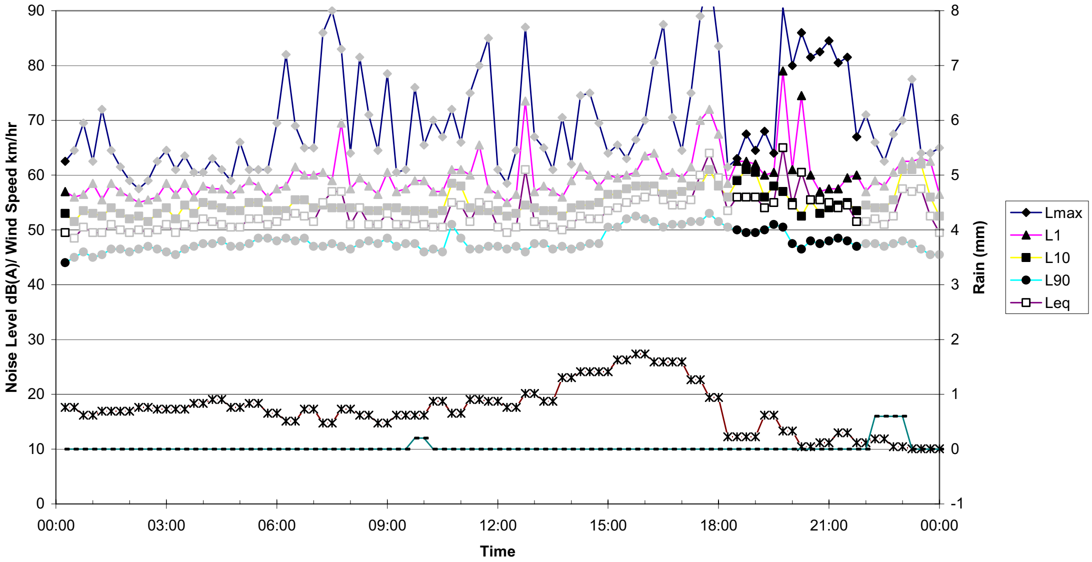
Measured Noise Levels
44 Yelgun Road - Wednesday 17/02/2010



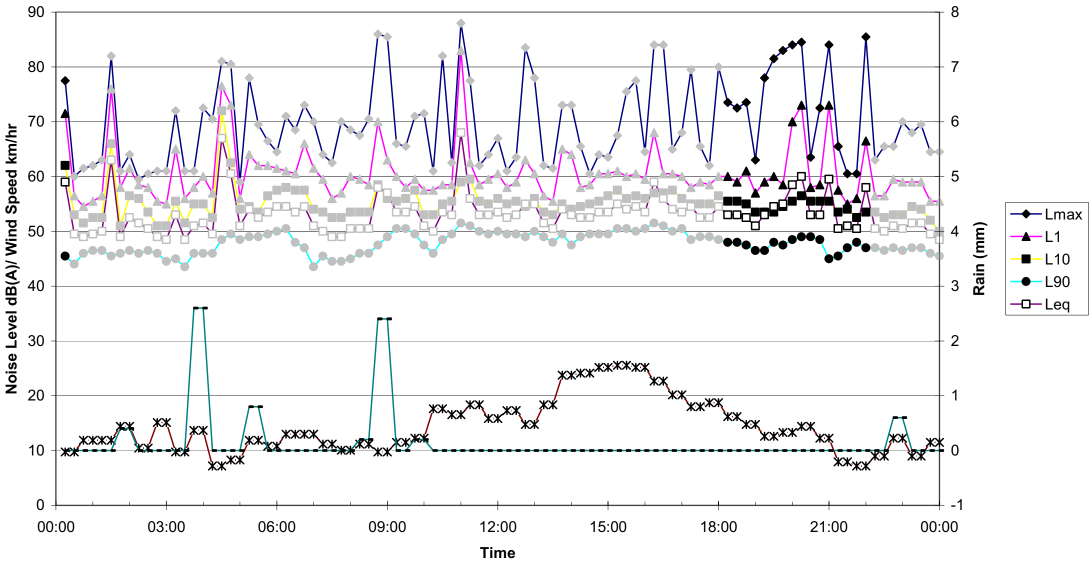
Measured Noise Levels
44 Yelgun Road - Thursday 18/02/2010



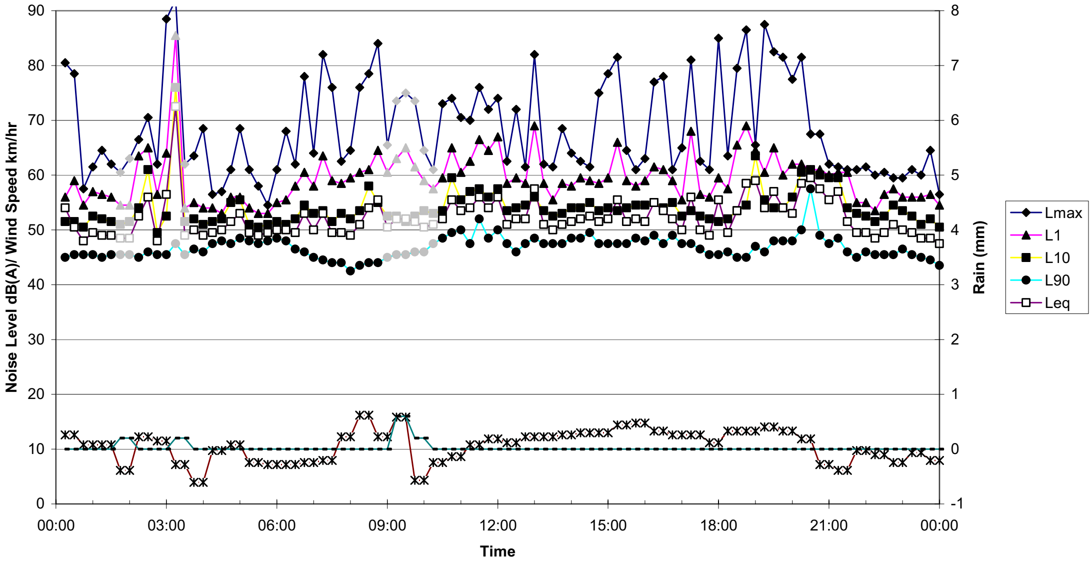
Measured Noise Levels
44 Yelgun Road - Friday 19/02/2010



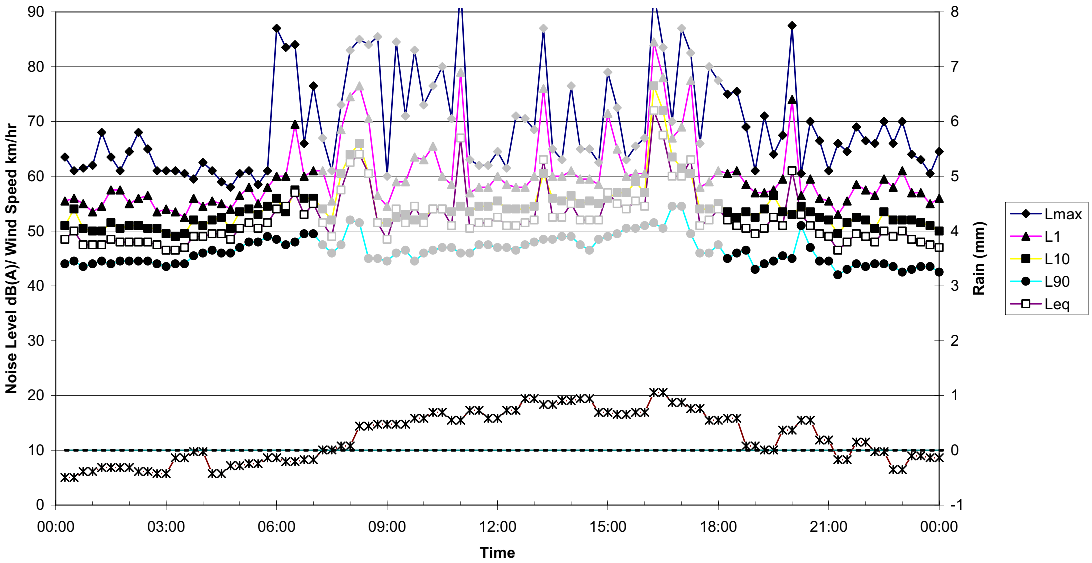
Measured Noise Levels
44 Yelgun Road - Saturday 20/02/2010

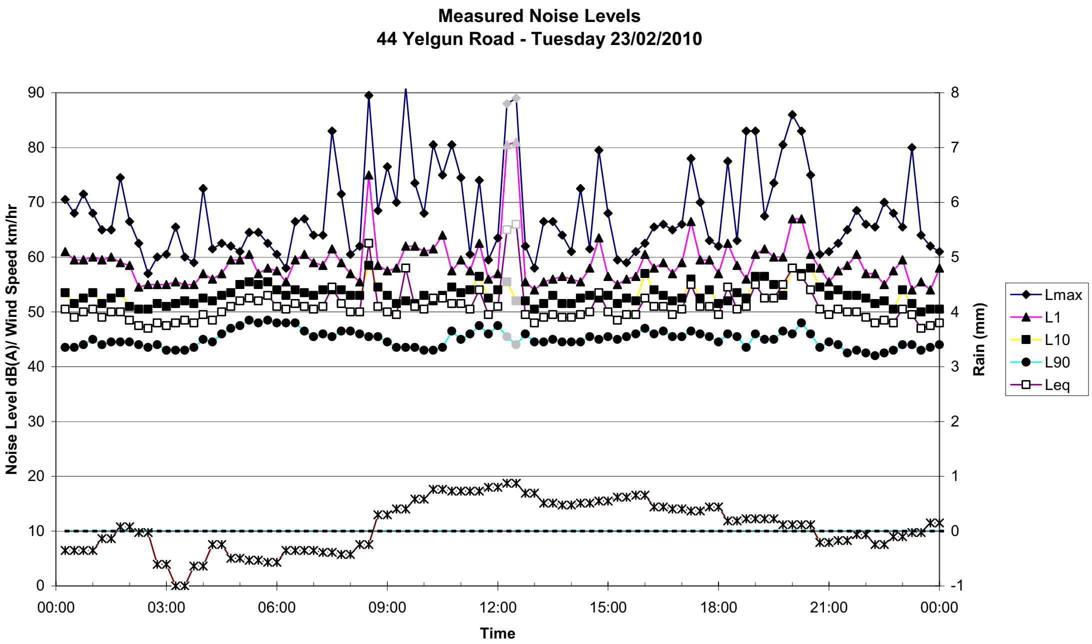


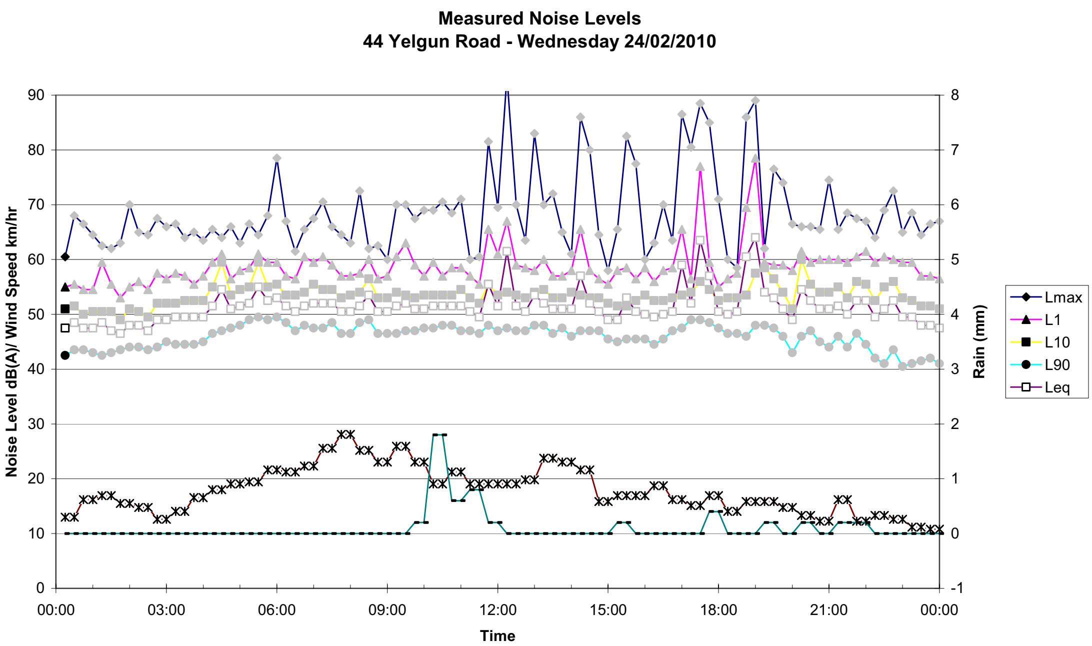
Measured Noise Levels
44 Yelgun Road - Sunday 21/02/2010

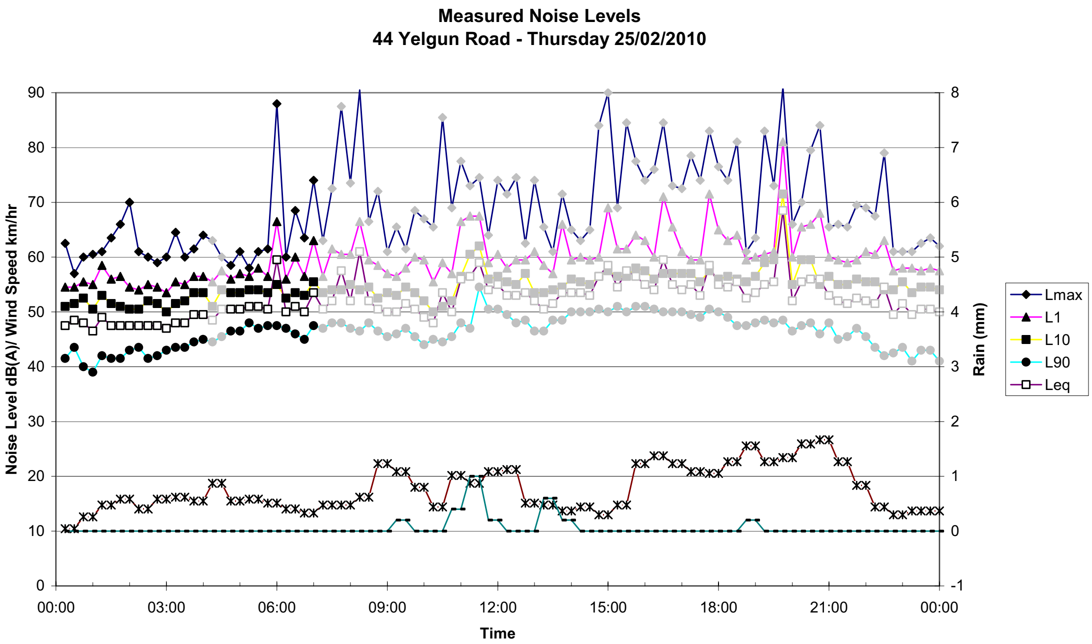


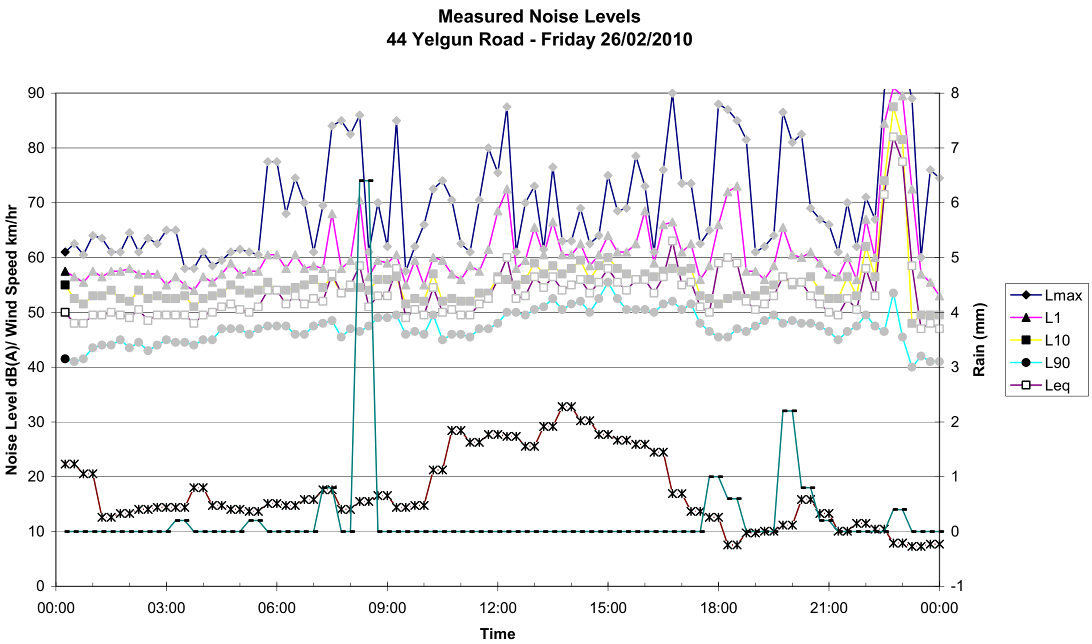
Measured Noise Levels
44 Yelgun Road - Monday 22/02/2010

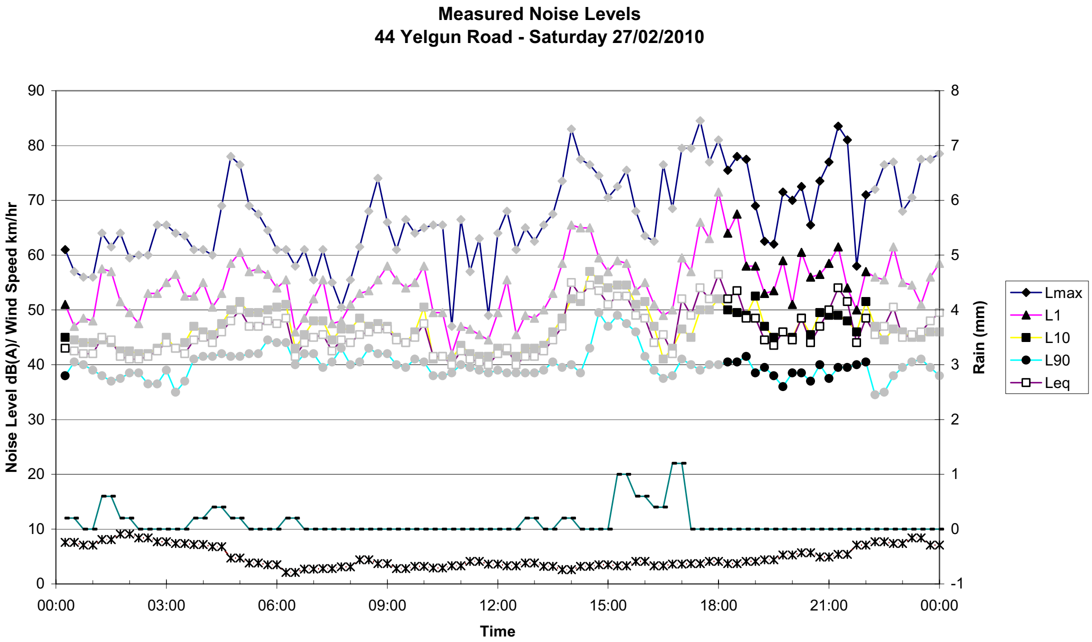


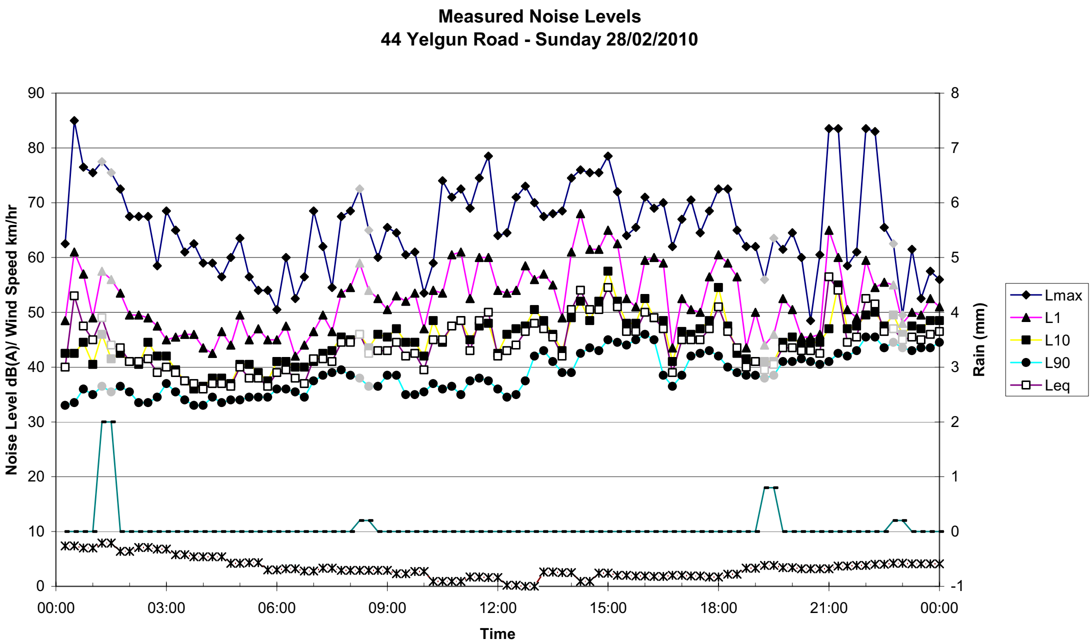

Measured Noise Levels
44 Yelgun Road - Tuesday 23/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq


Measured Noise Levels
44 Yelgun Road - Wednesday 24/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

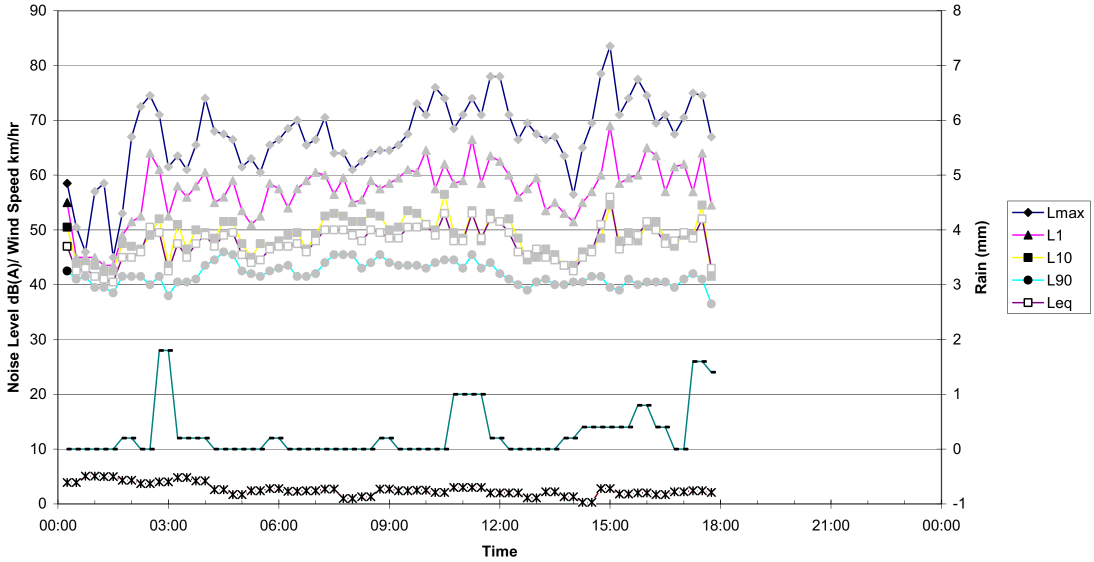

Measured Noise Levels
44 Yelgun Road - Thursday 25/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

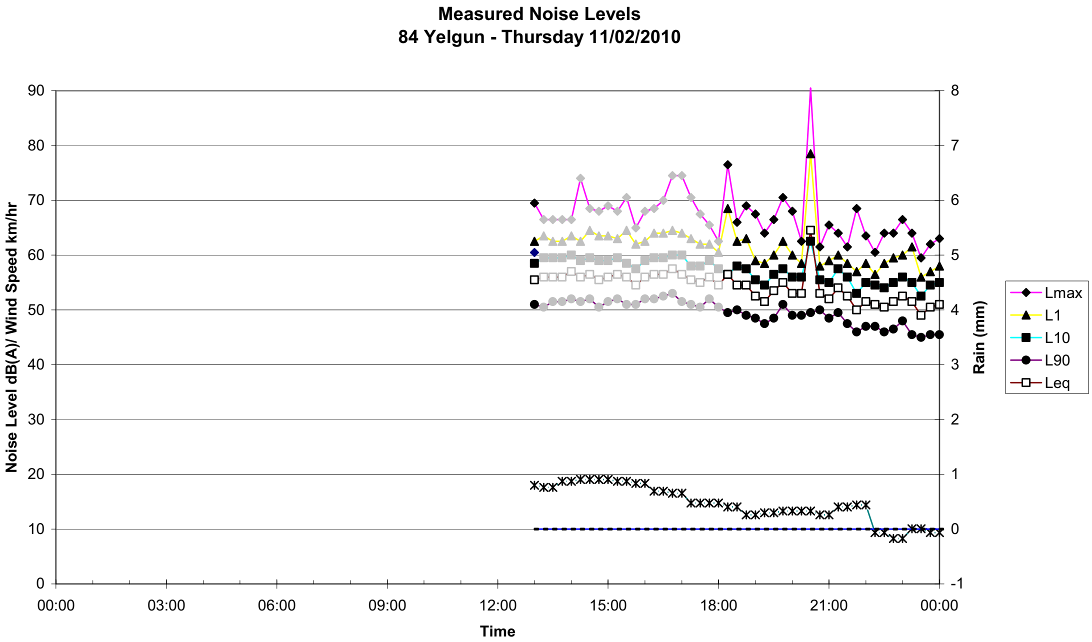

Measured Noise Levels
44 Yelgun Road - Friday 26/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

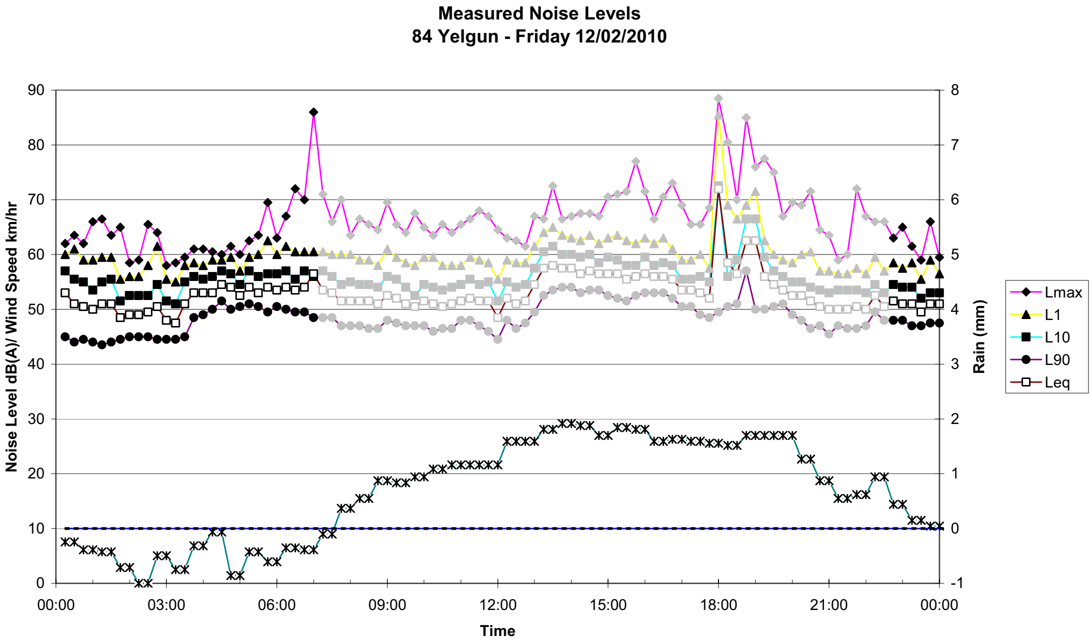

Measured Noise Levels
44 Yelgun Road - Saturday 27/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00

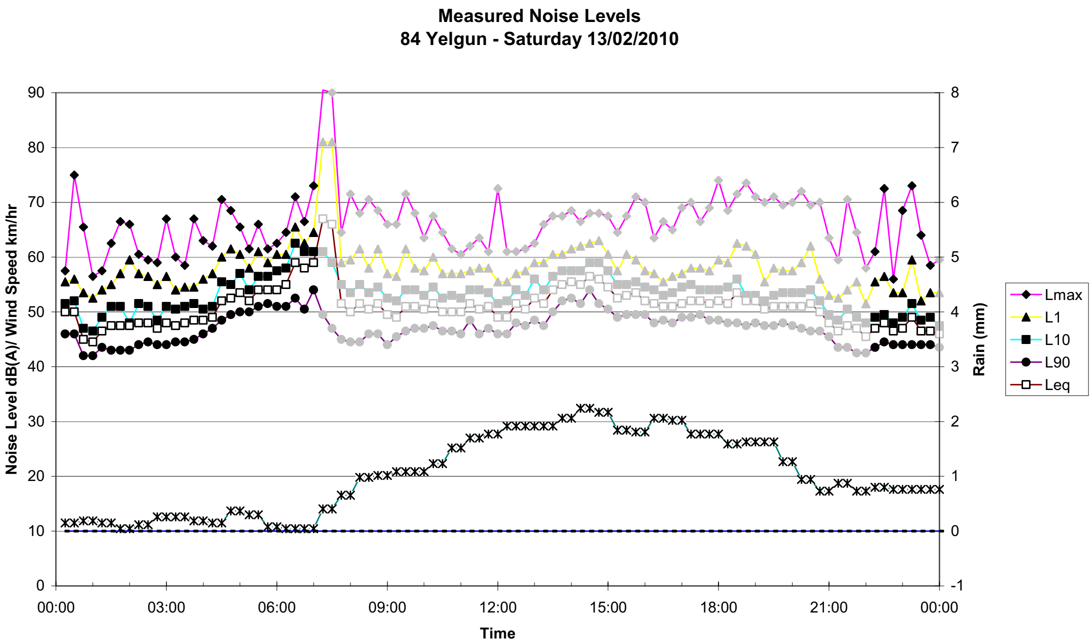

Measured Noise Levels
44 Yelgun Road - Sunday 28/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00

Measured Noise Levels
44 Yelgun Road - Monday 01/03/2010

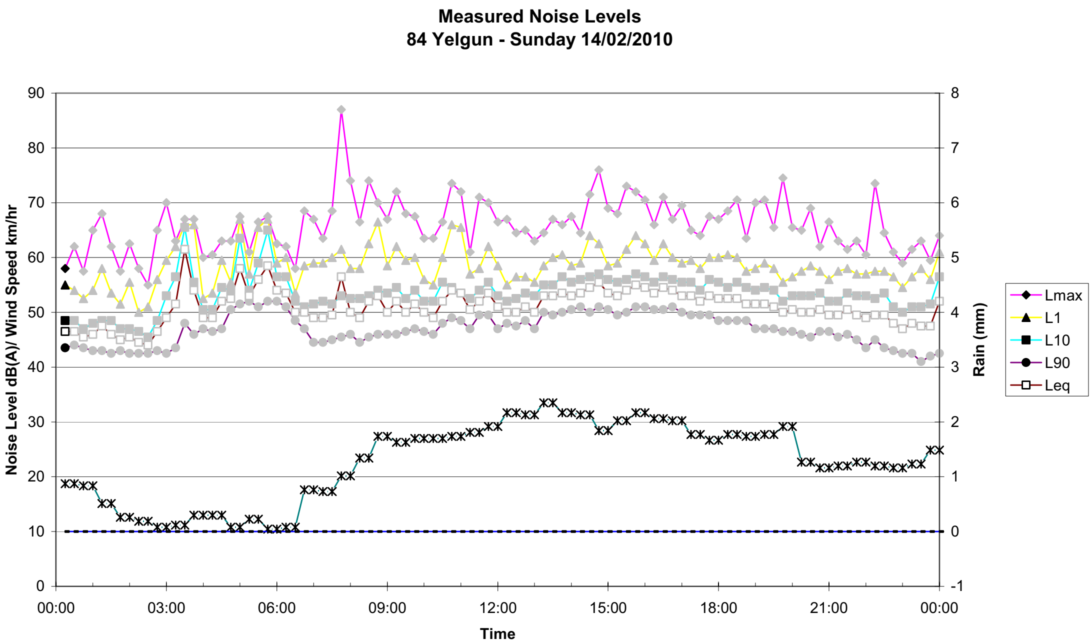



Measured Noise Levels
84 Yelgun - Thursday 11/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq
90
80
70
60
50
40
30
20
10
0
8
7
6
5
4
3
2
1
0
-1
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00

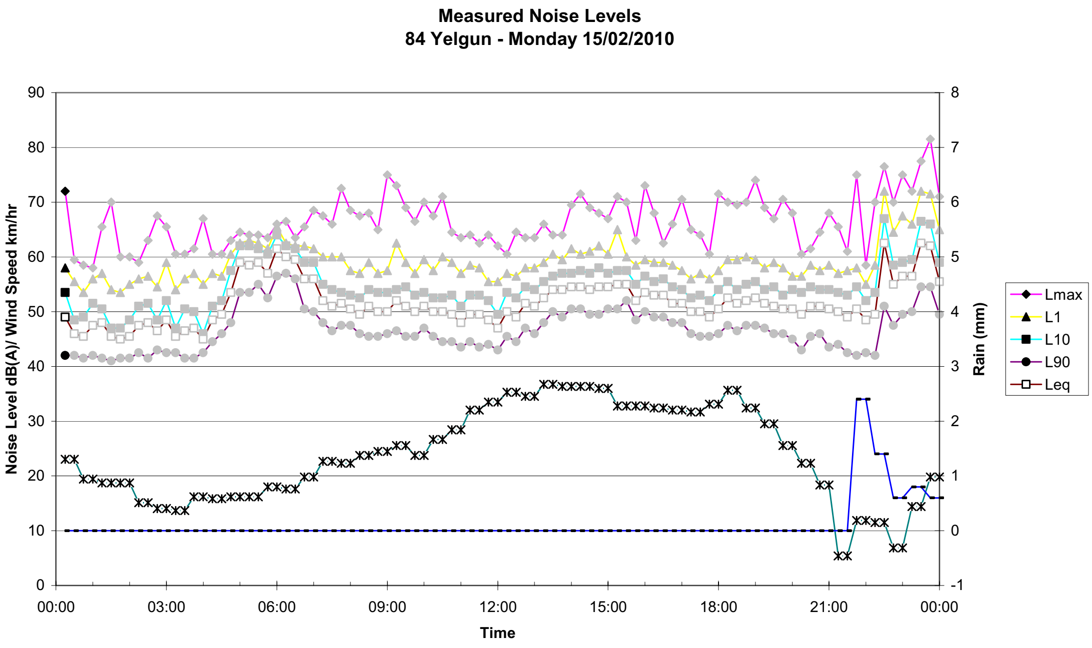

Measured Noise Levels
84 Yelgun - Friday 12/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq
90
80
70
60
50
40
30
20
10
0
8
7
6
5
4
3
2
1
0
-1
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00

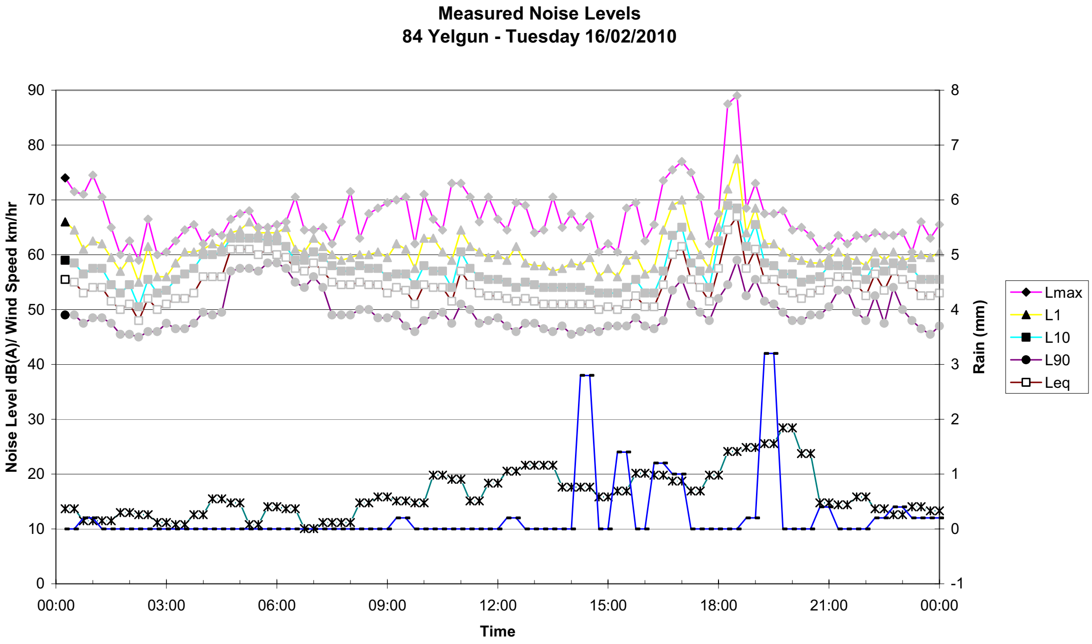


Measured Noise Levels
84 Yelgun - Saturday 13/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

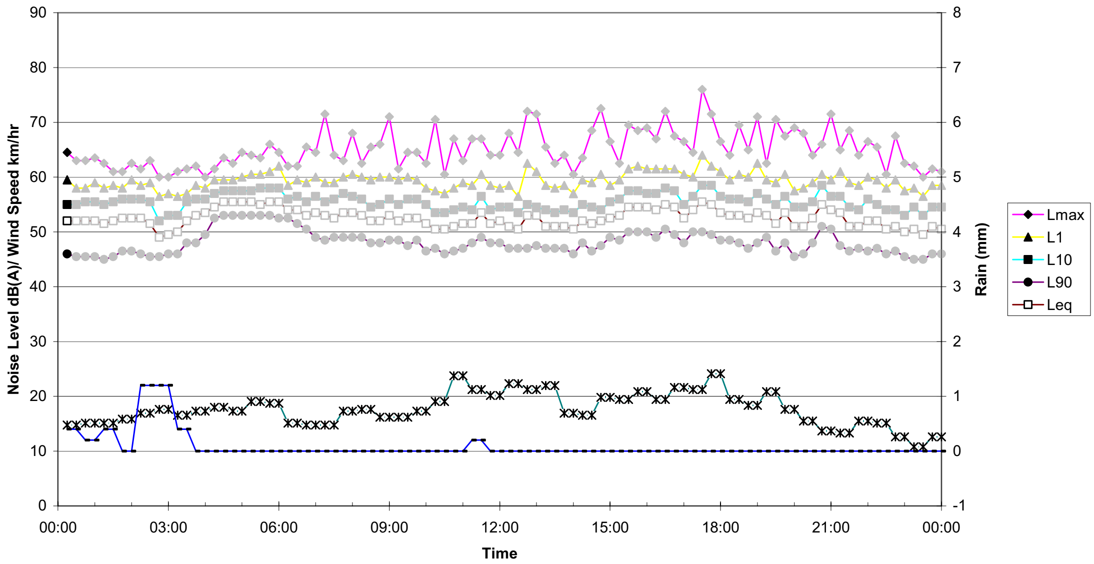


Measured Noise Levels
84 Yelgun - Sunday 14/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

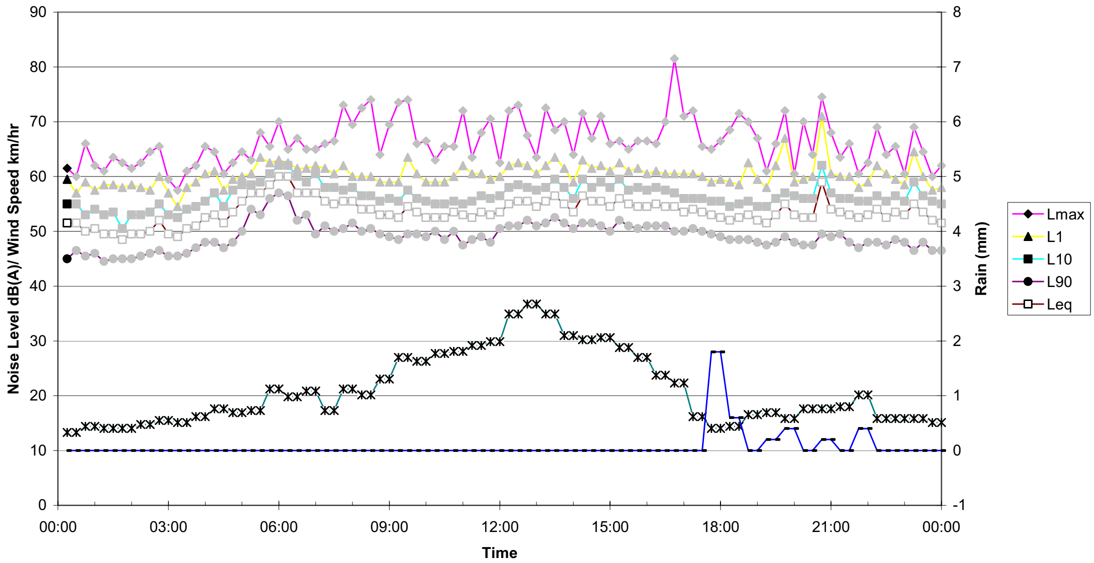

Measured Noise Levels
84 Yelgun - Monday 15/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00


Measured Noise Levels
84 Yelgun - Tuesday 16/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00

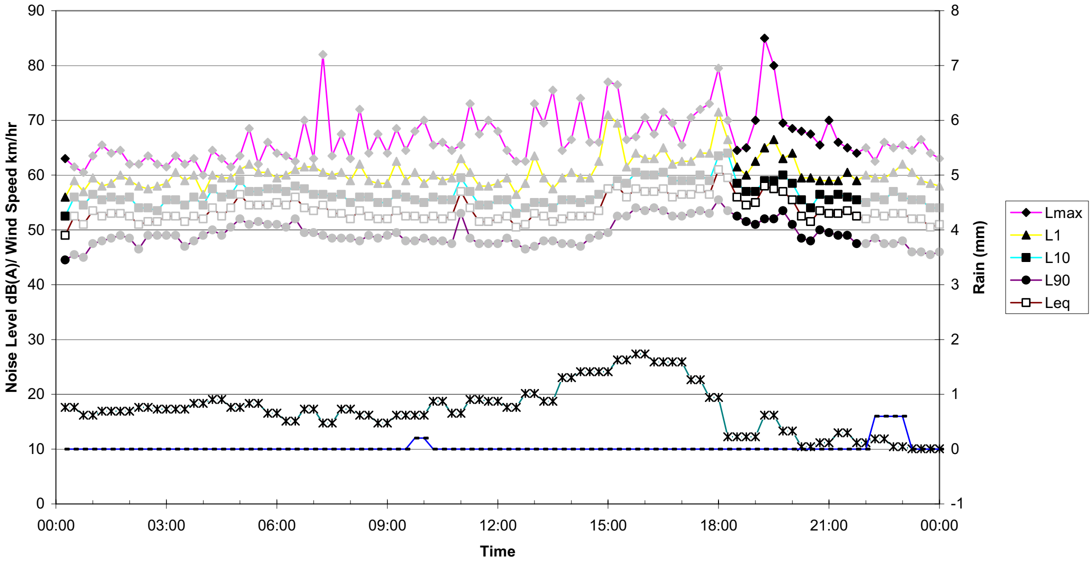
Measured Noise Levels
84 Yelgun - Wednesday 17/02/2010



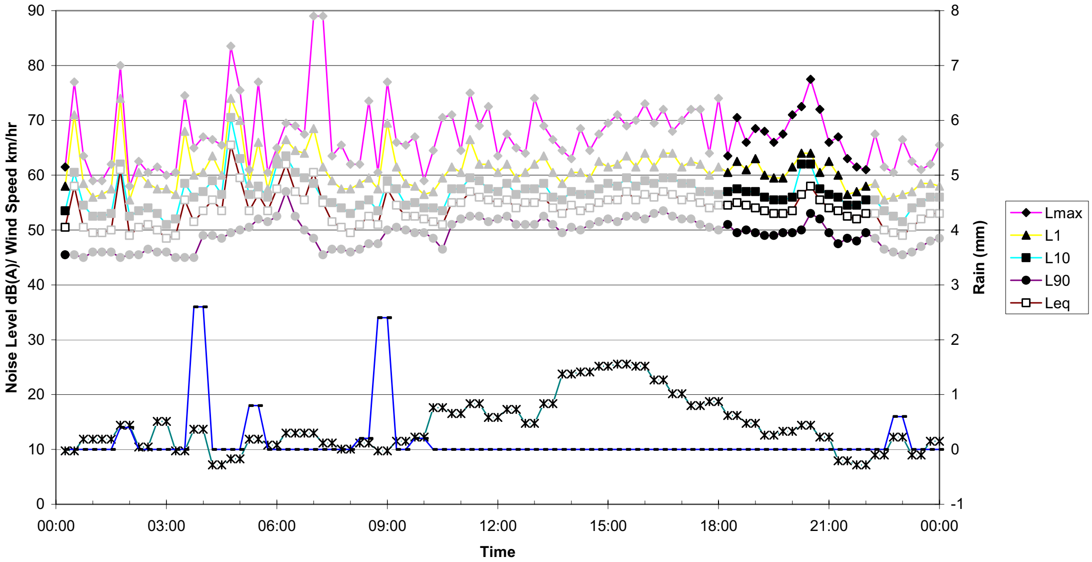
Measured Noise Levels
84 Yelgun - Thursday 18/02/2010



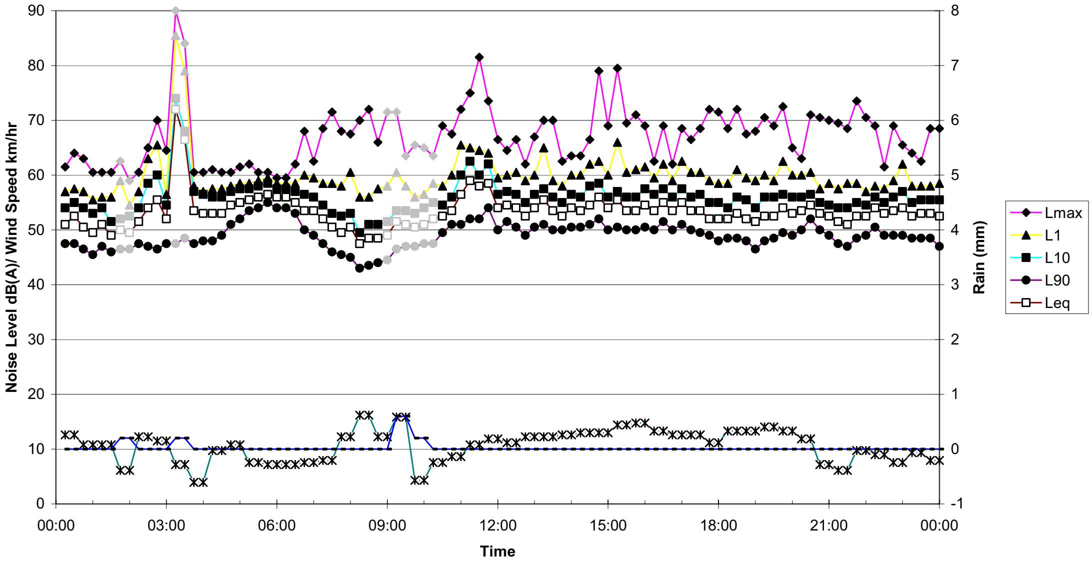
Measured Noise Levels
84 Yelgun - Friday 19/02/2010



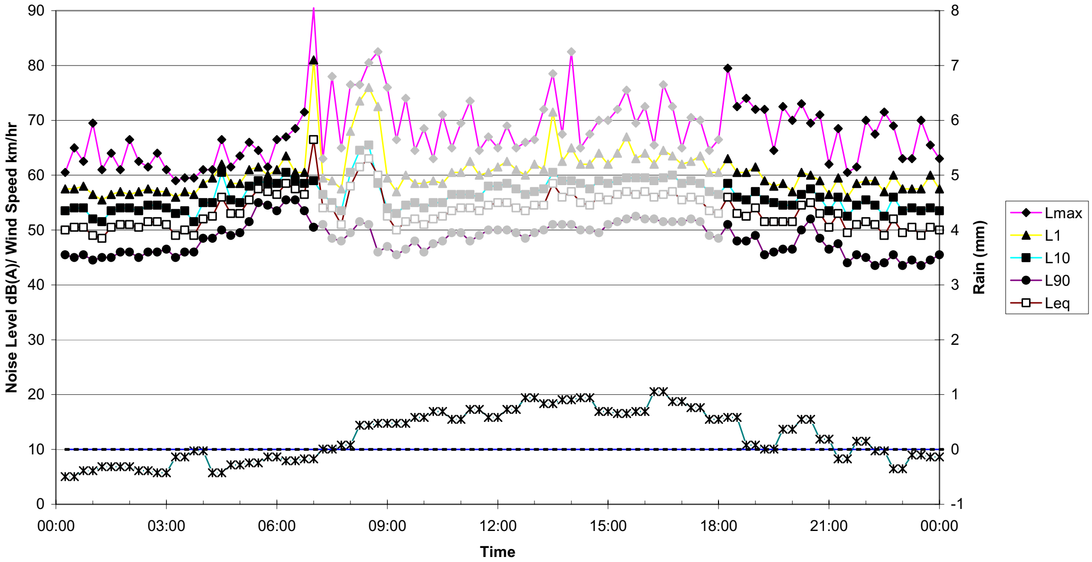
Measured Noise Levels
84 Yelgun - Saturday 20/02/2010



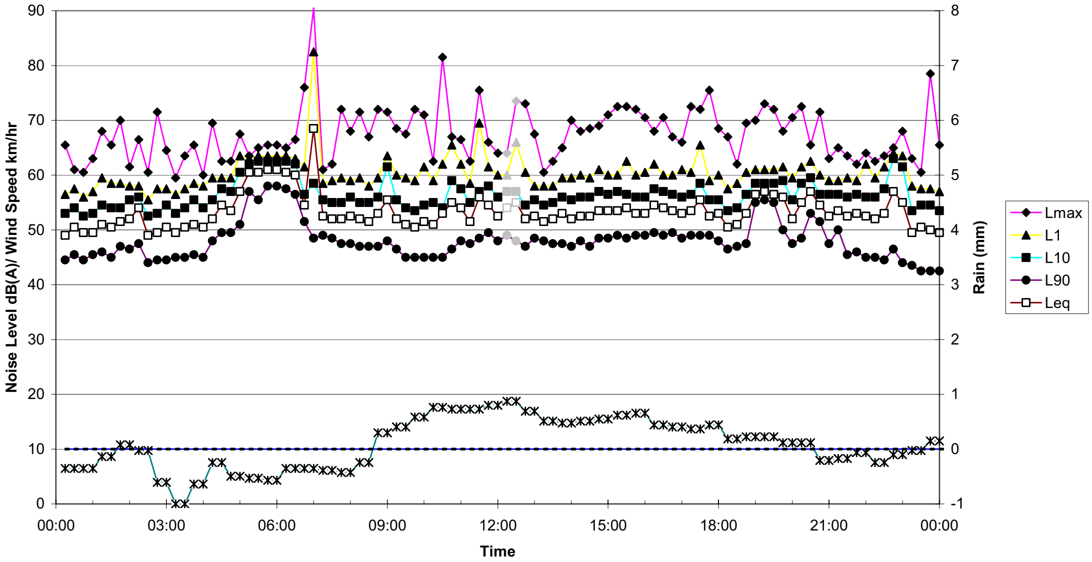
Measured Noise Levels
84 Yelgun - Sunday 21/02/2010



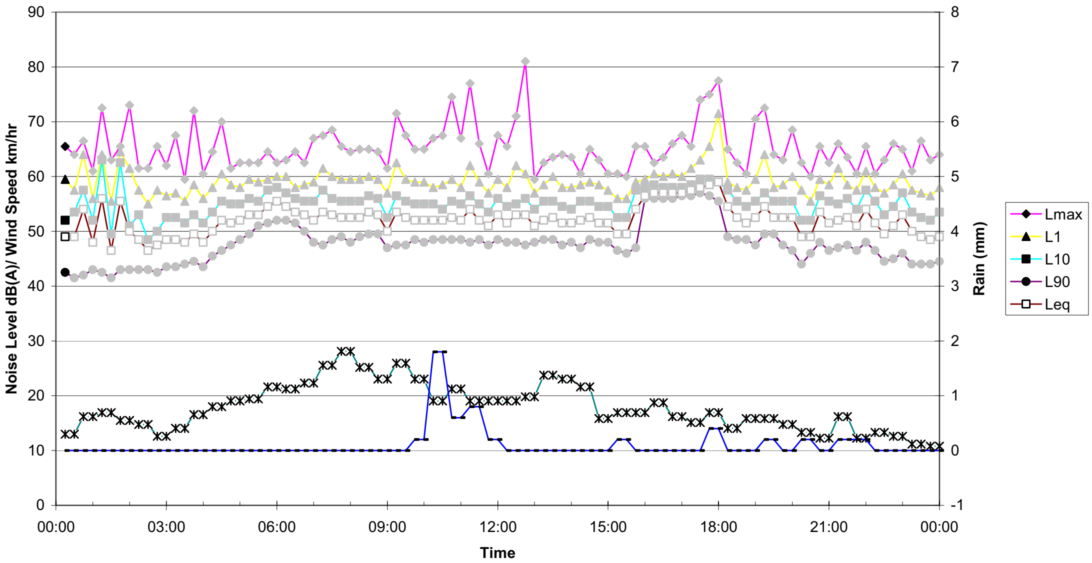
Measured Noise Levels
84 Yelgun - Monday 22/02/2010

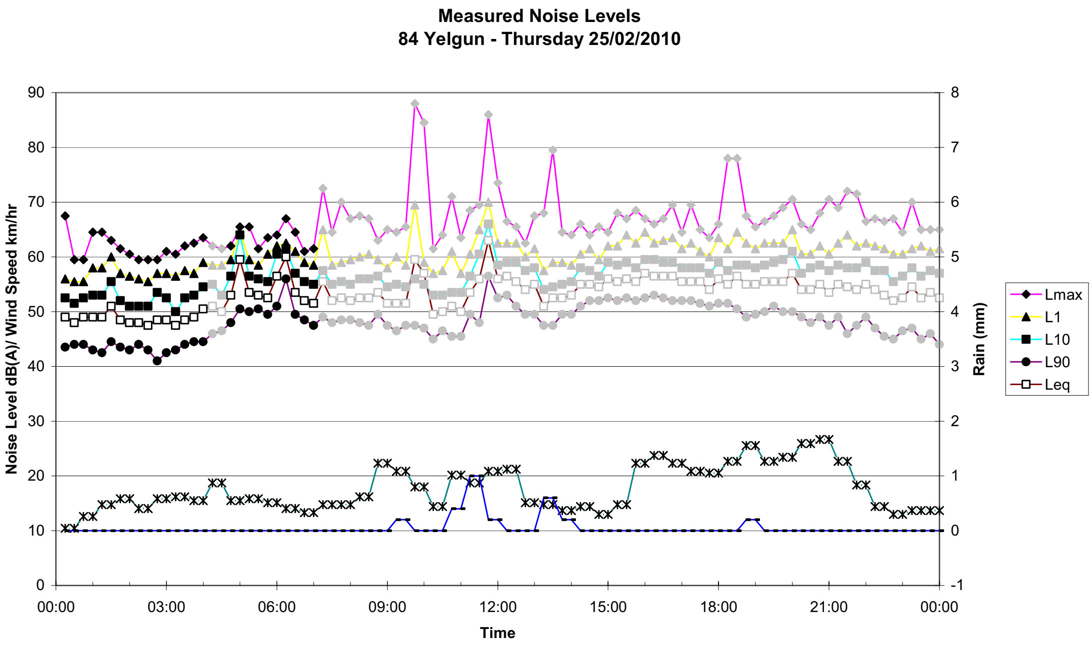


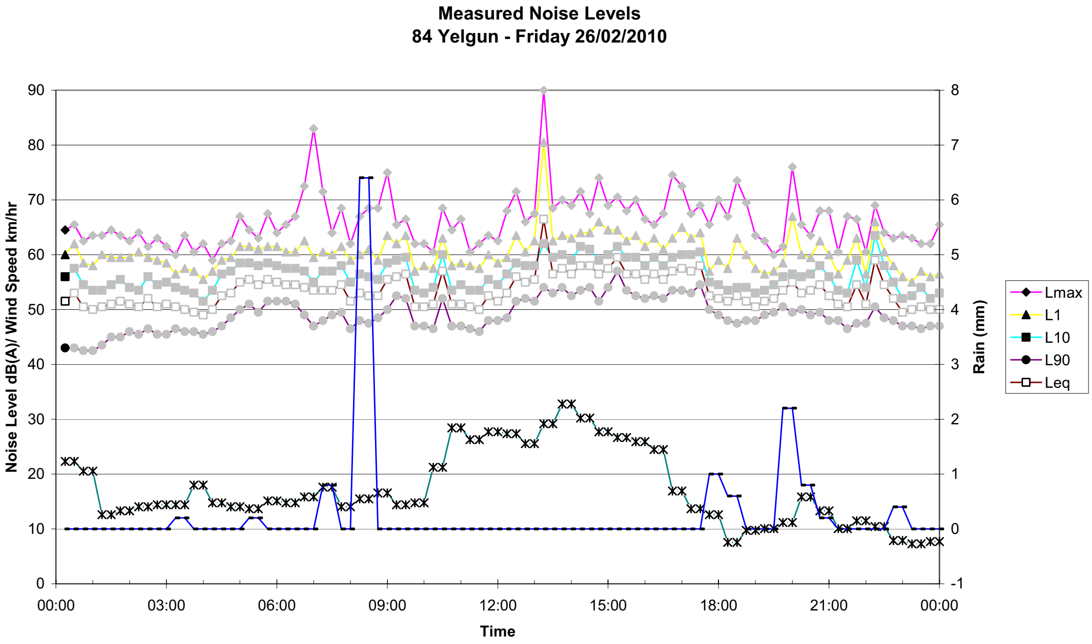
Measured Noise Levels
84 Yelgun - Tuesday 23/02/2010

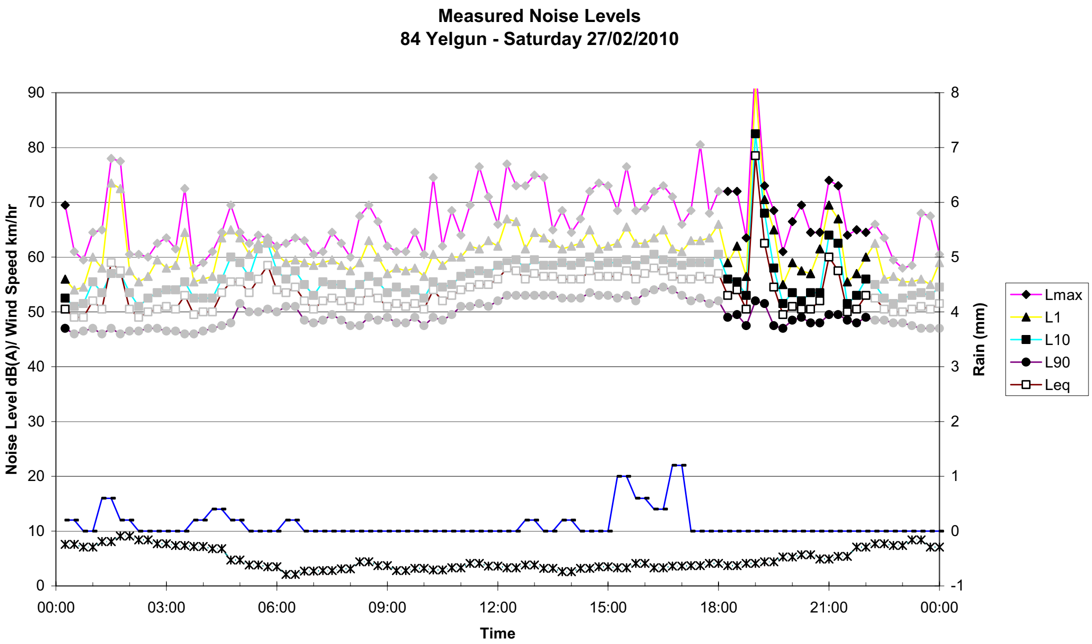


Measured Noise Levels
84 Yelgun - Wednesday 24/02/2010

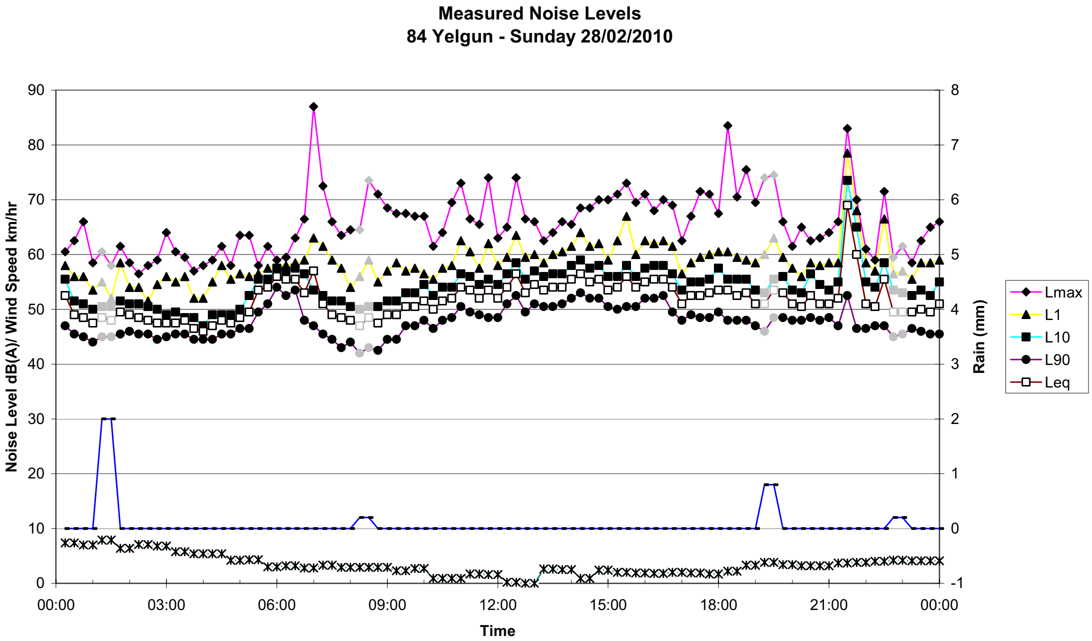



Measured Noise Levels
84 Yelgun - Thursday 25/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Lmax
L1
L10
L90
Leq


Measured Noise Levels
84 Yelgun - Friday 26/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Lmax
L1
L10
L90
Leq

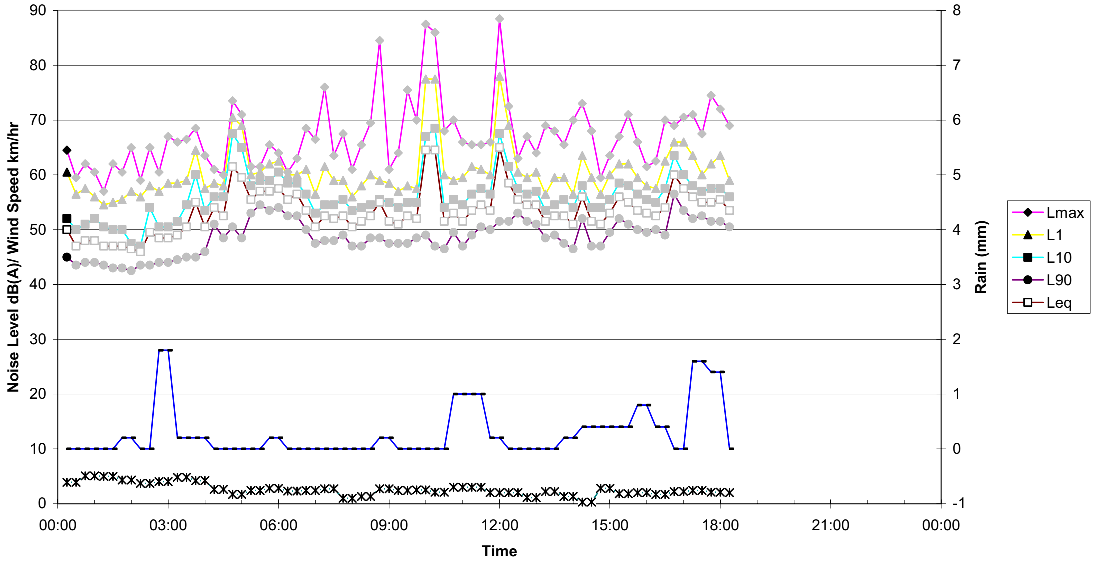


Measured Noise Levels
84 Yelgun - Saturday 27/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

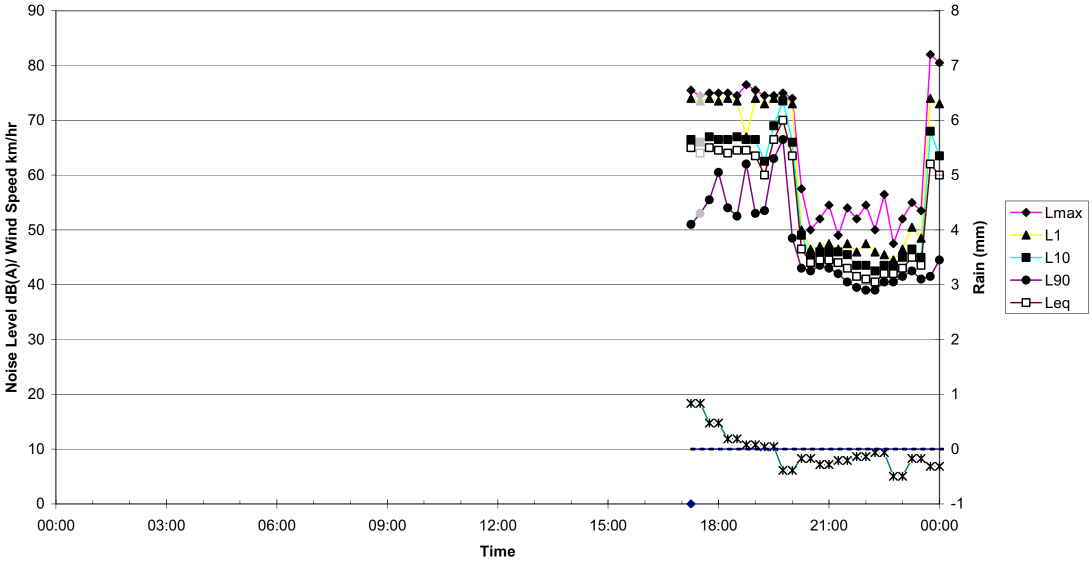


Measured Noise Levels
84 Yelgun - Sunday 28/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

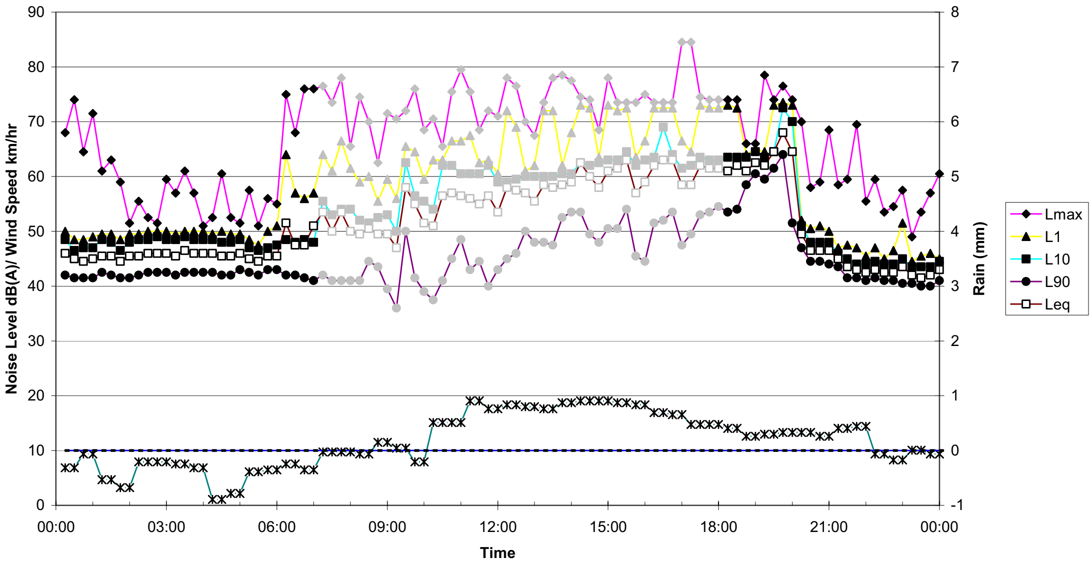
Measured Noise Levels
84 Yelgun - Monday 01/03/2010



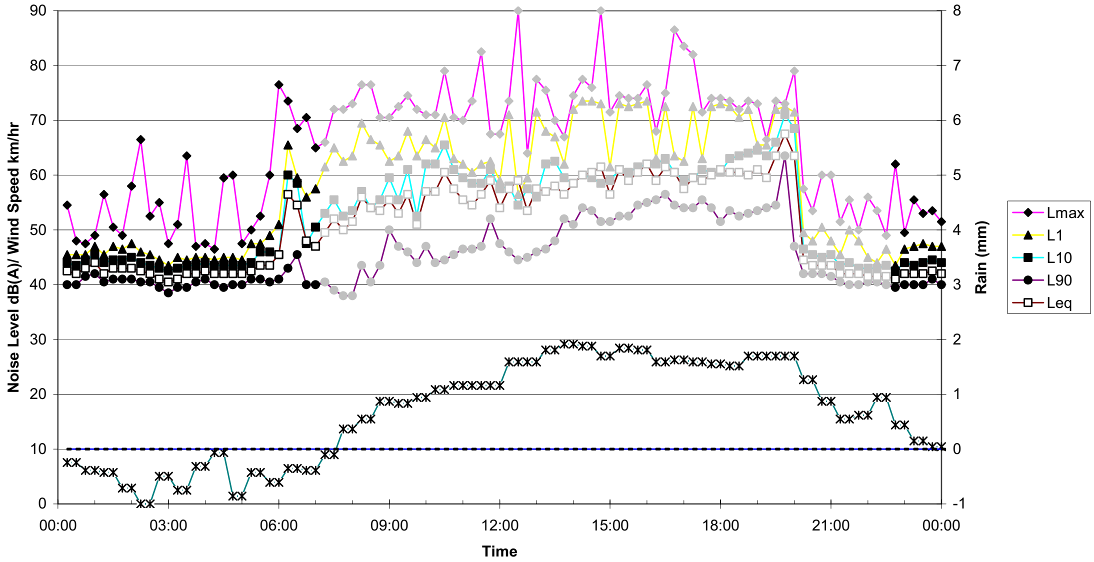
Measured Noise Levels
210 Wooyung Rd - Wednesday 10/02/2010



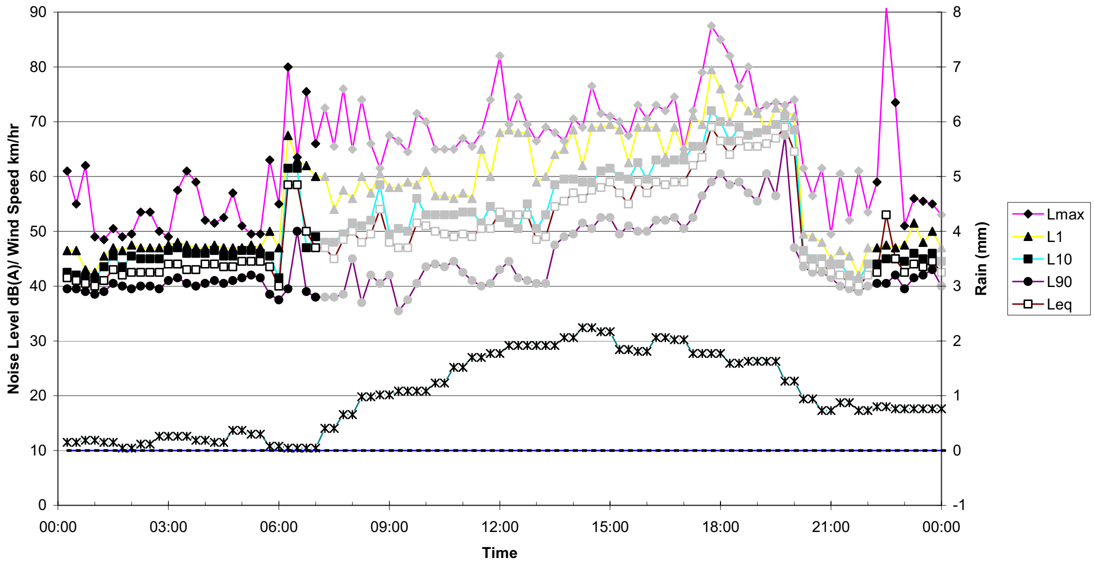
Measured Noise Levels
210 Wooyung Rd - Thursday 11/02/2010



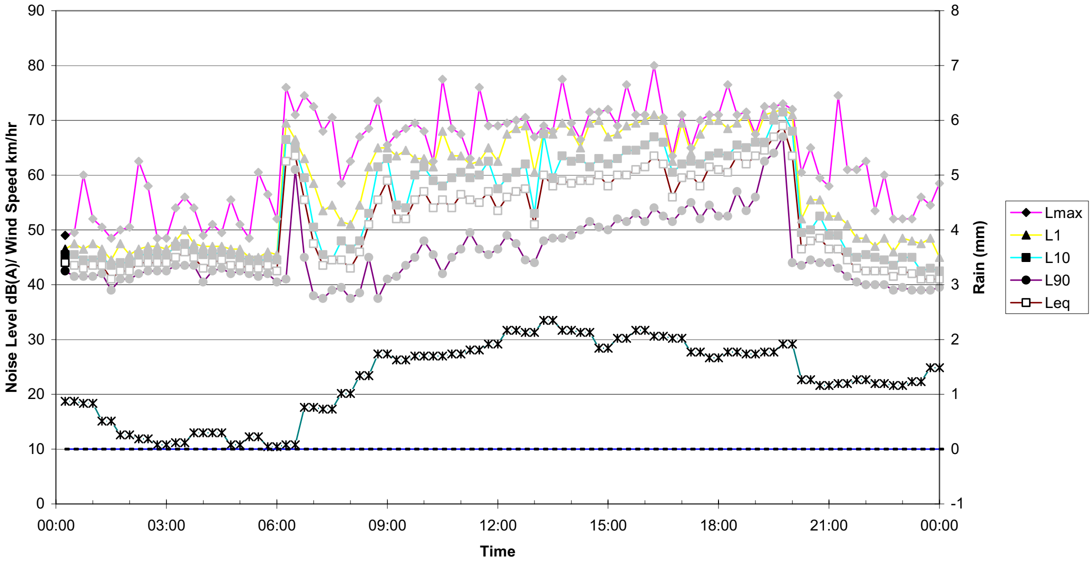
Measured Noise Levels
210 Wooyung Rd - Friday 12/02/2010



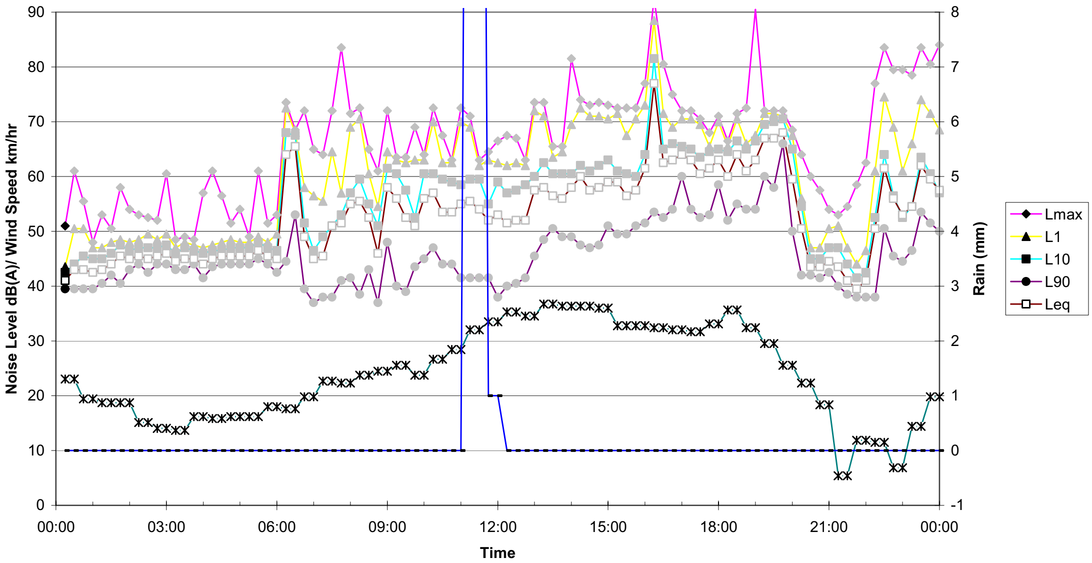
Measured Noise Levels
210 Wooyung Rd - Saturday 13/02/2010

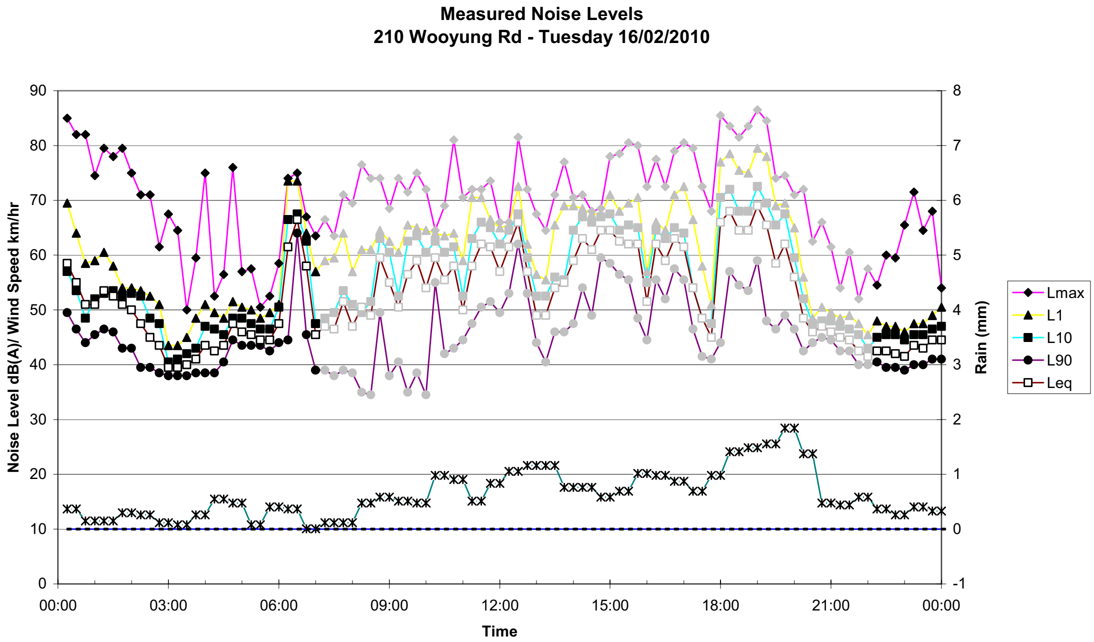


Measured Noise Levels
210 Wooyung Rd - Sunday 14/02/2010

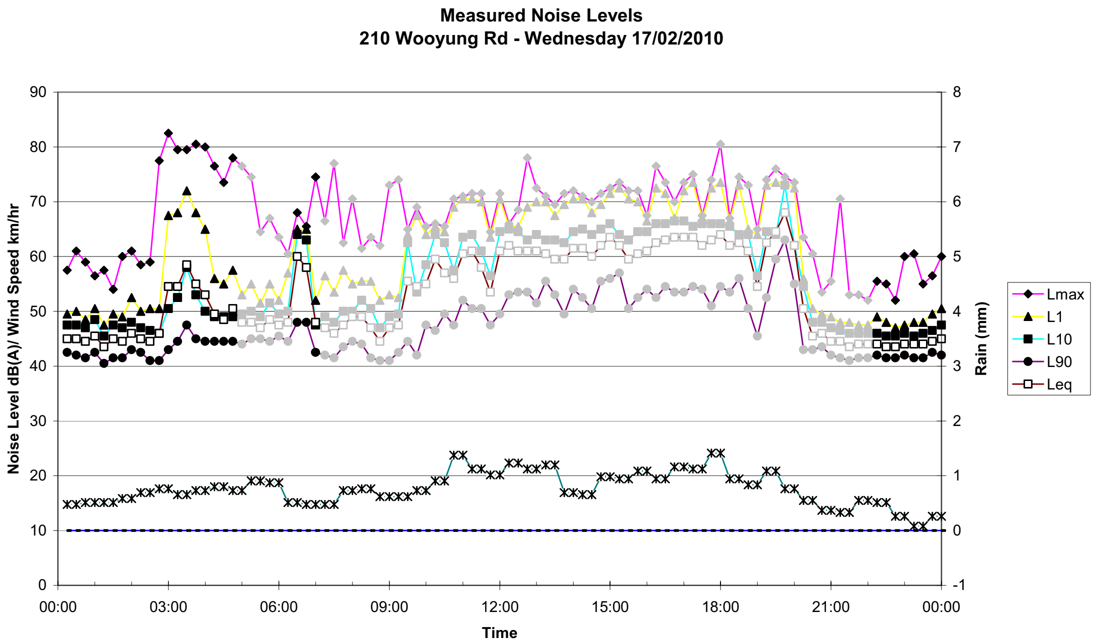


Measured Noise Levels
210 Wooyung Rd - Monday 15/02/2010

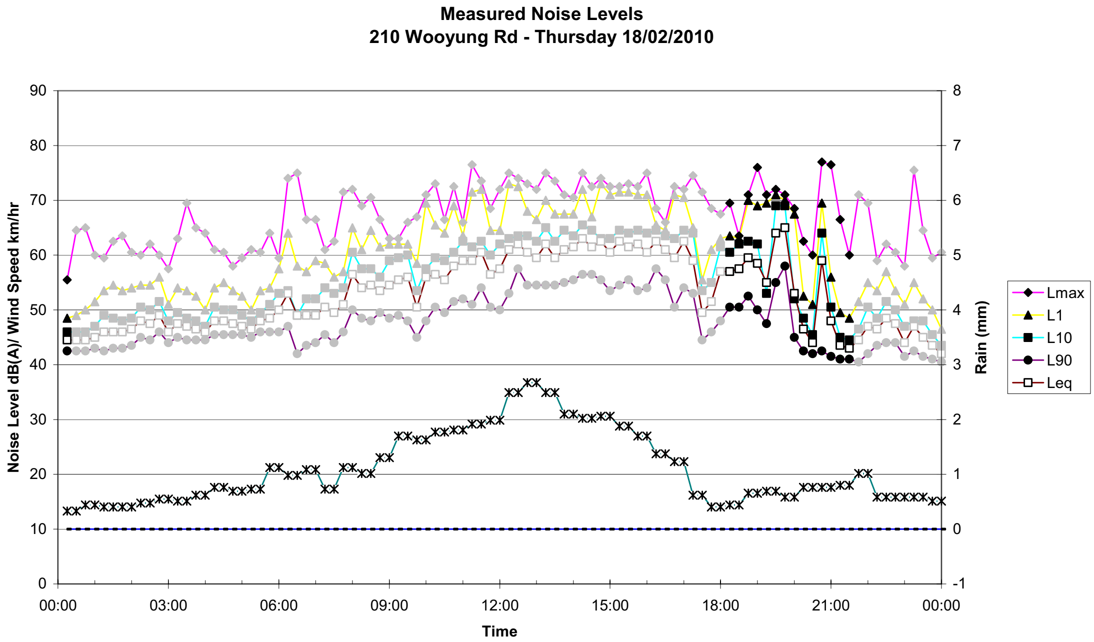




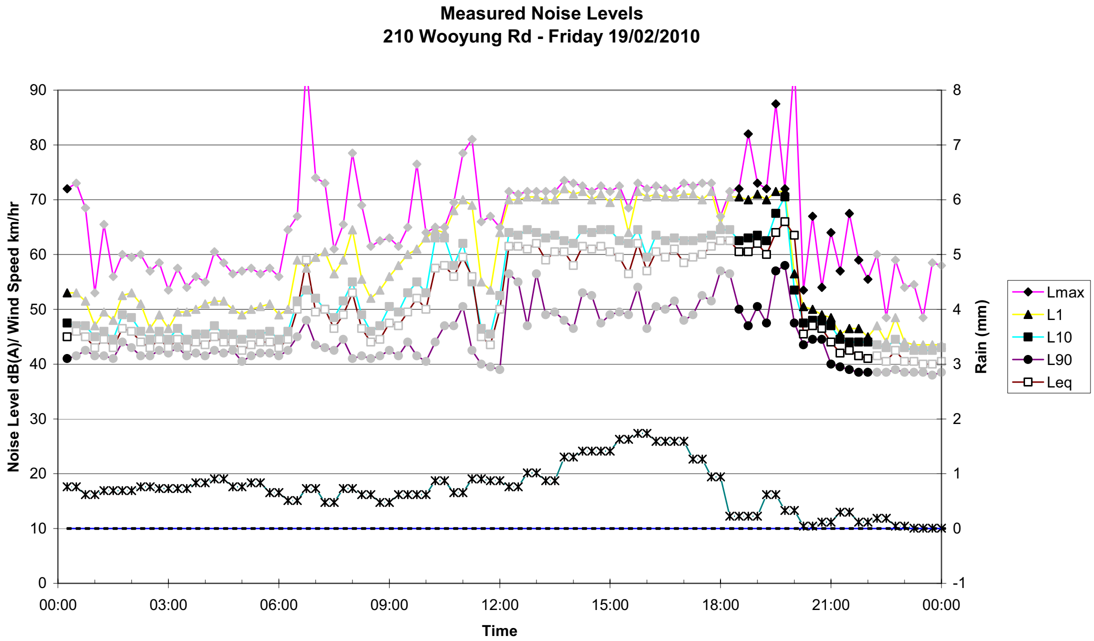
Measured Noise Levels
210 Wooyung Rd - Tuesday 16/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq



Measured Noise Levels
210 Wooyung Rd - Wednesday 17/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

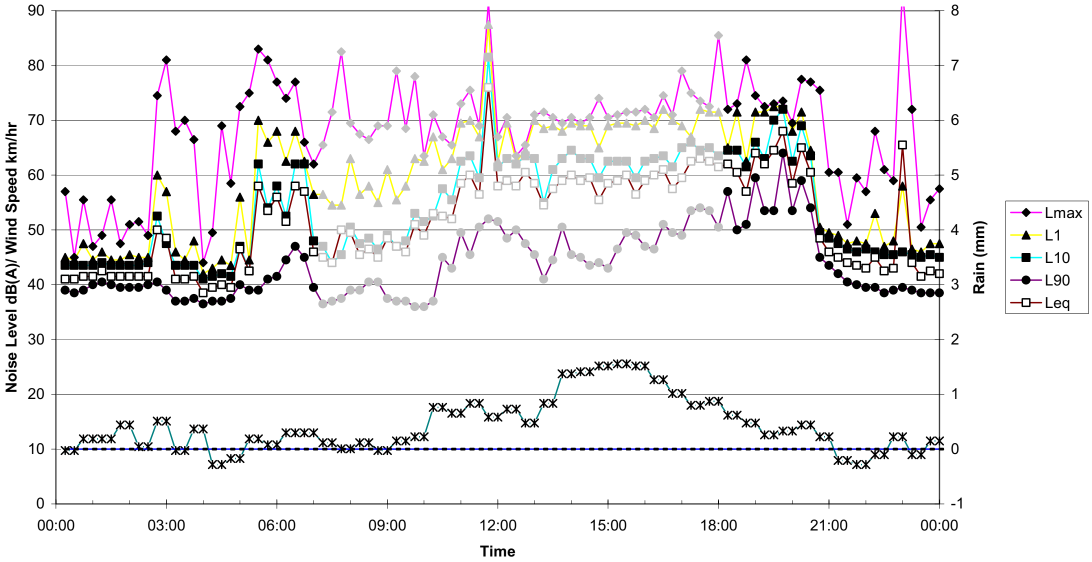


Measured Noise Levels
210 Wooyung Rd - Thursday 18/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Lmax
L1
L10
L90
Leq

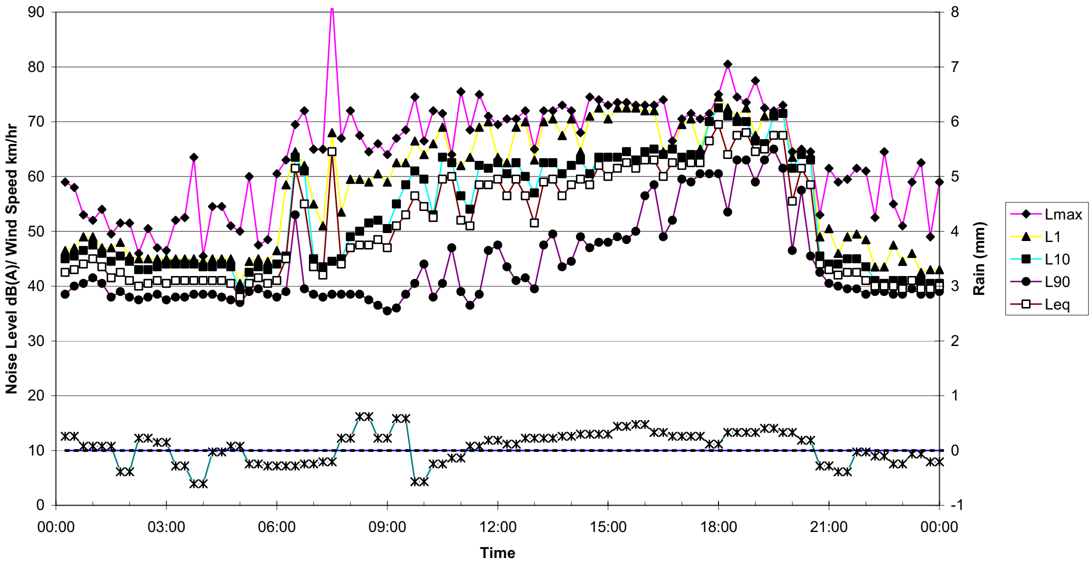


Measured Noise Levels
210 Wooyung Rd - Friday 19/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Lmax
L1
L10
L90
Leq

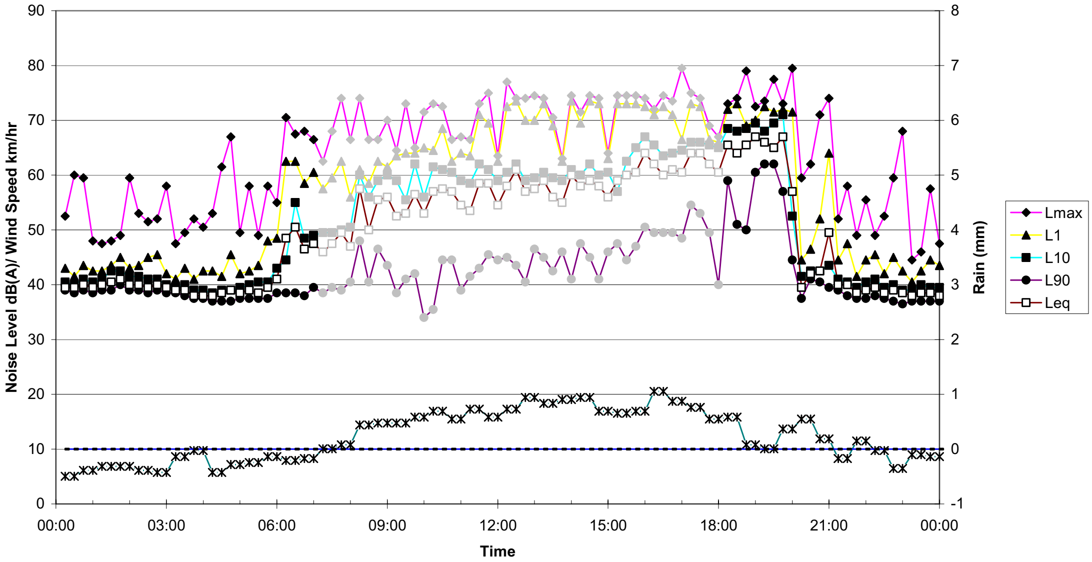
Measured Noise Levels
210 Wooyung Rd - Saturday 20/02/2010



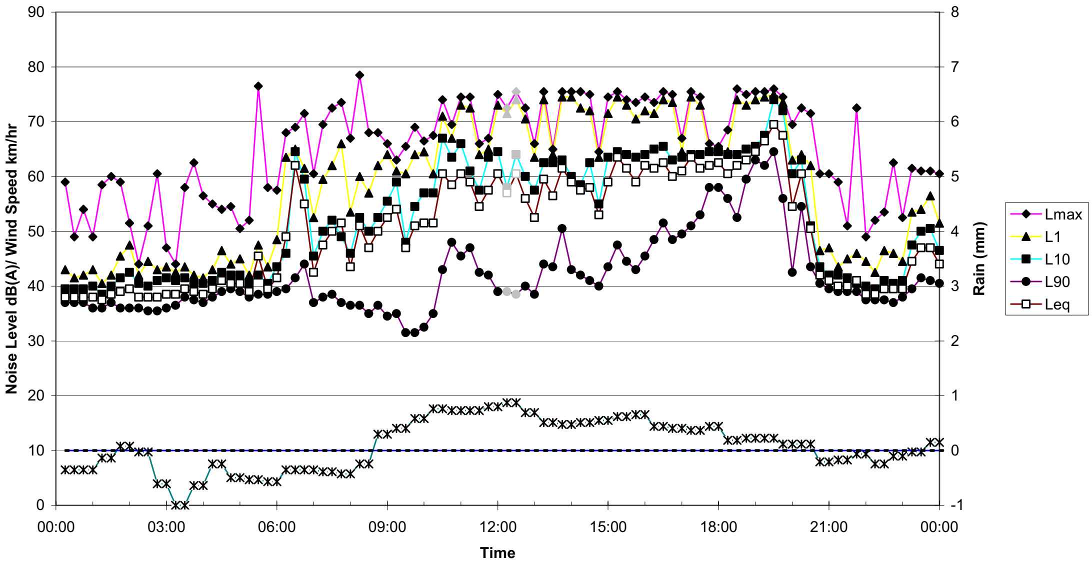
Measured Noise Levels
210 Wooyung Rd - Sunday 21/02/2010



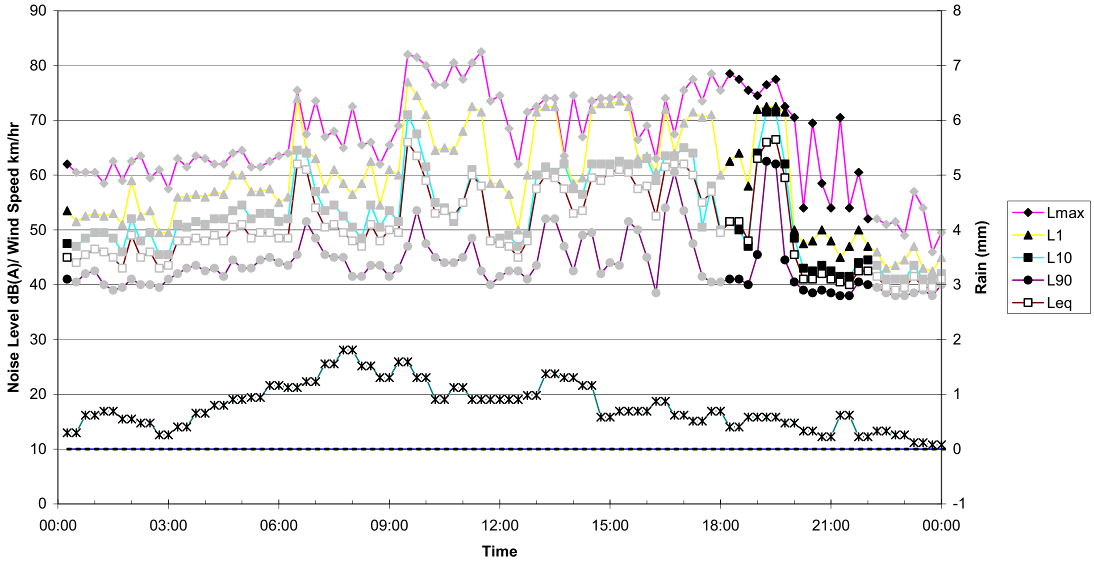
Measured Noise Levels
210 Wooyung Rd - Monday 22/02/2010



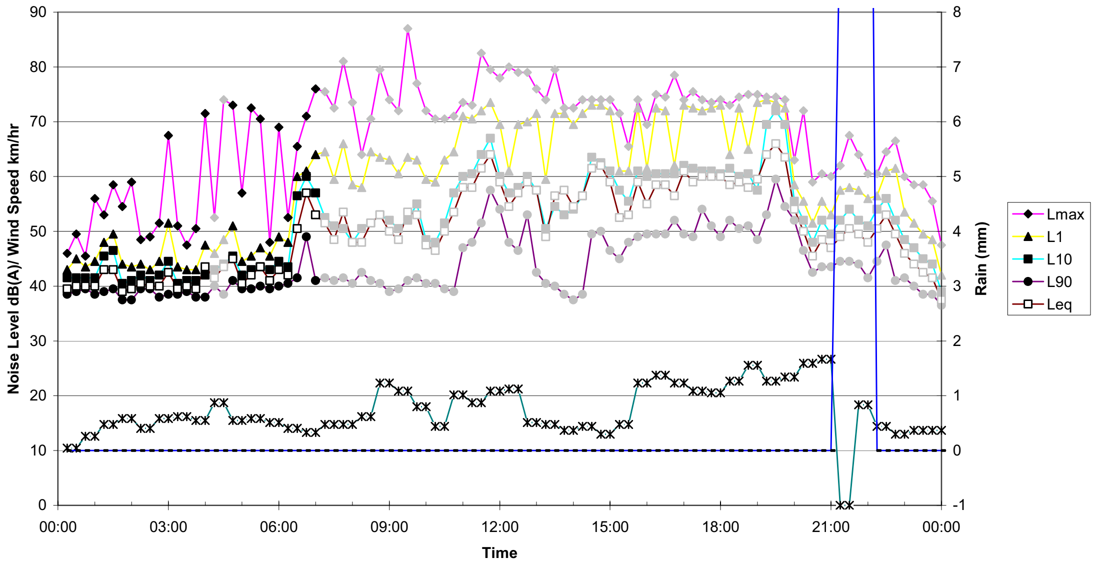
Measured Noise Levels
210 Wooyung Rd - Tuesday 23/02/2010

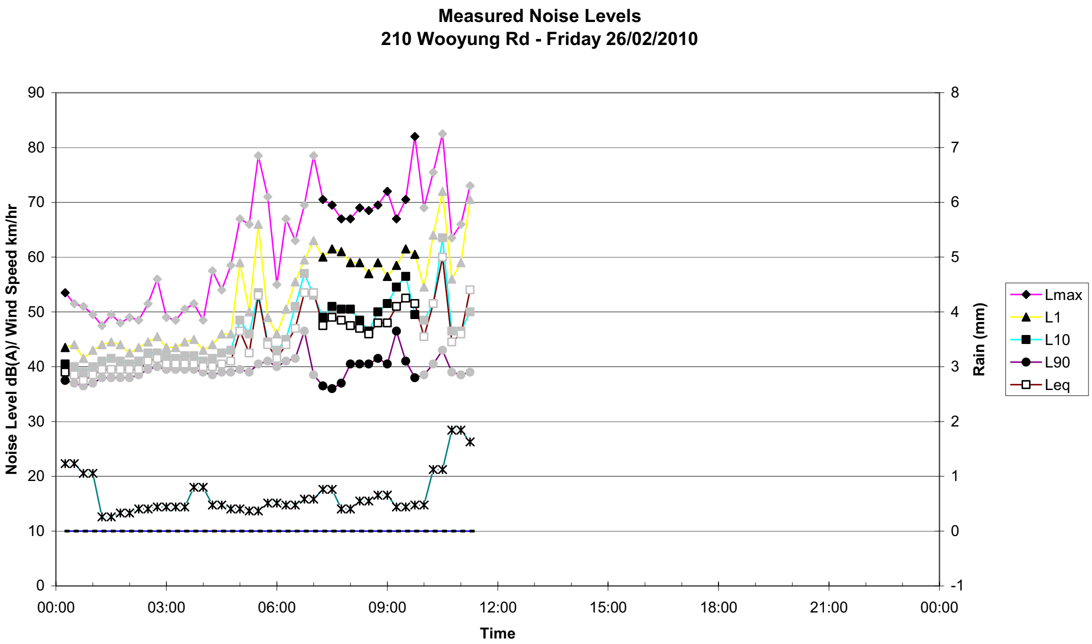


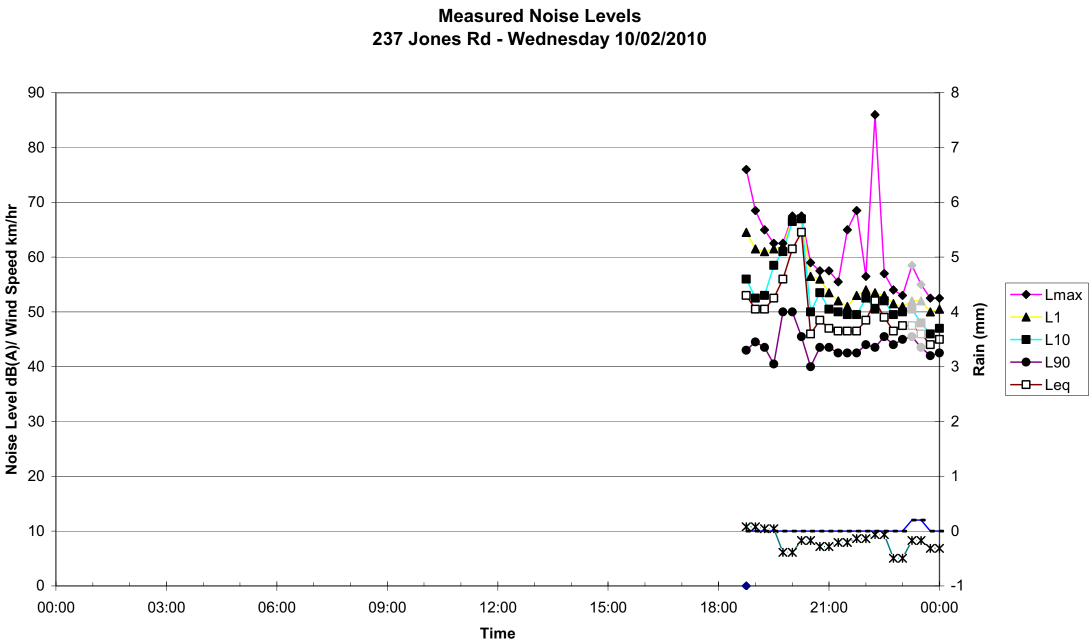
Measured Noise Levels
210 Wooyung Rd - Wednesday 24/02/2010

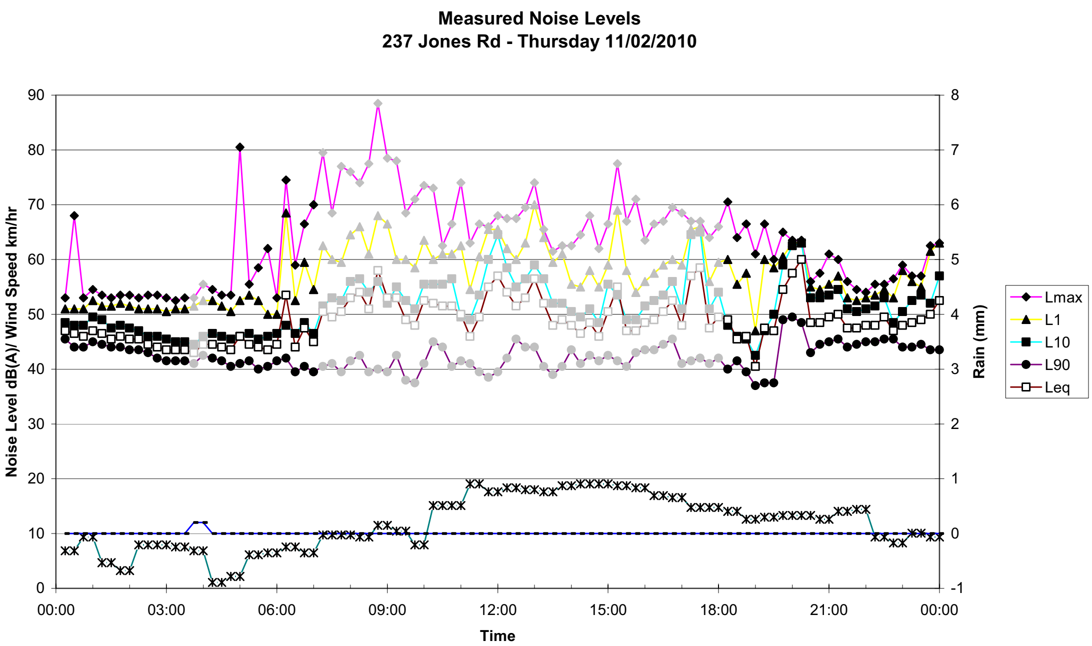


Measured Noise Levels
210 Wooyung Rd - Thursday 25/02/2010

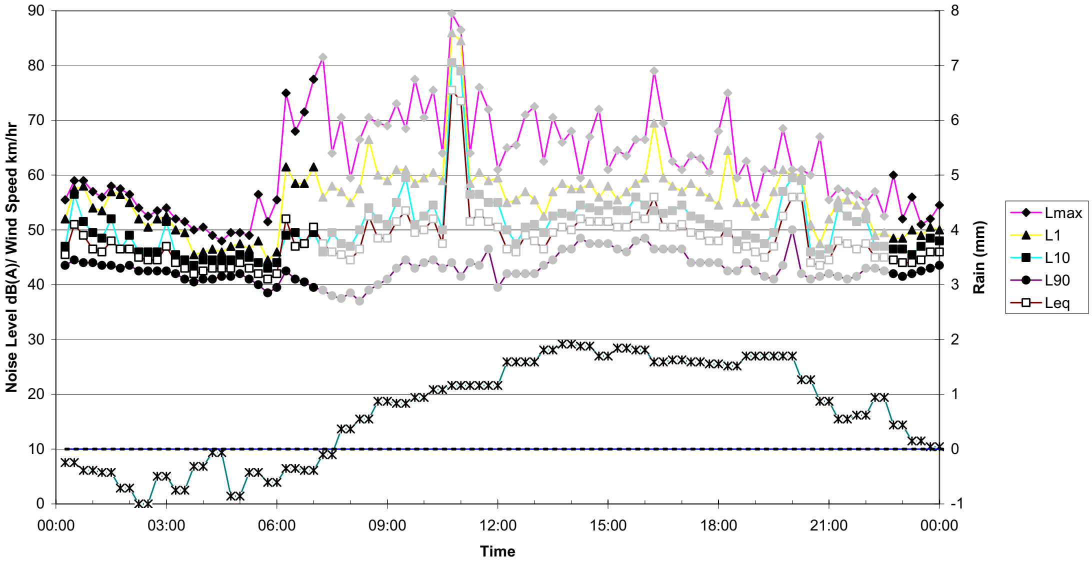



Measured Noise Levels
210 Wooyung Rd - Friday 26/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq
0
10
20
30
40
50
60
70
80
90
-1
1
2
3
4
5
6
7
8
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00

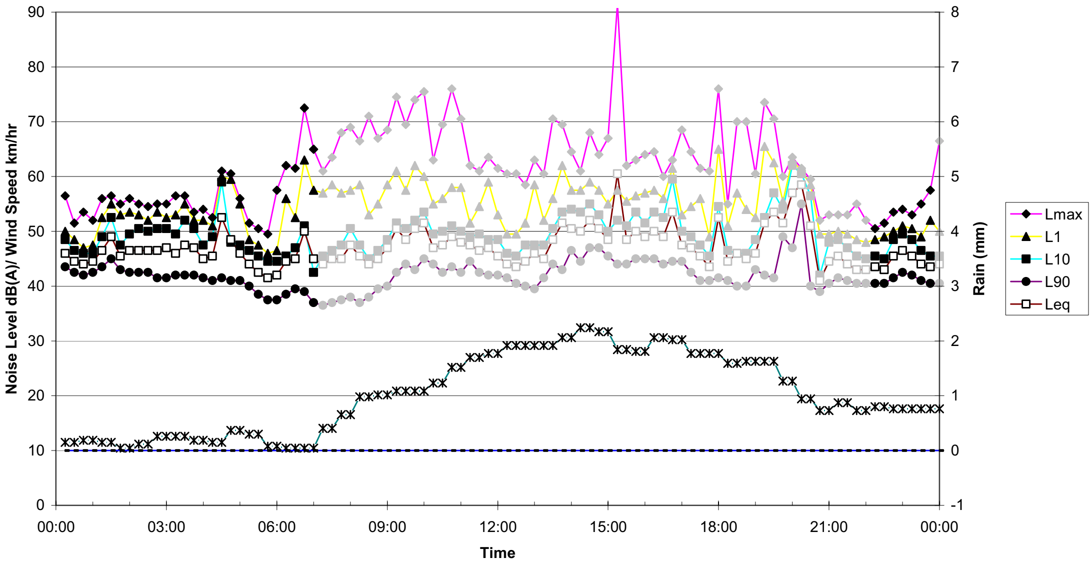

Measured Noise Levels
237 Jones Rd - Wednesday 10/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
90
80
70
60
50
40
30
20
10
0
8
7
6
5
4
3
2
1
0
-1
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Lmax
L1
L10
L90
Leq


Measured Noise Levels
237 Jones Rd - Thursday 11/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
90
80
70
60
50
40
30
20
10
0
8
7
6
5
4
3
2
1
0
-1
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Lmax
L1
L10
L90
Leq

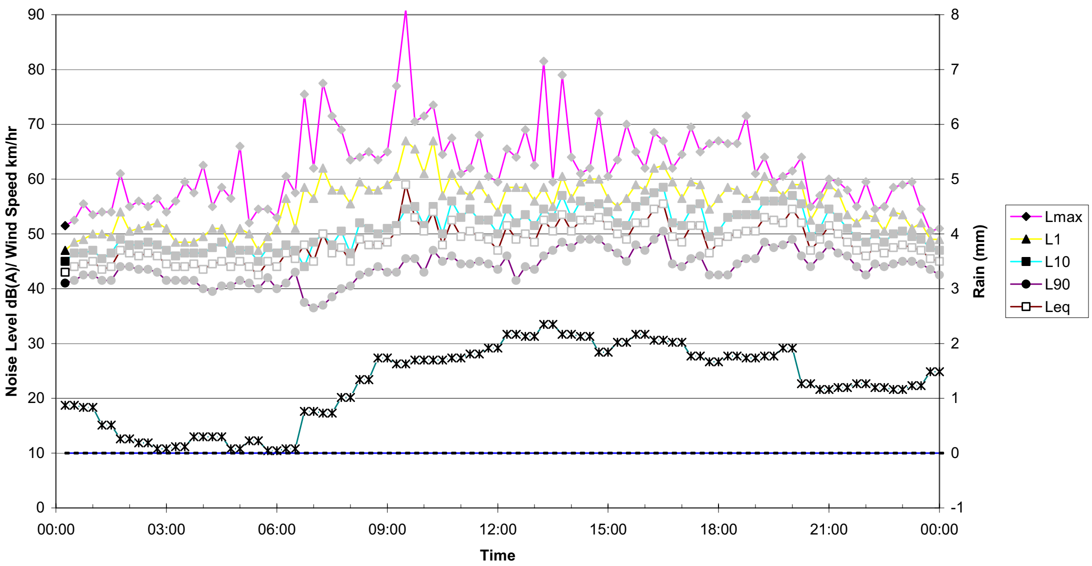
Measured Noise Levels
237 Jones Rd - Friday 12/02/2010



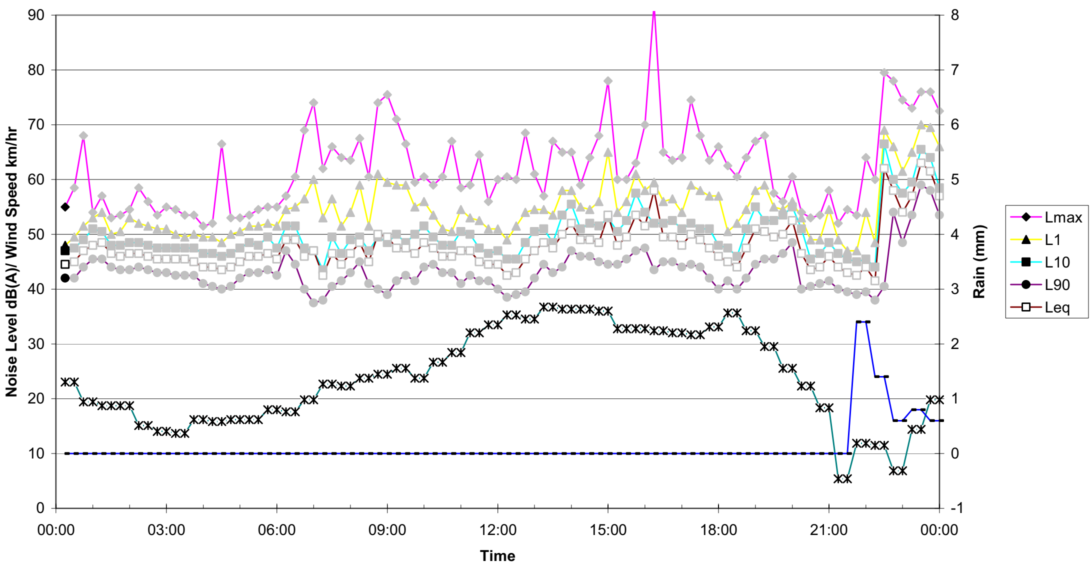
Measured Noise Levels
237 Jones Rd - Saturday 13/02/2010

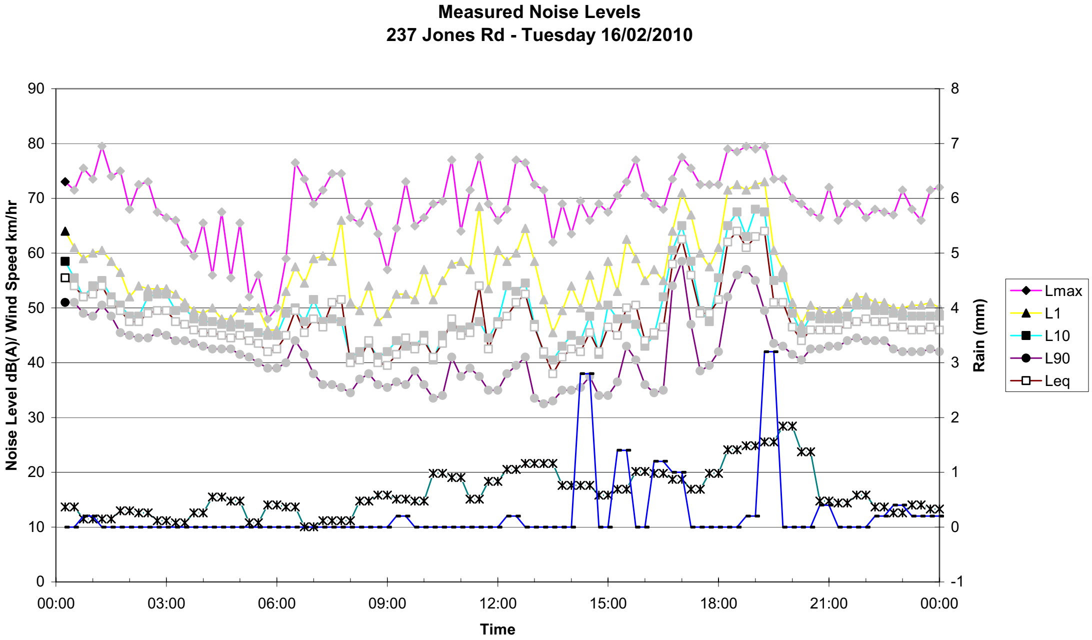


Measured Noise Levels
237 Jones Rd - Sunday 14/02/2010

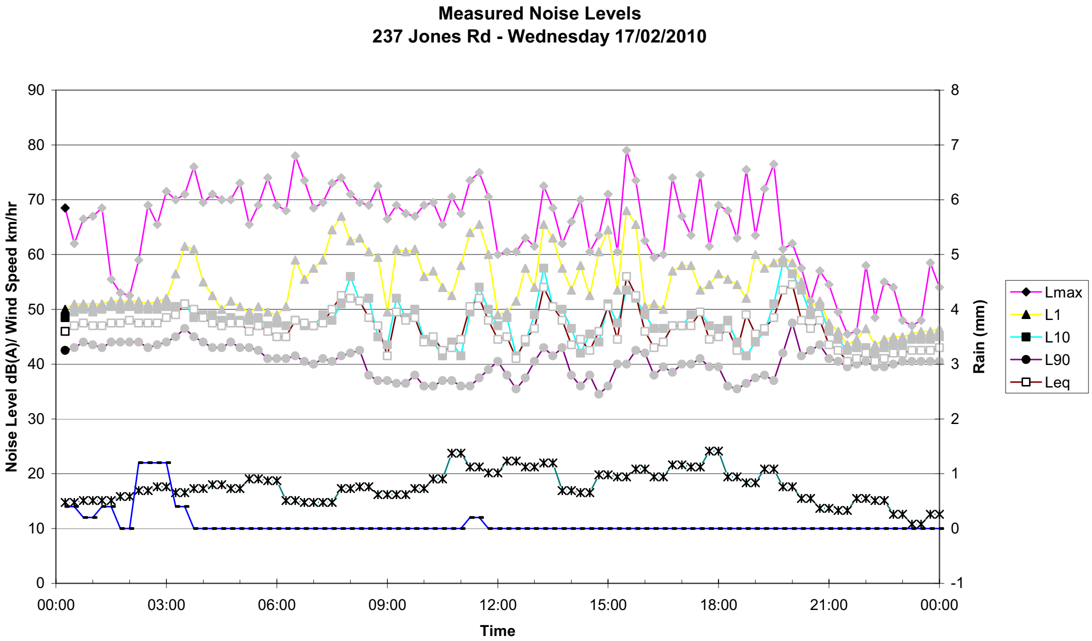


Measured Noise Levels
237 Jones Rd - Monday 15/02/2010



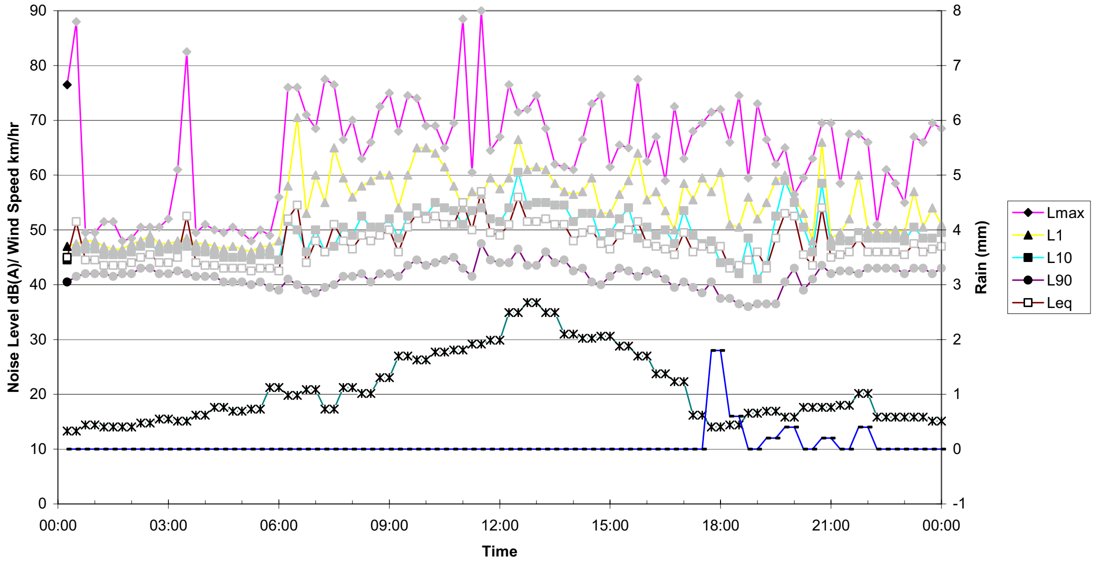


Measured Noise Levels
237 Jones Rd - Tuesday 16/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

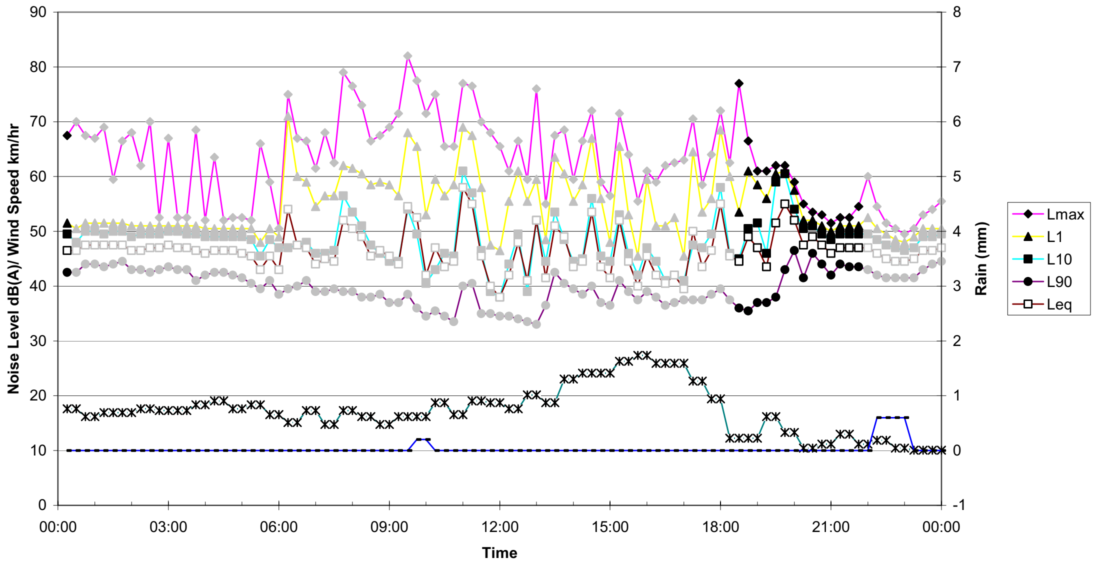


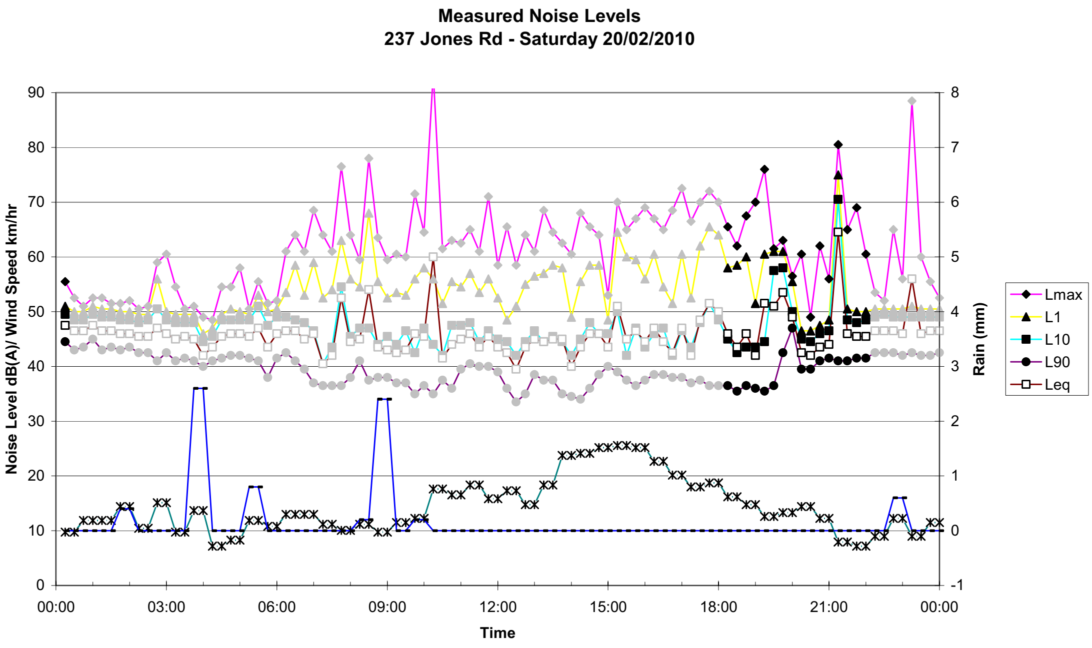
Measured Noise Levels
237 Jones Rd - Wednesday 17/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

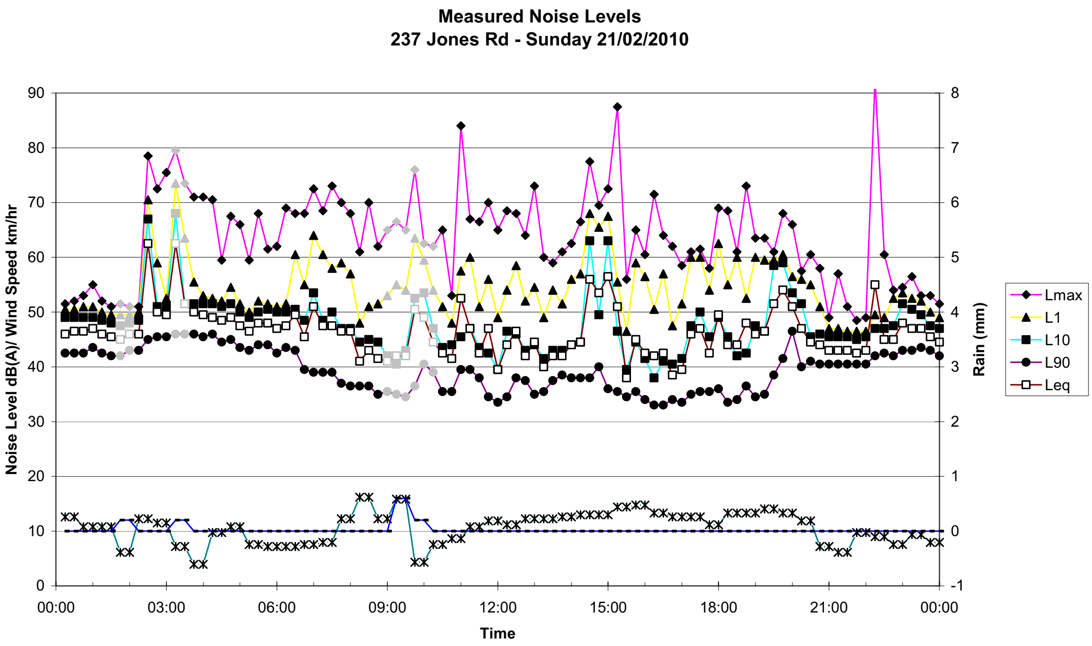
Measured Noise Levels
237 Jones Rd - Thursday 18/02/2010

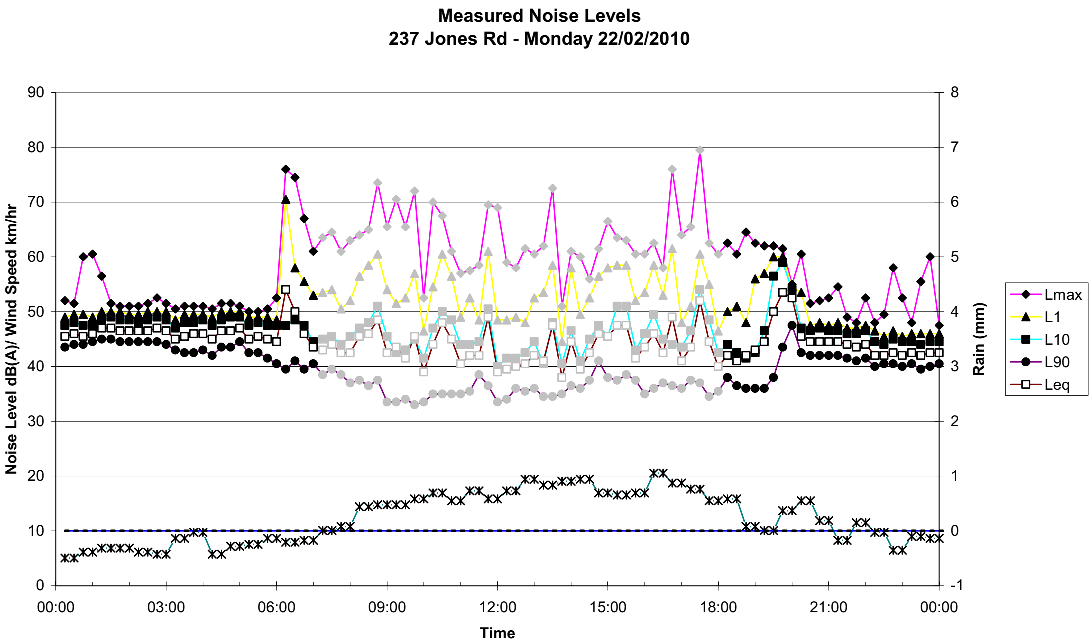


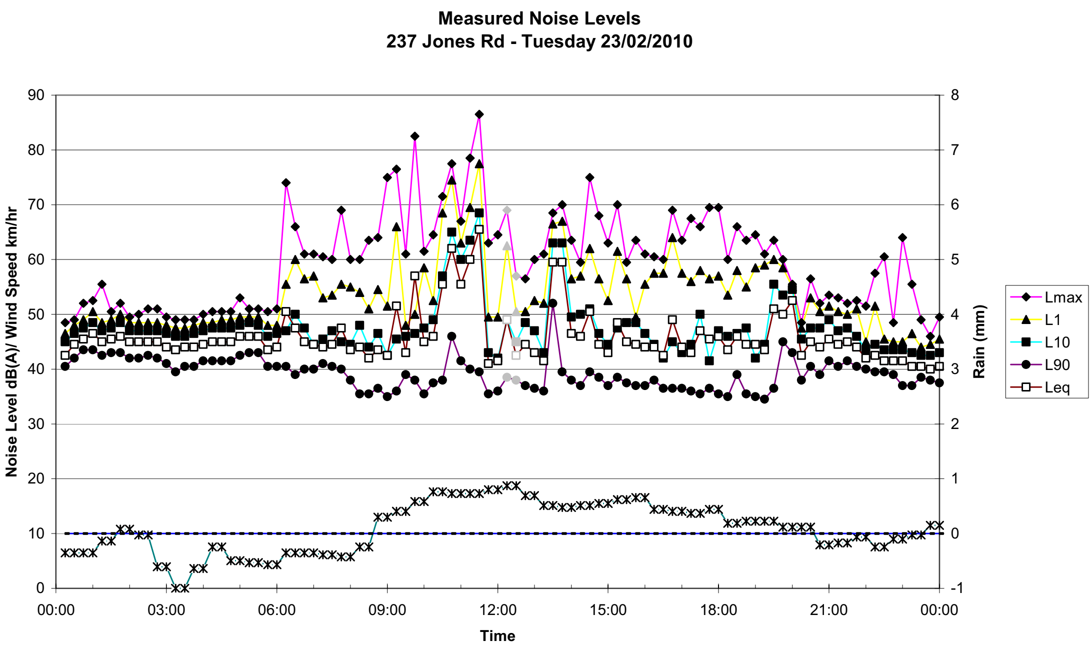
Measured Noise Levels
237 Jones Rd - Friday 19/02/2010



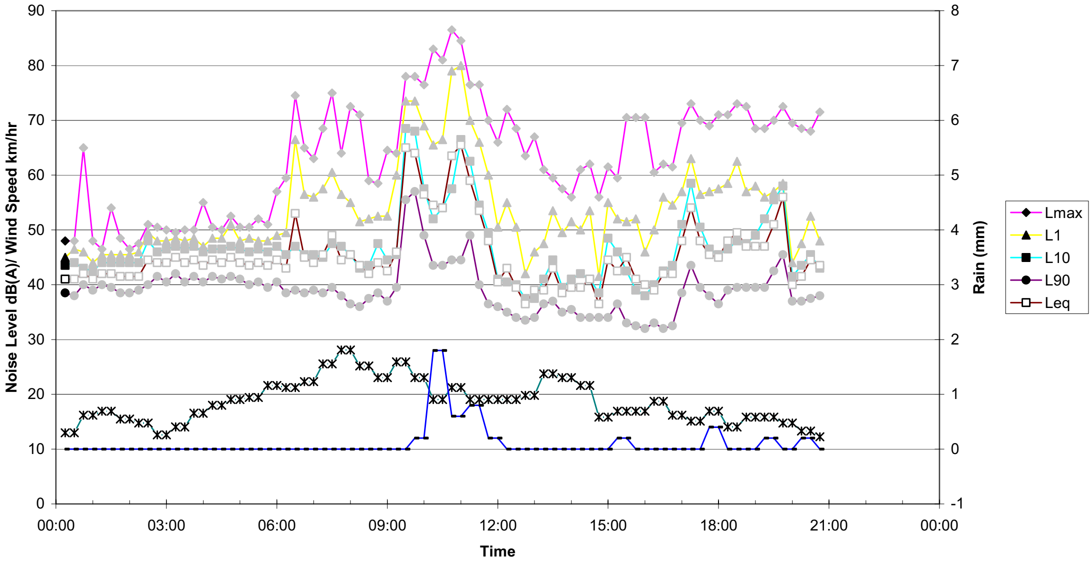

Measured Noise Levels
237 Jones Rd - Saturday 20/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Lmax
L1
L10
L90
Leq


Measured Noise Levels
237 Jones Rd - Sunday 21/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Lmax
L1
L10
L90
Leq

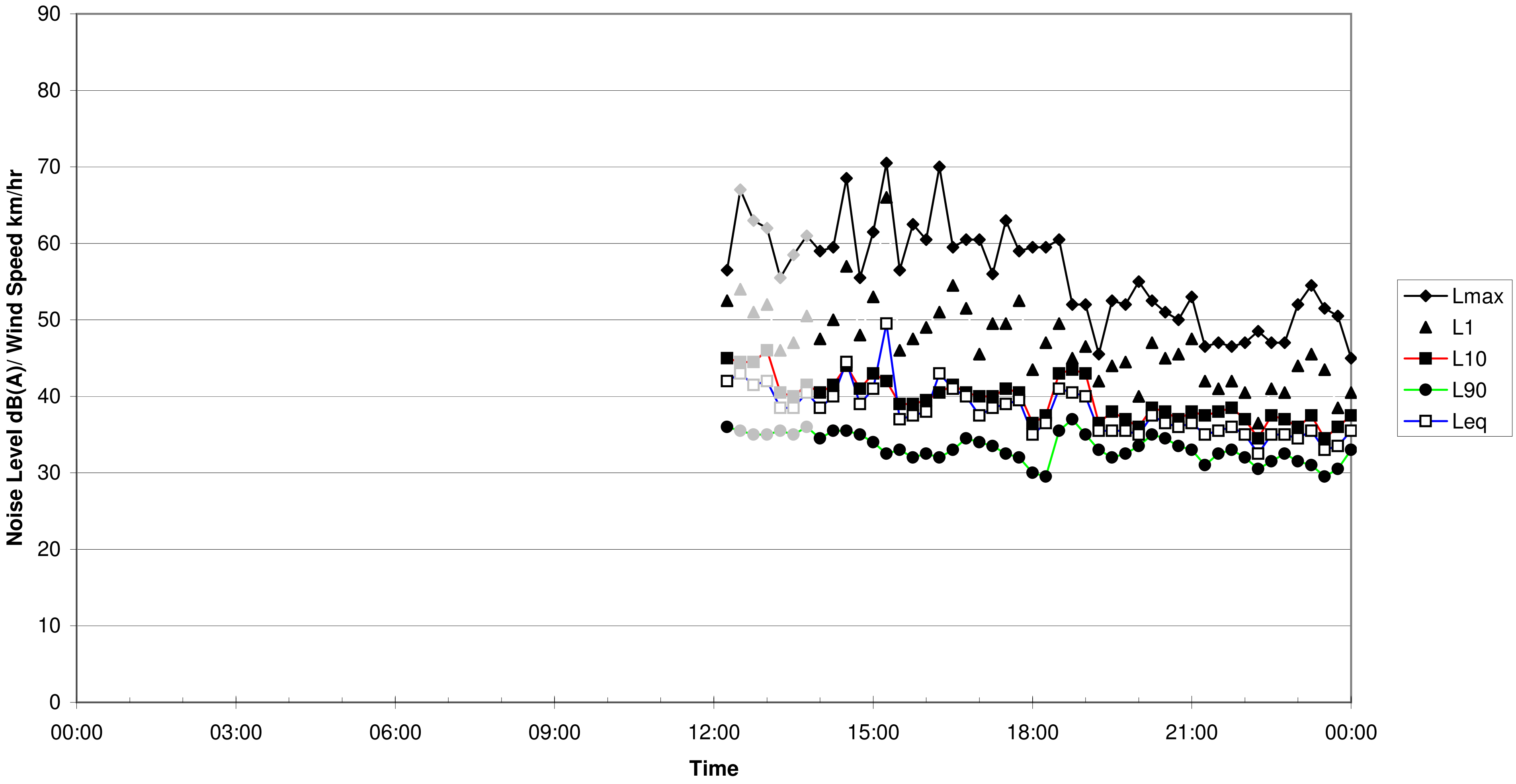

Measured Noise Levels
237 Jones Rd - Monday 22/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

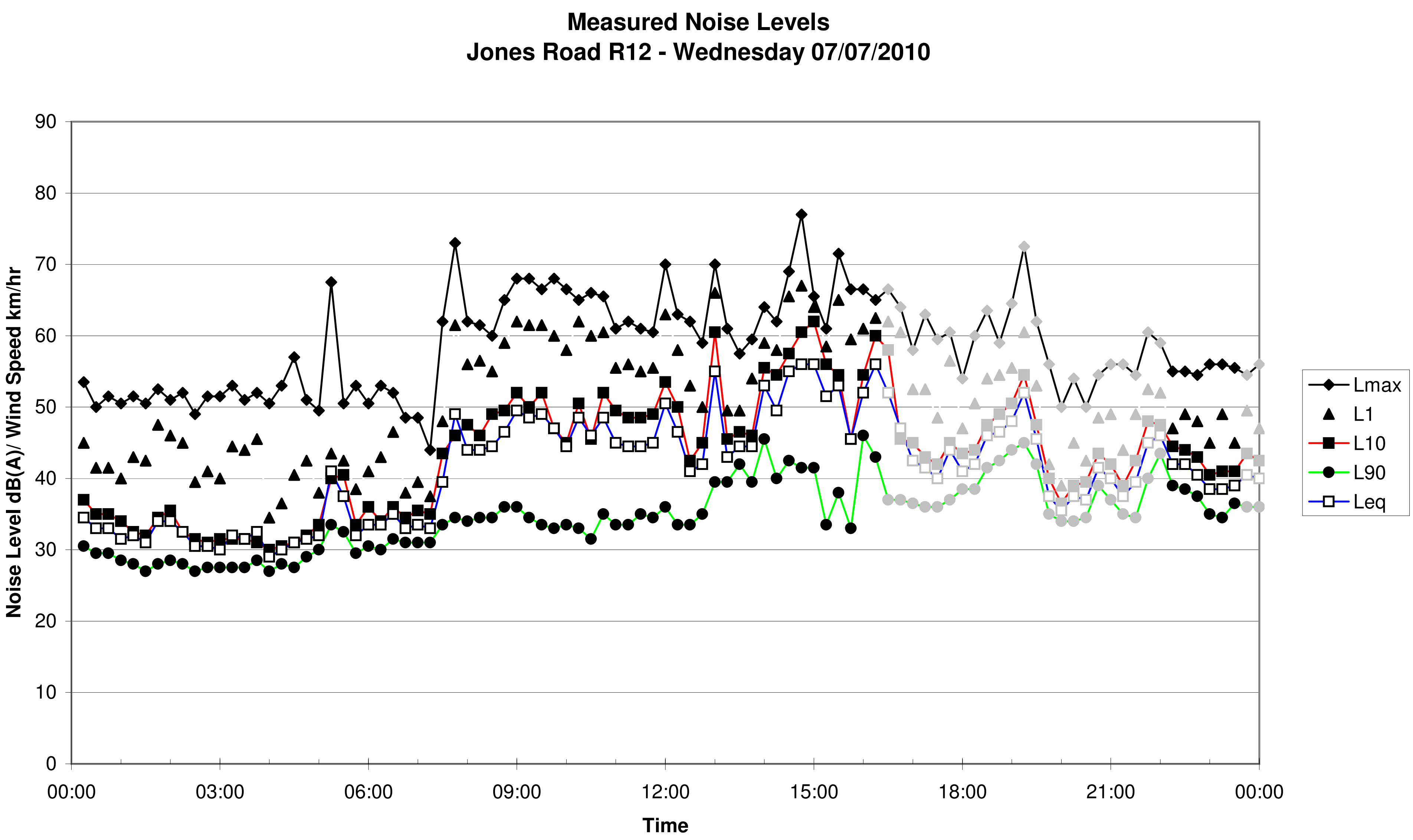

Measured Noise Levels
237 Jones Rd - Tuesday 23/02/2010
Noise Level dB(A)/ Wind Speed km/hr
Rain (mm)
Time
Lmax
L1
L10
L90
Leq

Measured Noise Levels
237 Jones Rd - Wednesday 24/02/2010

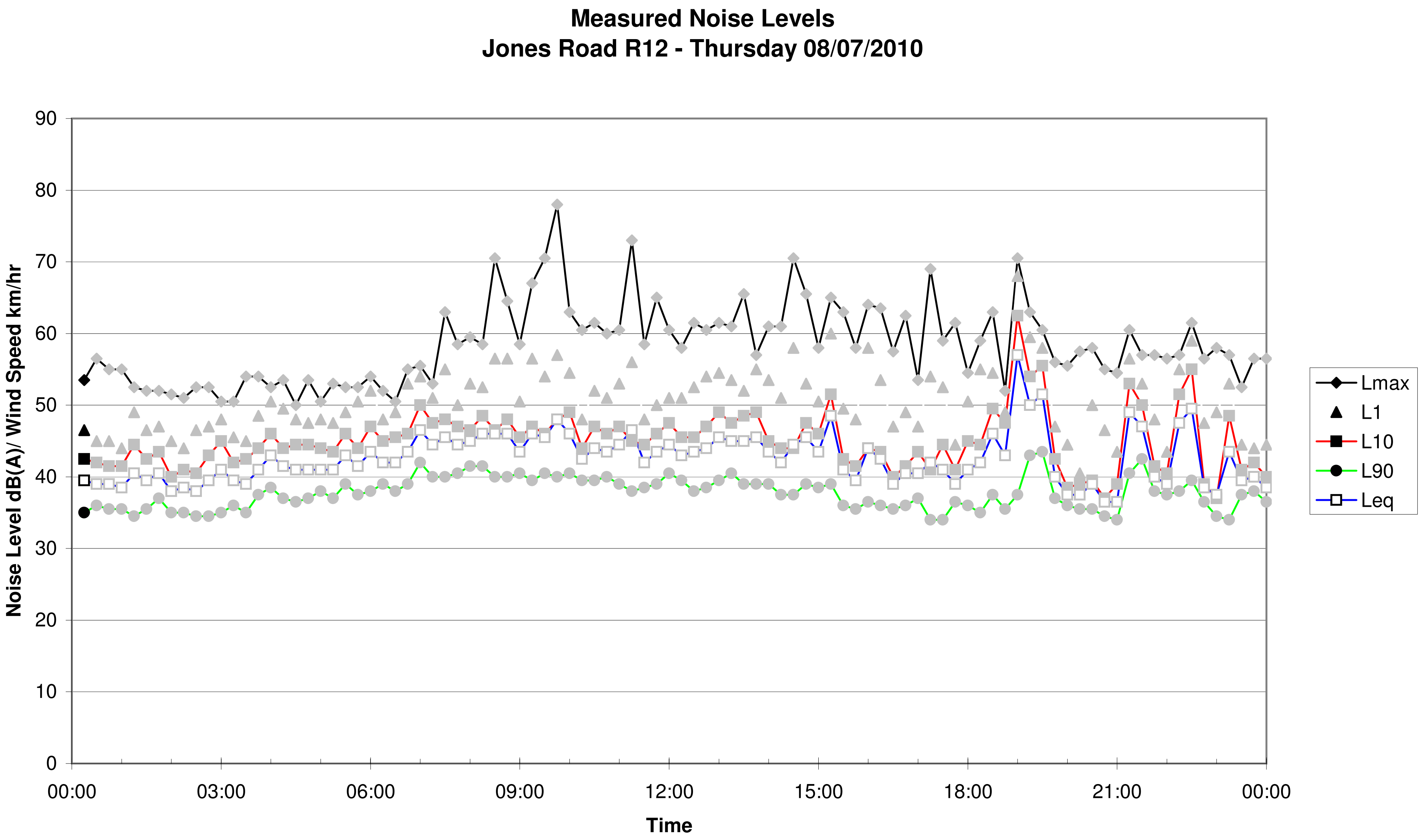


Measured Noise Levels
Jones Road R12 - Tuesday 06/07/2010



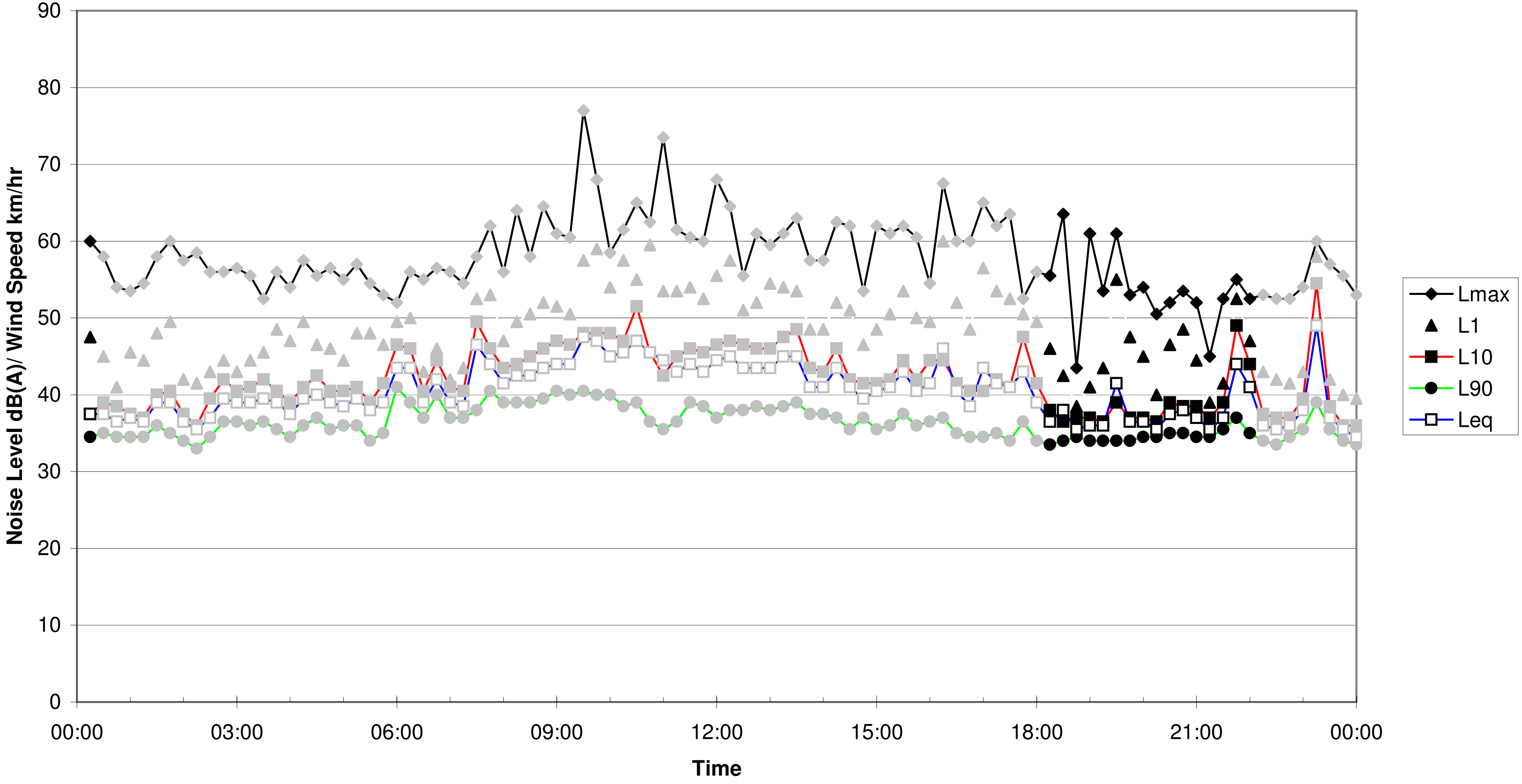


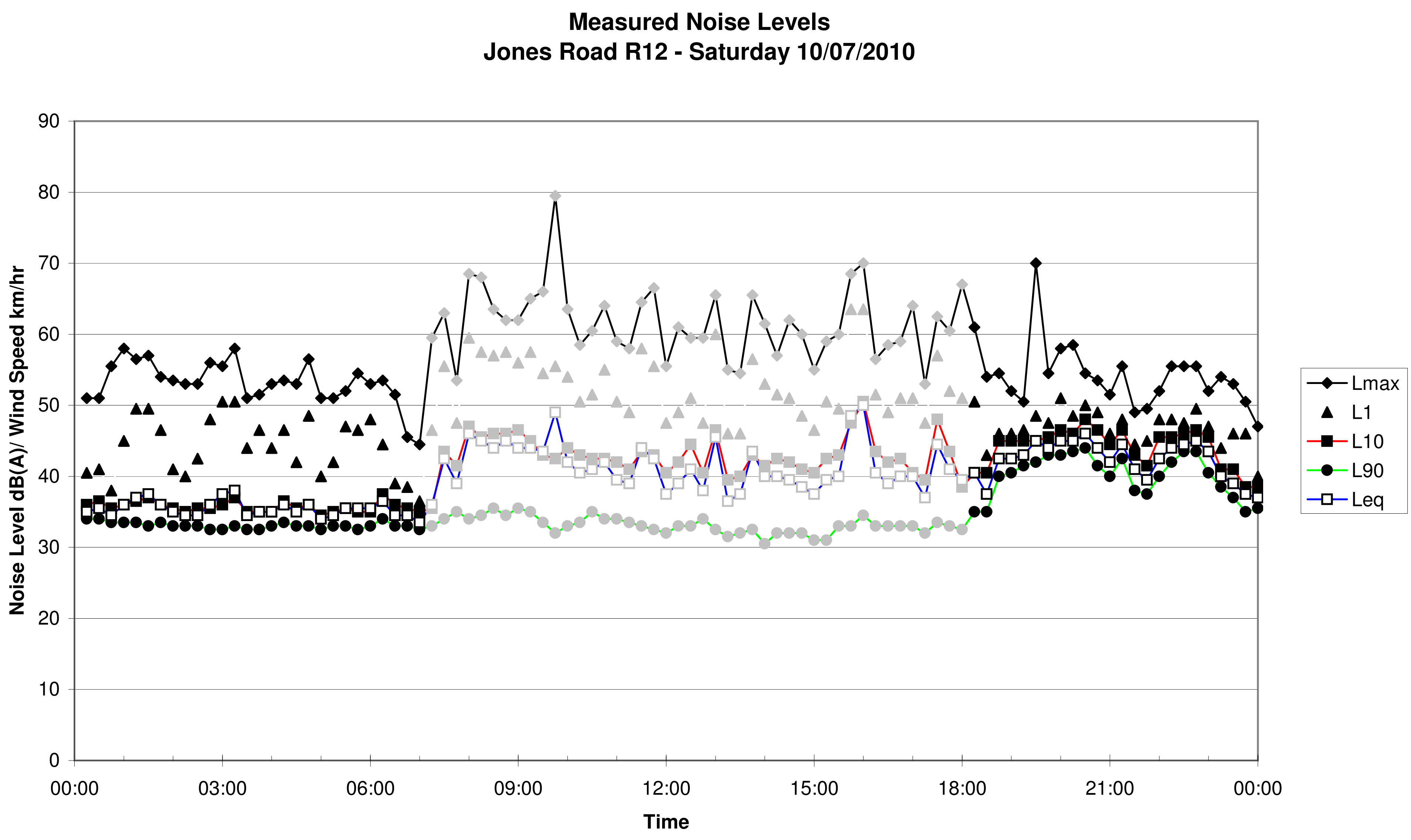
Measured Noise Levels
Jones Road R12 - Wednesday 07/07/2010
Noise Level dB(A)/ Wind Speed km/hr
0
10
20
30
40
50
60
70
80
90
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq



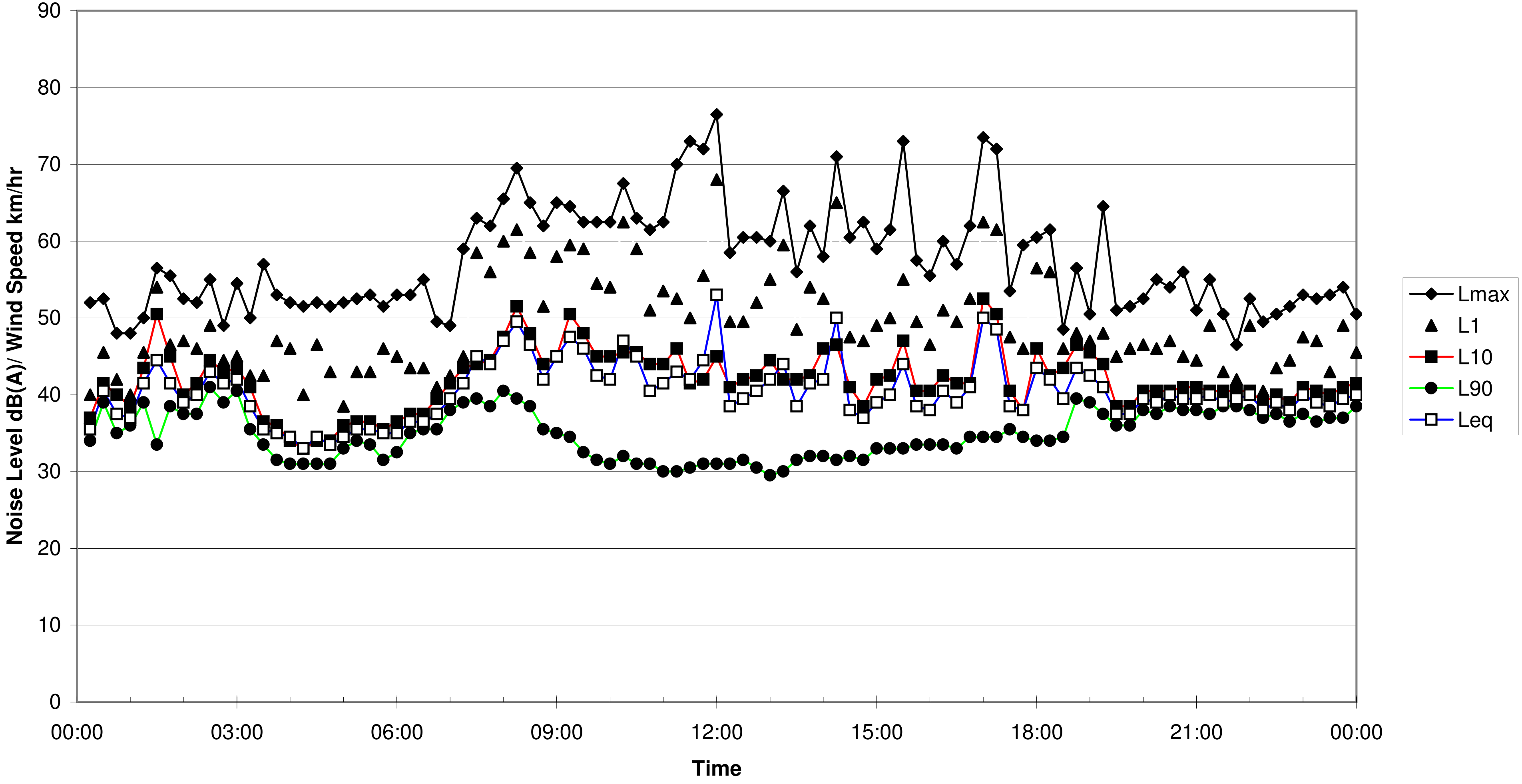
Measured Noise Levels
Jones Road R12 - Thursday 08/07/2010
Noise Level dB(A)/ Wind Speed km/hr
90
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq

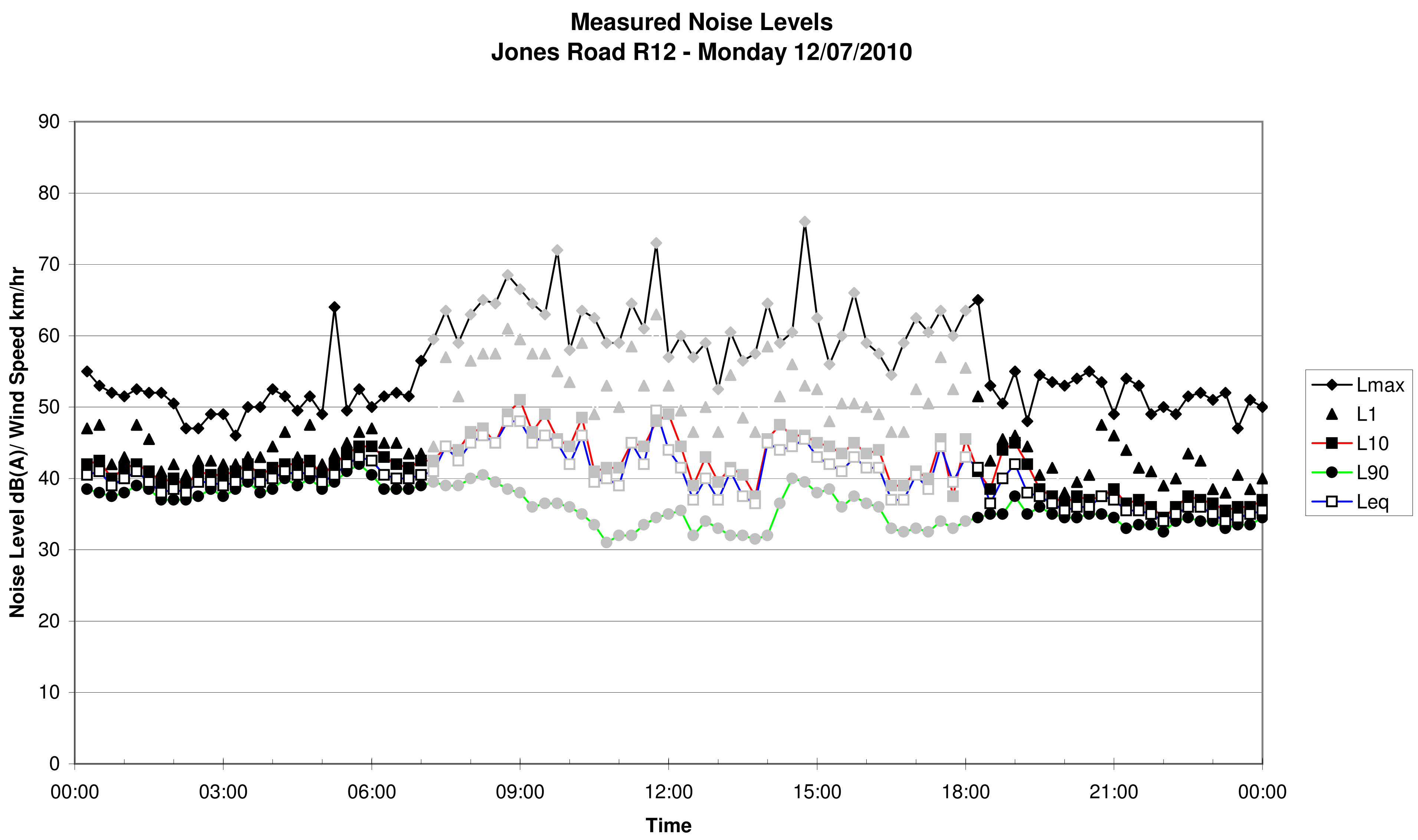
Measured Noise Levels
Jones Road R12 - Friday 09/07/2010



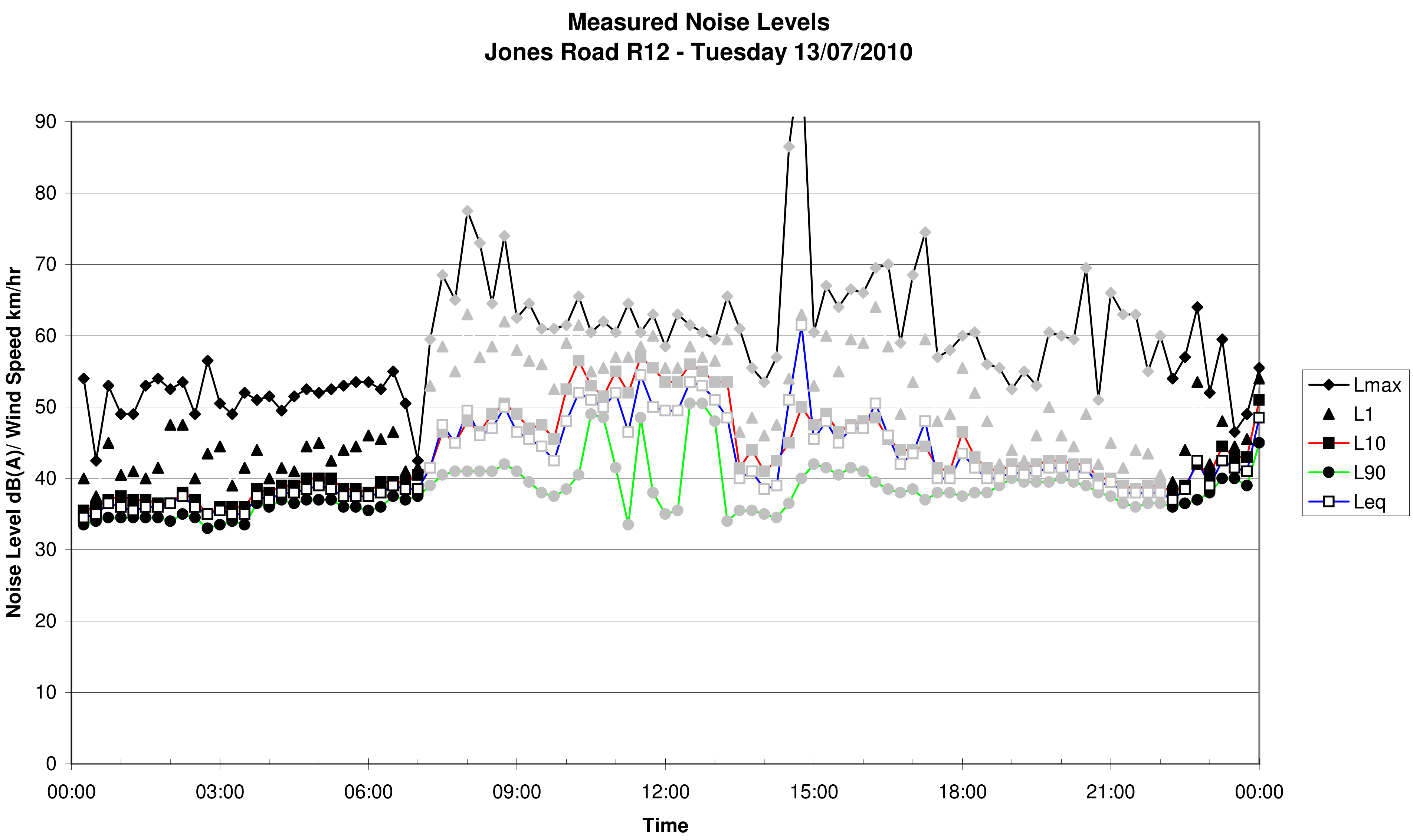

Measured Noise Levels
Jones Road R12 - Saturday 10/07/2010
Noise Level dB(A)/ Wind Speed km/hr
0
10
20
30
40
50
60
70
80
90
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq

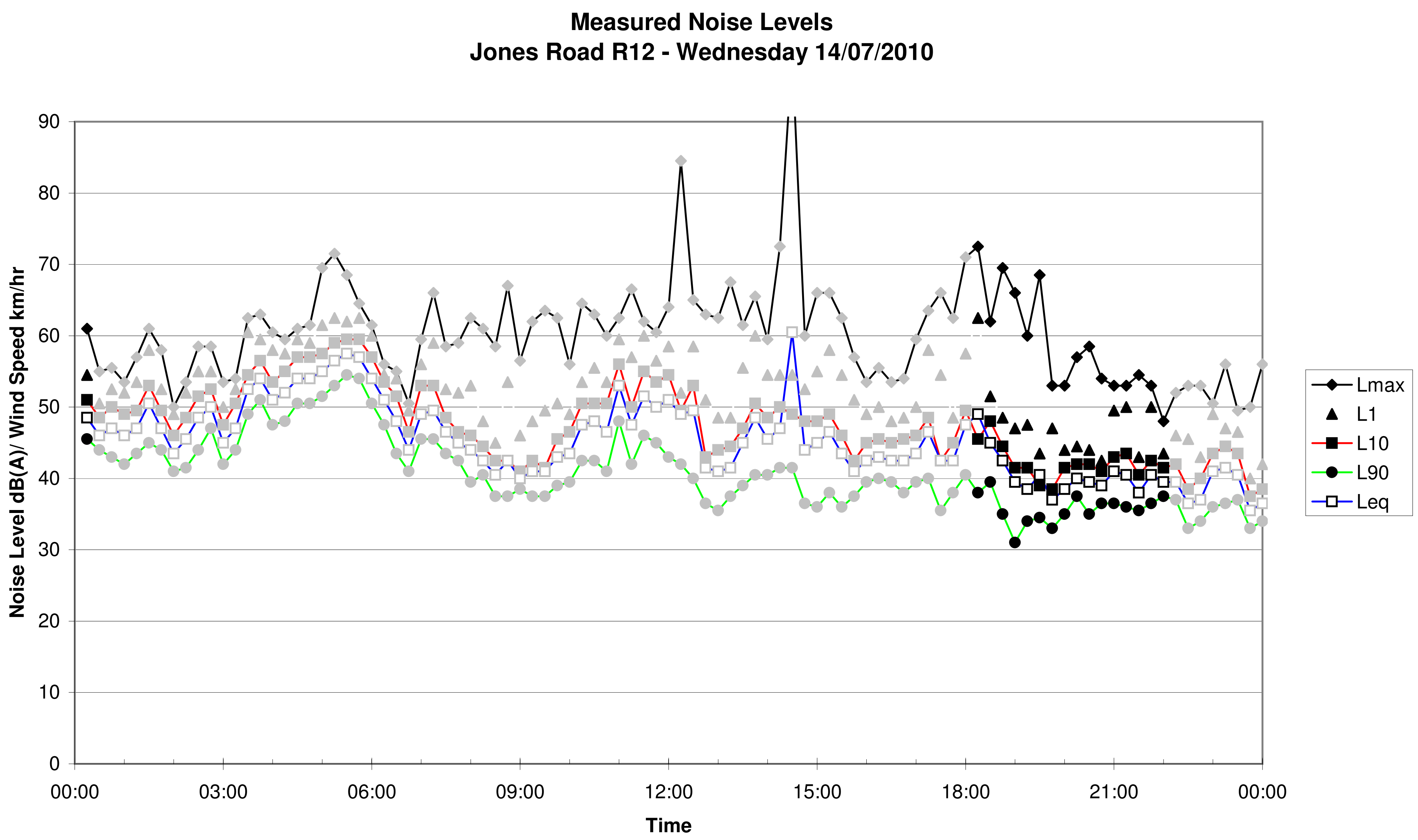
Measured Noise Levels
Jones Road R12 - Sunday 11/07/2010



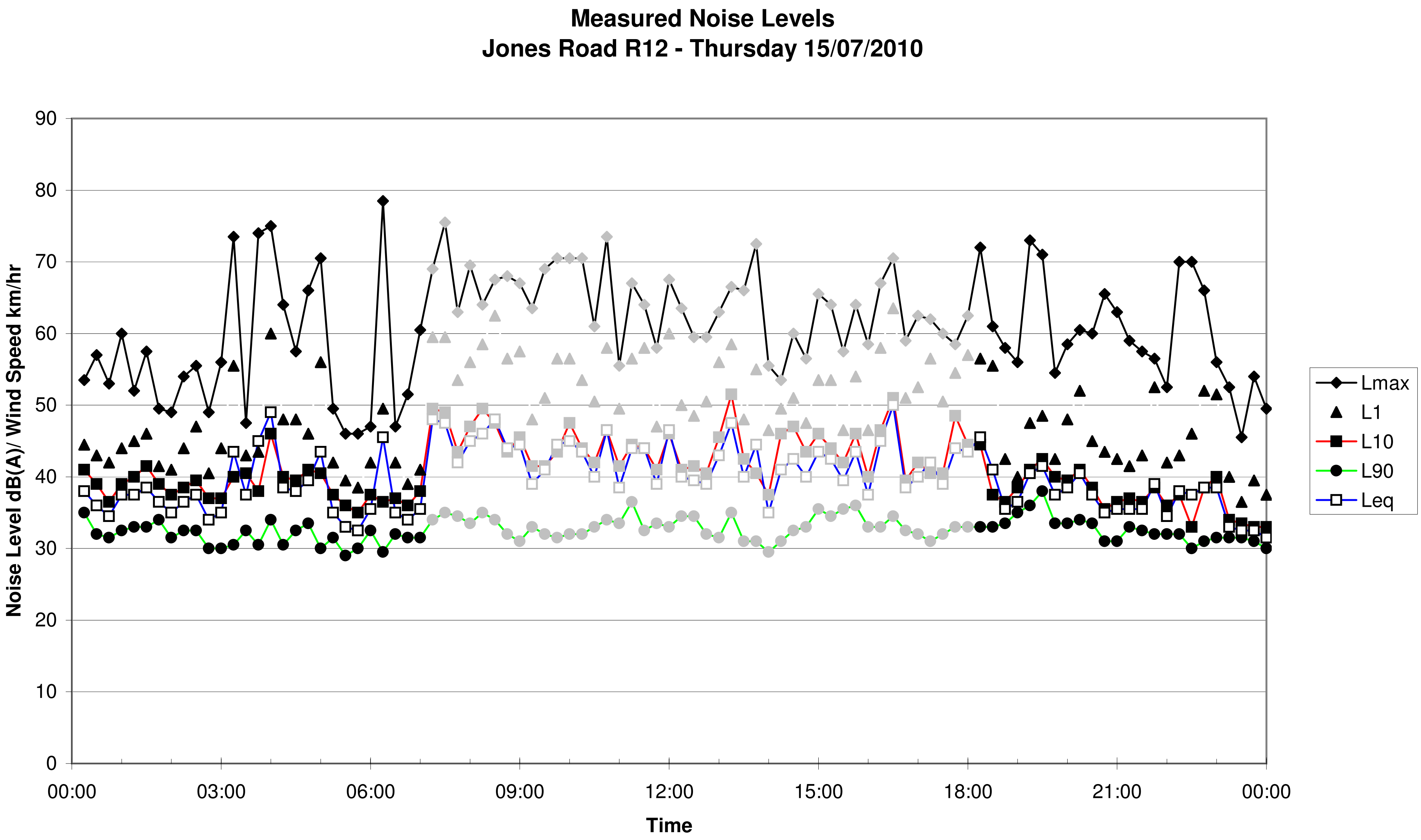


Measured Noise Levels
Jones Road R12 - Monday 12/07/2010
Noise Level dB(A)/ Wind Speed km/hr
90
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq

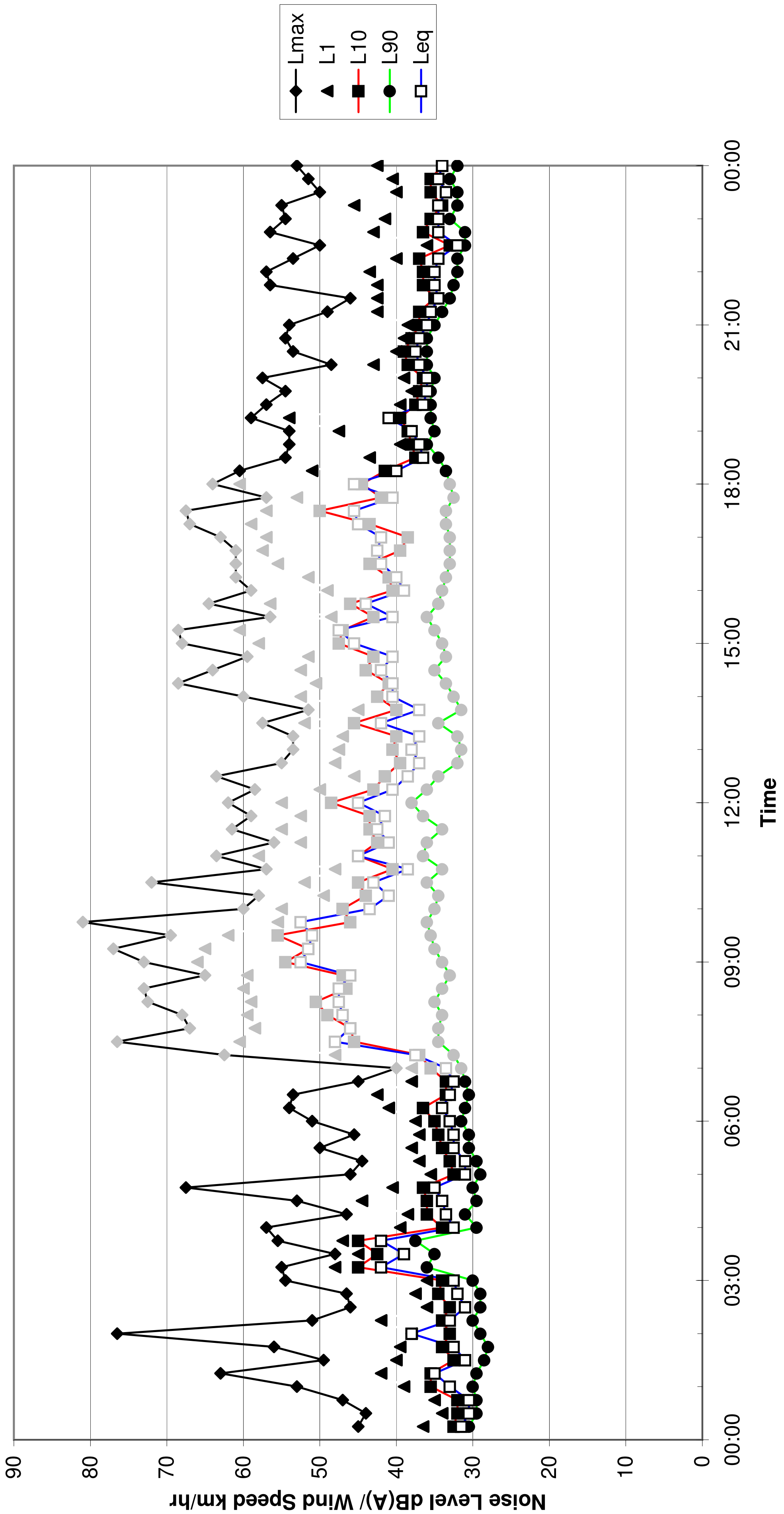

Measured Noise Levels
Jones Road R12 - Tuesday 13/07/2010
Noise Level dB(A)/ Wind Speed km/hr
0
10
20
30
40
50
60
70
80
90
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq

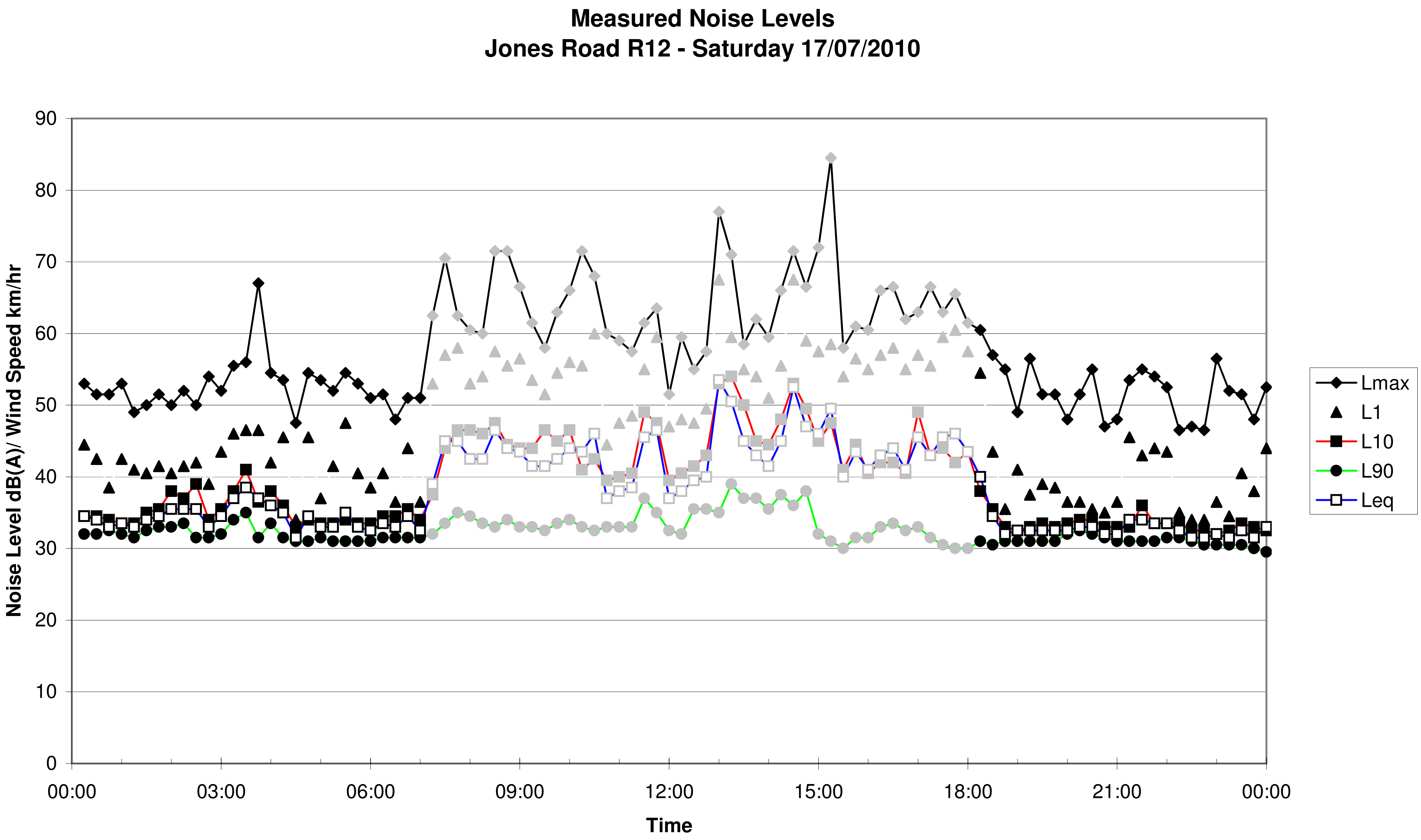


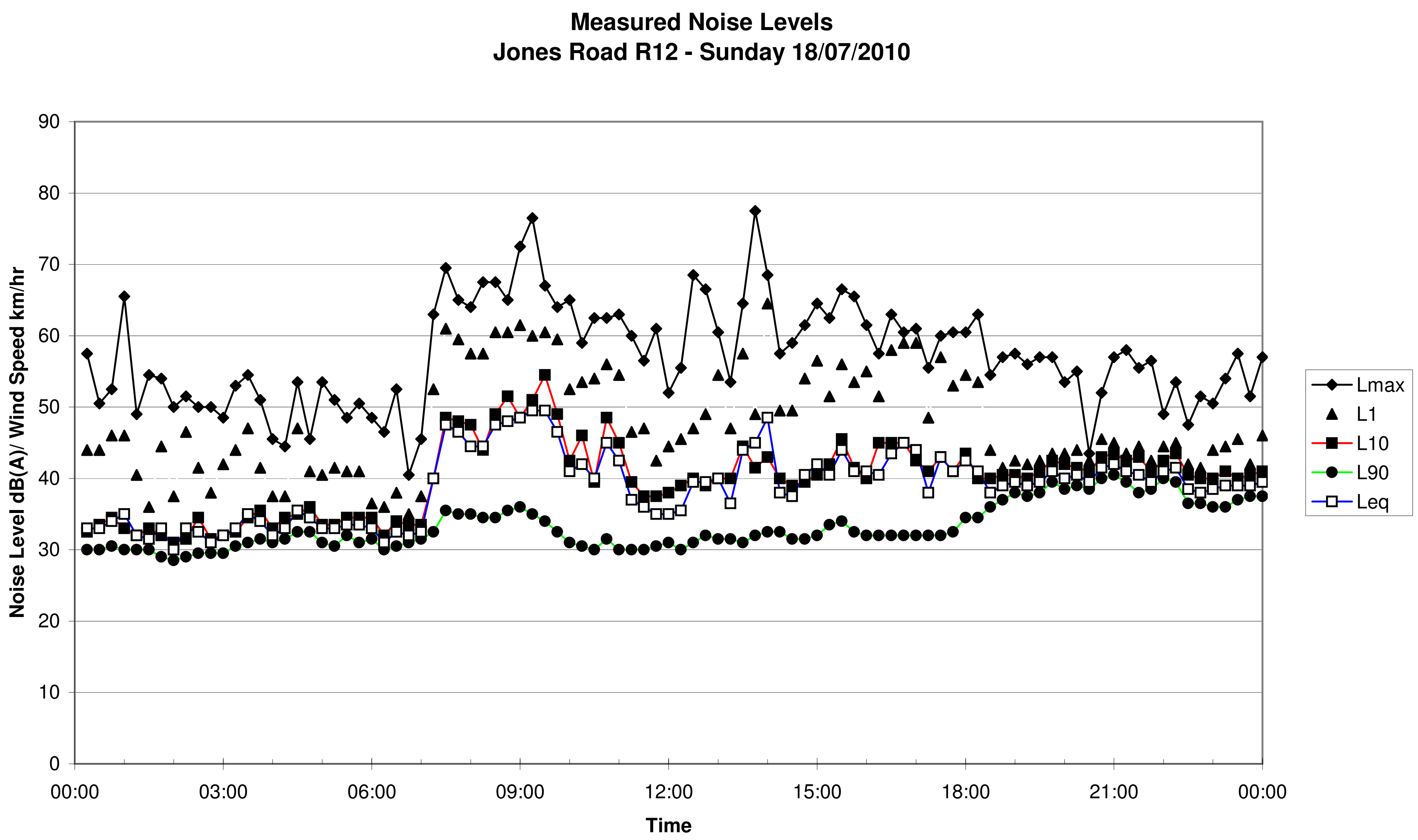
Measured Noise Levels
Jones Road R12 - Wednesday 14/07/2010
Noise Level dB(A)/ Wind Speed km/hr
90
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq

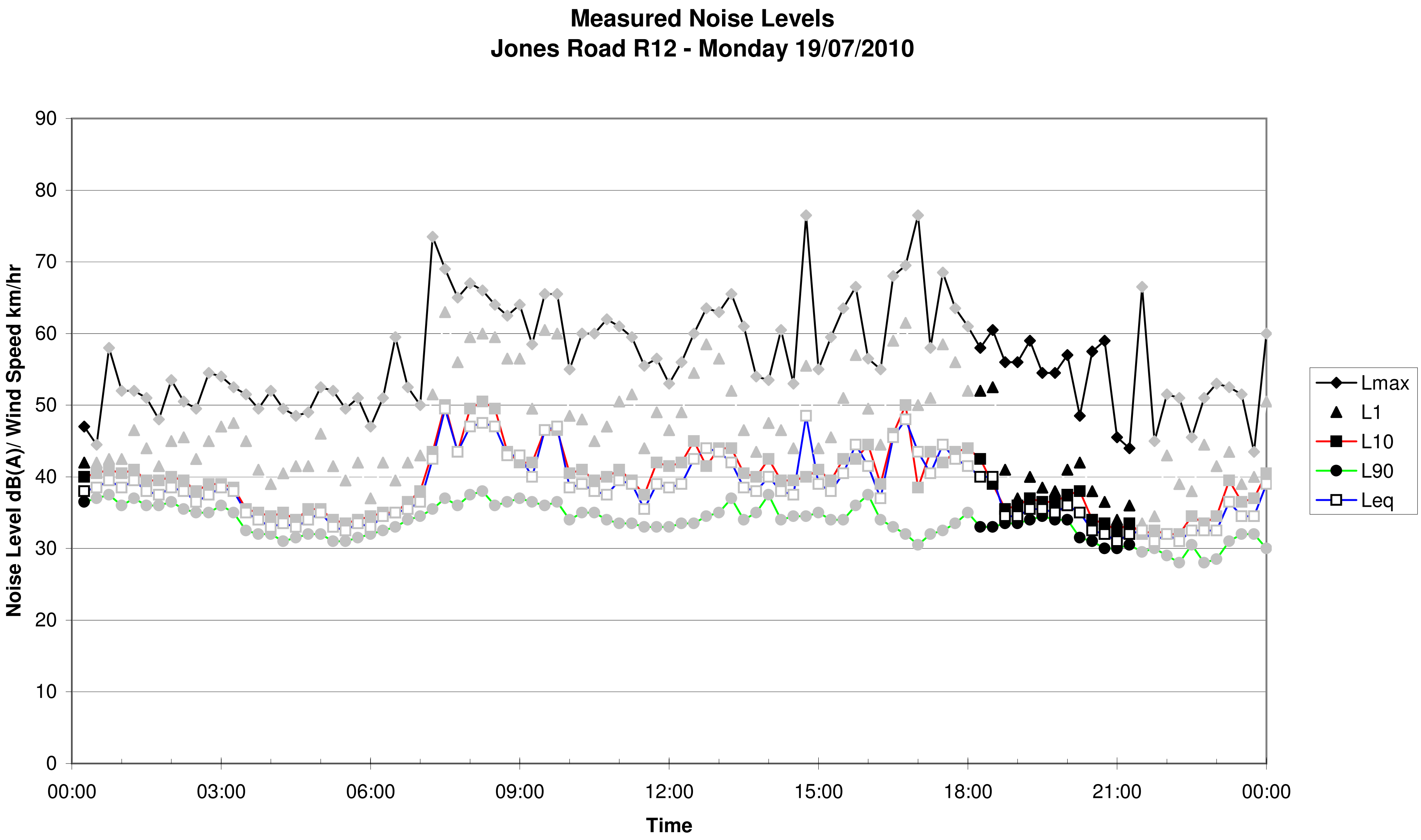

Measured Noise Levels
Jones Road R12 - Thursday 15/07/2010
Noise Level dB(A)/ Wind Speed km/hr
0
10
20
30
40
50
60
70
80
90
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq

Measured Noise Levels
Jones Road R12 - Friday 16/07/2010



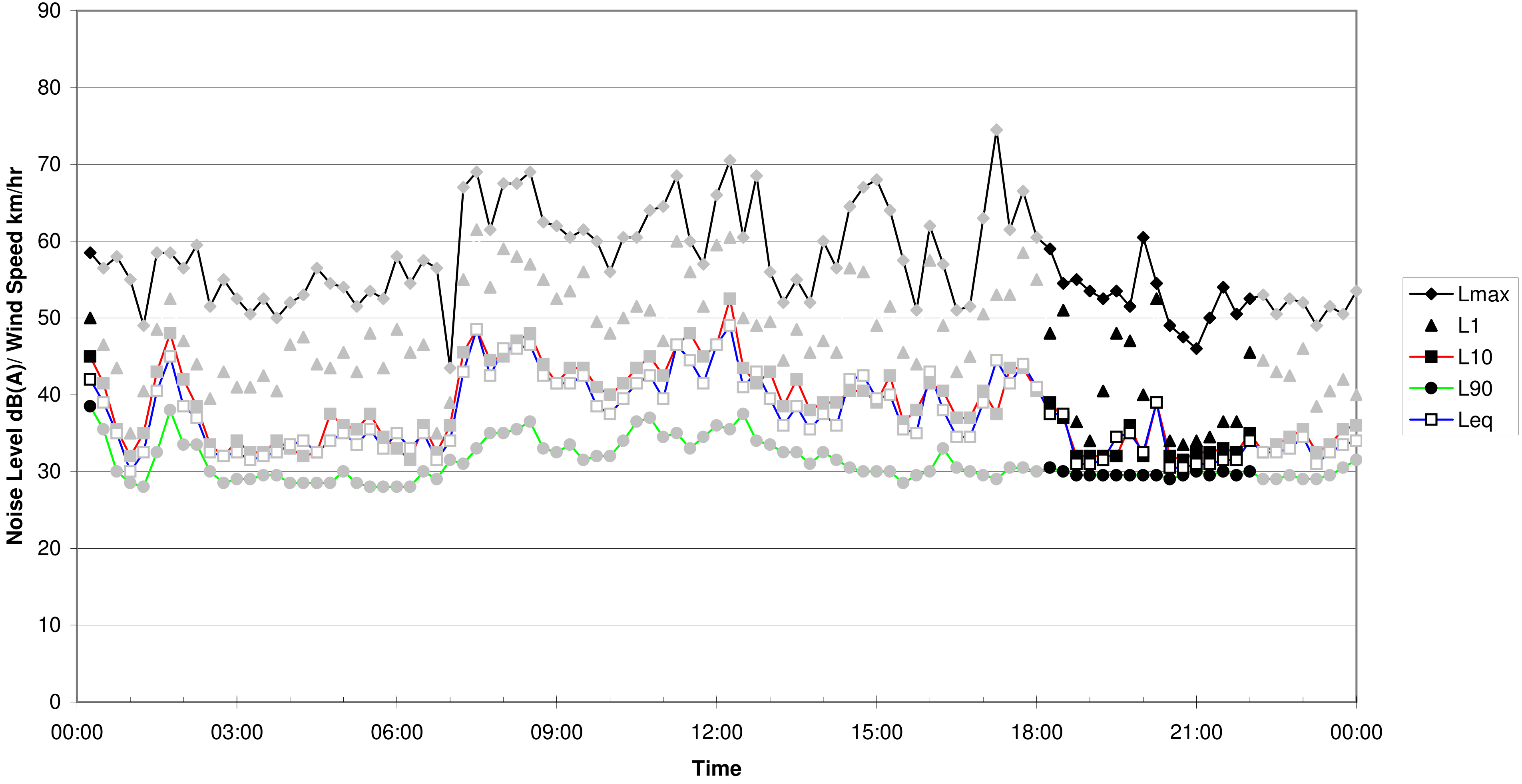

Measured Noise Levels
Jones Road R12 - Saturday 17/07/2010
Noise Level dB(A)/ Wind Speed km/hr
90
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq

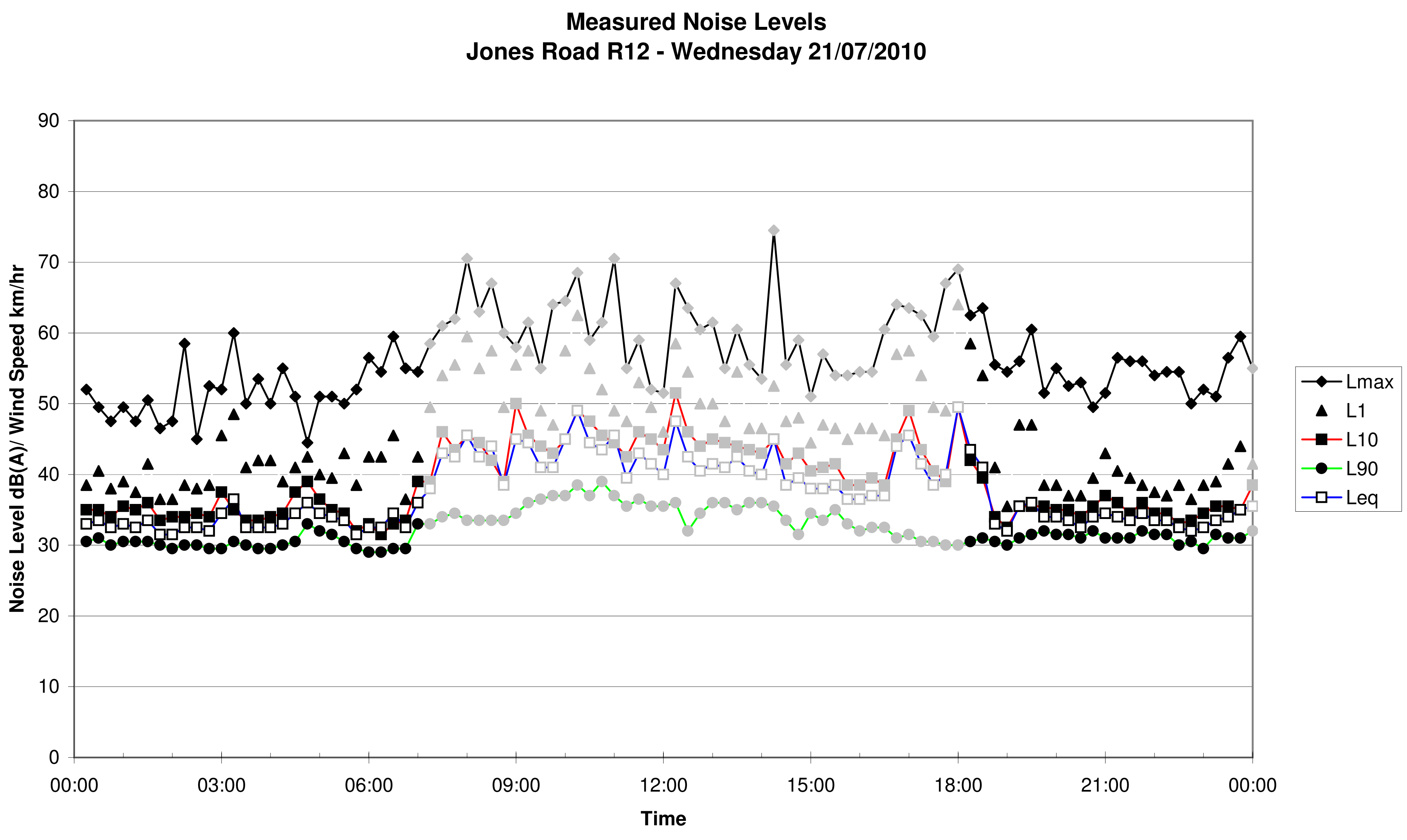

Measured Noise Levels
Jones Road R12 - Sunday 18/07/2010
Noise Level dB(A)/ Wind Speed km/hr
90
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq

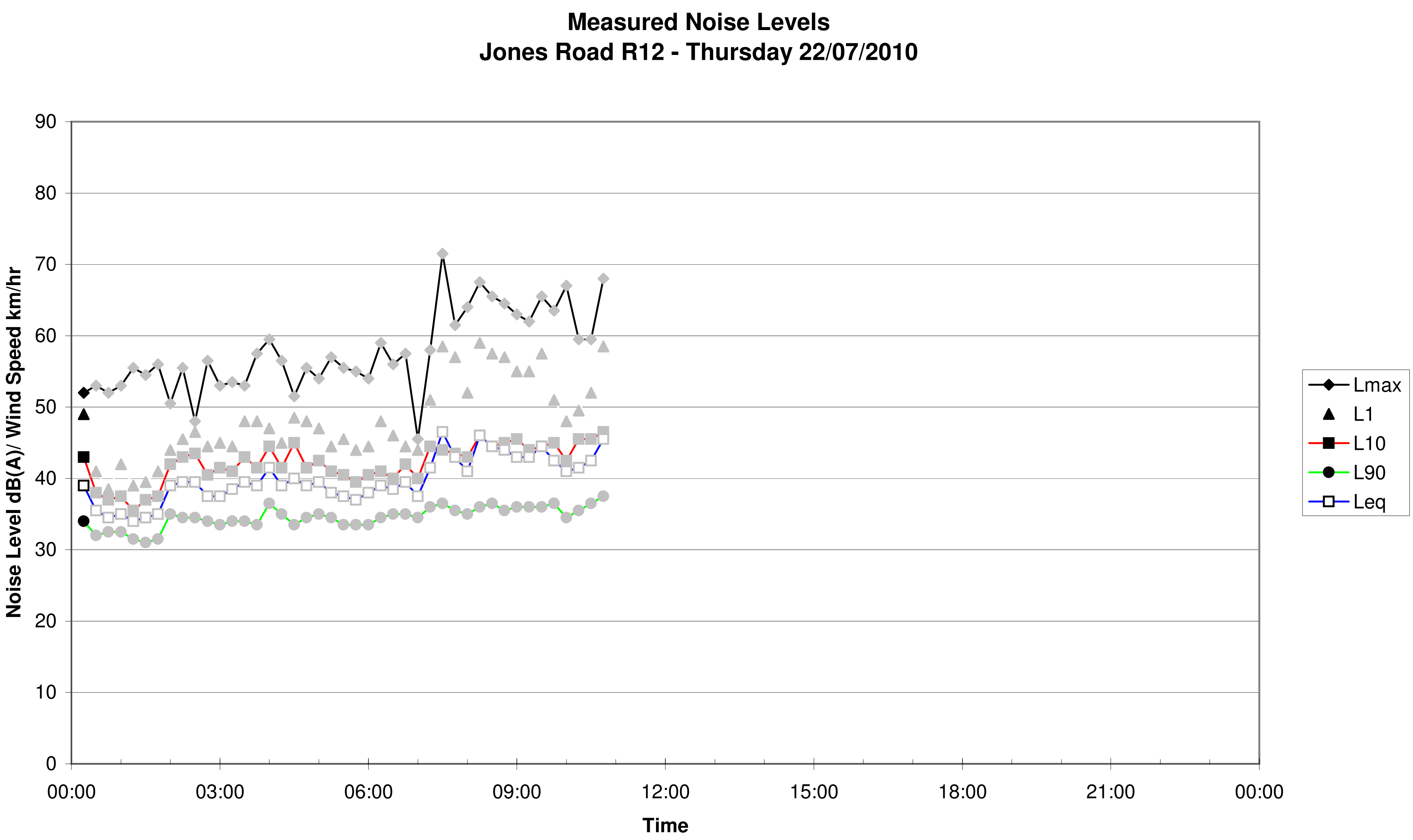


Measured Noise Levels
Jones Road R12 - Monday 19/07/2010
Noise Level dB(A)/ Wind Speed km/hr
90
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq

Measured Noise Levels
Jones Road R12 - Tuesday 20/07/2010




Measured Noise Levels
Jones Road R12 - Wednesday 21/07/2010
Noise Level dB(A)/ Wind Speed km/hr
0
10
20
30
40
50
60
70
80
90
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq



Measured Noise Levels
Jones Road R12 - Thursday 22/07/2010
Noise Level dB(A)/ Wind Speed km/hr
90
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
Time
Lmax
L1
L10
L90
Leq

Attachment 5: Meteorological Conditions

Temperature Inversion Assessment - Long-term Winter Nights Page 1
Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05060101	17.5	6.2	190.5	D	9	0
05060201	13.5	2.7	185.5	D	12.5	0
05060301	15.45	3.25	226.5	E	5	0
05060401	13.35	2.3	207.5	D	10.5	0
05060501	13.65	1.3	206.5	D	5	0
05060601	13.6	1.15	206	D	3.5	0
05060701	16	3.8	216	E	8.5	0
05060801	16.3	2.95	216.5	E	27.5	0
05060901	15.6	2.55	191.5	D	15	0
05061001	16.4	2.6	207.5	F	43.5	1
05061101	14.2	0.15	204.5	E	9.5	0
05061201	19.1	0.4	173	D	14	0
05061301	19	3.7	305.5	E	4	0
05061401	19.1	3.45	325	E	6.5	0
05061501	19.8	3.25	318.5	D	18.5	0
05061601	13.8	2.75	223	D	21	0
05061701	7.5	1.9	226.5	E	8.5	0
05061801	6.85	0.15	112	E	21	0
05061901	15.2	4.7	331	D	9	0
05062001	16.75	3.9	335	D	9.5	0
05062101	16.2	4.1	342	E	7	0
05062201	12.4	3.95	326	E	6	0
05062301	8.15	2.5	248	D	18	0
05062401	5.35	1.95	244	E	20	0
05062501	14.7	5.55	215	D	10	0
05062601	14.65	2.3	177	F	34	1
05062701	14.65	4.25	198	D	11	0
05062801	15	4.15	191	E	7	0
05062901	18.25	8.1	69.5	D	15.5	0
05063001	20.25	8.8	35.5	D	12.5	0
05070101	19.1	5.4	338	D	8.5	0
05070201	16.9	1	190	F	67.5	1
05070301	15.1	3.65	225.5	D	12	0
05070401	15.4	3.95	205	E	8.5	0
05070501	15.45	4.15	214	E	6	0
05070601	16.6	2.35	169	E	16.5	0
05070701	11.15	2.05	195.5	F	4.5	1
05070801	13.9	2.35	302.5	E	17.5	0
05070901	13.1	2.05	252	E	5	0
05071001	14.75	3.35	257	D	18.5	0
05071101	14.15	4.85	226	D	10	0
05071201	14.9	6.25	205.5	D	8.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05071301	14.15	2.6	207.5	D	22.5	0
05071401	13.5	0.95	219.5	D	11	0
05071501	9.35	2	245	E	18	0
05071601	8.4	1.75	228	E	19.5	0
05071701	9.1	1.3	259	F	31.5	1
05071801	7.9	2	203.5	F	4.5	1
05071901	13	4.3	215.5	E	8	0
05072001	12.95	5.4	205.5	D	10	0
05072101	15.15	5.15	189.5	D	14.5	0
05072201	14.45	3.75	202.5	E	9	0
05072301	14.35	2.7	204	D	12.5	0
05072401	12.5	1.8	206.5	D	20.5	0
05072501	12.65	1.7	229.5	F	1	1
05072601	10.35	2.85	252	F	2.5	1
05072701	9.1	1.85	186	F	24	1
05072801	12.05	1.8	200.5	E	5	0
05072901	12.9	0.25	115.5	D	13	0
05073001	13.4	1.1	152	E	5.5	0
05073101	12.3	1.55	220.5	F	3	1
05080101	14.35	0.5	107.5	E	16	0
05080201	15.6	2.4	180	E	6.5	0
05080301	11.8	1.6	200.5	E	9	0
05080401	12.2	0.85	119.5	F	2.5	1
05080501	15.2	3.45	206	D	18	0
05080601	13.05	5.7	224	D	8.5	0
05080701	10.05	2.7	196.5	D	6.5	0
05080801	10.7	2.45	233	E	7	0
05080901	9.5	2.4	197	E	7.5	0
05081001	10.9	0	0	D	10	0
05081101	9.35	1.9	232.5	D	14.5	0
05081201	6.9	1.45	210	E	19	0
05081301	9.9	3.45	197	E	8	0
05081401	12.5	3.95	205	E	8.5	0
05081501	11.05	2.05	175.5	E	8.5	0
05081601	10.9	1.25	204.5	D	15	0
05081701	13.4	3.5	199	D	11	0
05081801	11.3	2.4	227.5	E	6	0
05081901	10.8	2.1	195	E	8.5	0
05082001	15.2	3.8	320.5	E	5	0
05082101	12.85	2.9	214.5	E	22.5	0
05082201	10.35	2.5	257.5	F	4.5	1
05082301	10.3	2	210	D	13.5	0
05082401	13.4	3.95	205.5	E	5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05082501	14.6	4.2	206.5	E	6	0
05082601	15.1	3.75	216.5	E	5.5	0
05082701	15.65	4.85	194	E	7	0
05082801	13.6	6.3	199.5	D	13	0
05082901	14.15	3.8	208.5	E	8.5	0
05083001	15.5	3.7	136.5	D	32	0
05083101	17.3	4.95	10.5	D	26	0
06060101	6.3	1.6	220.5	F	23	1
06060201	8.45	2	234	D	12.5	0
06060301	12.8	3.95	278	D	11	0
06060401	14.05	2.4	281.5	D	21	0
06060501	14.9	5	213.5	D	8	0
06060601	11.5	2.1	209.5	D	13.5	0
06060701	11.35	2.65	179.5	D	11	0
06060801	14.5	3.85	202	E	8.5	0
06060901	16.7	4.95	204.5	D	7.5	0
06061001	16.45	3.7	182.5	D	24	0
06061101	21	7.4	349.5	D	10	0
06061201	13.35	6.55	212	D	9	0
06061301	14.85	5.25	211	D	9.5	0
06061401	15.3	4.15	201	E	8.5	0
06061501	13.3	1.95	188	D	11.5	0
06061601	11.45	2.65	239.5	F	4	1
06061701	13.8	4.85	195	E	8	0
06061801	14.1	4.6	210	D	10.5	0
06061901	14.5	3.6	197.5	D	13.5	0
06062001	14.15	3.95	165	E	6	0
06062101	14.1	2.15	282	D	12.5	0
06062201	14.1	3.15	205.5	E	9.5	0
06062301	14.9	3	181	D	13	0
06062401	14.4	2.1	163.5	D	16.5	0
06062501	13.95	1.2	206	D	13.5	0
06062601	13.5	2.5	177.5	E	9	0
06062701	12.4	3.85	190.5	E	8	0
06062801	11.8	2.35	180.5	D	15.5	0
06062901	15.05	3.35	188	E	8	0
06063001	15.4	1.75	197	D	13	0
06070101	15.1	3.4	318.5	E	7.5	0
06070201	10.25	1.3	189	D	15.5	0
06070301	11.65	1.9	223.5	D	6.5	0
06070401	9.45	2.05	177	D	19	0
06070501	15.45	5.2	200.5	D	8	0
06070601	11.95	1.7	193.5	D	10	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06070701	12.85	3.35	174	E	2.5	0
06070801	11.1	0.75	105.5	F	4	1
06070901	10.05	2	203.5	E	5	0
06071001	12.6	2.55	288.5	D	11.5	0
06071101	12.05	1.9	250.5	E	6.5	0
06071201	13.2	0	160	F	4	1
06071301	10.95	1.8	208	E	6.5	0
06071401	16.35	4.65	197	E	7.5	0
06071501	13.9	2.65	180	D	12.5	0
06071601	17.9	4.85	338	D	11	0
06071701	10.2	2	234	D	24	0
06071801	9.25	2.15	214.5	D	13.5	0
06071901	15	6.8	196.5	D	10.5	0
06072001	13.55	6.5	210.5	D	9	0
06072101	13.95	4.45	195.5	D	10.5	0
06072201	13.1	4.3	191.5	D	19	0
06072301	13.4	3.45	197	E	9	0
06072401	12.05	3.1	237.5	D	10.5	0
06072501	14.1	2.75	234	F	33	1
06072601	14.75	2.3	205	D	11	0
06072701	12.3	1.2	221	D	8	0
06072801	16.05	1.45	204	D	21.5	0
06072901	14.25	0.1	107	E	16.5	0
06073001	11.2	2	214.5	D	15.5	0
06073101	10.35	1.95	289.5	E	20	0
06080101	11.65	1	278	F	23.5	1
06080201	8.2	2.2	199.5	E	9	0
06080301	11.05	1.5	212.5	E	6	0
06080401	13.45	3.4	221.5	E	6	0
06080501	13	4.55	217	D	11.5	0
06080601	15.4	9.35	199	D	10.5	0
06080701	15.5	6.85	201	D	9.5	0
06080801	14.6	5.8	200	D	10.5	0
06080901	16.1	5.9	214.5	D	9.5	0
06081001	13.5	0.55	125	D	57.5	0
06081101	13.25	3.3	242.5	D	12.5	0
06081201	11.25	1.85	204	E	5	0
06081301	13.1	0.2	228	F	4	1
06081401	15	3.15	305.5	E	6.5	0
06081501	12.35	2.05	235	D	11	0
06081601	11.4	2.05	194	E	7.5	0
06081701	10.4	2.05	211	E	6.5	0
06081801	12.35	2.25	261.5	D	13	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06081901	13.05	0	0	D	12	0
06082001	13.45	2.55	215	D	14.5	0
06082101	13.75	1.85	233.5	D	17	0
06082201	13.95	2.6	248	E	5	0
06082301	11.9	1.9	247	D	12	0
06082401	11.1	1	293	F	22.5	1
06082501	18.5	4.25	330	E	7.5	0
06082601	17.05	4.7	180.5	E	8.5	0
06082701	15.5	3.45	205	D	11	0
06082801	18.35	2.6	135	E	24.5	0
06082901	16.35	6.15	207.5	D	10	0
06083001	15.05	2.35	171.5	D	13.5	0
06083101	19	4.3	108.5	D	12	0
07060101	15.75	0.95	203	D	15	0
07060201	18.15	4	205.5	D	10	0
07060301	16.5	1	182	D	8.5	0
07060401	17.7	3.05	234.5	D	7.5	0
07060501	18.15	3.65	209	D	12	0
07060601	16.6	3.35	236	D	14.5	0
07060701	16.6	4.15	308.5	D	13.5	0
07060801	16.15	2.15	247.5	F	32	1
07060901	10.8	5.5	306.5	D	13.5	0
07061001	8	2.3	252.5	E	8	0
07061101	12.25	1.15	197	D	10.5	0
07061201	11.3	1.05	209	D	15.5	0
07061301	11.05	2.6	231.5	D	19.5	0
07061401	10.7	1.05	217	D	14.5	0
07061501	15.3	3.45	203.5	D	15.5	0
07061601	11.8	1.8	208.5	D	11	0
07061701	6.85	0.8	116	F	29.5	1
07061801	16.15	2.65	222.5	D	11	0
07061901	15.9	3.8	319.5	D	13	0
07062001	7.45	3.2	311.5	D	10	0
07062101	10.55	1.55	246	E	17	0
07062201	11.85	4	217.5	D	11.5	0
07062301	13.05	3.05	211.5	D	11.5	0
07062401	13.75	5.9	207.5	D	12.5	0
07062501	15.1	3.8	196.5	D	25.5	0
07062601	16.2	3.2	246.5	D	24.5	0
07062701	12.65	1.6	263.5	D	38.5	0
07062801	7.05	2.75	314.5	D	9.5	0
07062901	11.2	5.45	316	D	12.5	0
07063001	12.8	0.6	271.5	F	47	1

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07070101	9.35	2.15	261.5	F	38	1
07070201	5	1.2	243	E	19.5	0
07070301	8.95	2.8	235.5	D	15	0
07070401	11.6	3.4	240.5	E	6	0
07070501	18.9	5.1	308	D	7.5	0
07070601	11.85	1	82.5	F	77	1
07070701	5.75	1.7	230.5	D	18	0
07070801	7.2	2	239.5	D	21	0
07070901	8.4	2.8	237.5	E	27.5	0
07071001	15.45	5.9	207.5	D	12	0
07071101	11.1	3.15	234.5	E	8	0
07071201	8.6	0.55	223.5	E	21.5	0
07071301	7.2	1.4	213	F	31	1
07071401	8.7	1.75	166.5	F	53.5	1
07071501	9.5	2.85	234	E	9	0
07071601	12.45	4.4	208.5	D	12	0
07071701	11.4	1.7	218.5	D	10.5	0
07071801	4.35	1.9	245	E	18.5	0
07071901	9.8	4.15	193	E	9.5	0
07072001	5.1	2.1	212	D	13	0
07072101	9.65	2.5	216.5	D	14.5	0
07072201	14.65	5.65	194	D	13	0
07072301	14.25	4.1	189	D	14.5	0
07072401	14.3	1.35	173	F	26.5	1
07072501	9.95	0.75	225	E	18	0
07072601	10.4	1.35	220.5	D	15.5	0
07072701	10.5	1.25	222	E	16	0
07072801	9.7	2.5	247.5	F	4	1
07072901	6.55	0.75	121	E	16.5	0
07073001	11.6	1.65	220	E	20.5	0
07073101	11.65	2.15	251.5	D	9.5	0
07080101	13.6	3.4	295	D	7	0
07080201	12.8	1.9	354	D	13.5	0
07080301	16.45	3.55	329	E	9.5	0
07080401	15.75	1.9	192	E	16	0
07080501	10.15	2.85	234.5	E	9.5	0
07080601	6.45	1.65	218.5	E	21.5	0
07080701	8.05	2.1	222	D	13	0
07080801	11.05	3.05	298	E	6.5	0
07080901	15.2	2.9	309	E	5	0
07081001	11.55	1.75	251.5	E	6	0
07081101	10.1	2.6	284.5	F	35.5	1
07081201	8.6	1.6	190.5	F	29.5	1

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07081301	11.1	1.2	221.5	D	11.5	0
07081401	16.85	3.7	203.5	D	9.5	0
07081501	15.2	1.8	213.5	D	11.5	0
07081601	15.65	1.75	231.5	F	25.5	1
07081701	16.85	2.95	315	E	8.5	0
07081801	17	1.75	172	D	11.5	0
07081901	17.65	3.4	204.5	D	12	0
07082001	15.55	3.35	192.5	E	35	0
07082101	14.2	0.65	118	F	44.5	1
07082201	16.45	10.8	166	D	11	0
07082301	16.95	8.4	147.5	D	10.5	0
07082401	17.5	7.55	138	D	9.5	0
07082501	16.4	4.35	193	D	11	0
07082601	15.5	3.45	224.5	E	9	0
07082701	15.8	3.75	203	D	11.5	0
07082801	11.65	1.75	235	E	7	0
07082901	10.8	1.25	308	F	23	1
07083001	12.3	1.4	221	D	12	0
07083101	12.45	1.05	219.5	D	15.5	0
08060101	17.1	3.85	186.5	E	9	0
08060201	17.3	4.45	158.5	D	27.5	0
08060301	20.65	6.8	82.5	D	12.5	0
08060401	15.9	1.55	209.5	F	43	1
08060501	15.65	1.2	246	E	7.5	0
08060601	14.9	1.85	242	E	8.5	0
08060701	15.4	1.35	207.5	D	17	0
08060801	16.5	6.3	201.5	D	12	0
08060901	17.4	3.85	174	D	25.5	0
08061001	16.05	2.4	204	D	10	0
08061101	15.75	1.75	175.5	D	13.5	0
08061201	17.15	1.4	310.5	F	45	1
08061301	16.4	2.5	292	E	8	0
08061401	11.35	2.95	229	D	17	0
08061501	14.4	4.7	211.5	D	13	0
08061601	17.05	5.1	203	D	14	0
08061701	17.05	3.3	197.5	D	8.5	0
08061801	16.85	3.4	208.5	D	12	0
08061901	16.25	1.65	197.5	E	20.5	0
08062001	15.95	3.1	288.5	E	5.5	0
08062101	12.55	3.35	233	E	5.5	0
08062201	10.2	2.9	234	E	7	0
08062301	13.25	4	236	E	9	0
08062401	9.35	2.1	214.5	E	9	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08062501	10.7	1.75	166.5	D	12	0
08062601	10.65	2.5	248.5	F	4	1
08062701	8.7	2.2	207	D	12	0
08062801	10.55	1.5	214.5	E	6	0
08062901	11.5	2.25	207.5	F	26.5	1
08063001	12.05	0.9	217.5	E	9.5	0
08070101	13	1.65	247.5	D	6	0
08070201	10.05	2.2	240	D	19	0
08070301	8.55	1.1	206.5	D	14.5	0
08070401	11.8	1.65	215.5	E	9	0
08070501	14	4	200	D	15.5	0
08070601	13.95	2.45	201	F	30.5	1
08070701	13	2.2	200.5	E	17.5	0
08070801	14.6	0	0	F	1	1
08070901	10.8	2.25	226.5	E	9.5	0
08071001	9.85	3.6	290.5	D	14	0
08071101	6	1.45	229	D	26.5	0
08071201	7.5	1.45	208.5	D	18.5	0
08071301	11.4	1.65	212.5	F	27	1
08071401	15.6	0.3	101.5	D	13	0
08071501	19.1	3.1	315.5	D	14	0
08071601	17.05	2.9	335	D	13.5	0
08071701	13.55	1.85	219.5	E	16	0
08071801	10.95	0.75	222	E	21	0
08071901	9.3	1.9	278	F	29	1
08072001	9.15	0.95	231	D	12.5	0
08072101	17.15	4.1	315.5	D	11	0
08072201	10.85	1.3	7	F	80	1
08072301	14.75	5.5	201	D	11.5	0
08072401	13.75	4.05	194.5	D	15	0
08072501	15.55	7.1	141	D	11	0
08072601	13.4	5.5	212.5	D	15.5	0
08072701	7.95	1.2	222	E	19.5	0
08072801	7.8	2.5	249.5	D	13	0
08072901	10.5	3.55	236	D	16.5	0
08073001	10.95	1.9	170.5	F	40	1
08073101	6.4	1.55	233.5	D	14.5	0
08080101	8.3	0.45	228.5	F	46.5	1
08080201	21.05	6.1	226.5	D	14.5	0
08080301	9.15	1.45	252.5	F	40.5	1
08080401	10.5	1	232.5	D	6	0
08080501	10.1	2.5	310	D	22.5	0
08080601	9.9	1.05	177	F	26.5	1

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08080701	9	3.15	238.5	E	6	0
08080801	8	1.35	226.5	F	27	1
08080901	6.9	2.95	229	E	6	0
08081001	6.2	1.65	232.5	D	15	0
08081101	5.45	2.05	243	D	10.5	0
08081201	6.3	2.8	252.5	D	13	0
08081301	7.9	2.65	254.5	D	10.5	0
08081401	6.9	0.9	210	D	12.5	0
08081501	5.75	1.2	211	F	26	1
08081601	6.6	1.05	240	F	32	1
08081701	8.2	1	295.5	F	31	1
08081801	10.8	2.9	225.5	D	5.5	0
08081901	5.35	0.55	225.5	D	16	0
08082001	11.75	2	229	D	12.5	0
08082101	8.85	1.55	245	F	3	1
08082201	13.4	0.35	98.5	E	21	0
08082301	12.85	3.25	246	D	14.5	0
08082401	13.6	6	189	D	12.5	0
08082501	13.35	3.4	211.5	D	11.5	0
08082601	11.95	2.75	225.5	D	15.5	0
08082701	15.2	3.2	315	D	11	0
08082801	14.55	3.7	212.5	D	16	0
08082901	14.3	2.4	174	D	12.5	0
08083001	16.2	2.2	325.5	E	5.5	0
08083101	17.6	3	324	E	7.5	0
09060101	18.5	6.35	129.5	D	9	0
09060201	14.85	3.1	219.5	D	12.5	0
09060301	14.8	1.95	194.5	E	9	0
09060401	15.65	0.95	177.5	F	32.5	1
09060501	14.85	0	0	D	11.5	0
09060601	12.7	2.05	242.5	D	14.5	0
09060701	12.9	0.9	245	D	11	0
09060801	12.45	3.7	271.5	D	11.5	0
09060901	10.5	2.15	191.5	E	20.5	0
09061001	8.4	3.45	247.5	E	5	0
09061101	6	1.6	304	D	28.5	0
09061201	5.1	1.55	227.5	D	10	0
09061301	8.6	0.9	224.5	E	21	0
09061401	9.05	0.6	218.5	E	8	0
09061501	11.4	1.45	313	D	11.5	0
09061601	12.25	2.8	235.5	E	7.5	0
09061701	10.15	1.5	204.5	D	10.5	0
09061801	14.8	4.8	209.5	D	12.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
09061901	14.75	4.2	198	D	12	0
09062001	15.1	5.4	197	D	12	0
09062101	17.95	3.75	125.5	D	23.5	0
09062201	19.3	8.3	54.5	D	8	0
09062301	15.4	6.25	199	D	12.5	0
09062401	12.1	0.7	272.5	D	13	0
09062501	10.25	1.3	148	F	47	1
09062601	15.6	2.55	330	D	13	0
09062701	14.3	3.35	312	D	10.5	0
09062801	10.65	1.3	221	F	29.5	1
09062901	8.8	0.15	64	F	57	1
09063001	8.8	1.6	223.5	D	10.5	0
09070101	14.3	3.5	325	E	5	0
09070201	14.75	2.15	340	F	34.5	1
09070301	11.45	2.65	243	D	15.5	0
09070401	8.6	2.5	307.5	D	22	0
09070501	6.6	1.35	279	D	23.5	0
09070601	8.3	1.85	220.5	D	12.5	0
09070701	12.8	1.5	123	D	15	0
09070801	13.9	6.25	207	D	12.5	0
09070901	13.5	4.65	203.5	D	11.5	0
09071001	13.15	6.85	194.5	D	11.5	0
09071101	13.9	5.35	222.5	D	12	0
09071201	12.3	2.7	236.5	E	26.5	0
09071301	13.4	3.2	321.5	E	6	0
09071401	11.8	2.25	235	D	15.5	0
09071501	7.25	2.75	234.5	D	9.5	0
09071601	9.6	2.95	298	D	16.5	0
09071701	8.65	1.7	281	F	35.5	1
09071801	13.45	3.8	195.5	D	11.5	0
09071901	11	0.95	221	E	8	0
09072001	11.8	1.5	204.5	E	9	0
09072101	10.7	2	239.5	E	6	0
09072201	10.6	1.4	247.5	F	2.5	1
09072301	17.55	7.1	328.5	D	10	0
09072401	15.4	3.75	225.5	D	14	0
09072501	13.95	3.95	220.5	D	10.5	0
09072601	10.65	1.2	117	E	19	0
09072701	15.5	3.1	306.5	D	12	0
09072901	10.8	1.6	215	D	3	0
09073101	10.6	2.1	240	F	1	1
09080101	9	1.7	224	F	3	1

09080201	10.1	0.85	214	F	3	1

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
09080301	10.8	1.65	229	F	4	1
09080501	11.8	2	218	F	23	1
09080601	12.5	2.3	199	E	5	0
09080701	11.5	0.3	107.5	F	3	1
09080801	14.85	2.8	309	D	11	0
09080901	13.05	3.9	207	D	7	0
09081001	9.85	1.6	218	D	14.5	0
09081101	10.4	1.05	211	F	4	1
09081201	17.4	6.9	350	D	8	0
09081301	17.65	6.7	327	D	7	0
09081401	12.7	2.1	222.5	D	14	0
09081601	15.3	3.2	296	E	5	0
09081801	20	4.1	207	E	8	0
09082101	14.4	3.1	305	E	2	0
09082201	19.1	7	332.5	D	7	0
09082401	19.6	2.4	355	E	5	0
09082901	15.3	2.5	249	F	4	1
09083001	20.1	5.9	14	D	4.5	0
09083101	19.1	3.3	183	D	13	0
05060102	17.5	6	196	D	8	0
05060202	14.8	3.35	198.5	D	11.5	0
05060302	15.35	2.6	205.5	D	17	0
05060402	13.8	2.1	214	E	8	0
05060502	13.5	1.25	211	D	12	0
05060602	12.95	2.05	189	E	7.5	0
05060702	16.05	4.15	211	D	11	0
05060802	16.1	3.5	204	D	20.5	0
05060902	14.6	1.8	182.5	E	8	0
05061002	15.6	2.9	215	D	14	0
05061102	13.75	1.55	203.5	D	14	0
05061202	19.15	2.9	336	D	11	0
05061302	18.75	3.1	305.5	E	7	0
05061402	19.05	3.45	326	E	8	0
05061502	19.55	2.8	334	D	8.5	0
05061602	14.45	3.15	204.5	D	15.5	0
05061702	7.05	1.15	233.5	E	19.5	0
05061802	6.85	0.7	192.5	D	10	0
05061902	15	4.35	309.5	E	7.5	0
05062002	17.25	4.8	332.5	E	8	0
05062102	15.1	3.4	309.5	D	12	0
05062202	12.05	4.1	330	E	4	0

05062302	7.65	2.95	285.5	E	8.5	0
05062402	5.2	2.1	242	E	16.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05062502	14.4	6.9	219.5	D	10	0
05062602	14.5	4.6	202	D	8.5	0
05062702	14.6	4.4	206.5	E	9.5	0
05062802	15.25	4.55	181.5	D	13	0
05062902	18.9	8.55	70.5	D	12	0
05063002	19.9	8.35	29	D	11.5	0
05070102	18.65	5.05	324	D	8	0
05070202	16.2	1.05	158.5	F	3.5	1
05070302	15.05	3.65	243	D	13	0
05070402	15.15	4.1	219.5	D	10	0
05070502	15.05	4	202	E	7.5	0
05070602	16.2	2.15	172.5	E	8.5	0
05070702	10.55	1.7	204.5	D	11.5	0
05070802	13.5	2.9	310.5	E	6.5	0
05070902	12.8	0.1	127.5	D	1	0
05071002	13.75	2.3	267.5	D	12	0
05071102	13.9	4.55	231	D	10.5	0
05071202	14.75	5.05	215.5	D	9	0
05071302	14.2	2.7	250	D	12.5	0
05071402	14	1.15	228.5	E	7.5	0
05071502	9.2	2.85	238.5	E	6	0
05071602	8.05	0.95	212	F	31	1
05071702	8.65	2.6	258.5	D	20	0
05071802	7.95	2.1	208.5	F	4	1
05071902	12.85	3.9	206.5	D	7	0
05072002	12.65	5.4	205.5	D	7.5	0
05072102	15.05	5.65	197.5	D	9.5	0
05072202	14.45	4.4	198	E	7.5	0
05072302	14.65	3	182	E	6	0
05072402	11.9	1.7	219.5	E	8	0
05072502	13.1	2.05	232	E	7	0
05072602	10.05	1.7	227.5	E	6	0
05072702	9.3	1.85	225.5	D	11.5	0
05072802	11.95	2.2	218	E	6	0
05072902	12.1	1.45	258	F	30	1
05073002	11.95	0.7	293	E	18	0
05073102	12.15	0.25	105.5	F	2	1
05080102	13.2	0.1	108.5	D	10.5	0
05080202	15.95	2.5	199.5	D	6	0
05080302	12.15	1.7	199.5	D	5	0

05080402	12.15	0.6	222.5	F	1.5	1
05080502	14.2	1.8	223.5	F	34	1
05080602	13	5.8	218	D	9	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05080702	10.1	1.4	217	E	9	0
05080802	9.35	2.45	241	D	10	0
05080902	9.15	2.1	202	E	7	0
05081002	10.35	0	0	F	3	1
05081102	9.2	2.5	221	F	34.5	1
05081202	7.5	3.2	154.5	D	10.5	0
05081302	9.65	4.2	199.5	D	7	0
05081402	12.3	3.65	203.5	D	12	0
05081502	10	1.7	188	E	9	0
05081602	11.1	2.35	246.5	D	13.5	0
05081702	13.2	3.6	196.5	E	9.5	0
05081802	11.45	2.2	216.5	D	13.5	0
05081902	10.65	2	203.5	D	13	0
05082002	15.35	3.65	313.5	E	6.5	0
05082102	12.25	3.25	200	D	18	0
05082202	9.85	2.5	238.5	F	4.5	1
05082302	9.9	2.15	212.5	E	5	0
05082402	12.9	2.15	191.5	D	15	0
05082502	14.35	3.85	212.5	E	6	0
05082602	14.2	2.95	210	D	6.5	0
05082702	15.45	5.3	192	D	7.5	0
05082802	14	7.55	204.5	D	9	0
05082902	14.15	2.35	195.5	F	26	1
05083002	15.1	3.35	172	E	9	0
05083102	13.65	2.5	261	D	11	0
06060102	6.45	1.7	275.5	F	59.5	1
06060202	7.25	2.1	232.5	D	11.5	0
06060302	9	2.25	209.5	F	32	1
06060402	12.25	0.9	307	F	52	1
06060502	14.95	5	213.5	D	8.5	0
06060602	11.35	2.5	209.5	D	10	0
06060702	11.25	3.95	207	E	9.5	0
06060802	14.25	3.95	203.5	E	7	0
06060902	16.55	5.7	209	D	9	0
06061002	16.7	2.45	179.5	E	25.5	0
06061102	20.35	6.15	337.5	D	10	0
06061202	13.6	6.7	206.5	D	10.5	0
06061302	15.15	5.55	207	D	9	0
06061402	14.75	2.85	166	E	24	0

06061502	13.7	2.2	188.5	D	15.5	0
06061602	11.5	2.25	231.5	F	4.5	1
06061702	12.35	3.9	210.5	D	12.5	0
06061802	14.05	4.35	202	D	11	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06061902	14.35	3.45	190	D	10	0
06062002	13.8	2.8	169	D	15.5	0
06062102	14.2	2.25	240.5	F	30	1
06062202	14.2	3.45	179.5	D	19.5	0
06062302	14.55	2.6	233.5	F	35	1
06062402	14.8	3.2	176.5	D	10.5	0
06062502	12.75	0.95	209	D	11.5	0
06062602	13.45	3	178	D	15	0
06062702	12.9	3.8	206.5	E	8.5	0
06062802	11	2.4	196.5	E	5	0
06062902	14	3.3	191.5	D	13	0
06063002	14.55	2.35	191.5	D	12.5	0
06070102	14.85	2.95	318	D	10	0
06070202	10	1.9	190	D	10.5	0
06070302	10.8	2	224.5	D	11	0
06070402	9.9	1.1	205	D	11	0
06070502	15.2	5.5	198.5	D	8	0
06070602	12.25	1.75	203	D	12.5	0
06070702	13.6	3.9	176	E	6	0
06070802	10.85	0.2	217.5	E	7	0
06070902	10	1.85	214	F	4.5	1
06071002	14.05	3.2	296.5	E	3.5	0
06071102	11.9	1.25	240	E	5	0
06071202	12.55	1.1	267.5	F	39	1
06071302	10.05	2	203	D	9.5	0
06071402	15.95	4.6	197	D	7.5	0
06071502	14.05	3.05	183	E	9	0
06071602	17.85	5.3	336.5	D	13	0
06071702	9.8	1.2	251.5	F	51	1
06071802	8.45	1.55	224	F	40	1
06071902	15.05	7.65	202	D	11	0
06072002	13.45	6.15	211.5	D	10.5	0
06072102	13.25	5.55	204.5	D	10	0
06072202	13.05	4.75	206.5	D	11.5	0
06072302	12.75	2.95	205	D	6.5	0
06072402	12.25	2.15	186.5	D	27.5	0
06072502	14.35	3.8	225.5	D	14.5	0
06072602	14.55	2.25	201	D	10.5	0

06072702	11.5	0.55	217	E	20.5	0
06072802	16.2	0.75	200	D	15.5	0
06072902	13	1.55	255	D	10.5	0
06073002	10.65	2.15	209.5	D	10	0
06073102	9.95	1.7	300.5	E	16	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06080102	10.65	1.45	236	F	23.5	1
06080202	8.1	2.05	200.5	D	10	0
06080302	10.95	0.9	211.5	E	5	0
06080402	13.9	4.75	225.5	E	8	0
06080502	13.2	4.1	213.5	D	12.5	0
06080602	15.15	8.3	200.5	D	12	0
06080702	14.5	6.5	183.5	D	10	0
06080802	14.45	6.75	202	D	10.5	0
06080902	15.45	4.5	214.5	E	8	0
06081002	14.1	2.5	277	F	44	1
06081102	12.9	4.15	237.5	E	6.5	0
06081202	10.95	1.9	202	E	6	0
06081302	12.9	1.4	220	E	5	0
06081402	15.15	3.7	309.5	E	3	0
06081502	12	1.6	216.5	E	6	0
06081602	10.95	1.95	197.5	D	7.5	0
06081702	10	1.85	200	D	3.5	0
06081802	12.15	2.25	255	E	5.5	0
06081902	13.7	0	0	E	7	0
06082002	14.9	3.3	209.5	E	8.5	0
06082102	13.2	1.55	225	D	11.5	0
06082202	13.45	2.25	250	E	7	0
06082302	11.35	2.55	233	D	14	0
06082402	12.55	1.55	278	D	12	0
06082502	18.1	4	332.5	E	6	0
06082602	16.45	3.8	212	D	11.5	0
06082702	15.7	3.6	205	E	8	0
06082802	20	4.2	17	D	10.5	0
06082902	16.1	6.2	200.5	D	8.5	0
06083002	14.7	2.5	194	D	8	0
06083102	18.95	5.05	108.5	D	12.5	0
07060102	15.7	1.15	211	E	6	0
07060202	18.1	4.2	199	D	13	0
07060302	15.9	1.7	210.5	E	17.5	0
07060402	17.4	2.65	234	D	11	0
07060502	17.85	3.9	196.5	D	11.5	0
07060602	16.55	2.45	199.5	D	18.5	0

07060702	16.05	2.95	314	D	21.5	0
07060802	15.75	2.25	262	E	17	0
07060902	10.3	4.7	308	D	13.5	0
07061002	9.75	1.9	221.5	D	17.5	0
07061102	12.1	0	0	E	18	0
07061202	10	0.35	121	F	28.5	1

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07061302	12.35	2.95	197	D	10	0
07061402	9.6	2.25	225	E	5	0
07061502	15.35	3.55	192	D	15	0
07061602	11.3	1	232.5	F	22.5	1
07061702	8.15	2.25	211	F	22.5	1
07061802	16.45	3	218.5	D	12	0
07061902	14.75	3.3	320	E	7	0
07062002	5.85	2.45	251.5	D	15.5	0
07062102	9	0.95	266	E	18	0
07062202	12.1	4.25	211.5	D	13	0
07062302	13.05	3.5	217.5	D	14	0
07062402	13.75	6.4	212.5	D	12.5	0
07062502	15.1	4	199	D	15	0
07062602	16.3	1.55	264.5	F	22.5	1
07062702	11.8	1.15	168.5	F	67	1
07062802	5.6	2.05	275	E	21.5	0
07062902	11.25	4.85	324	D	15	0
07063002	11.65	1.15	199	F	46	1
07070102	7.7	2.2	163	F	35	1
07070202	5.05	1.95	229.5	E	21.5	0
07070302	8.3	0.55	224	D	20	0
07070402	11.6	1.9	226.5	D	15.5	0
07070502	17.85	5	315.5	D	8.5	0
07070602	9.2	1.3	287	F	66	1
07070702	5.9	1.5	226.5	D	13	0
07070802	6.7	2	253.5	E	8	0
07070902	8.65	2.8	243.5	D	17.5	0
07071002	15.45	7.05	206	D	11.5	0
07071102	9.6	2.65	255.5	E	9.5	0
07071202	8.2	2.65	235.5	E	5.5	0
07071302	5.3	0.3	219	F	26	1
07071402	8.25	2.15	295	F	34	1
07071502	7.65	1.9	210	E	16.5	0
07071602	12.2	3.75	213.5	D	12.5	0
07071702	11	1.65	225	D	18	0
07071802	4.15	2.2	247.5	D	11.5	0

07071902	9.6	3.9	194.5	D	11	0
07072002	4.3	2.8	232	D	14.5	0
07072102	11.8	3.2	229	D	11.5	0
07072202	14.45	5.45	196	D	12	0
07072302	13.25	4.1	192	D	14.5	0
07072402	14.05	2.4	154	D	13	0
07072502	9.05	1.7	213.5	F	23	1

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07072602	10.15	1.4	209.5	E	8	0
07072702	9.85	1.85	227	D	15	0
07072802	9.15	2.3	239.5	D	5.5	0
07072902	5.3	1.7	256.5	E	8.5	0
07073002	10.05	2.2	224	E	16	0
07073102	11.45	2.9	234	E	6	0
07080102	14.5	3.5	304	D	10.5	0
07080202	14.35	3	179.5	E	4	0
07080302	15.65	3.45	329	D	10.5	0
07080402	15.75	2.65	173.5	E	8.5	0
07080502	10.25	3.15	206	E	9.5	0
07080602	5.25	0.85	234.5	D	15.5	0
07080702	7.7	0.8	216	E	18	0
07080802	13	3.2	302.5	E	7.5	0
07080902	14.2	2.3	316.5	D	14.5	0
07081002	10	1.75	262	D	11	0
07081102	8.7	2.45	217	D	60.5	0
07081202	7.2	0.15	114	F	31.5	1
07081302	10.6	1.35	218	D	15.5	0
07081402	16.65	4.2	200	D	11	0
07081502	15.7	2.55	201	D	18	0
07081602	17.2	1.7	293.5	F	37	1
07081702	17.7	4.1	328	D	11.5	0
07081802	17.8	2.6	201.5	D	13.5	0
07081902	16.75	3.25	197.5	D	10.5	0
07082002	15.8	4.15	197.5	D	18.5	0
07082102	14.2	0.6	24.5	D	34	0
07082202	16.7	9.95	160.5	D	10.5	0
07082302	15.3	7.6	155.5	D	12.5	0
07082402	17.4	7.6	140	D	9	0
07082502	16.35	4.85	182	E	9.5	0
07082602	15.3	3.65	209.5	D	11	0
07082702	15.1	3.1	225.5	D	10	0
07082802	11.35	1.65	234	E	6	0
07082902	10.25	1.3	311	F	23	1

07083002	11.95	1.2	229.5	E	9.5	0
07083102	13.45	0.45	203	F	23.5	1
08060102	17.05	4.1	184	E	9	0
08060202	17.15	5.4	182	D	12.5	0
08060302	21.1	7.85	59.5	D	10.5	0
08060402	15.5	0.8	184	D	22.5	0
08060502	14.95	0.2	116.5	F	0.5	1
08060602	13.9	0.9	196	D	14.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08060702	15.4	1.05	193.5	F	24	1
08060802	16.15	5	197.5	D	12.5	0
08060902	18.1	4.6	155.5	D	19.5	0
08061002	16.25	3	182	D	17	0
08061102	15.05	1.65	209.5	F	25	1
08061202	17.25	3.1	258	D	11.5	0
08061302	16.1	2.4	306	D	9	0
08061402	10.6	2.5	217	D	28.5	0
08061502	14	4.1	212	D	15	0
08061602	16.9	4.65	206	D	16	0
08061702	15.25	2	193.5	D	12	0
08061802	16.7	4.25	212	D	12	0
08061902	16.05	0.6	203	D	10.5	0
08062002	15.55	2.25	294.5	F	25	1
08062102	11.7	2.85	233.5	D	10	0
08062202	9.65	2.6	223.5	E	9	0
08062302	13.7	4.25	227.5	E	7.5	0
08062402	7.9	1.2	176.5	D	13.5	0
08062502	9.75	1.35	178	D	13.5	0
08062602	10	2.15	248	F	2.5	1
08062702	12	3.45	194	D	10	0
08062802	10.15	1.35	209.5	D	11.5	0
08062902	11.05	2.2	218	D	14.5	0
08063002	11.85	1.15	211	E	7	0
08070102	12.2	1.25	212.5	F	36	1
08070202	8.9	1.55	218	F	52.5	1
08070302	8.7	2.2	241.5	D	15.5	0
08070402	11.5	1.15	219	F	3.5	1
08070502	14.1	4.05	204.5	D	14	0
08070602	13.85	2.75	201	D	12	0
08070702	12	1.85	202	D	10	0
08070802	14.55	0.95	229	D	23.5	0
08070902	11.35	3.75	214.5	D	11.5	0
08071002	8.15	2.45	231	F	58	1

08071102	5.95	1.65	231	E	18	0
08071202	7.4	1.9	205	D	11.5	0
08071302	11.15	1.6	204.5	E	21	0
08071402	16.2	1.95	237	E	20.5	0
08071502	18.85	2.8	332.5	D	12.5	0
08071602	16.55	0	132	F	31	1
08071702	13.4	2.6	214	D	14	0
08071802	10.45	1.55	248	F	4.5	1
08071902	9.95	2.9	218.5	E	38	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08072002	9.05	1.1	213	D	12	0
08072102	17.3	5.55	325.5	D	11.5	0
08072202	12	2.3	246.5	D	26	0
08072302	14.75	5.65	201	D	12	0
08072402	13.65	3.35	205.5	D	11	0
08072502	15.6	8.2	134	D	10.5	0
08072602	13.25	5.15	213	D	16	0
08072702	7.25	1.75	210	F	37.5	1
08072802	7.35	1.45	229.5	E	20.5	0
08072902	10.8	3.9	205.5	D	15	0
08073002	7.9	1.1	219	F	37.5	1
08073102	5.4	0.7	220.5	D	18	0
08080102	7.05	0.7	146.5	D	25	0
08080202	19.65	4.65	206	D	17	0
08080302	7.5	1.95	200.5	E	20.5	0
08080402	9.95	1.2	219.5	E	16.5	0
08080502	10.55	1.85	243	E	9.5	0
08080602	9.3	0.6	114.5	E	7.5	0
08080702	8.7	3.75	237.5	E	4.5	0
08080802	7.6	2.7	228.5	E	23.5	0
08080902	10.45	3.7	226	D	12	0
08081002	4.7	1.25	221	E	16.5	0
08081102	4.95	1.35	226.5	F	26.5	1
08081202	3.95	2.1	261	F	24	1
08081302	7	1.65	236	F	4	1
08081402	6.7	1.55	213	D	5	0
08081502	6	1.1	245.5	D	26.5	0
08081602	7.1	1.3	244.5	D	14.5	0
08081702	12.45	3.2	228	D	19	0
08081802	10.15	0.55	101.5	E	5.5	0
08081902	5.1	0.55	219	F	24	1
08082002	10.25	1.15	180.5	F	24	1
08082102	8.55	1.5	236.5	F	3	1

08082202	13.8	1.05	240.5	D	15.5	0
08082302	10.6	3.05	265.5	D	13	0
08082402	12.5	4.2	185.5	D	11	0
08082502	14.1	4.15	212.5	D	11.5	0
08082602	11.6	3.4	235	E	6.5	0
08082702	14.9	3.45	312.5	E	9.5	0
08082802	13.15	2.15	177.5	E	21.5	0
08082902	14.1	2.45	201	D	11.5	0
08083002	15.35	1.7	307	E	9	0
08083102	17.95	3.3	320	E	9	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
09060102	17.75	4.8	156.5	D	16	0
09060202	15.3	3.85	199	D	54	0
09060302	15	1.9	199.5	D	12	0
09060402	15.7	2.65	142.5	D	11	0
09060502	14.3	1.2	235.5	F	4.5	1
09060602	12.6	0.75	227	D	14	0
09060702	13.05	0.5	241.5	D	9.5	0
09060802	11.75	3.7	279	D	12.5	0
09060902	10.25	2.3	237	E	9	0
09061002	8.35	3.9	246	E	3.5	0
09061102	6.35	2.8	253	D	17.5	0
09061202	4.8	1.2	231.5	D	10	0
09061302	8.8	1.15	211.5	E	22	0
09061402	8.3	0.7	163.5	F	36.5	1
09061502	10.95	1.4	263.5	D	13	0
09061602	11.95	3.6	243.5	E	5.5	0
09061702	9.65	1.4	196	D	5	0
09061802	14.7	4.75	215	D	12	0
09061902	14.75	4.55	209	D	13	0
09062002	15.1	4.7	197	D	11	0
09062102	17.3	5.05	88	D	10	0
09062202	18.55	7.75	39	D	10.5	0
09062302	15.4	6.1	191	D	12.5	0
09062402	12.1	1.6	241	D	13.5	0
09062502	10.35	1.8	255.5	F	3	1
09062602	15.35	1	161.5	D	11.5	0
09062702	14.2	2.7	284.5	D	11	0
09062802	10.5	1.45	263.5	E	18	0
09062902	8.15	0.35	166.5	F	28.5	1
09063002	7.7	0.7	227	F	3	1
09070102	14.75	4.2	330	D	7	0
09070202	15.25	2.3	358.5	D	10	0

09070302	8.85	1.2	328.5	F	23.5	1
09070402	6.85	1.5	272.5	E	18.5	0
09070502	6.4	2.4	225.5	D	12	0
09070602	7.95	1.95	222	E	8	0
09070702	12.1	1.9	195	F	28	1
09070802	13.85	5.55	202	D	12.5	0
09070902	13.7	5.05	205	D	12.5	0
09071002	12.8	6.8	198	D	12	0
09071102	13.7	5.45	220.5	D	11.5	0
09071202	13.75	4.1	212	D	13.5	0
09071302	13.15	2.85	338	E	7.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
09071402	11.4	1.7	216.5	D	10.5	0
09071502	6.85	2.45	220	D	13.5	0
09071602	10.1	3.3	326.5	D	18.5	0
09071702	9.7	3.45	254	D	26.5	0
09071802	11.8	2.9	239	D	13.5	0
09071902	10.1	0.9	213.5	E	7.5	0
09072002	11.2	1.15	201	E	6.5	0
09072102	10.6	1.7	233.5	E	6	0
09072202	10.7	0.8	225	E	8.5	0
09072302	17.6	6.35	335.5	D	10	0
09072402	15.55	4.9	202.5	D	11.5	0
09072502	13.85	4.05	218	D	11.5	0
09072602	12.5	2	266.5	D	39.5	0
09072702	15.7	3.7	310	D	10.5	0
09080802	14.3	3.4	314	E	3	0
09081502	12.3	2.2	231	F	2	1
05060103	17.5	6.15	200.5	D	8	0
05060203	14.7	4.55	176.5	D	12.5	0
05060303	14.9	2.65	167.5	D	13	0
05060403	13.85	3.05	172.5	E	8.5	0
05060503	12.95	0.55	97	E	7.5	0
05060603	13	2	194	F	4.5	1
05060703	15.85	3.7	202.5	D	10	0
05060803	16.3	4.35	199.5	D	13	0
05060903	14.6	2.65	178.5	E	8.5	0
05061003	14.9	2.65	208	D	10	0
05061103	13.75	1.65	214	D	10	0
05061203	19.3	3.85	323.5	D	5.5	0
05061303	18.8	2.9	310	E	6	0
05061403	19.6	3.4	329.5	D	10	0
05061503	19.2	3	276	D	14	0

05061603	14.1	2.7	199.5	D	11	0
05061703	6.9	2.2	230.5	E	20.5	0
05061803	5.95	0	0	F	4	1
05061903	15.05	3.1	309	E	7	0
05062003	17.2	5.1	331.5	D	8.5	0
05062103	15.1	3.5	320	D	6.5	0
05062203	11.9	4.2	331.5	D	5.5	0
05062303	6.3	2.7	275	D	11.5	0
05062403	4.3	1.65	250	E	16.5	0
05062503	14.5	7.45	209	D	11	0
05062603	14.3	4.5	200.5	E	9.5	0
05062703	14.65	3.4	220.5	E	9.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05062803	15.5	4.85	208	D	10	0
05062903	18.25	8.25	71.5	D	13	0
05063003	18.7	7.55	24.5	D	16.5	0
05070103	18.15	2.95	343	D	13.5	0
05070203	15.1	0	0	F	29	1
05070303	14.2	2.95	234	D	12	0
05070403	14.95	4.15	218	D	11	0
05070503	14.9	4.15	207.5	D	5.5	0
05070603	15.75	1.75	170.5	D	5.5	0
05070703	10.65	2.25	189	E	7	0
05070803	12.25	1.35	157.5	F	3.5	1
05070903	14.45	1.75	301	E	16	0
05071003	11.75	2.1	265	E	6.5	0
05071103	12.65	2.35	244	D	15.5	0
05071203	14.55	4.45	214	D	11	0
05071303	14.2	3.25	202.5	D	16.5	0
05071403	14.2	1.35	215.5	E	22	0
05071503	9.1	1.05	221.5	D	29	0
05071603	7.2	1.4	242	D	41.5	0
05071703	6.8	2.4	228.5	D	20.5	0
05071803	7.8	1.85	208	E	5.5	0
05071903	12.5	4.75	207	E	5	0
05072003	12.55	5.95	213	D	9	0
05072103	14.45	5.85	191.5	D	11.5	0
05072203	13.75	3.95	197.5	E	7	0
05072303	14.95	3.05	206.5	E	6	0
05072403	11	2.2	210	E	5	0
05072503	13.65	0.6	217.5	D	11	0
05072603	9.8	3.05	248.5	E	2.5	0
05072703	8.75	2	238.5	E	17.5	0

05072803	12.95	0.85	211.5	E	5.5	0
05072903	12	2.45	256	D	6.5	0
05073003	11.2	0.85	122	D	11.5	0
05073103	11.95	0.9	211	F	0.5	1
05080103	12.5	1.15	202.5	F	3.5	1
05080203	15.65	2.65	191	E	9	0
05080303	11.2	2.2	195.5	E	7.5	0
05080403	12.2	0.7	212	E	6.5	0
05080503	14.1	1.6	238.5	F	25.5	1
05080603	12.75	5.25	216.5	D	8.5	0
05080703	9.75	1.95	195.5	E	8	0
05080803	8.9	2.2	215	D	10	0
05080903	8.95	2.2	200.5	D	9	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05081003	9.7	0	0	E	7	0
05081103	8.55	1.35	214	E	20	0
05081203	7.45	4.1	166.5	E	7	0
05081303	9.95	5.5	207	D	9	0
05081403	12.35	4.95	204	E	8.5	0
05081503	9.95	2.1	185	D	14.5	0
05081603	10.55	1.9	239	E	6	0
05081703	14.05	4.35	200	D	10.5	0
05081803	11.6	2.05	208.5	E	7	0
05081903	9.95	2.15	202.5	E	7	0
05082003	15.65	3	299	E	7.5	0
05082103	12.45	3.55	203	D	24.5	0
05082203	9.65	1.45	227	D	17.5	0
05082303	9.35	1.85	209.5	D	8	0
05082403	12	2.25	219.5	D	11.5	0
05082503	14.75	4.6	209.5	E	7.5	0
05082603	13.7	3.1	221.5	E	5.5	0
05082703	15.2	5.45	188	D	7.5	0
05082803	14.5	6.5	195	D	9	0
05082903	14.2	3.05	196.5	D	12	0
05083003	15.2	3.35	185	D	12	0
05083103	12.6	2.4	247	E	5	0
06060103	5.7	1.95	228.5	D	13.5	0
06060203	6.35	2	233	D	10.5	0
06060303	8.35	3.15	265.5	D	18.5	0
06060403	9.55	0.65	254.5	F	35	1
06060503	14.75	5.1	208	D	8.5	0
06060603	10.8	2.55	185	D	11.5	0
06060703	11.9	3	196.5	D	17.5	0

06060803	13.75	3.45	195.5	E	8.5	0
06060903	16.4	4.65	201.5	D	10.5	0
06061003	16.5	2.6	228	D	16	0
06061103	20.1	6	339	D	10	0
06061203	13.8	6.15	204	D	10.5	0
06061303	14.9	6.5	214	D	10.5	0
06061403	15.25	3	200.5	E	9	0
06061503	13.9	3.15	193	D	23	0
06061603	11.35	1.55	213.5	D	7	0
06061703	11.95	2.95	211.5	D	13.5	0
06061803	13.95	3.15	197	D	13.5	0
06061903	13.85	3.35	198	E	9.5	0
06062003	14.15	3.1	164.5	D	18	0
06062103	14.4	2.1	264	F	55.5	1

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06062203	14.2	3.6	184.5	D	12	0
06062303	14.1	3.1	176	D	12	0
06062403	14.65	2.5	188.5	F	32	1
06062503	12.65	2.85	171.5	D	6	0
06062603	13.25	1.45	196	D	17.5	0
06062703	13	4.4	208	E	8.5	0
06062803	11.05	2.25	197	E	5.5	0
06062903	12.8	2.35	179.5	E	7.5	0
06063003	14.45	2.95	219.5	E	43	0
06070103	15.45	4	339	E	5.5	0
06070203	9.1	2	193.5	E	5.5	0
06070303	10.65	1.95	201	E	9	0
06070403	11.5	0.6	145	E	20.5	0
06070503	14.95	5.3	206.5	D	8.5	0
06070603	11.95	1.85	209	D	13	0
06070703	13.35	3.4	175	E	8	0
06070803	10.65	1.55	229	F	4	1
06070903	9.35	2	206.5	D	6.5	0
06071003	14.3	3.3	297.5	D	5	0
06071103	11.4	0.85	271	F	22.5	1
06071203	11.05	2.5	260	E	9.5	0
06071303	9.9	2	210.5	E	9.5	0
06071403	15.3	4.3	205	E	7	0
06071503	13.9	2.3	181.5	E	16.5	0
06071603	17.75	4.85	325	D	13.5	0
06071703	9.05	0.75	206.5	F	32.5	1
06071803	7.6	2.1	238.5	E	18	0
06071903	14.95	7.45	199	D	10	0

06072003	12.6	6.8	206	D	10.5	0
06072103	12.9	5.5	204.5	D	8.5	0
06072203	13.25	3.95	200	D	10.5	0
06072303	13.1	2.7	216	D	16.5	0
06072403	11.4	2.2	253	E	16	0
06072503	14.55	2.6	182.5	F	31.5	1
06072603	14.3	1.65	226	F	35	1
06072703	10.75	1.1	260	D	11	0
06072803	16.15	1.7	195.5	E	8	0
06072903	12.35	0.95	247.5	F	4.5	1
06073003	9.9	0.7	201	D	10.5	0
06073103	11.9	1.55	337	E	8	0
06080103	10.55	0.95	221	E	18	0
06080203	7.3	2.4	195	D	6.5	0
06080303	9.8	0	0	D	7.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06080403	13.1	3.45	212	D	16	0
06080503	13.2	5	207	D	11	0
06080603	15.15	7.8	214.5	D	12.5	0
06080703	14.45	5.85	203.5	D	12	0
06080803	14.3	6.7	202	D	11	0
06080903	15.65	4.95	217	E	7.5	0
06081003	13.05	3.55	245	D	11	0
06081103	12.95	5	229	D	7.5	0
06081203	10.75	2.1	189.5	D	3.5	0
06081303	12.5	1.65	214	D	5	0
06081403	14.95	3.7	309.5	E	4	0
06081503	11.3	1.95	188	E	9	0
06081603	10.7	1.7	196	E	5	0
06081703	9.9	2.05	214	E	7	0
06081803	11.75	1.25	248	E	9	0
06081903	14.3	1.85	308	D	15	0
06082003	15.1	3.2	201	E	9.5	0
06082103	13.25	1.7	226.5	E	6	0
06082203	13.65	1.2	262	E	6	0
06082303	11.4	1	89	F	34	1
06082403	12.25	2.85	293.5	D	10.5	0
06082503	17.9	3.15	328.5	E	5.5	0
06082603	16.35	3.55	208.5	D	9.5	0
06082703	15.8	3.8	203	D	7	0
06082803	16.95	2.7	290.5	F	42	1
06082903	15.65	5.6	207	D	10	0
06083003	14.1	2.1	206	D	12.5	0

06083103	19	5.35	108	D	13.5	0
07060103	15.15	1.2	213	E	7.5	0
07060203	17.85	4.45	199.5	D	11.5	0
07060303	16.05	0.35	104.5	D	13	0
07060403	17.25	2.1	122	F	34.5	1
07060503	17.95	3.95	204.5	D	12.5	0
07060603	16.45	2.3	186	D	17.5	0
07060703	16.2	3.45	301.5	D	14	0
07060803	15.8	2.2	233.5	F	23.5	1
07060903	9.7	5.4	303	D	12	0
07061003	9.45	1.5	215.5	E	17	0
07061103	12.2	0.7	198	E	5.5	0
07061203	8.8	0.5	103	E	20	0
07061303	11.45	3.55	187	D	17	0
07061403	8.4	1.85	210.5	F	29	1
07061503	15.4	4.1	205	D	10	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07061603	11.1	1.5	215	E	18	0
07061703	12.9	4.05	209	E	7.5	0
07061803	16	2.55	232.5	D	16	0
07061903	15.1	3.35	335.5	D	15.5	0
07062003	3.95	1.7	238.5	D	11	0
07062103	8.85	1.1	243	E	9	0
07062203	12.05	4.5	211.5	D	14	0
07062303	13.5	3.6	209	D	14	0
07062403	13.95	6.15	204.5	D	12	0
07062503	14.95	3.95	209	D	11	0
07062603	16.45	2.05	313.5	D	11	0
07062703	10.95	2.4	270	E	25.5	0
07062803	5.35	2.8	241	E	7	0
07062903	11.65	5.95	312.5	D	12.5	0
07063003	11.05	1.45	33.5	D	57.5	0
07070103	7	0.95	271.5	F	50	1
07070203	5.4	1.85	232	E	22	0
07070303	6.9	0.35	233	F	27	1
07070403	11	2.05	230	E	22	0
07070503	16.3	4.8	319	E	7.5	0
07070603	10.95	2.85	214.5	F	32	1
07070703	4.55	1	244.5	D	10.5	0
07070803	6.2	2.05	245.5	E	6.5	0
07070903	9.7	3.35	238	D	19	0
07071003	15.4	7.45	198.5	D	12.5	0
07071103	8.6	2.95	269.5	E	7	0

07071203	8.45	2.85	238	D	9.5	0
07071303	5.95	0.2	333.5	D	46.5	0
07071403	8	1.5	250	F	75.5	1
07071503	10.3	2.1	219	D	11	0
07071603	11.7	3.8	207	D	11	0
07071703	10.75	2.45	210	E	6.5	0
07071803	3.65	1.15	207	F	58.5	1
07071903	9.85	3.9	219	D	11	0
07072003	4.25	3.35	230.5	E	4.5	0
07072103	12.9	3.95	217.5	D	10.5	0
07072203	14.15	5.85	204	D	13.5	0
07072303	13.2	3.55	208.5	D	11.5	0
07072403	14.15	3.7	182.5	D	15.5	0
07072503	8.8	1.7	221	D	9.5	0
07072603	9.65	1.25	215	E	21.5	0
07072703	10.25	1.85	224	D	13.5	0
07072803	9	2.85	248	E	5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07072903	4.55	1.05	204	D	14.5	0
07073003	9.2	0.8	209.5	E	17	0
07073103	10.6	1.85	217.5	F	46	1
07080103	14.55	3.7	297	E	8	0
07080203	14	2.7	351.5	D	11.5	0
07080303	15.25	3.9	334	D	10	0
07080403	15.75	2.45	198	D	10.5	0
07080503	10.05	2.95	203.5	D	11	0
07080603	4.6	1.05	233	D	6	0
07080703	7.7	1.6	210.5	D	10.5	0
07080803	9.45	2.55	271.5	D	11.5	0
07080903	14.15	2.35	336	D	10	0
07081003	9.1	1.9	278	E	19.5	0
07081103	10.1	2.05	290.5	E	18.5	0
07081203	5.85	0.3	131.5	F	44.5	1
07081303	10.3	1.05	220.5	E	5.5	0
07081403	16.5	4.95	187	D	11.5	0
07081503	15.8	2.8	232.5	E	9	0
07081603	16.15	3.1	309.5	E	32.5	0
07081703	17.75	4.5	331	D	11	0
07081803	17.65	2.65	190	D	24	0
07081903	16.4	3.3	194.5	D	11	0
07082003	15.95	1.95	134.5	F	47	1
07082103	13.6	1.75	296	F	63.5	1
07082203	17.15	9.35	163	D	10.5	0

07082303	14.8	7.05	161.5	D	13	0
07082403	17.1	7.75	143	D	9	0
07082503	16.55	5.2	161	D	18.5	0
07082603	15.2	3.55	207	E	8.5	0
07082703	13.95	2.65	222.5	E	8.5	0
07082803	10.85	1.65	229.5	E	7	0
07082903	10.15	1.55	284	D	22	0
07083003	11.5	0.4	224	D	12	0
07083103	12.75	1	217.5	F	24.5	1
08060103	17.35	4.25	184.5	E	9.5	0
08060203	17.35	4.85	190.5	D	13	0
08060303	19.45	8.2	352.5	D	19	0
08060403	15.1	1.1	201	F	36.5	1
08060503	15.2	0.65	228	D	11	0
08060603	13.95	0.3	107	E	5.5	0
08060703	15.15	0	0	D	14	0
08060803	15.8	5.45	202	D	13.5	0
08060903	17.2	3.9	160	D	20.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08061003	16	1.65	225.5	D	23.5	0
08061103	15.55	1.1	212	D	34.5	0
08061203	16.95	3.2	244.5	D	11.5	0
08061303	15.75	2.35	310.5	E	9.5	0
08061403	10.2	4.2	240	E	6.5	0
08061503	14.4	4.85	210	D	13	0
08061603	16.85	4.55	206.5	D	15	0
08061703	14.95	1.8	187.5	E	16.5	0
08061803	16.6	4.45	206	D	11	0
08061903	16.05	1.3	191	F	33.5	1
08062003	16.55	3.65	292.5	E	8	0
08062103	11.1	3.25	217	E	29	0
08062203	8.9	2.9	234.5	D	8	0
08062303	13.95	4.6	215	D	12	0
08062403	10.5	2.85	187	E	9.5	0
08062503	9.25	1.6	228.5	E	7.5	0
08062603	9.4	2.5	247.5	F	1.5	1
08062703	12.15	3	161.5	D	23	0
08062803	10.35	1.65	214	E	9.5	0
08062903	10.95	2.5	212	D	18.5	0
08063003	11.15	0.4	208.5	E	9	0
08070103	11	2.3	254	F	35	1
08070203	7.6	1.95	245.5	F	32.5	1
08070303	8.75	2.85	233	E	8	0

08070403	11.4	0.25	97	D	3	0
08070503	14.2	4.35	203	D	12	0
08070603	14.5	3.15	196.5	D	10	0
08070703	11.95	1.75	206	D	14	0
08070803	14.65	1.75	249.5	D	12.5	0
08070903	9.9	3.4	217	D	10	0
08071003	10.4	4.05	321	D	13.5	0
08071103	5.8	1.7	241.5	E	17	0
08071203	7.35	1.9	196.5	E	9.5	0
08071303	11.8	1.3	207.5	D	15	0
08071403	16.15	1.5	244	E	17	0
08071503	18.95	3.45	318	D	13.5	0
08071603	16.7	2	9	D	38.5	0
08071703	12.6	2.35	184	D	12	0
08071803	13.35	3.4	303.5	D	18	0
08071903	8.2	1.35	135	F	44.5	1
08072003	9.05	0.55	219.5	E	9	0
08072103	16.95	4.7	335	D	10	0
08072203	11.55	2.85	226.5	F	31.5	1

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08072303	14.4	4.8	208.5	D	12.5	0
08072403	14.45	3.9	197.5	D	19	0
08072503	14.6	7.25	140	D	12	0
08072603	12.95	4.15	216	D	17.5	0
08072703	5.95	0.2	263.5	E	16.5	0
08072803	6.65	0.3	127	D	37.5	0
08072903	11.25	5.85	208.5	D	13.5	0
08073003	10.95	3.35	229.5	D	13.5	0
08073103	4.45	0	0	D	11.5	0
08080103	6.6	2.15	258	D	10	0
08080203	17.7	1.9	144.5	F	66	1
08080303	6.2	1.5	258	F	34.5	1
08080403	9.6	1.95	245.5	E	6.5	0
08080503	11.25	3.45	236.5	E	8	0
08080603	7.8	1.2	235	D	14	0
08080703	7.45	3.35	232	E	7	0
08080803	5.5	0.65	219.5	E	18	0
08080903	10.95	2.2	237	D	22	0
08081003	4.95	1.45	236	D	14	0
08081103	5.45	1.9	237	F	22.5	1
08081203	5	3.15	252	D	13.5	0
08081303	6.2	1.1	230.5	E	20.5	0
08081403	6.85	1.85	217.5	E	5.5	0

08081503	4.7	0.5	237	D	10.5	0
08081603	6.1	0.75	211.5	E	20	0
08081703	13.65	5.65	222	D	14	0
08081803	9.7	1.3	201.5	D	10	0
08081903	3.6	0.85	244.5	F	29	1
08082003	9.45	1.5	212.5	E	16.5	0
08082103	9.1	1.4	229.5	D	4.5	0
08082203	15.5	2.4	307	D	10.5	0
08082303	9.6	2.15	241.5	E	17	0
08082403	12.25	5.05	187.5	D	11	0
08082503	13.8	4.1	214	D	11	0
08082603	11.05	1.15	188	F	38	1
08082703	14.95	4	307.5	E	9.5	0
08082803	13.25	2.45	190	D	13.5	0
08082903	14.4	2.8	199	D	13.5	0
08083003	16.15	2.85	295	D	11	0
08083103	18.2	4.2	320	D	10.5	0
09060103	16.2	5.25	164	D	20	0
09060203	15	2.5	201	D	29.5	0
09060303	14.8	2.55	164.5	D	19.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
09060403	15.65	1.8	192	E	18.5	0
09060503	14.2	0.7	216	E	19	0
09060603	11.45	1.1	250.5	D	15.5	0
09060703	14.05	0.3	186.5	E	22	0
09060803	10.3	2.9	297.5	E	42	0
09060903	9.25	2.55	244	E	7.5	0
09061003	7.6	2.75	242	E	6.5	0
09061103	5.05	2.4	242	D	12.5	0
09061203	4.55	1.1	222	E	9	0
09061303	8.3	0.7	224.5	D	15	0
09061403	11.55	3.35	332.5	D	10.5	0
09061503	10.6	1.65	257.5	D	22.5	0
09061603	10.65	1.25	183	E	21	0
09061703	9.1	1.55	206	E	8.5	0
09061803	14.8	5.2	213	D	13	0
09061903	14.7	4.4	213.5	D	12	0
09062003	15.5	3.35	189.5	E	56.5	0
09062103	18.1	5.2	83.5	D	14	0
09062203	18.55	6.7	31	D	9	0
09062303	15.9	5.9	155.5	D	10.5	0
09062403	11.4	2.05	248	D	11	0
09062503	9.65	0.7	255.5	F	1	1

09062603	14.65	0.55	119	D	36.5	0
09062703	14.25	2.65	308	D	13	0
09062803	9.75	0.85	230	F	38.5	1
09062903	8.2	0.5	215.5	F	50.5	1
09063003	7.15	0.55	219	E	8	0
09070103	14.3	3.4	335	D	14	0
09070203	14.75	2.1	351	E	19	0
09070303	7.3	1.55	258	F	35.5	1
09070403	5.25	1.35	217.5	F	79.5	1
09070503	5.25	1.3	296.5	F	43.5	1
09070603	7.05	1.9	221	D	12.5	0
09070703	12.1	1.6	214.5	E	18.5	0
09070803	13.8	6.25	205.5	D	13	0
09070903	13.15	5.3	206	D	12.5	0
09071003	12.75	5.8	198	D	12.5	0
09071103	13.7	5.7	217.5	D	12.5	0
09071203	13.4	3.85	220.5	D	12	0
09071303	12.7	2.7	343	E	7.5	0
09071403	9.95	0.65	221.5	F	66	1
09071503	6.55	1.9	227	E	17.5	0
09071603	9.8	3.7	322.5	E	8	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
09071703	8.8	2.4	296	E	25.5	0
09071803	12.65	3.35	217.5	D	11.5	0
09071903	11.15	0.25	112.5	E	6.5	0
09072003	11.25	1.65	208.5	D	11	0
09072103	9.25	0.45	115	D	2.5	0
09072203	9.85	0.25	80	D	12	0
09072303	17.4	4.15	336	D	10.5	0
09072403	15.4	5.45	203	D	12	0
09072503	13.85	3.65	216	D	14.5	0
09072603	12.45	2.5	222	D	16.5	0
09072703	16.1	5.2	315.5	D	10	0
09072803	11.1	1.5	203	E	9	0
09072903	10.1	0	0	F	0	1
09073003	10.05	1.7	226	E	7	0
09073103	9.4	2.1	229	F	4	1
09080103	8.55	1.65	218.5	D	5	0
09080203	9.55	1.6	214	D	15	0
09080603	12.25	0.4	156	E	16	0
09080803	13.9	2.3	288.5	E	9	0
09080903	12.55	3.5	222	D	10	0
09081003	9.4	1.3	223	F	1	1

09081103	9.6	0.8	242	F	1	1
09081203	16.8	5.6	315	D	8	0
09081403	13	1.9	193	D	19	0
09081603	14.6	2.8	295	F	3	1
09081803	18.2	7.5	181	D	7	0
09082003	10.8	0.35	115	F	4.5	1
09082203	18.2	5.95	337	D	6.5	0
09082303	14.3	0.9	225	F	2	1
09082403	18.6	3.7	330	E	5	0
09082603	13.95	0.5	250	D	2	0
09082703	11.3	2.2	189	E	17	0
09082903	14.6	0.5	223	D	11	0
09083103	15.85	3.3	180	D	16	0
05060104	17.05	6.55	201	D	8	0
05060204	14.45	3.3	164.5	E	7.5	0
05060304	15.05	3.6	174	D	10.5	0
05060404	13.4	2.75	177.5	E	9	0
05060504	13.2	2.45	198.5	D	17	0
05060604	12.8	1.9	182.5	D	4.5	0
05060704	15.95	4	204.5	D	7	0
05060804	15.95	3.2	217	E	8	0
05060904	15.1	2.9	174.5	E	7.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05061004	14.6	2.6	190	E	8	0
05061104	13.3	1.2	209.5	D	12	0
05061204	19.3	3.45	317	E	7	0
05061304	19.05	2.45	342	E	7.5	0
05061404	19.6	4.15	327	E	8	0
05061504	18	4.8	211.5	D	20.5	0
05061604	14.7	4.35	213	D	10.5	0
05061704	6.7	1.25	229.5	E	18	0
05061804	6.15	0.65	229.5	D	12	0
05061904	15.3	2.7	333	D	5	0
05062004	17.25	4.2	329.5	E	8	0
05062104	14.75	3.7	324.5	E	7	0
05062204	12.05	4.65	332.5	E	5	0
05062304	7.85	4.2	322	E	3.5	0
05062404	5.35	1.25	324	F	38	1
05062504	14.65	8.1	204.5	D	10.5	0
05062604	14.15	5	198.5	D	9.5	0
05062704	14.4	4.05	186.5	E	7.5	0
05062804	14.9	3.9	184	D	15	0
05062904	18.3	10	69.5	D	12	0

05063004	19.75	5.15	354.5	D	26	0
05070104	18.65	3.75	353.5	D	8	0
05070204	14.2	0.15	82.5	F	27.5	1
05070304	13.7	3.35	221.5	D	14.5	0
05070404	14.65	5.05	217	D	8.5	0
05070504	14.8	4.2	207.5	E	7	0
05070604	16.35	3.3	184.5	E	8	0
05070704	10.25	2	178.5	F	1.5	1
05070804	11.35	1.15	324.5	D	15.5	0
05070904	14.75	2.5	324	E	9	0
05071004	12.35	1.3	246.5	F	34.5	1
05071104	11.6	2.65	262	D	15	0
05071204	14.35	5.1	204	D	8	0
05071304	13.9	1.75	242.5	D	31.5	0
05071404	14.4	1.7	247	D	14.5	0
05071504	10.1	0.85	209.5	E	20.5	0
05071604	7	1.4	234	E	22	0
05071704	6.2	2	259.5	E	18	0
05071804	8.9	2.05	194	E	8.5	0
05071904	12.1	4.65	206	E	5.5	0
05072004	12.45	7.15	214	D	9.5	0
05072104	14.45	5.1	198.5	D	10	0
05072204	13.4	3.55	198	E	7.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05072304	14.4	2.95	174.5	D	22	0
05072404	11.1	2.15	218	D	9.5	0
05072504	13.45	1.65	237.5	D	25	0
05072604	9.15	3.5	246	E	2.5	0
05072704	7.85	2.05	188	E	21.5	0
05072804	13.1	3	172	E	4	0
05072904	11.35	2.8	253.5	F	2.5	1
05073004	10.5	0.65	204	D	14.5	0
05073104	11.5	1.65	213	F	2	1
05080104	12.55	0.5	94.5	E	5	0
05080204	15.7	2.5	191.5	D	10	0
05080304	10.9	2.45	193.5	E	5.5	0
05080404	12.25	0.9	185.5	D	11	0
05080504	13.6	2.5	234.5	D	34	0
05080604	12.55	6.05	215	D	10	0
05080704	9.55	1.85	197	F	3.5	1
05080804	8.85	1.45	216	D	12	0
05080904	9.15	2.3	197	E	7	0
05081004	9	0	0	F	0	1

05081104	7.65	1.3	224	F	30.5	1
05081204	6.35	2.45	200.5	D	16.5	0
05081304	10.1	6.1	208	D	8.5	0
05081404	12.2	4.5	199.5	E	8	0
05081504	10.95	1.65	192	E	21.5	0
05081604	10.05	2	246.5	F	4	1
05081704	14.45	4.6	208	D	7.5	0
05081804	10.85	1.9	212.5	D	5.5	0
05081904	9.95	1.95	216	E	9.5	0
05082004	16.25	3	283.5	E	6	0
05082104	10.85	1.7	221	F	53.5	1
05082204	8.9	0.75	232	F	35	1
05082304	8.45	2.2	207.5	E	19	0
05082404	13.25	4.1	210	E	7	0
05082504	14.45	4.45	214	E	7.5	0
05082604	14.35	3.95	210.5	E	5	0
05082704	15	3.9	201	E	7.5	0
05082804	14.4	5.9	184.5	D	9	0
05082904	13.9	2.1	199	D	22.5	0
05083004	15.15	2.95	177	D	16.5	0
05083104	12.15	0.55	117.5	F	4	1
06060104	5.45	1.75	224.5	E	18.5	0
06060204	6.5	0.3	236.5	F	75.5	1
06060304	11.5	4.1	255	D	36.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06060404	7.9	1.35	217.5	E	16	0
06060504	14.35	5.2	216.5	D	9.5	0
06060604	11.65	3.7	180.5	E	7.5	0
06060704	12.15	4.5	196.5	E	8	0
06060804	14.3	4.1	198	E	9	0
06060904	16.6	4	201.5	D	13.5	0
06061004	16.4	2.1	200	D	9.5	0
06061104	19.7	5.15	332.5	D	9	0
06061204	13.75	6.85	210.5	D	10	0
06061304	14.9	5.7	209	D	10.5	0
06061404	14.75	3.05	196	E	9	0
06061504	14.4	3	206	D	13	0
06061604	10.85	1.15	207	F	3.5	1
06061704	11.75	2.55	198	D	13.5	0
06061804	13.65	3.5	198.5	D	14	0
06061904	13.85	3.85	195.5	D	14	0
06062004	14.1	2.9	217.5	E	28.5	0
06062104	13.9	1.45	241	F	62.5	1

06062204	14.15	4.75	181	D	10	0
06062304	14.15	4.3	190	D	10.5	0
06062404	14.5	2.45	245.5	F	36	1
06062504	12.8	2.8	191.5	E	9	0
06062604	13.3	2.3	181.5	F	32	1
06062704	12.95	4.7	209	E	8	0
06062804	11.4	2.85	186	E	9	0
06062904	12.15	1.95	204	D	10.5	0
06063004	14.15	3.7	221.5	E	7	0
06070104	14.95	4.6	317	E	7	0
06070204	9.05	2	197	E	5.5	0
06070304	10.2	1.55	190	E	9.5	0
06070404	12.7	3	233	D	16	0
06070504	14.3	4.25	207.5	D	7	0
06070604	11.7	1.7	213	E	5.5	0
06070704	13.25	3.55	189.5	E	8.5	0
06070804	10.45	2.2	230.5	F	1	1
06070904	9.15	1.95	202.5	F	3	1
06071004	14.05	3.45	290.5	E	3.5	0
06071104	13.55	2.3	329	D	14	0
06071204	10.35	1.1	231	E	9	0
06071304	9.35	2.05	205.5	D	13	0
06071404	15.1	4.65	206	E	9	0
06071504	13.95	2.55	165.5	E	8.5	0
06071604	18	6.8	333.5	D	10	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06071704	8.55	2.5	243	D	20.5	0
06071804	7.8	1.2	219	D	10	0
06071904	15	8.05	200.5	D	9.5	0
06072004	12.65	7.25	206.5	D	10	0
06072104	12.65	6.15	212	D	9	0
06072204	12.85	5	204.5	D	8	0
06072304	12.85	2.1	196.5	E	22	0
06072404	11.35	1.8	260	E	19	0
06072504	14.3	2.15	184	E	17	0
06072604	14.4	1.95	175.5	E	17	0
06072704	10.7	2.3	232.5	E	6	0
06072804	15.75	2.55	173	D	11.5	0
06072904	11.6	1.6	255.5	D	26	0
06073004	9.25	2	227.5	E	18.5	0
06073104	11.25	1.5	334	F	35	1
06080104	10	1.8	226.5	F	22.5	1
06080204	7.35	2.1	191.5	E	8.5	0

06080304	8.85	1.3	226.5	E	6.5	0
06080404	11.7	1.3	187.5	E	19.5	0
06080504	13	5.45	213.5	D	10.5	0
06080604	14.85	8.75	203.5	D	10	0
06080704	14.3	6.9	209.5	D	9	0
06080804	14.15	6.8	205.5	D	11	0
06080904	16.05	5.5	214	D	7	0
06081004	10.05	0.85	249	D	40	0
06081104	12.8	4.45	226.5	E	7	0
06081204	10.9	2.1	206	F	3	1
06081304	13	0	0	F	3	1
06081404	15.35	3.65	301.5	E	5	0
06081504	11.3	2.2	211.5	F	2.5	1
06081604	10.2	2	187	D	11.5	0
06081704	9.4	2.05	212	D	10.5	0
06081804	12	0.65	230	E	5.5	0
06081904	15.05	3.75	309	E	6.5	0
06082004	15	3.3	214.5	D	12	0
06082104	12.55	0.75	228	D	7	0
06082204	13	2.25	239.5	D	4.5	0
06082304	9.85	1.8	236.5	F	26.5	1
06082404	12.45	1.35	280.5	E	16.5	0
06082504	17.85	3.6	333	E	7.5	0
06082604	16.3	3.6	180	E	6	0
06082704	15.35	3.3	197	E	9.5	0
06082804	17.2	2.45	302.5	F	36.5	1

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06082904	15.5	5.45	211.5	D	9.5	0
06083004	14.55	2.45	191	D	19	0
06083104	18.9	5.15	107.5	D	13	0
07060104	15.1	0.3	105	E	7.5	0
07060204	17.7	4.35	199	D	12	0
07060304	15.15	0.3	168	D	16.5	0
07060404	16.45	1.2	194.5	E	18.5	0
07060504	18.15	3.55	199.5	D	12	0
07060604	16.35	2.2	221	F	38.5	1
07060704	16.3	3.6	304	D	16	0
07060804	15.55	0	148	E	16.5	0
07060904	9.2	5.45	306.5	D	10	0
07061004	8.2	1.5	270.5	E	20	0
07061104	11.75	1.65	199.5	E	9	0
07061204	8	0.45	258.5	D	15	0
07061304	11.2	3.2	180	D	10	0

07061404	8.5	2.45	172.5	D	4.5	0
07061504	15.35	3.55	205.5	D	11.5	0
07061604	10.4	1.45	222	D	14.5	0
07061704	13.75	4.5	207.5	E	8	0
07061804	15.7	2.5	212	D	15	0
07061904	15.35	4.2	319	D	12	0
07062004	2.7	0.9	236	E	21	0
07062104	9.2	2.2	246	D	10.5	0
07062204	11.6	4.7	209	D	13	0
07062304	13.35	3.95	198.5	D	11	0
07062404	13.55	5.95	216	D	13.5	0
07062504	15.2	3.55	201.5	D	16	0
07062604	16.5	2.65	287	D	11.5	0
07062704	9.5	1.85	226	D	47	0
07062804	4.8	2.1	250.5	E	19.5	0
07062904	11.6	5.3	319.5	D	12	0
07063004	13.15	1.65	2	F	70.5	1
07070104	6.9	1.3	227.5	F	30.5	1
07070204	5.3	2.2	245	D	12	0
07070304	6.55	1.05	232	E	17.5	0
07070404	11.05	1.4	225	E	21	0
07070504	15.45	3.95	277.5	D	37	0
07070604	12.6	3.25	279	D	17	0
07070704	5	1.65	226	E	8.5	0
07070804	5.95	0.65	232	D	4	0
07070904	9.35	3.55	237	D	16.5	0
07071004	15.15	7.5	200	D	13	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07071104	8.25	2.95	290	E	9	0
07071204	7.35	2.25	230	E	5	0
07071304	5.55	0.25	191.5	F	55	1
07071404	9.45	2.7	237.5	D	12	0
07071504	8.5	2.4	202	D	14.5	0
07071604	11.55	3.55	209	D	10.5	0
07071704	8.6	2	199	E	9	0
07071804	2.4	1.3	238.5	E	22	0
07071904	9.75	4.1	220	D	13.5	0
07072004	3.25	2.55	223	D	11	0
07072104	13.3	4.9	211	D	11.5	0
07072204	13.45	5.3	210	D	12.5	0
07072304	13.1	3.9	207.5	D	13.5	0
07072404	14.35	4.4	194.5	D	13	0
07072504	8.6	1.45	210.5	E	16.5	0

07072604	9.5	1.6	207	D	15.5	0
07072704	8.9	1.95	218	F	23	1
07072804	8.5	2.6	252	E	5	0
07072904	5.85	0.65	202	F	23	1
07073004	8.6	1.3	221	F	25	1
07073104	10.15	0.75	205.5	E	18.5	0
07080104	14	3.05	303	D	8.5	0
07080204	14.1	3.65	349.5	D	6	0
07080304	15.65	4.65	338	E	9	0
07080404	16.3	2.9	214.5	D	14.5	0
07080504	9.25	2.35	215	E	16	0
07080604	4.95	0.9	215	E	16	0
07080704	8	2.05	205.5	E	8.5	0
07080804	9	2.5	266	E	7.5	0
07080904	14.6	2.85	325.5	E	5	0
07081004	8.05	1.85	272.5	E	21.5	0
07081104	9.05	2.7	275.5	D	13.5	0
07081204	6.3	1.1	202	F	29.5	1
07081304	10.3	0.9	227	D	23.5	0
07081404	16.4	4.65	191	D	11	0
07081504	14.65	2.55	207	D	11	0
07081604	15.7	1.7	250.5	E	18	0
07081704	17.85	4.25	341	E	9	0
07081804	18.3	3.1	207.5	D	16	0
07081904	16.45	3.8	190.5	D	12	0
07082004	15.6	2	212.5	F	54	1
07082104	13.6	1.75	231	F	62	1
07082204	16.8	10.15	160	D	10	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07082304	16.15	7.95	155	D	10.5	0
07082404	16.85	6.75	143.5	D	12.5	0
07082504	16.5	5.65	147	D	23.5	0
07082604	14.9	3.4	198.5	D	12	0
07082704	12.65	2.3	230	E	8	0
07082804	10.6	1.55	233	E	6.5	0
07082904	9.35	1.35	259	D	11	0
07083004	11.15	0.2	112.5	F	4	1
07083104	12.8	0.95	207.5	F	41	1
08060104	16.8	3.3	176.5	D	17.5	0
08060204	17.45	5	159	D	25	0
08060304	18.55	3.8	311.5	D	15.5	0
08060404	15.65	0.8	231	D	15	0
08060504	15.05	0.75	241	F	4.5	1

08060604	13.05	0	0	D	8	0
08060704	15.5	1.95	195.5	D	36.5	0
08060804	15.85	5	207	D	13	0
08060904	17.75	5.7	142	D	9.5	0
08061004	16.1	2.55	197	F	44.5	1
08061104	15.55	1.4	201	D	13.5	0
08061204	16.5	2.75	247.5	E	8.5	0
08061304	16.25	2.7	294	E	9.5	0
08061404	8.9	2.45	195.5	D	15	0
08061504	14.1	4.6	201	D	12	0
08061604	16.8	3.95	206	D	15.5	0
08061704	16.3	2.85	201.5	D	18	0
08061804	16.65	4.2	205.5	D	12	0
08061904	16.05	1	213.5	D	15	0
08062004	16.5	2	253	F	24	1
08062104	10.8	3.4	221.5	D	16.5	0
08062204	8.1	2.25	270.5	F	32.5	1
08062304	14.15	5.1	212	D	12.5	0
08062404	13	3.5	193	E	9.5	0
08062504	9.9	1.8	219	E	7	0
08062604	8.6	1.85	242	F	2	1
08062704	14.2	3.7	187.5	D	20	0
08062804	9.85	1.8	215	E	9	0
08062904	10.45	1.2	180	D	11	0
08063004	10.85	0.45	209.5	D	6	0
08070104	11.5	1.3	233.5	D	36.5	0
08070204	7.25	1.85	220.5	F	46.5	1
08070304	7.15	1.4	239.5	E	16.5	0
08070404	11.6	1.55	197	D	11.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08070504	14.05	4.1	203.5	D	12.5	0
08070604	14.5	3.05	190	E	8.5	0
08070704	12.9	2.45	205	D	17	0
08070804	15.15	2.75	338	D	16.5	0
08070904	6.35	1	226.5	E	16	0
08071004	10.5	6.35	300.5	D	11.5	0
08071104	6.1	2.25	250	D	12.5	0
08071204	6.95	1.95	170.5	D	8.5	0
08071304	11.55	1.5	215.5	D	19	0
08071404	15.7	0.35	127.5	E	7	0
08071504	18.65	3.05	321	D	16	0
08071604	16.45	1.4	304	F	38.5	1
08071704	12.1	2.35	180	E	6	0

08071804	14.1	4.4	321	E	7	0
08071904	7.5	1.8	251.5	F	40.5	1
08072004	8.85	1.65	221	D	11	0
08072104	17.35	4.9	331.5	E	9.5	0
08072204	10.65	2.3	191	E	19.5	0
08072304	14.3	4.7	201.5	D	11	0
08072404	14.05	4	179	D	40	0
08072504	14.2	4.55	173	D	25	0
08072604	12.5	4.05	224	D	17.5	0
08072704	5.8	1.5	233.5	E	21.5	0
08072804	8.15	2.05	242.5	E	16.5	0
08072904	11.35	7.15	216	D	14.5	0
08073004	9.65	2.1	235.5	E	6	0
08073104	3.8	1.5	231.5	F	27	1
08080104	6.9	1.85	262.5	F	23.5	1
08080204	16.4	2.7	245.5	F	56.5	1
08080304	6.75	2.65	234.5	D	13.5	0
08080404	10	1.55	231	F	4	1
08080504	11.4	3.75	228.5	D	8.5	0
08080604	7.7	1.2	258.5	D	15.5	0
08080704	7.05	1.8	240.5	D	12.5	0
08080804	6.35	2.05	234.5	E	19.5	0
08080904	6.2	0.7	300	F	43	1
08081004	4.7	0.55	229.5	E	9	0
08081104	5.1	3.7	247.5	E	5.5	0
08081204	3	1.4	250.5	F	23	1
08081304	6	1.8	214.5	E	20	0
08081404	6.25	1.85	209.5	D	14	0
08081504	3.7	1.15	222	E	18.5	0
08081604	5.2	0.6	229.5	E	17.5	0

Temperature Inversion Assessment - Long-term Winter Nights

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08081704	12.9	3.75	212	D	28.5	0
08081804	9.35	0.7	189	D	9.5	0
08081904	6.6	1.2	246.5	F	60.5	1
08082004	9.9	1.85	196	D	11	0
08082104	10.3	1	217	E	7	0
08082204	15.7	2.75	301.5	E	8	0
08082304	9.9	1.8	253.5	F	44.5	1
08082404	12.15	4.15	187.5	D	11.5	0
08082504	13.15	4	221.5	D	10.5	0
08082604	11.15	1.7	220.5	F	25	1
08082704	14.6	3.75	309.5	E	7.5	0
08082804	12.15	1.15	178.5	D	14.5	0

08082904	14.05	1.65	202.5	D	11.5	0
08083004	16.45	2.9	303.5	D	7	0
08083104	17.95	4.65	317.5	D	11.5	0
09060104	15.15	3.55	201.5	E	9.5	0
09060204	14.85	3.45	219.5	D	17.5	0
09060304	14.2	2.6	175	E	9.5	0
09060404	15.6	1.55	162	E	19	0
09060504	13.8	0.25	109.5	E	8.5	0
09060604	10.9	1.35	223	D	14	0
09060704	13.85	1.15	269.5	F	22.5	1
09060804	9.3	1.5	288.5	F	42.5	1
09060904	9.5	3.35	250	E	6	0
09061004	6.85	1.65	225	D	16.5	0
09061104	5.05	2.15	238	D	24.5	0
09061204	4.3	0.85	235	D	12	0
09061304	8.15	1.35	207.5	F	24.5	1
09061404	10.8	2.8	328	D	16	0
09061504	10.95	1	257.5	E	18.5	0
09061604	9.95	0.2	228.5	E	16.5	0
09061704	8.9	1.95	213.5	E	9	0
09061804	14.75	5.95	210.5	D	12.5	0
09061904	14.65	4.95	214.5	D	12.5	0
09062004	15.7	5.3	143.5	D	23	0
09062104	18.35	4.85	71.5	D	14	0
09062204	18.65	7	35	D	8.5	0
09062304	16.6	6	168	D	12	0
09062404	10.75	1.6	228.5	E	6.5	0
09062504	10.05	1.95	249	F	2.5	1
09062604	14.15	0.85	246.5	F	4	1
09062704	14.95	4.1	305	D	11.5	0
09062804	9.9	1.45	225	F	27.5	1

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
09062904	7.45	0.25	223.5	F	56.5	1
09063004	7	1.05	229.5	F	3	1
09070104	15.3	2.95	351	E	42	0
09070204	13.2	1.05	259	D	15.5	0
09070304	8.5	2.85	279	D	18.5	0
09070404	5.35	2.05	238.5	D	30.5	0
09070504	4.9	1.65	245	D	13.5	0
09070604	7.6	1.8	212.5	D	15.5	0
09070704	12.1	1.6	181	E	19.5	0
09070804	13.75	5.9	206.5	D	12.5	0
09070904	12.95	5.2	205.5	D	12.5	0

09071004	12.75	6.45	198	D	12.5	0
09071104	13.55	5.5	214.5	D	13.5	0
09071204	12.9	2.85	222.5	D	10.5	0
09071304	12.65	3.4	337.5	D	13	0
09071404	10.25	1.75	211	E	20.5	0
09071504	6.1	1.25	230.5	E	16	0
09071604	10.25	3.95	329	D	10.5	0
09071704	11.65	4.45	244.5	D	22	0
09071804	13.2	3.95	210.5	D	11	0
09071904	11.45	0	0	E	5	0
09072004	10.6	1.55	192	E	8	0
09072104	8.7	0	0	F	3.5	1
09072204	13.55	2.9	299	E	40.5	0
09072304	17.35	4.95	327.5	E	9	0
09072404	14.95	5	199	D	11.5	0
09072504	13.7	3.55	199.5	D	12	0
09072604	11.7	1.85	217.5	E	18	0
09072704	16.2	5.3	323	D	9.5	0
09072804	10	2.1	220.5	D	9	0
09080204	9.4	1.5	215.5	E	5.5	0
09080804	14.1	2.2	276	E	17	0
09080904	12.2	3.1	226	D	11	0
09081604	13.55	0.9	303	D	10	0
09082004	10.6	1.35	222.5	E	8	0
09082204	18.3	6.6	336	D	8	0
05060105	16.8	6.35	201.5	D	8.5	0
05060205	14.15	3.1	163.5	D	7	0
05060305	15.3	3.15	204	D	11.5	0
05060405	13.4	2.55	191.5	D	10.5	0
05060505	12.8	2.45	206	D	11	0
05060605	13.45	1.65	191	E	9.5	0
05060705	15.9	4.3	205.5	E	7.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05060805	15.1	2.55	211.5	E	7	0
05060905	14.65	2.9	176	E	8	0
05061005	14.8	3.35	172	E	8.5	0
05061105	13.15	2	194	E	7.5	0
05061205	19.5	3.45	328.5	E	7.5	0
05061305	18.3	2.55	322	D	10.5	0
05061405	19.6	4.6	329	D	7.5	0
05061505	17.05	2.4	223	D	15.5	0
05061605	14.95	6.1	220.5	D	9.5	0
05061705	6.2	0.45	219	F	41.5	1

05061805	5.35	0.4	98	E	22	0
05061905	15.3	1.9	333	D	15	0
05062005	17.3	3.2	329.5	D	12	0
05062105	14.3	4.7	322.5	E	2.5	0
05062205	12.25	4.1	341.5	E	4	0
05062305	6.35	2.4	283	D	13.5	0
05062405	5.55	0.45	185.5	F	36	1
05062505	14.7	7.7	206.5	D	10	0
05062605	13.7	4.9	212	D	9	0
05062705	14.25	4.5	187	D	8	0
05062805	14.95	3.5	195	D	11.5	0
05062905	18.55	10.7	68.5	D	12	0
05063005	18.35	7.2	346.5	D	13.5	0
05070105	17.4	2.9	335.5	D	10	0
05070205	14.2	0.6	222	F	3	1
05070305	13.55	4.45	242	D	10	0
05070405	14.55	5.65	215.5	D	8	0
05070505	14.75	4	208.5	E	6.5	0
05070605	16.7	4.4	201	E	7	0
05070705	10.2	2	198	E	5.5	0
05070805	11.05	0.95	289	D	11	0
05070905	14	2.05	304.5	D	13	0
05071005	12.7	2.95	219	E	41	0
05071105	11.85	2.8	261.5	D	16.5	0
05071205	14.55	4.4	208.5	D	10	0
05071305	13.4	1.65	168.5	E	5.5	0
05071405	13.85	1.5	229.5	D	14.5	0
05071505	11.15	1.15	257	F	28.5	1
05071605	6.5	1.85	239.5	E	17	0
05071705	5.5	1.9	224.5	F	44.5	1
05071805	9.1	2.3	181	E	5	0
05071905	12.3	5.25	211.5	D	7.5	0
05072005	12.15	6.8	213.5	D	8.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05072205	13.7	3.75	200.5	E	6	0
05072305	14.3	2.15	138	F	33.5	1
05072405	10.65	2.05	208	F	4	1
05072505	11.75	1.3	251.5	E	20	0
05072605	9.25	2.1	220	D	13	0
05072705	8.15	2.3	219	E	19.5	0
05072805	13.55	2.5	184.5	F	4.5	1
05072905	10.9	3.15	245	E	1.5	0
05073005	10.05	2	214	E	8	0

05073105	11.95	1.55	202.5	F	1.5	1
05080105	12.4	0	0	D	8	0
05080205	15.7	2.4	189	D	8.5	0
05080305	10.95	3	176	E	3.5	0
05080405	11.8	0.85	147	F	28.5	1
05080505	13.3	4.05	211.5	D	10.5	0
05080605	12.45	6.65	216	D	9.5	0
05080705	9.2	2	186.5	F	3	1
05080805	7.75	2.25	208.5	E	8.5	0
05080905	8.25	2.1	194	D	10.5	0
05081005	8.55	1.45	246	E	7.5	0
05081105	6.45	2.3	214.5	F	23	1
05081205	7.95	2.7	203.5	D	13.5	0
05081305	10.25	6.3	211.5	D	8	0
05081405	12.75	5.75	197.5	D	9	0
05081505	10.5	2	225	F	29	1
05081605	10.1	2	262	F	3.5	1
05081705	14.95	4.7	205	E	7.5	0
05081805	11.6	2.35	232	E	5.5	0
05081905	9.55	2.05	205.5	E	9.5	0
05082005	15.85	2.45	291.5	F	3.5	1
05082105	8.7	1.65	253.5	F	51.5	1
05082205	8.2	0.85	261.5	F	63	1
05082305	9.3	2.7	224	E	6.5	0
05082405	13.25	5.1	212.5	D	7	0
05082505	15.05	6.25	217.5	D	8.5	0
05082605	15.35	4.4	211	D	7.5	0
05082705	15	4.25	203	E	6.5	0
05082805	14.3	6.15	191.5	D	8.5	0
05082905	12.95	2.25	192.5	D	14.5	0
05083005	15.3	2.55	201.5	F	33.5	1
05083105	11.5	1	214	E	6	0
06060105	4.65	2.05	250.5	F	38.5	1
06060205	5.8	2.15	234	D	11.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06060305	8.85	3.4	264.5	D	19	0
06060405	8.85	0.05	75	F	41	1
06060505	14.1	4.6	218.5	D	10.5	0
06060605	13.5	4	213	D	12	0
06060705	12.1	4.5	201	D	8.5	0
06060805	14.75	4.1	211	E	8.5	0
06060905	16.15	2.7	194.5	D	20.5	0
06061005	16.05	2.4	175.5	E	8.5	0

06061105	19.3	4.45	326	E	7.5	0
06061205	13.7	7.1	207	D	11	0
06061305	14.6	6.05	208.5	D	9.5	0
06061405	14.05	3.75	192	E	9	0
06061505	14.8	2.25	336	F	53.5	1
06061605	10.45	0.8	109.5	D	12	0
06061705	11.1	4.1	179	E	9	0
06061805	13.6	4.65	195.5	D	10.5	0
06061905	14.35	3.4	208.5	D	7.5	0
06062005	13.9	3.7	181	D	11	0
06062105	14.1	3.65	192.5	D	11.5	0
06062205	13.95	4.15	178	D	16	0
06062305	14.05	4.2	192	D	11	0
06062405	14.45	3.7	241	E	9	0
06062505	12.8	3.65	180.5	E	6	0
06062605	12.85	2.9	172	E	8	0
06062705	12.65	4.35	205	E	8.5	0
06062805	11.9	2.25	177	E	9.5	0
06062905	12.8	2.55	191.5	D	10.5	0
06063005	14.15	2.6	190.5	D	21	0
06070105	15.15	5.45	305	D	4.5	0
06070205	8.65	1.05	185	F	4	1
06070305	10.05	2.6	175.5	E	8.5	0
06070405	13.9	5.6	209	D	9	0
06070505	14.55	4.5	202	E	6.5	0
06070605	11.25	1.55	219.5	E	5.5	0
06070705	14.1	4.55	196	E	9	0
06070805	10.35	1.75	228.5	E	7.5	0
06070905	8.6	1.85	209.5	F	3.5	1
06071005	13.35	3.3	286	E	3	0
06071105	14.2	3.1	315.5	E	9.5	0
06071205	9.65	2.35	248.5	D	13.5	0
06071305	8.45	1.5	204.5	D	13	0
06071405	14.65	4.45	207	E	9	0
06071505	14.25	2.5	190	E	28.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06071605	17.75	5.85	321.5	D	11	0
06071705	8.75	2.5	231.5	D	19	0
06071805	7.15	1.25	197	D	14	0
06071905	14.8	8.05	204	D	10	0
06072005	12.7	6.1	212	D	9.5	0
06072105	12.5	7.3	205.5	D	9	0
06072205	12.95	5.25	203	D	12.5	0

06072305	12.65	4.05	178.5	E	7	0
06072405	11.3	1.9	201.5	D	12.5	0
06072505	14.1	2.15	217	D	16	0
06072605	14	3.1	164	D	11	0
06072705	10.75	1.2	228.5	D	11.5	0
06072805	15.75	2.6	171.5	E	8	0
06072905	10.9	1.75	223	D	15	0
06073005	8.6	1.5	213.5	D	14.5	0
06073105	12.3	0.45	100.5	F	39.5	1
06080105	9.7	1.6	233.5	F	26	1
06080205	7.3	2.3	190.5	E	6.5	0
06080305	8.05	1.85	222.5	F	28	1
06080405	11	2.65	178	D	15	0
06080505	13.25	5.95	212	D	11	0
06080605	14.6	8.75	205	D	9.5	0
06080705	14.2	7	209.5	D	9	0
06080805	14.05	6.2	206	D	10.5	0
06080905	16.05	6.75	208.5	D	8.5	0
06081005	8.15	2.05	264.5	F	36	1
06081105	13.1	4.95	214.5	E	7	0
06081205	10.4	1.8	205.5	D	13.5	0
06081305	11.65	1.95	230	E	8.5	0
06081405	15.05	4.55	307.5	E	4.5	0
06081505	9.8	2.4	218.5	E	5.5	0
06081605	10.5	2.35	185.5	E	7	0
06081705	9.1	1.95	200	D	3.5	0
06081805	11.9	2.85	246	D	3	0
06081905	14.6	3.35	301	E	4	0
06082005	14.5	3.15	215.5	E	8	0
06082105	11.85	1.2	213	D	10.5	0
06082205	13	1.8	202	D	14	0
06082305	9.75	2.2	236	D	15	0
06082405	11.15	1.15	255.5	E	7.5	0
06082505	18.1	4.9	345	D	10	0
06082605	15.3	3.5	184	E	6.5	0
06082705	16	3.7	202.5	E	7	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06082805	16.8	2.5	215.5	E	22.5	0
06082905	15.35	5.05	214.5	D	10	0
06083005	15.15	2.95	189.5	D	14	0
06083105	18.65	5.7	111.5	D	14	0
07060105	14.7	1.2	195	D	12	0
07060205	17.45	4.75	198.5	D	11.5	0

07060305	14.85	0.8	196	D	10.5	0
07060405	15.25	1.85	213	D	12	0
07060505	18.2	3.75	204.5	D	12	0
07060605	16.3	2.55	213	D	15.5	0
07060705	16.35	3.55	291	D	11.5	0
07060805	15.5	0.7	143.5	D	10	0
07060905	8.9	5.1	305	D	11	0
07061005	7.95	0.55	277.5	D	17.5	0
07061105	11.75	2.1	193.5	D	13.5	0
07061205	7.25	1.35	241.5	D	12.5	0
07061305	12.65	4.4	207	D	11.5	0
07061405	9.75	3.6	173	D	12	0
07061505	15.2	3.4	207.5	D	19.5	0
07061605	9.35	0.8	219	E	9.5	0
07061705	13.05	4.05	206.5	E	8.5	0
07061805	12.25	1.5	255	E	19	0
07061905	14.65	4.25	305.5	D	14	0
07062005	6.2	1.5	173	F	53	1
07062105	8.95	1.4	266	F	28.5	1
07062205	11.65	4.8	211	D	12	0
07062305	13.7	4.15	202	D	11	0
07062405	13.55	5	210.5	D	13	0
07062505	15.05	2.5	187	E	23	0
07062605	16.45	2.35	296.5	D	15.5	0
07062705	8.9	1.9	261	F	47	1
07062805	4.35	1.45	268	F	35	1
07062905	11.6	4.9	313	D	11.5	0
07063005	12.9	1.55	7	F	50.5	1
07070105	6.4	2.2	240.5	D	13	0
07070205	4.65	1.7	201.5	E	18.5	0
07070305	6.5	0.45	109.5	D	11.5	0
07070405	9.65	0.5	114.5	D	12	0
07070505	12.65	1	70	D	52	0
07070605	12.85	3.7	237.5	D	51	0
07070705	4.4	1.75	238	D	14	0
07070805	6	1.7	223	D	11.5	0
07070905	7.05	1.65	253	D	14.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07071005	14.9	8.5	196	D	12	0
07071105	8.9	2.55	254.5	D	14.5	0
07071205	6.55	2.2	230	E	6.5	0
07071305	4.7	0.55	103.5	F	48.5	1
07071405	6.9	2.25	250	D	14	0

07071505	7.25	2.85	160.5	D	11	0
07071605	10.2	3.5	195.5	D	11	0
07071705	7.65	1.55	181.5	D	31	0
07071805	2	1.5	240.5	F	25.5	1
07071905	9.1	4.1	217	D	12.5	0
07072005	2.4	1.05	204	E	16	0
07072105	13.35	4.9	211.5	D	12	0
07072205	13.2	5.8	208.5	D	11.5	0
07072305	12.95	4.15	203.5	D	16	0
07072405	13.85	3.9	192	D	10.5	0
07072505	8.85	1.7	205.5	D	14	0
07072605	8.9	1.4	211	E	8.5	0
07072705	8.9	1.85	217	E	17	0
07072805	8.4	2.4	248	D	11	0
07072905	5.75	0.7	241	D	26	0
07073005	7.9	1.1	212.5	E	19.5	0
07073105	8.85	0.9	87.5	D	10.5	0
07080105	13.15	2.7	304	E	5	0
07080205	14	4	327	E	8	0
07080305	15	3.85	338.5	E	8.5	0
07080405	16.8	3.15	217.5	D	10	0
07080505	9.15	1.4	213.5	E	16.5	0
07080605	4.35	1.35	240	E	6	0
07080705	7.2	2.05	208	E	5.5	0
07080805	8.55	2.65	279.5	E	5	0
07080905	13.6	2	317	D	8	0
07081005	8.65	1.55	245.5	D	8	0
07081105	5.3	1.8	241	D	13.5	0
07081205	7.6	2.15	171.5	E	20	0
07081305	10.55	1.85	226.5	D	12.5	0
07081405	16.5	4.7	188	D	10.5	0
07081505	14.3	2.15	209.5	E	19.5	0
07081605	15.4	2.4	246	E	9.5	0
07081705	17.45	4.2	347	E	6.5	0
07081805	15.65	3.25	172	D	16	0
07081905	16.4	4.25	193	D	11	0
07082005	15.95	3.5	112.5	D	20	0
07082105	12.75	2.6	208	D	25.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07082205	16.55	9.15	156.5	D	11	0
07082305	16.9	8.95	149	D	10	0
07082405	16.45	7.9	131.5	D	8.5	0
07082505	16.7	5.25	173	D	10.5	0

07082605	14.85	3.7	200.5	D	11	0
07082705	12.1	2.3	215	E	9	0
07082805	9.85	1.35	231.5	E	5.5	0
07082905	8.7	1.45	249.5	E	9	0
07083005	10.85	0.3	219	D	12	0
07083105	11.8	1.3	222	F	28	1
08060105	17.05	3.95	183	D	10.5	0
08060205	18.25	7.9	107.5	D	12	0
08060305	18.55	5.1	14.5	D	31.5	0
08060405	15.35	1.8	199.5	D	15	0
08060505	14.45	0.45	217	E	7	0
08060605	12.7	0.65	233.5	E	7.5	0
08060705	15.45	1.75	172	E	7	0
08060805	15.85	4.9	209.5	D	12.5	0
08060905	16.85	3.35	194.5	E	32	0
08061005	16.15	3.15	189	D	16	0
08061105	14.9	1	199.5	F	26	1
08061205	15.85	1.95	221.5	E	17	0
08061305	16.7	4.25	311	E	8	0
08061405	11.1	3.3	175.5	D	10.5	0
08061505	14.45	5.7	208	D	13	0
08061605	16.55	4.05	218.5	D	14	0
08061705	16.95	3.75	224.5	D	10	0
08061805	16.7	3.85	193.5	D	12	0
08061905	15.45	0	0	F	3	1
08062005	15.4	1.4	303.5	D	15.5	0
08062105	10.25	3.25	232	D	11	0
08062205	8.2	1.35	196.5	F	30	1
08062305	13.8	4.6	210	D	12	0
08062405	13.6	3.7	200	D	12.5	0
08062505	9.75	1.75	220	E	5	0
08062605	8.6	1.9	247.5	D	3.5	0
08062705	16.3	4.75	204.5	D	10.5	0
08062805	10.05	1.8	214	F	4.5	1
08062905	10.3	2.65	229	D	15.5	0
08063005	9.9	0.3	112.5	F	31.5	1
08070105	11.25	1.55	259	F	43.5	1
08070205	5.7	0.75	112.5	F	43.5	1
08070305	7.5	1.35	206	D	15.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08070405	12.7	1.95	201.5	E	17.5	0
08070505	13.95	4.05	203.5	D	15	0
08070605	14.25	2.9	124	E	39.5	0

08070705	13.25	2.65	271.5	E	28	0
08070805	15.3	3.15	331	D	9.5	0
08070905	6.05	1.8	239.5	D	25	0
08071005	9.85	6.1	308	D	9.5	0
08071105	7.65	3.55	241	E	7.5	0
08071205	7.5	1.85	164	F	4	1
08071305	11.25	1.8	179.5	D	10.5	0
08071405	15.3	0.15	104.5	F	33	1
08071505	18.25	4.25	339.5	D	10.5	0
08071605	16.35	1.55	281	F	38.5	1
08071705	12.15	2.2	197.5	D	15.5	0
08071805	13.8	3.85	327.5	E	5	0
08071905	7.35	1.5	239	E	19.5	0
08072005	8.55	1.3	227	D	9.5	0
08072105	17	5.2	329	D	10	0
08072205	10.85	2.05	171	D	15.5	0
08072305	13.9	5.35	202	D	13	0
08072405	13.6	3.25	210	D	22	0
08072505	13.55	4.4	211.5	D	12.5	0
08072605	11.4	2.55	241	D	21	0
08072705	6.5	1.55	230	D	15.5	0
08072805	8.7	2.3	233.5	F	31	1
08072905	11.25	6.95	215	D	14	0
08073005	6.4	1.3	230	F	32	1
08073105	6.15	3.05	240.5	D	24.5	0
08080105	6.85	0.3	130.5	D	22.5	0
08080205	15.85	4.95	163	D	20	0
08080305	7.6	3.4	234.5	E	7.5	0
08080405	8.45	0.4	108.5	F	1.5	1
08080505	9.7	2.45	228	D	12.5	0
08080605	7.75	1.7	227	D	14	0
08080705	6.9	1.9	232.5	D	11.5	0
08080805	5.25	1.55	237.5	E	20.5	0
08080905	4.85	1.2	257	F	35.5	1
08081005	4.7	0.9	211.5	E	7	0
08081105	5.4	4	241.5	E	6	0
08081205	2.65	1.55	245.5	D	11.5	0
08081305	4.5	0.5	227	D	11	0
08081405	6.7	3	224.5	D	10.5	0
08081505	3.7	1.5	227	F	28.5	1

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08081605	3.85	0.8	233.5	F	25	1
08081705	11.95	3.2	212	D	22.5	0

08081805	9.75	1.1	208	E	8	0
08081905	9.45	3.1	197	D	20.5	0
08082005	9.05	1.5	201	E	8.5	0
08082105	11.15	0.95	219	E	6	0
08082205	15.8	1.85	315.5	D	10	0
08082305	10.6	2.35	198.5	F	54.5	1
08082405	12.55	5.3	196	D	12.5	0
08082505	12.9	4.45	211	D	12	0
08082605	10.6	1.45	241	D	23.5	0
08082705	14.55	3.45	322	D	10	0
08082805	12.2	1.7	191.5	F	29	1
08082905	14.15	2.15	231.5	E	6.5	0
08083005	16.15	2.95	303.5	E	7.5	0
08083105	17.95	4.85	328	D	11	0
09060105	15.05	3.4	196	E	9.5	0
09060205	14.6	2.4	195.5	D	17	0
09060305	14.3	2.55	178	E	28	0
09060405	15.65	2.7	174.5	E	9	0
09060505	13.15	0.9	218.5	E	18	0
09060605	10.85	1.5	210	D	33.5	0
09060705	15.3	3.1	307.5	D	16	0
09060805	9.35	3.85	243.5	E	6.5	0
09060905	9.55	3	235	E	7	0
09061005	5.9	2.35	249	E	9.5	0
09061105	4.7	1.4	249.5	F	49	1
09061205	4.15	1.2	222	F	26.5	1
09061305	8.45	0.85	208.5	D	13	0
09061405	9.5	1	2	D	14	0
09061505	11.35	2.9	284	E	34	0
09061605	9.8	1.85	205.5	F	27.5	1
09061705	8.05	1.25	203	E	19.5	0
09061805	14.65	5.25	205.5	D	12.5	0
09061905	14.5	4.55	213.5	D	13.5	0
09062005	15.55	3.55	151	D	16.5	0
09062105	16.55	3.15	161.5	E	34.5	0
09062205	18.3	7.35	33.5	D	11.5	0
09062305	15.95	6.25	185.5	D	10.5	0
09062405	10.7	1.9	217.5	E	17.5	0
09062505	9.45	0.65	122	F	0.5	1
09062605	14.1	0.15	91.5	F	42	1
09062705	14.65	3.7	332	D	11	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
09062805	9.45	2.95	258	E	8	0

09062905	7.35	0.65	251	F	51	1
09063005	7.35	1	237	D	9	0
09070105	14.3	4.15	333.5	D	9	0
09070205	13.25	2.5	323.5	D	15	0
09070305	8.95	2.8	288	D	16	0
09070405	4.45	2.4	245	D	10	0
09070505	5.85	1.9	234.5	D	10.5	0
09070605	7.7	1.55	170.5	E	7	0
09070705	12.15	1.9	190.5	E	17.5	0
09070805	13.85	4.9	204.5	D	12.5	0
09070905	12.9	5.75	204	D	12.5	0
09071005	12.55	6.95	206	D	13.5	0
09071105	13.45	5.8	214.5	D	11	0
09071205	11.45	1.45	206	D	16	0
09071305	13.2	4.65	329	D	11.5	0
09071405	11.5	2.35	200	D	14.5	0
09071505	6.15	2.9	239.5	D	14	0
09071605	9.25	3.15	283	D	25.5	0
09071705	11.4	4.55	234.5	D	13.5	0
09071805	12.9	4.3	204	D	10	0
09071905	11.1	0	0	E	6	0
09072005	10.55	1.5	208.5	F	4	1
09072105	9.65	1.2	163.5	E	16	0
09072205	14.25	3.55	301	D	12	0
09072305	17.8	7.1	343.5	D	8.5	0
09072405	14.65	5.25	197	D	11.5	0
09072505	13.6	4.6	207.5	D	12.5	0
09072605	12.1	0.85	227	F	37.5	1
09072705	16	5.15	321.5	D	9.5	0
09081105	8.9	0	0	F	0	1
09081705	16.2	6.2	335	D	9	0
05060106	16.25	5.85	201	D	7.5	0
05060206	14.2	3.95	169	D	6.5	0
05060306	14.85	3.4	194	D	8.5	0
05060406	12.95	2.2	201	D	9	0
05060506	12.45	1.6	181.5	D	11	0
05060606	14.35	1.7	199.5	D	11.5	0
05060706	15.95	4.45	208	D	8	0
05060806	15.45	3.95	172	D	9	0
05060906	15.5	2.4	181	C	37	0
05061006	15.15	0.45	108	D	48.5	0
05061106	13.35	1.95	196	D	9.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class

05061206	19.25	3.25	303.5	D	9	0
05061306	18.1	2	334.5	D	7.5	0
05061406	19.7	4.35	334.5	D	8.5	0
05061506	16.95	0	0	C	60	0
05061606	14.3	6.7	208.5	D	9	0
05061706	6.2	0	0	D	15	0
05061806	5.4	0.8	103	D	11.5	0
05061906	15	1.2	335	B	25.5	0
05062006	17.55	3.8	335.5	D	8	0
05062106	13.9	3.9	318.5	B	47	0
05062206	12.1	4.4	343.5	D	3.5	0
05062306	7.95	3.4	301.5	D	8.5	0
05062406	5.05	0.3	140.5	C	40.5	0
05062506	14.5	7.2	215	D	10.5	0
05062606	13.8	4.8	202	D	14	0
05062706	14.35	4.8	196	D	8	0
05062806	15.25	3.6	213	D	13.5	0
05062906	18.5	9.9	66.5	D	13	0
05063006	18.75	6.8	24.5	D	24.5	0
05070106	17	3.2	336.5	D	7	0
05070206	13.85	0.85	207.5	D	6.5	0
05070306	12.6	3.75	230	D	11.5	0
05070406	14.85	5.85	216.5	D	9	0
05070506	14.55	3.85	205.5	D	6.5	0
05070606	16.75	3.95	200	D	7	0
05070706	10	2.25	192.5	D	11	0
05070806	11.2	0	0	D	0	0
05070906	12.85	1.25	254	C	38.5	0
05071006	12.25	4.4	272	C	16.5	0
05071106	14	3.55	222.5	D	14	0
05071206	14.45	3.65	211.5	D	9	0
05071306	13.55	1	125.5	D	6	0
05071406	13.6	1	229.5	D	3.5	0
05071506	11.35	1.65	227.5	C	42	0
05071606	6.75	1.55	260	D	17.5	0
05071706	5.45	1.6	239.5	D	45.5	0
05071806	8.45	2.25	177	B	4	0
05071906	11.95	5.05	211.5	D	8	0
05072006	12.5	6.9	213	D	8.5	0
05072206	14.45	5.15	204.5	D	6.5	0
05072306	14.1	2.85	154	C	20.5	0
05072406	10.35	2.15	200.5	D	12	0
05072506	10.4	2.5	238	C	16.5	0

		Wind	Wind	Stability	Sigma	

Time	Temp	Speed	Direction	Class	Theta	F-Class
05072606	8.3	1.65	210.5	D	4	0
05072706	8.7	2.05	208	D	15	0
05072806	13.35	3	187	D	13	0
05072906	11.5	1.9	275.5	D	19.5	0
05073006	9.85	2.05	211	D	5.5	0
05073106	11.95	1.7	201.5	D	2	0
05080106	12.25	0.8	95	D	8.5	0
05080206	15.05	2.8	176	D	8	0
05080306	11.6	3.15	176	D	5	0
05080406	11.75	1.3	240.5	D	7	0
05080506	12.8	5.45	205	D	7.5	0
05080606	12.5	6.3	221	D	10	0
05080706	9.2	2	205	D	5.5	0
05080806	7.7	1.85	194.5	D	5	0
05080906	8.45	2	193.5	D	5.5	0
05081006	8.15	1.6	252.5	D	21	0
05081106	6.35	0.95	235.5	A	30.5	0
05081206	10.15	3.3	202	B	12	0
05081306	10.6	7.1	218	D	9	0
05081406	12.5	4.45	205	D	9.5	0
05081506	10.4	1.6	202	D	14	0
05081606	10.15	1.95	251.5	C	29.5	0
05081706	14.2	4.9	201	D	8	0
05081806	10.8	2.8	184	D	6.5	0
05081906	8.9	2	193.5	D	8.5	0
05082006	15.3	2.75	160.5	C	21.5	0
05082106	8.25	1.65	255.5	D	27	0
05082206	8.5	0.55	236	D	37	0
05082306	10.1	1.75	189	B	11	0
05082406	13.3	4.85	219	D	9.5	0
05082506	14.85	5.6	212.5	D	9	0
05082606	14.55	4.35	210	D	7	0
05082706	14.95	5.5	207.5	D	9.5	0
05082806	14.5	6.25	187.5	D	9	0
05082906	13.4	2.85	185.5	D	11.5	0
05083006	14.95	2.25	183	D	11.5	0
05083106	11.7	0.8	218	D	7.5	0
06060106	4.05	2.05	249.5	C	29.5	0
06060206	6.1	2.55	236.5	D	13	0
06060306	7.3	2.4	260.5	D	16	0
06060406	9.9	1.75	324.5	C	19	0
06060506	13.8	4.05	218	D	9	0
06060606	13.3	4	210	D	9	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06060706	12.65	4.4	198.5	D	8.5	0
06060806	14.5	4.6	198.5	D	11	0
06060906	15.8	3.55	213.5	D	11	0
06061006	15.95	2.9	163	D	13	0
06061106	19.05	5.2	337	D	8.5	0
06061206	14	7.95	202	D	10	0
06061306	14.4	6.1	207.5	D	8.5	0
06061406	13.9	4.05	197	D	8	0
06061506	14.35	4.3	229	D	11.5	0
06061606	9.9	2.05	209	C	18	0
06061706	12.1	3.9	206	D	10.5	0
06061806	13.45	4.25	203	D	10	0
06061906	14.05	2.65	195.5	C	18	0
06062006	13.5	3.35	183.5	D	7	0
06062106	14.35	3.9	205	D	7	0
06062206	13.8	4.45	192	D	8	0
06062306	13.9	3.95	206.5	D	9.5	0
06062406	14.65	2.7	249.5	C	55.5	0
06062506	13.2	3.35	200	D	7.5	0
06062606	12.65	2.15	179.5	D	13.5	0
06062706	12.55	4.25	209.5	D	8	0
06062806	12.8	1.75	191	C	19	0
06062906	14.35	3.35	170	C	19	0
06063006	14.45	3.6	206	D	9.5	0
06070106	13.6	3.4	274	B	23.5	0
06070206	8.4	0	0	D	0.5	0
06070306	10.35	3.05	164.5	D	7.5	0
06070406	14.3	5.75	212.5	D	8.5	0
06070506	14.6	5.15	203	D	8	0
06070606	10.7	1.75	209.5	D	13	0
06070706	14	4.25	211.5	D	8	0
06070806	9.85	1.5	182	D	6.5	0
06070906	8.15	1.6	226	D	4	0
06071006	13.2	3.45	283	D	4	0
06071106	14.75	3.9	290.5	D	5.5	0
06071206	9.8	2.4	241	D	13.5	0
06071306	8.8	1.95	184.5	D	4.5	0
06071406	14.4	4.55	210.5	D	9.5	0
06071506	14.45	1.4	243.5	C	59	0
06071606	17.85	5.55	329.5	D	9	0
06071706	8.25	1.85	226.5	C	22	0
06071806	7.05	2.35	248.5	C	18	0
06071906	15	8.35	193.5	D	9.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06072006	12.4	5.75	211	D	9	0
06072106	12.45	6.85	207.5	D	10	0
06072206	12.95	3.85	206.5	D	12	0
06072306	12.65	2.8	186.5	D	7.5	0
06072406	10.85	2.05	220.5	B	22.5	0
06072506	13.9	2.45	164	D	12.5	0
06072606	13.65	3.2	166.5	D	15.5	0
06072706	10.5	0	0	B	23.5	0
06072806	16.1	3.15	166	D	8.5	0
06072906	10.6	1.3	215	C	38	0
06073006	8.6	1.7	217	D	9	0
06073106	13.95	0.85	321.5	C	48	0
06080106	8.8	1.1	232.5	D	36	0
06080206	7.3	2.35	180	D	8	0
06080306	6.85	1.6	229.5	D	9.5	0
06080406	10.3	1.9	194	C	16	0
06080506	13.05	6	214	D	10	0
06080606	14.7	9.9	200	D	9.5	0
06080706	13.95	5.5	211	D	8.5	0
06080806	13.75	6.35	214.5	D	10	0
06080906	15.6	5.35	209	D	11	0
06081006	7.55	1.3	225.5	C	49	0
06081106	13.55	5.5	209.5	D	9	0
06081206	10.5	1.7	215.5	D	10	0
06081306	11.75	2.05	213.5	D	23.5	0
06081406	14.5	4.1	299	D	5.5	0
06081506	9.5	2.35	206	D	10	0
06081606	10.3	2.45	179.5	D	4	0
06081706	8.75	2.1	205.5	D	5.5	0
06081806	11.45	2.05	235.5	C	18.5	0
06081906	14.35	2.7	316	D	6.5	0
06082006	14.1	3.25	195	D	10	0
06082106	11.5	0	0	D	5	0
06082206	11.25	1.15	229.5	C	34	0
06082306	11.6	3.75	177.5	D	8.5	0
06082406	10.4	1.5	271.5	B	24.5	0
06082506	17.45	4.9	340.5	D	10.5	0
06082606	14.75	2.7	183.5	D	8.5	0
06082706	15.3	3.3	183	D	9	0
06082806	16.7	1.45	195	B	26.5	0
06082906	15.4	5.8	209	D	11.5	0
06083006	15.6	1.9	189.5	D	10	0
06083106	18.55	5.55	118.5	D	13.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07060106	14.7	1.75	195	D	9	0
07060206	17.25	4.8	200.5	D	12	0
07060306	14.85	1.6	179	C	16.5	0
07060406	14.95	1.7	216	D	9.5	0
07060506	17.9	4	199.5	D	12.5	0
07060606	16.5	2.5	164.5	D	21.5	0
07060706	16.35	3.55	309.5	C	18	0
07060806	15.35	2	286.5	C	16.5	0
07060906	8.5	3.6	311.5	D	15	0
07061006	8.3	2.1	247.5	D	15	0
07061106	11.55	0.9	110	B	23	0
07061206	6.65	1.85	246.5	D	10.5	0
07061306	12.55	4.45	216.5	D	12	0
07061406	12.55	4.6	209	D	12.5	0
07061506	14.65	3.5	202	D	9	0
07061606	8.05	1.55	242	D	12	0
07061706	8.9	3.05	218	D	10	0
07061806	12.65	1.65	233.5	D	21.5	0
07061906	14.15	5.35	297	D	10	0
07062106	8.6	0.7	227.5	A	33	0
07062206	11.9	5.2	212	B	13	0
07062306	13.65	4.15	197.5	D	12.5	0
07062406	13.65	5.35	204	D	13.5	0
07062506	15.05	3.25	206.5	D	13.5	0
07062606	16.25	1.3	322	D	13.5	0
07062706	7.65	1.6	231.5	B	25.5	0
07062806	4.85	2.25	258.5	A	54.5	0
07062906	11.1	4.25	322.5	D	12	0
07063006	12.05	1.85	253	D	34	0
07070106	5.65	1.25	239	B	23	0
07070206	3.95	1.5	237.5	D	15.5	0
07070306	5.5	1.2	227.5	C	16.5	0
07070406	8.25	0.6	125.5	D	13	0
07070506	12.15	1.65	238.5	C	56	0
07070606	10.95	3.2	277	B	30	0
07070706	3.7	1.75	231.5	D	9.5	0
07070806	4.85	0.25	113	D	7.5	0
07070906	5.55	0.6	11	C	35.5	0
07071006	14.9	8.35	196	D	12	0
07071106	9.15	2.85	249.5	D	14.5	0
07071206	6.6	2.8	244.5	D	5	0
07071306	4.65	0.3	259.5	D	31.5	0
07071406	6.75	2.4	262	D	10.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07071506	4.6	1.1	189	B	25	0
07071606	10.2	3.2	189.5	D	15.5	0
07071706	7.05	1.95	220.5	C	18	0
07071806	2.6	2.6	219.5	B	24.5	0
07071906	9.35	4.75	222	D	10.5	0
07072006	1.65	1.45	214.5	D	15.5	0
07072106	13	5	206.5	D	10.5	0
07072206	13.2	5.4	208.5	D	12.5	0
07072306	12.75	2.85	181.5	D	12	0
07072406	13.4	3.85	202.5	D	13.5	0
07072506	7.95	1.6	199.5	D	9.5	0
07072606	8.9	1.6	215	D	8.5	0
07072706	8	1.25	198.5	C	19.5	0
07072806	7.65	1.6	254	D	9.5	0
07072906	6.2	1.15	194.5	C	36.5	0
07073006	6.3	2.45	208.5	C	18	0
07073106	8.85	0.75	143	B	28	0
07080106	11.95	2.3	305.5	D	5	0
07080206	13.55	3.25	335	D	11	0
07080306	13.85	2.65	316	C	19	0
07080406	17	3.5	223.5	D	9	0
07080506	4.9	0.95	209	D	18.5	0
07080606	4.65	1.55	240	D	19.5	0
07080706	5.75	1.6	193	D	6	0
07080806	8.5	2.6	279	D	3	0
07080906	13.85	2.6	312.5	C	19.5	0
07081006	7.6	1.75	264	B	28.5	0
07081106	4.65	1.4	261.5	A	34.5	0
07081206	9.45	1.4	344.5	A	43	0
07081306	8.35	1.05	210.5	B	14.5	0
07081406	16.25	4.3	199.5	D	13	0
07081506	15	2.55	181	C	17	0
07081606	15.4	2.35	246	D	13	0
07081706	17.55	4.6	343.5	D	8	0
07081806	15.5	2.1	154.5	D	12	0
07081906	16.2	4.45	188	D	11	0
07082006	16.2	3.2	116.5	D	9.5	0
07082106	12.45	2.85	218	C	16	0
07082206	16.1	9.45	155.5	D	11	0
07082306	17.2	8.75	150	D	10	0
07082406	16.4	6.2	151	D	11	0
07082506	16.55	4.95	175.5	D	11	0

07082606	14.7	3.65	207.5	D	10	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07082706	12.05	1.85	211.5	D	10	0
07082806	9.75	1.55	234.5	D	7.5	0
07082906	8.4	2.1	240.5	D	6	0
07083006	11.2	0.85	216.5	D	15.5	0
07083106	12.45	1.3	215.5	C	22	0
08060106	17.25	4	183	D	9.5	0
08060206	18.25	8.75	119.5	D	13.5	0
08060306	17.9	3.15	339.5	D	12.5	0
08060406	15.65	1.3	218	B	25.5	0
08060506	13.9	0.1	109.5	A	29	0
08060606	11.8	0.8	242.5	B	12.5	0
08060706	16.7	2	200	C	17.5	0
08060806	15.6	6.05	210.5	D	13	0
08060906	15.9	4.4	167.5	D	23.5	0
08061006	16.25	2.35	211.5	D	18	0
08061106	14.55	1.65	189.5	C	19.5	0
08061206	14.85	1	126.5	A	61.5	0
08061306	17.05	4.2	315.5	B	10	0
08061406	12.35	3.9	198.5	D	9.5	0
08061506	14.25	5.4	210	D	13.5	0
08061606	15.9	3.1	218	D	11.5	0
08061706	17.35	4.35	216.5	D	12	0
08061806	16.5	4.2	202	D	12.5	0
08061906	15.55	0.05	113	D	10.5	0
08062006	15.8	1.6	314	D	11	0
08062106	10	3.05	237.5	D	8	0
08062206	7.95	1.9	208.5	D	19	0
08062306	13.6	3.9	211.5	D	11.5	0
08062406	14.05	4.25	200.5	D	13.5	0
08062506	9.3	1.3	228	D	13.5	0
08062606	8.95	1.7	280.5	D	7	0
08062706	16.25	4.3	197	D	10	0
08062806	9.85	1.85	213.5	D	10.5	0
08062906	10.05	2.15	204.5	D	12	0
08063006	9.8	1	122.5	D	7.5	0
08070106	11.8	1.35	309	C	34.5	0
08070206	7.75	2.5	206.5	A	41	0
08070306	14.3	3.95	199.5	D	11.5	0
08070406	11	1.75	190.5	D	10	0
08070506	13.9	4.15	189.5	D	14.5	0
08070606	14.4	2.55	193	C	19.5	0

08070706	13.25	1.9	208.5	C	18	0
08070806	14.8	3.15	267.5	C	16.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08070906	7.85	2.6	228	B	22.5	0
08071006	9.1	4.95	314	D	10.5	0
08071106	7.6	2.6	251	D	10.5	0
08071206	7.2	2.05	164	D	11.5	0
08071306	11	1.55	180	D	8.5	0
08071406	14.55	0.75	223.5	C	18	0
08071506	18	3.8	339	D	10	0
08071606	16.25	2.35	259.5	D	38	0
08071706	12	2.3	195.5	D	6.5	0
08071806	14.6	4.3	330	D	7	0
08071906	5.75	1.2	236.5	C	34	0
08072006	7.9	1.5	229	D	7	0
08072106	16.4	3.6	317.5	D	9	0
08072206	9.7	1.95	216.5	C	21	0
08072306	13.65	6	205	D	12.5	0
08072406	13.4	4	178.5	C	29.5	0
08072506	13.1	5.55	203	D	13.5	0
08072606	11.85	4.1	212.5	D	12	0
08072706	5.65	1.45	234	D	10.5	0
08072806	9.35	2.6	232	D	26	0
08072906	11.45	7	214.5	D	13	0
08073006	5.65	1.1	238.5	C	33.5	0
08073106	7.8	4.1	240.5	D	12	0
08080106	6.45	1.05	261	C	18.5	0
08080206	14.35	4.9	195	C	18.5	0
08080306	7.05	2.2	217	C	16	0
08080406	7.7	0.65	114.5	D	6	0
08080506	8.3	2.25	228.5	C	17.5	0
08080606	6.85	0.3	241.5	C	18.5	0
08080706	5.4	0.6	231.5	D	8	0
08080806	4.3	1.7	219.5	C	44.5	0
08080906	4.2	0.25	111	D	29	0
08081006	3.5	1.9	232.5	D	21	0
08081106	4.3	1.45	230	B	23.5	0
08081206	2.9	2.5	231.5	A	36.5	0
08081306	5.4	1.85	215	B	12	0
08081406	5.35	1.95	208	C	21	0
08081506	3.15	1.75	230.5	A	37.5	0
08081606	4.1	2.05	247.5	C	20	0
08081706	12.45	2.95	221.5	A	41.5	0

08081806	9.9	0.9	180	B	3.5	0
08081906	11.5	5.45	202	D	12	0
08082006	8.85	1.5	203.5	D	10.5	0

Temperature Inversion Assessment - Long-term Winter Nights Page 60
Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08082106	11.85	0.5	218.5	D	2	0
08082206	15.2	2.35	329.5	D	11	0
08082306	10	3.3	260	B	42	0
08082406	12.8	6.3	203	D	13	0
08082506	12.75	4.25	214.5	D	12.5	0
08082606	10.45	1.9	216	B	23	0
08082706	14.8	3.7	320.5	D	9.5	0
08082806	13.45	2.15	199.5	D	11	0
08082906	13.5	1.9	206	D	14	0
08083006	16.3	2.3	312.5	D	11	0
08083106	18.3	5.2	330.5	D	11	0
09060106	15.1	4	199.5	D	10.5	0
09060206	14.6	3.05	190.5	D	11	0
09060306	14.35	3.05	171	D	9	0
09060406	15.9	2.9	184	D	11	0
09060506	13.3	0.75	210.5	B	28	0
09060606	10.2	1.6	221.5	A	40	0
09060706	14.6	2.55	299	B	12.5	0
09060806	8.3	1.15	289.5	A	45.5	0
09060906	9.45	3.65	245.5	B	3	0
09061006	5.65	1.85	222.5	A	35	0
09061106	3.4	1.15	242.5	A	29	0
09061206	3.3	0.55	87	B	7.5	0
09061306	8.1	1.1	238.5	D	13	0
09061406	9.4	1.7	128.5	D	33.5	0
09061506	10.75	1.4	90.5	A	29	0
09061606	9.15	1.85	207.5	A	40.5	0
09061706	8.25	1.9	218.5	B	6	0
09061806	14.6	5.15	204	D	13.5	0
09061906	14.25	4.35	210.5	D	12.5	0
09062006	15.85	3.95	161	B	25	0
09062106	18.55	4.55	60	C	44	0
09062206	18.2	6.9	39.5	D	13	0
09062306	16.2	6.3	187	D	10.5	0
09062406	9.65	1.05	226	D	3.5	0
09062506	9.3	0.45	119.5	D	2.5	0
09062606	13.8	0.7	261	D	8	0
09062706	14.15	2.55	324	D	13.5	0
09062806	8.85	1.8	253	D	10	0

09062906	7.2	0.2	18.5	C	64	0
09063006	7.25	0.65	110	D	10	0
09070106	14.85	3.2	351	D	13	0
09070206	12.65	1.65	223	C	42	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
09070306	7.6	2.15	271.5	A	36	0
09070406	3.9	1.3	242.5	B	12.5	0
09070506	5.1	1	224	C	16.5	0
09070606	8	2.1	170	D	10	0
09070706	12.5	2.05	195.5	D	12	0
09070806	13.7	5.95	193.5	D	12.5	0
09070906	12.8	5.6	202.5	D	13.5	0
09071006	12.85	7.25	200.5	D	13.5	0
09071106	13.55	6.05	207	D	11.5	0
09071206	9.5	1.45	163.5	D	12.5	0
09071306	12.75	4.1	325.5	D	9.5	0
09071406	14.3	2.85	207.5	C	17	0
09071506	6.05	1.5	231	C	17	0
09071606	7.3	0.45	210.5	D	12	0
09071706	10.25	2.65	258.5	C	17.5	0
09071806	12.6	3.9	203.5	D	10.5	0
09071906	11	0.2	119.5	D	9	0
09072006	10.55	2	182	D	5.5	0
09072106	11.95	2.85	314.5	D	8.5	0
09072206	13.95	3.3	308.5	D	9.5	0
09072306	17.75	6.75	346	D	8	0
09072406	14.4	5.45	200.5	D	11.5	0
09072506	13.65	4.3	205	D	11	0
09072606	12.45	1.9	295	C	22	0
09072706	15.7	3.55	315.5	D	10	0
05060122	15.5	3.65	205	D	10	0
05060222	16.3	3.2	205	D	13.5	0
05060322	14.9	2.05	234	D	12	0
05060422	14.15	0.6	223	E	9	0
05060522	15.1	2.05	207.5	D	10.5	0
05060622	17.25	2.5	274.5	D	29.5	0
05060722	16.6	2.8	188	D	11.5	0
05060822	16.85	2.8	183.5	D	10	0
05060922	16.4	1.1	220	E	21	0
05061022	16.1	2.35	212	D	11	0
05061122	18.9	1.8	306	E	8.5	0
05061222	19.25	2.8	326.5	E	7.5	0
05061322	19.3	3	312	E	9.5	0

05061422	20.7	3.4	336	D	10	0
05061522	14.5	1.5	253.5	D	12	0
05061622	10.3	2.1	215	D	15.5	0
05061722	9.65	1.6	218	D	10.5	0
05061822	14.7	3.05	305.5	D	7	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05061922	16.65	3.7	319	D	10.5	0
05062022	17.05	3.7	334.5	D	10	0
05062122	12.45	1.6	183.5	F	30.5	1
05062222	11.3	4.2	319	E	6	0
05062322	9.95	3.5	284	E	45.5	0
05062422	9.6	1.3	248.5	E	18	0
05062522	15.5	4	195.5	D	12	0
05062622	14.45	3.05	200	D	15	0
05062722	14.65	3.95	199.5	E	9	0
05062822	19.3	7.55	71.5	D	12	0
05062922	20.85	6.75	59	D	17	0
05063022	17.85	3.15	326.5	D	6.5	0
05070122	17.1	0.35	132	D	1.5	0
05070222	15.25	1.9	229.5	F	4.5	1
05070322	14.75	4.9	209	E	7	0
05070422	15.4	3.5	196	E	7.5	0
05070522	17	4.55	208.5	E	7	0
05070622	12.75	2.65	228	F	4.5	1
05070722	13	2.45	269	E	23	0
05070822	15.65	2	318	E	16	0
05070922	18.05	4.8	315	E	9	0
05071022	14.3	2.7	263.5	E	27	0
05071122	16.4	4.75	217.5	D	11	0
05071222	15.35	0.6	75.5	D	20	0
05071322	15.8	2.5	325	E	8	0
05071422	11.2	3.05	246.5	D	10.5	0
05071522	13.8	3.9	303	E	6	0
05071622	12.65	4.05	218.5	D	10	0
05071722	9.05	2.35	228.5	D	14.5	0
05071822	13.2	4	205.5	E	6.5	0
05071922	14.35	5.1	195.5	D	8	0
05072022	14.4	5.1	193.5	D	18.5	0
05072122	13.95	3.95	212	E	6	0
05072222	16.25	3.65	196.5	E	7	0
05072322	15.15	2.65	221.5	D	12.5	0
05072422	13.95	2.35	243	D	7	0
05072522	11.1	2.4	243	D	8	0

05072622	11.95	2.3	240.5	F	4	1
05072722	13.4	2.45	237	F	4.5	1
05072822	13.45	1.4	247.5	E	21.5	0
05072922	13.1	2.3	277.5	E	8.5	0
05073022	13.15	1.9	220	E	18.5	0
05073122	14.6	1.45	252.5	E	21.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05080122	17.55	3.8	193.5	E	7	0
05080222	13.05	2.1	223	E	5.5	0
05080322	13.75	1.8	238.5	D	12.5	0
05080422	19.35	3.8	334.5	D	12	0
05080522	12.6	4.3	234	D	7	0
05080622	12.2	1.6	215.5	E	9.5	0
05080722	11.3	2.7	244	F	4.5	1
05080822	10.4	0.8	112	E	9.5	0
05080922	14.4	3.1	311.5	E	7	0
05081022	10.95	0.35	247.5	D	14.5	0
05081122	10.5	3.25	235	E	9	0
05081222	10.4	4.75	223	D	13	0
05081322	14	6.6	208.5	D	10.5	0
05081422	12.5	2.15	216	F	4.5	1
05081522	13.35	2.1	262.5	D	14	0
05081622	14.75	4.35	197	E	7	0
05081722	13	2.1	181.5	D	4.5	0
05081822	12.7	2	217	D	6	0
05081922	16.3	3.8	325	D	16	0
05082022	13.5	3.45	244.5	D	12	0
05082122	11.75	1.55	235.5	E	16	0
05082222	11.2	1.4	220	E	9.5	0
05082322	13.4	3.4	212.5	E	4.5	0
05082422	14.05	3.65	204	E	5	0
05082522	15.95	3.7	207.5	E	8.5	0
05082622	15.75	5.3	190.5	D	7.5	0
05082722	15.15	6.05	191	D	11.5	0
05082822	13.95	4.05	206	D	10	0
05082922	17.1	3.8	150.5	D	46.5	0
05083022	19.4	4.75	20.5	D	11.5	0
05083122	17.9	3.2	315	E	5	0
06060122	10.5	2.05	216.5	E	9.5	0
06060222	10.05	2.95	243.5	E	27.5	0
06060322	14.2	0.85	228	F	44	1
06060422	15.6	4.3	202.5	E	7.5	0
06060522	13.2	2.1	226.5	D	11	0

06060622	13.6	3.65	211	E	7	0
06060722	14.2	3.55	186.5	E	8	0
06060822	16.65	4.5	194.5	E	9	0
06060922	16.65	3.15	210	E	6.5	0
06061022	20.3	5.3	337	D	8.5	0
06061122	13.45	4.6	219.5	D	12	0
06061222	15.55	6.15	194	D	8.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06061322	15.2	4.4	205.5	E	9	0
06061422	14	2.05	229.5	D	12.5	0
06061522	12.3	2.25	236	D	11	0
06061622	14.3	4.55	210	E	7	0
06061722	14.35	3.9	182.5	D	16	0
06061822	14.65	4	192.5	D	10.5	0
06061922	14.1	2.9	179.5	D	11	0
06062022	14.35	2.55	212.5	E	7.5	0
06062122	14.2	3.7	195	D	9.5	0
06062222	14.85	2.55	185.5	D	8	0
06062322	15.5	2.1	221.5	F	30.5	1
06062422	15.35	2.25	234	E	9	0
06062522	14.5	2.75	222.5	E	9.5	0
06062622	14.05	4.15	211.5	E	9	0
06062722	13.1	2.45	224.5	D	13	0
06062822	15	2.3	181.5	F	24	1
06062922	16.75	2.7	203	D	15	0
06063022	15.95	3.6	313.5	E	9	0
06070122	11.25	2.05	216	E	9	0
06070222	12.85	2.15	234	E	7	0
06070322	11.25	2.7	246.5	D	13.5	0
06070422	16.6	5.55	200	D	8.5	0
06070522	13.3	2.7	223	D	6.5	0
06070622	12.55	1.75	221	F	27	1
06070722	11.85	1.6	232	E	7.5	0
06070822	11.1	1.75	222	E	9	0
06070922	14.3	2.8	308	D	16	0
06071022	13.4	1.85	289.5	D	13	0
06071122	15.2	1.45	322	E	6	0
06071222	12.2	1.6	223.5	E	9	0
06071322	17.1	4.2	204	E	9	0
06071422	14.3	2.8	193.5	E	9	0
06071522	16.75	4.05	319.5	D	8.5	0
06071622	14.85	3.65	314.5	D	29.5	0
06071722	11.05	1.95	222.5	D	11.5	0

06071822	14.5	4.65	204.5	D	11	0
06071922	14.3	7.05	199.5	D	9.5	0
06072022	14.45	5.15	198	D	9	0
06072122	13.6	5.45	207	D	12.5	0
06072222	13.55	4.2	216	E	8.5	0
06072322	13.65	1.65	152	F	40.5	1
06072422	16.4	5.6	23.5	D	30	0
06072522	18.3	5.5	64	D	13.5	0

Temperature Inversion Assessment - Long-term Winter Nights Page 65

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06072622	14.3	2.8	188	E	8	0
06072722	16.35	1.75	209	D	15	0
06072822	16.4	1.45	233.5	D	15.5	0
06072922	12.5	1.95	210.5	D	14	0
06073022	12.3	0.8	289.5	F	32.5	1
06073122	13.2	2	273	F	42	1
06080122	9.3	2.05	212	E	9.5	0
06080222	12.45	1.6	229	D	15.5	0
06080322	15.05	4.45	204	E	7.5	0
06080422	12.75	4.35	189	D	10	0
06080522	14.6	8	212	D	11	0
06080622	15.15	4.35	187.5	D	15	0
06080722	14.75	7.9	189.5	D	10.5	0
06080822	17.35	4.6	198.5	D	10.5	0
06080922	15.45	2.05	290.5	D	13.5	0
06081022	13.65	4	238	E	6	0
06081122	12.85	1.85	214.5	E	7.5	0
06081222	14.75	1.95	224.5	D	13	0
06081322	15	1.65	253.5	E	7.5	0
06081422	13.75	1.85	218.5	E	21	0
06081522	12.8	2	212	D	15.5	0
06081622	12.4	2	225.5	E	9.5	0
06081722	17.45	4	359.5	D	32.5	0
06081822	13.8	2.55	270	D	13	0
06081922	14.75	2.2	246	F	23.5	1
06082022	14.75	2.85	249.5	D	12.5	0
06082122	16.05	1	250	D	12	0
06082222	18.45	3.45	307.5	D	27.5	0
06082322	12.35	1.35	235	E	8	0
06082422	17.85	3.15	325.5	E	6.5	0
06082522	16.8	3.3	208	D	19	0
06082622	16.5	4.35	205.5	D	12	0
06082722	15.65	1.85	223	F	47	1
06082822	15.9	3.55	207	E	6	0

06082922	17.15	1.8	329	F	24	1
06083022	18.75	4.75	106	D	17	0
06083122	18.35	5.55	94	D	17	0
07060122	18.5	4	210.5	D	9.5	0
07060222	18	2.45	186.5	D	11	0
07060322	18.8	1.95	226.5	D	11	0
07060422	17.45	2.75	194	D	15	0
07060522	17.55	4.2	194.5	D	10.5	0
07060622	17.45	2.95	313.5	D	20.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07060722	16.75	2.45	259.5	D	17.5	0
07060822	10.85	3.45	303	D	12.5	0
07060922	9	2.3	272	E	19	0
07061022	12.95	2.2	229.5	E	9.5	0
07061122	12.6	1.65	222.5	D	10.5	0
07061222	11.5	2.95	233.5	E	8.5	0
07061322	13	3	220	E	7.5	0
07061422	15.4	3.05	219	D	12	0
07061522	12.4	2.9	236	D	6	0
07061622	9.55	3.25	237.5	E	6	0
07061722	12.65	0.95	228	E	22	0
07061822	15.9	3.3	323	E	7	0
07061922	11.8	3.7	285	D	11	0
07062022	9.85	0.6	145.5	F	32.5	1
07062122	9.3	2.3	240.5	E	17	0
07062222	13.7	3.75	234.5	D	11.5	0
07062322	13.2	6.2	197	D	12	0
07062422	15.3	4	205.5	D	12.5	0
07062522	16.05	3.25	209.5	D	18.5	0
07062622	13.8	1.95	163.5	D	37	0
07062722	9.35	1.9	318	F	27.5	1
07062822	10.1	3.65	315	D	13.5	0
07062922	11	2.6	307.5	E	24	0
07063022	10.95	1.5	117	F	87	1
07070122	7.7	2.35	250	E	21	0
07070222	9.85	3.3	242.5	E	7.5	0
07070322	12.25	1.6	252	E	16.5	0
07070422	17.4	3.45	303.5	D	17	0
07070522	12.75	2.7	238.5	F	34.5	1
07070622	7.7	1.85	217.5	D	10.5	0
07070722	10.2	3	239.5	E	7.5	0
07070822	7.15	1.1	271.5	D	30.5	0
07070922	16.55	5.45	208	D	13.5	0

07071022	13.8	3.85	211	D	11	0
07071122	10.2	2.75	225.5	D	20.5	0
07071222	9.75	2.2	221	D	10	0
07071322	10.7	2.9	211.5	D	15.5	0
07071422	8.2	1.5	215.5	F	26	1
07071522	9.35	3	226.5	E	6.5	0
07071622	12.6	1.4	214	E	9.5	0
07071722	10.15	1.5	329	E	16.5	0
07071822	10.55	2.95	225.5	D	14	0
07071922	4.7	2.1	219	D	7.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07072022	12	2.65	213	D	9	0
07072122	15.25	5.85	194.5	D	13.5	0
07072222	14.8	4.75	201.5	D	10.5	0
07072322	14.25	3.2	191	D	12.5	0
07072422	11.5	1.95	232.5	E	16	0
07072522	11.3	0.95	214.5	D	15.5	0
07072622	11.65	1.25	225.5	E	17	0
07072722	11.6	2.3	237	D	14	0
07072822	10.4	2.55	225	D	18	0
07072922	12.35	1.65	197	D	14.5	0
07073022	10.75	2.45	239	E	8.5	0
07073122	10	1.25	239.5	E	5	0
07080122	12.7	0.7	209.5	D	51	0
07080222	18.5	4.75	341	D	9	0
07080322	17.35	4.15	350	D	12	0
07080422	10.2	2.4	231	E	7.5	0
07080522	8.7	2.9	234	D	10.5	0
07080622	10.15	2.2	238	E	20	0
07080722	10.2	2.2	257	F	4.5	1
07080822	15.45	2.85	299	D	10	0
07080922	16.2	3.4	307.5	D	10	0
07081022	12	2.2	223	F	29	1
07081122	10.15	1.7	240	E	9.5	0
07081222	12.65	1.95	239	D	13.5	0
07081322	15.9	2	212	D	21.5	0
07081422	15.7	2.45	204.5	D	13	0
07081522	15.7	1.7	233	D	14	0
07081622	17.75	3	326.5	E	9.5	0
07081722	17.8	2.05	321	E	20	0
07081822	17.55	2.9	205.5	D	12.5	0
07081922	15.15	4.15	188.5	D	11	0
07082022	14.9	6.55	224.5	D	13.5	0

07082122	17.2	10.2	157.5	D	10	0
07082222	17.25	8.6	150.5	D	10.5	0
07082322	15.65	5.3	172.5	D	11.5	0
07082422	16.25	4.15	170	D	11	0
07082522	16.35	4	203	D	10	0
07082622	16.35	4.35	192	D	9	0
07082722	13.35	1.95	237.5	E	8	0
07082822	14.7	2.65	303	D	19	0
07082922	13.55	2.15	243	E	9	0
07083022	12.95	1.45	228.5	D	10	0
07083122	17	4	345	D	24.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08060122	19.7	8.5	138	D	10.5	0
08060222	20.1	9.1	89	D	9	0
08060322	16.4	1.1	245.5	D	13	0
08060422	17.8	2.95	331.5	E	6	0
08060522	15.6	1.6	229	D	18	0
08060622	15.7	2.25	227	D	10.5	0
08060722	17.55	6.3	199.5	D	12.5	0
08060822	16.55	4.3	199.5	D	12.5	0
08060922	15.8	1.85	216.5	F	58	1
08061022	16.35	1	213	E	5.5	0
08061122	16.6	1.45	227	E	21.5	0
08061222	16.3	2.85	285.5	E	7	0
08061322	15.4	2.15	247.5	F	38	1
08061422	8.4	1.55	278	E	6	0
08061522	17	3.5	211.5	D	14.5	0
08061622	16	3.1	170	E	6.5	0
08061722	17.45	3.95	210.5	D	11	0
08061822	16.8	2.35	230.5	D	11.5	0
08061922	15.55	1.2	224.5	D	9	0
08062022	14.85	3.35	239.5	E	9.5	0
08062122	11.55	1.55	221	E	17.5	0
08062222	10.4	3.6	250.5	E	6.5	0
08062322	10.75	1.15	222	D	15.5	0
08062422	12.45	2.35	216.5	E	18.5	0
08062522	11.8	2.15	249	F	3.5	1
08062622	11	1.45	203	E	20	0
08062722	11.9	0.95	220.5	D	13.5	0
08062822	13.85	2.7	232.5	E	8.5	0
08062922	13	1.1	234.5	D	15	0
08063022	14.7	2.4	256	D	11.5	0
08070122	12.65	1.5	219.5	F	42	1

08070222	11.65	1.05	196	F	27.5	1
08070322	12.9	1.75	209.5	E	17.5	0
08070422	14.45	5.2	192.5	D	13	0
08070522	14.85	2.95	198.5	E	60	0
08070622	14.75	3.05	224	D	10.5	0
08070722	14.8	0.95	116	E	18	0
08070822	12.3	1.85	284.5	D	15.5	0
08070922	10.45	3.65	280.5	D	12.5	0
08071022	10.1	3	266.5	D	20	0
08071122	8.25	1.6	212	F	28.5	1
08071222	12.45	1.6	201	D	15.5	0
08071322	16.2	1.3	222	D	21	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08071422	17.65	2.75	327	D	13	0
08071522	17.35	0.65	313.5	D	13.5	0
08071622	15.35	3.15	219	D	12.5	0
08071722	12.75	2.7	251	F	4.5	1
08071822	12.8	4.3	244.5	E	4.5	0
08071922	10.1	0.8	218	D	11	0
08072022	17.4	4.6	320.5	D	11	0
08072122	10.25	0.6	270	F	74	1
08072222	14.55	4.85	209	D	12	0
08072322	13.15	4.55	204.5	D	13.5	0
08072422	15.45	9.1	123.5	D	9.5	0
08072522	13.85	4.75	209.5	D	15	0
08072622	9.2	1.25	214.5	F	23.5	1
08072722	9.8	2.05	252.5	E	17	0
08072822	10.05	1.9	251.5	E	19.5	0
08072922	10.3	3.3	233.5	E	6.5	0
08073022	9.2	0.75	106	E	20.5	0
08073122	9.55	2.35	252.5	D	11	0
08080122	17.7	4.2	314.5	E	8	0
08080222	10.5	2.65	224.5	E	8.5	0
08080322	12.55	0.8	219	F	23	1
08080422	14.4	2.9	308	F	4	1
08080522	11.9	3.15	243	D	4.5	0
08080622	10.95	3.75	238	D	3.5	0
08080722	9.55	2.4	228	E	26.5	0
08080822	8.9	1.55	216	E	21	0
08080922	8.35	0.55	210	F	3.5	1
08081022	8.35	3.2	236	E	5.5	0
08081122	5.5	1.25	243.5	F	27	1
08081222	7.75	3.05	243.5	E	5	0

08081322	8.8	1.25	221	D	14.5	0
08081422	7.1	1.5	234.5	D	15	0
08081522	9.55	1.75	243	D	14	0
08081622	13.95	3.55	274.5	D	28.5	0
08081722	10.95	3.1	245.5	D	6	0
08081822	10.65	2.55	284	E	23.5	0
08081922	12.65	3.3	230	D	13.5	0
08082022	10.35	2.6	252	E	5	0
08082122	13.8	2.85	240	E	8	0
08082222	12.6	2.35	227	E	19	0
08082322	15.1	5.35	200	D	11.5	0
08082422	13.3	3.45	210	E	9.5	0
08082522	11.75	2.05	248.5	D	10.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08082622	15.05	3.2	302	E	5	0
08082722	16.65	4.75	199.5	D	13	0
08082822	14.4	1.4	227.5	E	7	0
08082922	17.65	4.15	22.5	D	36.5	0
08083022	19.15	4.65	343.5	D	8.5	0
08083122	19.9	4.75	354.5	E	7	0
09060122	15.45	2.95	195	D	11	0
09060222	15.65	2.5	223.5	F	42.5	1
09060322	16.25	2.5	202.5	D	12.5	0
09060422	17	0.9	123	F	3	1
09060522	14.8	2	226.5	E	19.5	0
09060622	12.65	1.5	237.5	E	17.5	0
09060722	13.15	2.8	261	F	60	1
09060822	11.1	3.15	238.5	E	3.5	0
09060922	10.4	2.05	211.5	D	47.5	0
09061022	12.55	2.65	144.5	D	43	0
09061122	6.2	1.6	220.5	E	21	0
09061222	8.45	1.45	227	E	6.5	0
09061322	9.65	2.55	252	E	5	0
09061422	15.05	2.15	313.5	E	9.5	0
09061522	13	2	239.5	E	8.5	0
09061622	11.9	1.95	242.5	E	6	0
09061722	15.6	4.4	199.5	D	12	0
09061822	14.65	5.15	204.5	D	11.5	0
09061922	15.35	4.05	208.5	D	13	0
09062022	16.6	2.85	288	F	63	1
09062122	19.05	8.4	38	D	10	0
09062222	15.6	3.85	200.5	D	23	0
09062322	14.85	2.45	195.5	D	10	0

09062422	12.45	2.15	276	E	16	0
09062522	17.2	4.5	317	E	8.5	0
09062622	15.4	3.2	325.5	E	7.5	0
09062722	12.85	1.35	201	E	20	0
09062822	10.75	2.25	245.5	D	12.5	0
09062922	10.2	2	240	E	8	0
09063022	13.85	1.05	313	D	13	0
09070122	18.7	4.5	17.5	E	8	0
09070222	9	1.35	215	F	23	1
09070322	12.25	2	312	D	25	0
09070422	8.3	1.15	239	D	24	0
09070522	9.25	1.7	235.5	D	12	0
09070622	13.6	1.6	213.5	E	18.5	0
09070722	13.7	4.15	174	D	16.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
09070822	15.15	5.35	196	D	11	0
09070922	14.4	7.2	196.5	D	12	0
09071022	14.55	4.85	206.5	D	12.5	0
09071122	13.15	2.85	231	D	12.5	0
09071222	14.3	3.55	296.5	E	9.5	0
09071322	12.9	1.8	251.5	F	3.5	1
09071422	9.75	2.9	249.5	E	7	0
09071522	9.25	1.6	252.5	D	15	0
09071622	9.5	2.75	246	D	39	0
09071722	10.35	2.95	247	D	4.5	0
09071822	11.15	1.45	228	D	14	0
09071922	13.25	1.45	222	D	12	0
09072022	12.05	2.4	247	E	5	0
09072122	12.35	1.25	226.5	D	12	0
09072222	17.9	4.95	327.5	D	12.5	0
09072322	16.5	3.6	215.5	D	14.5	0
09072422	14.3	4.55	207.5	D	11.5	0
09072522	11.1	1.75	229	E	5	0
09072622	15.9	2.45	302.5	D	12.5	0
09073022	11.4	2.4	250	F	3	1
09073122	10.8	2.7	230	E	6	0
09080222	11.9	1.6	236	E	6	0
09080722	14.2	2.7	270	E	5	0
09081222	17.9	3.8	314	E	8	0
09081322	15.5	1.2	207	F	3	1
09081422	13.2	2.1	241	D	13	0
09081522	13.3	2.3	288	E	6	0
09082122	18.9	4.6	328	D	9	0

09082222	18.4	0.2	114	F	56	1
09082422	18.5	2.4	343	D	14	0
09082522	17	0.5	251	F	1	1
09083022	21.8	2.4	199	D	16	0
05060123	15	3.45	214	E	8.5	0
05060223	16	3.95	208	D	10.5	0
05060323	14.55	2.15	222	D	8	0
05060423	13.8	1.2	224	E	7.5	0
05060523	14.55	2.1	216.5	D	10	0
05060623	16.15	5.1	206	D	11	0
05060723	16.8	3.9	184	D	27	0
05060823	16.15	2.6	178.5	D	12	0
05060923	15.95	2.2	204.5	F	22.5	1
05061023	15.65	1.95	196	D	12	0
05061123	19.3	1.25	306	D	11	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05061223	19.7	3.05	333.5	E	7.5	0
05061323	19.15	3.4	313.5	D	9.5	0
05061423	20.9	4.7	347	D	7.5	0
05061523	14.05	1.1	232.5	D	11	0
05061623	9.4	1.9	200	D	11.5	0
05061723	9.35	1.45	209.5	D	15	0
05061823	15.1	3.1	296	E	6.5	0
05061923	16.55	3.1	339	D	14.5	0
05062023	16.45	3.5	320	D	11	0
05062123	11.05	1.5	267	F	56	1
05062223	11.3	4.15	313.5	E	5.5	0
05062323	9.05	1	55.5	F	48.5	1
05062423	10.7	2.7	197	D	10.5	0
05062523	14.85	3.15	195	D	10	0
05062623	14.7	4.55	193	D	10.5	0
05062723	14.4	3.3	214	D	5.5	0
05062823	19.9	7.6	70	D	12	0
05062923	21.1	7	25.5	D	12	0
05063023	18.15	3.45	332.5	E	7.5	0
05070123	16.45	0	0	F	2	1
05070223	14.75	2.75	222	E	9	0
05070323	14.9	4.4	195.5	E	6	0
05070423	15.65	3.7	209	D	12	0
05070523	16.9	3.7	201	E	8	0
05070623	12.2	2.2	210.5	E	6.5	0
05070723	12.45	2.1	264	D	10.5	0
05070823	14	0.65	295	D	8.5	0

05070923	17.6	4.75	317.5	D	10	0
05071023	14.15	3.95	250.5	D	11	0
05071123	15.45	4.5	209	D	14	0
05071223	14.25	2.5	227	F	41.5	1
05071323	14.4	1.3	284	E	18	0
05071423	10.5	1.65	238.5	E	17.5	0
05071523	11.8	2.65	258.5	F	40.5	1
05071623	12.45	3.35	245	E	9	0
05071723	8.8	1.55	224.5	E	8.5	0
05071823	12.8	4.2	209	E	6	0
05071923	13.75	5.5	196	D	9	0
05072023	14.9	4.95	188	D	17.5	0
05072123	14.15	3.95	204.5	D	8	0
05072223	16.4	3.6	198.5	E	8.5	0
05072323	14.95	1.45	231.5	F	30	1
05072423	13.2	2.75	242.5	F	4.5	1

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05072523	10.7	2.75	247	E	7	0
05072623	11	1.95	247.5	D	14	0
05072723	13.1	2.55	229.5	F	4	1
05072823	13.1	1.75	268	E	16	0
05072923	13.85	1.65	299	D	15	0
05073023	12.55	1.65	235.5	E	9.5	0
05073123	14.55	1	223	D	4.5	0
05080123	16.4	3.3	184	D	7.5	0
05080223	12.45	1.65	227	E	5.5	0
05080323	13.25	0.9	236.5	F	4.5	1
05080423	18.25	3.3	280	D	28.5	0
05080523	12.55	4.65	228	E	7.5	0
05080623	11.05	2.3	224.5	E	7	0
05080723	10.75	2.7	257	E	7	0
05080823	9.75	1.9	207.5	E	6.5	0
05080923	14.1	2.35	301.5	E	6.5	0
05081023	10.5	1.35	258.5	F	40	1
05081123	9.05	1.4	209.5	F	35	1
05081223	10.05	4.65	199	E	9.5	0
05081323	13.4	5.45	214.5	D	12	0
05081423	11.6	2.35	214.5	D	8.5	0
05081523	13.2	2.1	252	E	9.5	0
05081623	14.25	3.65	197	E	7	0
05081723	12.8	1.9	223	D	13	0
05081823	12.15	2	216	E	5.5	0
05081923	15.8	3.6	317.5	E	6	0

05082023	12.25	1.4	210	F	23	1
05082123	11.15	2.15	241.5	E	7.5	0
05082223	10.35	2.2	203	D	14	0
05082323	14.15	4.05	214	E	6	0
05082423	14.3	3.9	204.5	D	6.5	0
05082523	16.15	3.2	202.5	D	9.5	0
05082623	15.75	4.9	187.5	E	8.5	0
05082723	15.35	5.85	195.5	D	10	0
05082823	14.05	2.8	216.5	F	32	1
05082923	15.85	3.25	150.5	E	35.5	0
05083023	19.45	4.75	8.5	E	9.5	0
05083123	17.1	2.5	310.5	D	10.5	0
06060123	9.35	2.4	207.5	D	16.5	0
06060223	11.55	4.35	264	D	10	0
06060323	14.65	0.8	275	F	26	1
06060423	15.3	4.65	213	E	7.5	0
06060523	13	2.25	206.5	D	13	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06060623	13.35	3.65	217	D	9.5	0
06060723	14.6	4.1	211	D	8.5	0
06060823	16.9	5.1	200	D	8.5	0
06060923	16.75	3.2	185.5	D	13.5	0
06061023	20.6	6.6	340.5	D	10	0
06061123	13.3	6.35	214	D	10	0
06061223	14.6	3.65	180	D	10	0
06061323	15	4.55	201	E	9	0
06061423	13.6	1.35	192.5	D	12.5	0
06061523	12.05	2.5	235.5	E	5	0
06061623	14.4	4.5	207	E	8	0
06061723	14.45	4.85	205.5	D	15	0
06061823	14.7	3.3	197	D	8	0
06061923	14.2	3.15	173	E	6	0
06062023	14.45	2.85	220	E	8	0
06062123	14.5	2.95	192.5	D	12	0
06062223	14.9	3.35	193	E	8	0
06062323	15.35	2.2	200	D	11.5	0
06062423	14.8	2.4	251	D	22	0
06062523	14.75	2.65	209.5	E	7.5	0
06062623	13.7	3.95	207	E	9.5	0
06062723	12.45	1.95	203.5	E	8	0
06062823	14.7	3.35	204.5	E	6.5	0
06062923	16.3	2.85	207	D	14	0
06063023	16.05	3.45	297	D	12.5	0

06070123	10.9	2	203	D	7.5	0
06070223	12.3	2.05	203.5	E	16	0
06070323	10.4	2.3	225.5	E	9.5	0
06070423	16.35	5.75	194.5	D	8.5	0
06070523	12.5	1.7	211.5	F	4	1
06070623	12.55	1.7	193.5	D	14	0
06070723	11.45	1.6	218.5	E	8.5	0
06070823	10.65	1.8	215.5	E	7.5	0
06070923	12.5	1.25	257	F	30	1
06071023	14.8	2.15	288	D	12.5	0
06071123	13	0.95	322.5	D	6	0
06071223	12.1	2.2	232.5	D	12	0
06071323	16.85	4.05	208.5	E	8	0
06071423	14.3	2.35	202	E	16.5	0
06071523	16.85	3.2	320	D	10.5	0
06071623	12	2.3	202	E	17.5	0
06071723	11.2	1.9	209.5	D	10	0
06071823	14.7	4.3	214	D	11	0

Coolangatta 2005-2009

Time	**Temp**	**Wind Speed**	**Wind Direction**	**Stability Class**	**Sigma Theta**	**F-Class**
06071923	14.1	6.65	197	D	9.5	0
06072023	14	5.3	197.5	D	8	0
06072123	13.25	4.5	211.5	D	13.5	0
06072223	13.4	3.3	210	E	9.5	0
06072323	12.85	2.8	233	F	34.5	1
06072423	14.5	2.75	231	D	15.5	0
06072523	16.1	3.6	206.5	D	33.5	0
06072623	14.05	3.25	162.5	D	18	0
06072723	15.75	1	203	D	15	0
06072823	16.25	1.9	238	D	13	0
06072923	11.9	1.65	231	D	11	0
06073023	11.35	1.45	246	D	11	0
06073123	12.45	1.9	218.5	D	14	0
06080123	8.8	2.15	203.5	E	8.5	0
06080223	12.1	1.25	231.5	D	10.5	0
06080323	14.55	4.2	199.5	D	10	0
06080423	12	3.55	201	D	11.5	0
06080523	14.85	8.4	209.5	D	10	0
06080623	14.5	3.5	204.5	D	13	0
06080723	14.45	6.35	205	D	12.5	0
06080823	17.5	3.75	211.5	D	13.5	0
06080923	12.4	2.6	263.5	D	21.5	0
06081023	12.65	3.35	241	E	6.5	0
06081123	12	2.05	200.5	E	9	0

06081223	13.95	1.65	226	E	18.5	0
06081323	15.25	1.6	299	E	20.5	0
06081423	13	1.85	235.5	D	14.5	0
06081523	12.05	2.15	200.5	D	10.5	0
06081623	11.35	1.85	201.5	D	12.5	0
06081723	13.95	1.55	282.5	D	34.5	0
06081823	13.75	2.1	260	D	6	0
06081923	13.5	1.65	228	F	24	1
06082023	14.9	2.05	229.5	E	9.5	0
06082123	15.25	1.95	245.5	E	5.5	0
06082223	16.6	1.95	313.5	F	29	1
06082323	11.95	1.45	232.5	D	10.5	0
06082423	17.8	3.35	319	E	6	0
06082523	18.05	5.15	168.5	D	10	0
06082623	16.25	4.05	196.5	D	12.5	0
06082723	16.05	2	232.5	F	29.5	1
06082823	16.15	4.8	197	D	8.5	0
06082923	16.4	0.7	62	D	34	0
06083023	19.2	5.1	100.5	D	12	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06083123	19.45	5	104.5	D	14	0
07060123	18.65	4.45	208.5	D	11	0
07060223	17.75	1.4	196	E	21	0
07060323	18.65	2.25	211	D	12.5	0
07060423	18	3.15	221	D	10.5	0
07060523	17.05	2.05	271	F	45.5	1
07060623	17.45	3.95	324.5	D	16	0
07060723	16.55	1.05	163	E	18.5	0
07060823	11.3	5.05	309.5	D	10	0
07060923	10.6	2.65	254.5	F	39.5	1
07061023	12.55	1.65	212.5	D	14.5	0
07061123	13.45	2.5	223	D	14	0
07061223	10.25	2.65	243.5	E	6	0
07061323	11.65	2.7	203.5	D	14	0
07061423	15.3	3.5	200	D	13.5	0
07061523	11.95	2.7	230.5	D	11	0
07061623	7.95	2.1	243.5	D	10.5	0
07061723	13.05	1.5	214	F	23.5	1
07061823	16.25	3.5	317	E	7	0
07061923	10.7	2.75	255	D	18	0
07062023	10.15	0.3	129.5	E	16.5	0
07062123	7.85	1.8	205	D	11.5	0
07062223	13.55	3.3	221.5	D	16	0

07062323	13.45	4.85	203.5	D	12	0
07062423	14.9	3.55	194	D	17	0
07062523	16	2.65	235	E	23.5	0
07062623	13.55	1.85	214	F	33	1
07062723	10	3.05	297	D	13.5	0
07062823	10.55	4.5	317.5	D	12	0
07062923	13.75	3.8	293	D	19.5	0
07063023	9.2	2.1	231.5	F	53.5	1
07070123	6.9	2.1	201.5	F	24	1
07070223	8.4	1.3	216.5	E	18	0
07070323	11.5	1.15	202.5	F	33.5	1
07070423	18.55	5.05	308	D	33.5	0
07070523	9.6	1.8	189.5	D	29.5	0
07070623	6.65	1.5	237.5	D	12	0
07070723	9.45	2.15	232	E	9.5	0
07070823	6.25	1.35	260	F	36	1
07070923	16.25	6.05	206	D	14	0
07071023	10.5	2.5	241.5	E	9	0
07071123	11.25	2.65	214.5	E	9.5	0
07071223	9.5	2.35	220.5	E	9	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07071323	7.2	2.25	239.5	D	13.5	0
07071423	8.1	1.95	218	D	11	0
07071523	13.05	4.9	197	D	11.5	0
07071623	12.3	1.3	230.5	D	17	0
07071723	7.2	1.9	307	F	36.5	1
07071823	12.1	4.4	215	D	10.5	0
07071923	4.6	2	215	D	11	0
07072023	10.8	2.45	202	E	8	0
07072123	15.05	6.1	192.5	D	12	0
07072223	14.15	4.3	218.5	D	12.5	0
07072323	14.3	2.3	162	F	23.5	1
07072423	11.25	1.75	223.5	E	19	0
07072523	10.35	0.95	113.5	F	4.5	1
07072623	11.25	1.25	223	D	10	0
07072723	10.85	2.4	237	E	9	0
07072823	10.1	2.6	230.5	D	16	0
07072923	12.6	2.15	226.5	D	10.5	0
07073023	12.1	2.55	233	D	13	0
07073123	9.05	1.95	245	E	5	0
07080123	14.1	1.05	102.5	D	13	0
07080223	17.7	5.25	346.5	D	8	0
07080323	17.4	2.9	188.5	E	23.5	0

07080423	10.3	3.1	232	E	5	0
07080523	8.15	1	231.5	D	14.5	0
07080623	9.15	2.15	215.5	E	6.5	0
07080723	9.8	2.15	260.5	E	9	0
07080823	16.15	3.8	295.5	D	8.5	0
07080923	16.65	3.85	333	D	14.5	0
07081023	10.3	2.75	290.5	F	51.5	1
07081123	8.7	0.25	107.5	D	13	0
07081223	11.85	1.55	212	E	21.5	0
07081323	17.3	3.55	197.5	D	10.5	0
07081423	15.65	2	213.5	F	4.5	1
07081523	15.55	1.4	240	D	15	0
07081623	16.45	2.6	306	E	8	0
07081723	17.75	1.85	301	F	33	1
07081823	17.35	2.4	210	D	13	0
07081923	15.2	4.75	187.5	D	10.5	0
07082023	14.35	4.45	266	D	16	0
07082123	16.45	10.7	155.5	D	10.5	0
07082223	16.85	7.15	155	D	11	0
07082323	16.75	5.6	152.5	D	10	0
07082423	16.25	4.35	191.5	D	13	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07082523	16.25	3.8	201	D	13	0
07082623	16.4	4.2	196.5	E	9.5	0
07082723	12.6	1.55	220.5	E	20.5	0
07082823	12.6	1.45	291.5	E	17.5	0
07082923	13.35	1.25	228	D	10.5	0
07083023	12.8	1.45	228.5	D	15	0
07083123	14.25	2.75	254.5	E	7	0
08060123	18.45	7.85	136	D	11.5	0
08060223	20	8.05	92	D	9.5	0
08060323	16.15	3.1	244	E	9.5	0
08060423	17.2	2.45	297	D	15.5	0
08060523	15.3	1.5	231	E	16	0
08060623	15.65	1.8	219.5	E	20.5	0
08060723	17.35	7.25	199	D	11.5	0
08060823	16.45	4.65	189.5	D	14	0
08060923	15.85	1.75	193	D	15	0
08061023	16.15	1.05	120.5	F	24	1
08061123	16.75	2.2	218.5	E	21	0
08061223	17.2	3.1	308	E	8.5	0
08061323	13.95	0.3	118.5	F	42	1
08061423	9.85	2.6	251.5	D	12	0

08061523	17.45	4.4	208	D	15	0
08061623	17.2	3.95	185.5	D	10	0
08061723	17.2	3.95	214	D	11.5	0
08061823	16.75	2.75	228	E	7.5	0
08061923	15.05	1.05	231.5	E	19.5	0
08062023	14.35	3.15	229.5	E	5.5	0
08062123	10.8	1.55	207.5	D	13.5	0
08062223	11.15	3.6	245	E	7	0
08062323	10.25	1.5	225	D	11.5	0
08062423	11.25	2.25	222	D	11	0
08062523	11.05	2.5	253.5	D	5	0
08062623	9.75	1.5	224	D	10.5	0
08062723	11.75	1.65	228	E	6	0
08062823	12.2	2.05	211.5	D	11	0
08062923	12.7	1.45	236.5	D	13.5	0
08063023	15.9	2.65	292.5	E	7.5	0
08070123	11.5	2.3	246	F	45	1
08070223	11.1	1.85	170	D	14	0
08070323	12.55	1.85	216	D	11.5	0
08070423	14.2	4.4	201.5	D	13.5	0
08070523	13.95	3.1	225	D	14	0
08070623	14.15	1.75	201.5	E	18	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08070723	14.55	1.6	249.5	D	14.5	0
08070823	11.55	1.05	313.5	D	32	0
08070923	10.95	4.75	267.5	D	12	0
08071023	7.05	1.55	292.5	F	27	1
08071123	8.4	1.6	223.5	E	18.5	0
08071223	12.9	1	187.5	E	18	0
08071323	16.5	0.65	214	E	9	0
08071423	17.85	3.1	312	D	11	0
08071523	16.2	1.85	330	F	34	1
08071623	15	2.85	199	D	11.5	0
08071723	12.5	3	250.5	E	3.5	0
08071823	12.25	3.75	240	E	6	0
08071923	9.65	1.1	219.5	D	11.5	0
08072023	17.75	5.95	324	D	11	0
08072123	11	2.45	155.5	F	53	1
08072223	14.55	4.85	205.5	D	12	0
08072323	13.25	4.7	208.5	D	12.5	0
08072423	15.4	8.05	131.5	D	10	0
08072523	13.7	5.45	214.5	D	14	0
08072623	8.95	3.4	244	E	5	0

08072723	9.85	1.55	204	F	64.5	1
08072823	11.3	3.15	216	D	15	0
08072923	12.5	3.75	216.5	D	11	0
08073023	7.95	2.05	243	E	9.5	0
08073123	9.2	1.55	239.5	D	15	0
08080123	16.9	3.5	271	D	12.5	0
08080223	11.95	3.5	186.5	D	12.5	0
08080323	12.05	0.55	215	D	10	0
08080423	12.5	1.15	248	D	12.5	0
08080523	12.3	2.1	243	D	14.5	0
08080623	10	2.15	213	E	22	0
08080723	9	1.15	219	F	33.5	1
08080823	8.5	2.8	217.5	D	14	0
08080923	7.65	0.6	160.5	F	53	1
08081023	7.6	2.8	227.5	D	14.5	0
08081123	6.15	3.7	245.5	E	6.5	0
08081223	7.05	2.95	251	D	5	0
08081323	8.05	1.5	221	D	10.5	0
08081423	6.8	2.65	239	E	8	0
08081523	9.3	1.8	232.5	D	14	0
08081623	11.35	2	305.5	F	28	1
08081723	10	3.3	245	E	5.5	0
08081823	8.1	2.2	262.5	E	21.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08081923	12.9	3.05	226	D	10	0
08082023	9.6	1.9	249	F	3.5	1
08082123	14.2	2.15	234.5	F	4.5	1
08082223	12.95	2.35	226.5	E	19	0
08082323	14.5	5.4	197	D	11.5	0
08082423	13.15	3.4	212	D	10	0
08082523	11.9	2.2	196.5	D	27	0
08082623	14.85	3.2	308	D	6	0
08082723	16.3	4.2	195.5	D	13.5	0
08082823	14.45	4	230.5	D	17	0
08082923	16.55	2.45	259.5	D	13.5	0
08083023	18.95	4.2	334	E	9	0
08083123	19.9	4.05	346	E	9	0
09060123	15.55	2.75	181	E	28.5	0
09060223	15.2	2.65	220	D	11	0
09060323	15.75	2.05	196	F	24.5	1
09060423	15.9	1.35	247	D	12	0
09060523	13.8	1.6	244.5	D	13	0
09060623	12.85	2.6	236	D	19.5	0

09060723	12.25	2.85	250	D	12	0
09060823	10.75	3.2	242.5	E	4	0
09060923	9.35	2.9	248	D	10	0
09061023	11.65	3.35	237	E	40	0
09061123	5.85	1.8	231	D	11.5	0
09061223	9.2	1.7	232.5	D	11.5	0
09061323	9.5	2.3	250	E	9	0
09061423	14.25	1.55	318.5	D	13.5	0
09061523	12.95	2.95	244	E	7	0
09061623	10.8	2.05	228	E	5.5	0
09061723	15.35	4.85	204.5	D	13.5	0
09061823	14.7	5.15	209.5	D	12.5	0
09061923	15.2	4.9	203.5	D	12.5	0
09062023	18.3	4.5	94	D	35	0
09062123	19.1	7.35	39.5	D	9	0
09062223	15.55	4.4	177.5	E	8	0
09062323	15.05	3.25	208.5	E	7.5	0
09062423	11.6	2.25	262	E	7	0
09062523	16.95	3.15	327.5	D	10	0
09062623	15.15	3.6	321.5	D	10.5	0
09062723	13.2	2.05	234.5	E	18.5	0
09062823	10.75	2.95	248.5	D	14	0
09062923	9.7	1.6	226.5	D	9	0
09063023	14.55	2.9	324	D	10	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
09070123	17.45	3.4	16.5	D	13	0
09070223	8.8	3	213.5	E	41	0
09070323	10	2.45	318	D	21	0
09070423	8.6	2.95	232.5	E	9	0
09070523	9.3	2.65	235.5	E	5.5	0
09070623	13.6	1.45	211	E	8	0
09070723	13.05	4.15	169	D	19	0
09070823	14.7	5.1	197.5	D	11.5	0
09070923	13.75	7.1	199.5	D	12.5	0
09071023	13.85	4.3	225	D	12.5	0
09071123	13.55	3.2	225	E	9.5	0
09071223	14.5	3.4	310.5	D	7.5	0
09071323	12.8	1.6	233	D	23	0
09071423	8.6	3.05	242	E	3.5	0
09071523	8.85	1.65	237	E	7	0
09071623	8.15	1	38	F	69.5	1
09071723	10	1.75	223.5	D	10.5	0
09071823	11	0.85	209.5	D	14.5	0

09071923	12.25	1.6	181.5	D	14	0
09072023	11.7	1.85	235.5	E	8.5	0
09072123	12.25	2.55	248.5	F	4	1
09072223	17.65	5.95	327	D	12.5	0
09072323	14.55	2.4	206.5	D	32	0
09072423	14.55	4	208	D	11	0
09072523	10.95	1.85	217.5	D	13	0
09072623	16.3	3	330.5	D	17.5	0
09072823	10.3	1.4	213	D	11	0
09080523	13.8	2	218	D	2	0
09081323	13.7	0.5	198	E	9	0
09081423	13.5	2.6	254	E	7	0
09081623	18.5	4.7	324	D	7	0
09082123	19.2	4.6	330	E	9	0
09082223	17.1	1.7	150	E	6	0
05060124	14.7	3.55	230	D	10.5	0
05060224	15.6	3.45	235	E	6	0
05060324	14.05	2.2	213.5	E	7	0
05060424	13.55	1.25	201	D	13.5	0
05060524	13.3	2.05	203	F	2.5	1
05060624	16.05	4.15	228.5	E	8	0
05060724	16.65	3.35	180.5	E	46.5	0
05060824	15.6	2.4	180	E	22.5	0
05060924	16.5	4.55	187	D	13	0
05061024	15.05	1.55	198.5	D	14.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05061124	19.45	0.65	155	F	3.5	1
05061224	19.45	3.75	326.5	E	8.5	0
05061324	19.05	2.95	331	E	7	0
05061424	20.6	5.25	341.5	D	9.5	0
05061524	13.65	1.45	210	E	19.5	0
05061624	8.75	2.05	211	E	20.5	0
05061724	7.95	2.1	211	D	10.5	0
05061824	15.25	3.75	318	E	9	0
05061924	16.3	3.05	339.5	E	7	0
05062024	16.6	4.1	347	E	6	0
05062124	11.2	3.15	318.5	E	7	0
05062224	9.95	2.65	265	F	31.5	1
05062324	6.55	0.8	279	D	15	0
05062424	14.15	3.85	205	D	13	0
05062524	15	3.65	177	D	34	0
05062624	14.5	4.1	198.5	E	9	0
05062724	14.85	3.1	208.5	E	8	0

05062824	19.45	7.7	72.5	D	12.5	0
05062924	21	6.55	30	D	13	0
05063024	19	4.6	331	E	8.5	0
05070124	16.75	0.3	126.5	D	10	0
05070224	16.25	4.3	224	D	11	0
05070324	15.45	4	197.5	D	9.5	0
05070424	15.9	4.2	210	D	7	0
05070524	16.7	3.1	197.5	E	7.5	0
05070624	11.6	2	208	F	3.5	1
05070724	11.85	0.8	272.5	D	14	0
05070824	13.2	1.55	273	E	7	0
05070924	16.45	3.85	301	D	18	0
05071024	13.25	2.55	239.5	D	10	0
05071124	15.25	5.15	203.5	D	10	0
05071224	14.1	2.9	242.5	D	10.5	0
05071324	13.9	1.15	211.5	F	25.5	1
05071424	9.7	1.85	234.5	D	10	0
05071524	9.2	1.75	226.5	D	15	0
05071624	10.35	0.95	217	F	23	1
05071724	7.95	1.85	205.5	D	7.5	0
05071824	12.9	4.35	207.5	D	6.5	0
05071924	13.4	4.45	203.5	D	10	0
05072024	14.85	5.65	195	D	11	0
05072124	14	3.75	198.5	E	7.5	0
05072224	15.5	3.95	189.5	E	8	0
05072324	13.3	1.15	233	F	29	1

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
05072424	13	0.7	213.5	E	7.5	0
05072524	10.9	2.45	262.5	E	7.5	0
05072624	9.6	0.75	244	F	27.5	1
05072724	12.85	1.45	222	D	4	0
05072824	12.85	1.4	268	D	16.5	0
05072924	15.65	2.8	316	E	5	0
05073024	12.55	1.8	229	E	6	0
05073124	14.35	0	0	F	1	1
05080124	15.8	3.05	174.5	E	5.5	0
05080224	12.1	2.05	204.5	E	6	0
05080324	12.35	0	0	E	6	0
05080424	16.95	3.55	213	E	9	0
05080524	13.05	5.3	222	D	8	0
05080624	10.9	3.05	220.5	E	7	0
05080724	11.55	2.35	228.5	E	5	0
05080824	9.15	1.9	203.5	E	5.5	0

05080924	12.85	1.9	315	F	4	1
05081024	9.2	3.2	261	D	15	0
05081124	7.4	2.2	216.5	D	11	0
05081224	9.7	3.15	205.5	E	8.5	0
05081324	12.85	5	214	D	11.5	0
05081424	11.25	2.3	179	F	4.5	1
05081524	12.1	1.45	280	E	20.5	0
05081624	13.75	3.2	201	E	8.5	0
05081724	11.65	2.05	229	E	7	0
05081824	11.15	1.8	207	F	4.5	1
05081924	15.45	3.65	317.5	E	3	0
05082024	12.1	3	223	D	9.5	0
05082124	11.3	2.35	242	D	8	0
05082224	10.7	2.45	226	D	13.5	0
05082324	14.45	4.55	215.5	E	6	0
05082424	14.65	4.4	203	E	7	0
05082524	15.25	2.7	202	D	14	0
05082624	15.8	5.5	191	D	8.5	0
05082724	14.4	7.25	197.5	D	9.5	0
05082824	14.1	3.55	221.5	E	8.5	0
05082924	16.5	2.35	271.5	F	55.5	1
05083024	19.35	4.8	12.5	D	10.5	0
05083124	17.05	2.8	315	E	8.5	0
06060124	9.05	2	227	D	11	0
06060224	10.65	2.1	236.5	E	16.5	0
06060324	14.75	3.1	233.5	D	16	0
06060424	15.35	5.1	217.5	D	7.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06060524	12.9	2	214	E	16.5	0
06060624	11.5	3	194	D	12.5	0
06060724	14.15	3.45	213	E	8.5	0
06060824	16.7	4.9	203	E	9	0
06060924	16.95	3.2	171	D	12	0
06061024	20.9	6.5	346	D	10	0
06061124	13.35	6.9	209.5	D	10	0
06061224	14.5	3.75	181.5	D	11.5	0
06061324	14.95	4.3	203	D	7.5	0
06061424	13.65	0.9	214	D	20	0
06061524	11.15	2.55	241.5	F	3.5	1
06061624	14.15	4.6	198.5	E	8.5	0
06061724	14.4	5.3	204.5	D	10	0
06061824	14.55	3.2	190.5	D	13.5	0
06061924	14.05	3.4	165.5	E	5.5	0

06062024	14.6	1.65	105	F	51.5	1
06062124	14.2	2.45	214	D	13	0
06062224	14.4	3	180.5	E	8.5	0
06062324	14.6	2.2	209.5	E	7.5	0
06062424	13.9	2.55	236.5	D	14	0
06062524	13.9	2	194.5	E	9	0
06062624	12.95	3.85	184	E	8.5	0
06062724	12.2	2.25	188	D	10.5	0
06062824	15.05	3.15	191.5	D	8	0
06062924	15.75	2.45	195	E	9	0
06063024	15.25	1.7	291.5	F	25	1
06070124	10.35	2.3	195.5	D	10.5	0
06070224	11.95	1.9	224	D	12	0
06070324	10.3	1.1	207.5	E	22	0
06070424	15.75	5.4	193	D	9	0
06070524	12.1	2	200	D	10	0
06070624	12.35	2.35	196	E	5.5	0
06070724	11.5	1.3	219.5	D	4.5	0
06070824	10.35	1.85	209	D	9	0
06070924	11.45	1.9	297.5	F	22.5	1
06071024	13.3	1.3	271	E	5	0
06071124	13.6	0.95	327	F	4.5	1
06071224	11.5	1.6	215	D	10	0
06071324	16.8	4.2	205	E	7.5	0
06071424	14	2.85	173.5	E	8	0
06071524	17.45	4.2	332.5	E	9	0
06071624	11.3	0.9	229	F	32	1
06071724	9.9	2.5	225.5	D	11	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06071824	14.7	5.65	206	D	10	0
06071924	13.9	6	206.5	D	11.5	0
06072024	13.75	5	197	D	8.5	0
06072124	13.2	3.75	203.5	D	13.5	0
06072224	13.5	3.65	215	D	8.5	0
06072324	12.75	2.1	197	F	25	1
06072424	13.95	3.05	221	D	12	0
06072524	15.25	3.05	223	D	17.5	0
06072624	12.95	1.7	190.5	D	14.5	0
06072724	16.05	1.8	208	D	11.5	0
06072824	15	1.5	226	E	9.5	0
06072924	11.35	2.35	234.5	E	7.5	0
06073024	10.8	1.9	258.5	E	7	0
06073124	12.1	1.55	12	D	62	0

06080124	8.25	2.15	194.5	D	6	0
06080224	11.4	2.1	240	E	8.5	0
06080324	14.1	3.8	225	E	7.5	0
06080424	12.45	4.15	215	E	9.5	0
06080524	15.45	8.15	205	D	11	0
06080624	15.2	5.35	202	D	9	0
06080724	14.6	6.25	200	D	10	0
06080824	17.05	6.3	204.5	D	10	0
06080924	12.6	2.7	265	E	28.5	0
06081024	14.15	3.8	213.5	E	7.5	0
06081124	11.9	1.95	216	E	6.5	0
06081224	13.4	1.55	225.5	E	6.5	0
06081324	15.3	3.4	298	E	4	0
06081424	12.6	1.55	225	D	7	0
06081524	11.4	2.05	202.5	D	4	0
06081624	10.3	1.9	204.5	D	10.5	0
06081724	14.1	1.75	303	E	19.5	0
06081824	13.4	1.75	264.5	F	4.5	1
06081924	11.95	2	165	F	56.5	1
06082024	14.15	0.7	216.5	E	8.5	0
06082124	14.6	2.15	236.5	F	2.5	1
06082224	12.65	1.6	255.5	F	37	1
06082324	11.65	1.75	235.5	E	5	0
06082424	18.8	4.4	321.5	D	5.5	0
06082524	17.4	4.55	178	D	11	0
06082624	15.65	3.55	195.5	D	19	0
06082724	16.45	2.1	296.5	F	42.5	1
06082824	16.2	6.25	199.5	D	8.5	0
06082924	15.7	2.05	191.5	E	19	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
06083024	19.1	4.05	107	D	12	0
06083124	19.45	5.2	104.5	D	13.5	0
07060124	18.3	3.9	206	D	10	0
07060224	17.2	1.65	176.5	E	17	0
07060324	17.85	2	232.5	D	11	0
07060424	18.2	3.5	212.5	D	11	0
07060524	16.8	2.95	234	D	12	0
07060624	16.95	3.2	309.5	D	15	0
07060724	16.55	2.7	182	D	14.5	0
07060824	10.9	4	316.5	D	13.5	0
07060924	9	1.7	271	D	14.5	0
07061024	12.55	0.6	220	D	11.5	0
07061124	13.65	3.7	197.5	E	9.5	0

07061224	11.15	3.55	239.5	E	7	0
07061324	11.65	2.1	207	E	21	0
07061424	15	3.45	194	D	12	0
07061524	11.95	1.85	235	E	19.5	0
07061624	7.05	0.5	231	E	17.5	0
07061724	14.8	2.3	252.5	D	20.5	0
07061824	16.2	3.55	317	D	9	0
07061924	8.15	1.3	280.5	F	28	1
07062024	10.25	1.65	253	E	9	0
07062124	11.1	3.35	237	D	12.5	0
07062224	12.8	3.2	226	E	8.5	0
07062324	13.55	5.45	206.5	D	13.5	0
07062424	15	3.5	188.5	D	24.5	0
07062524	16.4	2.8	212.5	F	44	1
07062624	13.25	2.35	262.5	F	37.5	1
07062724	7.45	2.95	288	E	8.5	0
07062824	10.5	4.8	320.5	D	10.5	0
07062924	14.35	4.75	289.5	D	11.5	0
07063024	11.4	2.6	245.5	F	40.5	1
07070124	5.8	1.55	238.5	D	24.5	0
07070224	9.1	3.1	252	D	3.5	0
07070324	11.4	1	127.5	E	21	0
07070424	19.45	5.55	307.5	D	8	0
07070524	8.65	1.7	185.5	F	31.5	1
07070624	6.1	1.75	235	F	23.5	1
07070724	8.45	2.3	209	F	24.5	1
07070824	6.2	1.85	209	F	37.5	1
07070924	15.8	6.35	208	D	13	0
07071024	11	2.5	227.5	E	6	0
07071124	10.85	2.7	210.5	D	11	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07071224	8.3	2.4	226.5	D	10	0
07071324	6.85	2.2	215.5	D	14	0
07071424	7.25	2.5	228	E	7	0
07071524	13	5.2	212	D	12.5	0
07071624	11.7	2	237.5	D	15.5	0
07071724	6.4	2.15	254.5	F	27.5	1
07071824	10.5	3.75	202	E	8	0
07071924	5.35	2.2	218	D	14.5	0
07072024	10	2.25	212	D	12	0
07072124	15	5.4	194.5	D	11.5	0
07072224	14.6	4.45	209	D	12	0
07072324	14.95	2.6	203.5	D	12.5	0

07072424	10.1	1.5	220.5	D	12.5	0
07072524	10.5	1.5	226	D	7.5	0
07072624	10.4	1.5	230	D	14	0
07072724	10.3	2.4	243.5	E	5	0
07072824	7.8	0.95	200.5	F	51.5	1
07072924	12.1	1.5	219.5	E	9.5	0
07073024	11.55	1.95	215.5	F	25	1
07073124	8.8	2.1	259.5	D	11	0
07080124	14.55	1.8	39	F	30	1
07080224	17.6	4.75	343.5	E	8	0
07080324	16.5	3.1	152.5	D	13.5	0
07080424	10.4	3.3	240	D	5.5	0
07080524	6.45	0.5	240.5	D	19.5	0
07080624	9	2.05	226.5	D	12.5	0
07080724	9.25	2.15	266	E	8	0
07080824	15.95	3.75	302	E	9	0
07080924	13.7	1.55	259	F	31.5	1
07081024	12.85	2.95	329	E	43.5	0
07081124	8.2	1.65	228	E	19	0
07081224	11.25	1.2	221.5	F	22.5	1
07081324	17.25	3.8	204	E	9	0
07081424	15.1	1.95	201.5	E	8.5	0
07081524	15.65	1.95	225.5	D	12.5	0
07081624	16.95	3.6	314.5	E	6.5	0
07081724	16.65	1.25	180.5	F	34	1
07081824	17.45	2.65	212.5	D	11.5	0
07081924	15.2	4.25	186	D	11	0
07082024	14.15	1.75	240	E	22	0
07082124	16.05	10.95	163.5	D	11	0
07082224	17.3	7.6	155	D	9.5	0
07082324	17.85	7.85	139	D	9	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
07082424	16.05	4	193	D	12.5	0
07082524	16.1	3.45	196	D	13	0
07082624	16.4	4.3	193.5	E	9.5	0
07082724	11.6	1.4	235	D	12	0
07082824	12.1	2.05	280	D	33.5	0
07082924	12.95	1.55	232.5	D	6	0
07083024	12.45	1.25	221	D	11.5	0
07083124	13.35	2.05	253.5	E	7	0
08060124	17.5	6.65	130.5	D	16	0
08060224	20.15	7.65	94	D	9.5	0
08060324	15.75	2	246.5	F	4.5	1

08060424	16.95	1.95	239.5	D	10.5	0
08060524	14.8	0.9	230	D	15.5	0
08060624	15.05	1.35	213.5	D	13.5	0
08060724	16.85	4.75	200	D	14.5	0
08060824	16.95	4.2	181	D	12.5	0
08060924	16.2	2.55	186.5	E	9.5	0
08061024	15.8	2.05	182.5	E	16.5	0
08061124	17.2	1.8	179.5	D	23	0
08061224	17.15	3.35	311	D	8	0
08061324	12	2.55	260.5	F	44	1
08061424	13.2	3.55	233	D	11	0
08061524	17.25	5.6	200.5	D	13	0
08061624	16	3	182	D	11	0
08061724	17.3	3.45	207.5	D	11.5	0
08061824	16.55	3.1	251.5	D	12.5	0
08061924	14.85	2.05	266.5	F	23	1
08062024	13.65	2.8	234.5	E	6.5	0
08062124	10.3	2.15	217.5	D	9	0
08062224	12.5	3.3	241	D	12	0
08062324	9.6	2	217	E	7.5	0
08062424	10.3	2.6	224	E	8	0
08062524	11.1	2.35	248.5	F	4	1
08062624	9.05	1.2	220	E	20	0
08062724	11.15	1.4	212	D	10.5	0
08062824	13.05	2.8	222	E	8.5	0
08062924	12.6	1.25	224.5	D	10.5	0
08063024	15.15	2.25	296	F	23	1
08070124	10.25	1.8	255.5	F	39	1
08070224	9.8	2.55	195	D	15	0
08070324	12.1	2.2	213.5	E	6.5	0
08070424	14.2	4.7	206	D	12	0
08070524	14.2	2.85	183	D	16.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08070624	14.4	3.25	227	D	11.5	0
08070724	14.6	0.45	254.5	F	44	1
08070824	11.35	2.1	237.5	D	11	0
08070924	11.2	4.7	273	D	13.5	0
08071024	6.5	2.25	253	D	14.5	0
08071124	7.95	1.75	208.5	E	18.5	0
08071224	11.65	1.6	217.5	E	17	0
08071324	15.85	0	0	E	17	0
08071424	18.6	3.45	310	D	12	0
08071524	17.05	2.9	333.5	D	8.5	0

08071624	14.2	2.7	195.5	D	10	0
08071724	12.2	2.6	240	E	7	0
08071824	10.25	1	197.5	F	65.5	1
08071924	9.1	0.3	215.5	D	13.5	0
08072024	17.35	5.2	320	D	9.5	0
08072124	10.65	2.05	190	F	37.5	1
08072224	14.6	4.85	208	D	11.5	0
08072324	13.55	3.65	195.5	D	14	0
08072424	15.45	7.6	140.5	D	9	0
08072524	13.45	5	217	D	13.5	0
08072624	8.65	1.85	224.5	E	20	0
08072724	8.8	2.35	297	E	20.5	0
08072824	10.9	2.85	220	E	22.5	0
08072924	12.8	3.65	209	D	15	0
08073024	7	1.05	211.5	D	11.5	0
08073124	8.9	2.35	256	D	11	0
08080124	15.05	2.95	255.5	D	18.5	0
08080224	11.45	3.05	234.5	D	18	0
08080324	11.15	1.5	227	E	9	0
08080424	11.5	0.65	214	E	19.5	0
08080524	11.5	1.2	213	F	23	1
08080624	8.65	2.25	193	E	17.5	0
08080724	8.4	2.25	237.5	F	25	1
08080824	6.8	0	0	D	14	0
08080924	7.15	1.6	232.5	D	10.5	0
08081024	6.95	1.7	235	E	20.5	0
08081124	6	3.35	250	E	8	0
08081224	8.05	3.1	248	E	8	0
08081324	7.5	0.85	217.5	D	14.5	0
08081424	5.45	1.15	247	F	25	1
08081524	8.2	1	220.5	E	22	0
08081624	8.4	1.1	280	F	58	1
08081724	10.3	3.7	240.5	E	3.5	0

Coolangatta 2005-2009

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
08081824	6.9	2.6	244	D	13.5	0
08081924	12.65	2.95	230.5	D	10.5	0
08082024	9.1	1.75	246	E	5	0
08082124	14.2	1	238.5	D	15.5	0
08082224	11.85	2.5	238.5	D	13.5	0
08082324	14.25	6.1	190.5	D	11.5	0
08082424	13.7	4.1	206	D	11.5	0
08082524	12.3	2.35	235.5	D	14.5	0
08082624	15	3.35	308	E	7.5	0

08082724	15.75	5	210	D	12.5	0
08082824	14.2	2.4	185	D	16.5	0
08082924	16.35	2.4	298	D	13	0
08083024	17.8	3.2	319.5	E	7	0
08083124	18.85	4.1	333.5	D	50.5	0
09060124	15.3	3.65	196	D	20	0
09060224	15.05	2.75	183	D	10	0
09060324	15.3	2.2	214.5	E	8.5	0
09060424	15.2	0.6	242	F	3.5	1
09060524	13.1	1.2	229.5	E	19.5	0
09060624	13.3	1.1	219	D	12	0
09060724	11.5	2.9	261	E	29.5	0
09060824	10.6	2.95	222.5	D	11.5	0
09060924	8.4	3.15	251	E	7	0
09061024	8.4	2.15	244.5	F	44	1
09061124	5.55	1.25	210	D	14	0
09061224	9.15	1.15	217.5	D	12.5	0
09061324	10.2	1	207.5	E	18	0
09061424	12.9	1.4	315.5	F	33	1
09061524	13.25	3.15	242	D	9	0
09061624	9.8	1.75	222	D	7	0
09061724	14.95	5.05	210.5	D	12	0
09061824	14.55	4.75	212.5	D	14.5	0
09061924	15.15	4.6	206	D	14	0
09062024	16.65	3.1	117	E	33	0
09062124	19.6	7.75	50	D	8.5	0
09062224	15.45	5.6	188.5	D	11.5	0
09062324	14.15	1.85	272.5	F	57	1
09062424	10.95	0.9	148	F	36.5	1
09062524	15.85	2.8	329	D	6.5	0
09062624	14.45	4.45	312	D	11	0
09062724	12.3	1	200	E	21.5	0
09062824	9.85	2	258.5	E	19	0
09062924	8.35	0.1	103.5	E	5.5	0

Time	Temp	Wind Speed	Wind Direction	Stability Class	Sigma Theta	F-Class
09063024	15.6	3.95	305	E	8.5	0
09070124	16	2.05	354	F	28	1
09070224	9.6	2.25	248	E	22	0
09070324	10.05	3.45	308.5	D	13	0
09070424	8.95	3.75	247.5	D	28.5	0
09070524	8.15	1.1	230.5	F	4.5	1
09070624	13.7	2	216.5	E	16	0
09070724	13.6	5.2	192.5	D	13.5	0

09070824	13.95	4.75	204.5	D	11.5	0
09070924	13.95	7.35	195.5	D	12.5	0
09071024	14.05	4.8	220.5	D	11.5	0
09071124	13	2.75	222	D	11.5	0
09071224	13.7	2.85	317	E	9.5	0
09071324	11.75	1	245.5	F	26	1
09071424	8.15	3.45	237.5	E	5.5	0
09071524	8.65	1.4	246.5	F	1.5	1
09071624	7.55	1.65	219	F	34.5	1
09071724	10.8	2.4	206	D	13.5	0
09071824	10.65	1.45	227	D	11.5	0
09071924	11.85	1.65	218.5	D	6.5	0
09072024	10.95	1.6	246.5	D	4.5	0
09072124	11.2	2.05	253	E	5	0
09072224	17.7	7.3	330.5	D	11	0
09072324	13.05	2.4	246.5	D	14.5	0
09072424	13.8	3.85	207.5	D	10.5	0
09072524	11.3	1.5	209.5	D	12	0
09072624	16	3.15	319	D	13	0
09072824	10.1	1.6	225	F	4	1
09072924	10.8	0.8	230	F	2	1
09080124	10.5	1.4	225	E	6	0
09080524	13.1	3.1	226	E	2	0
09081724	21.2	4.3	209	D	10	0
					Total F-Class Hours	478
					Total Winter night hours with complete data	3901
					%	**12.3%**

WIND ROSE PLOTS

Data availability = 94.43%

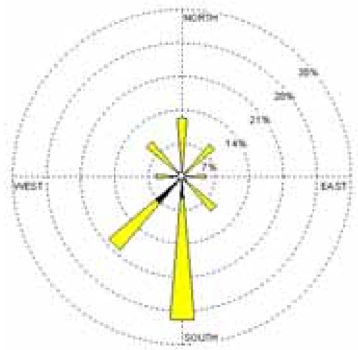
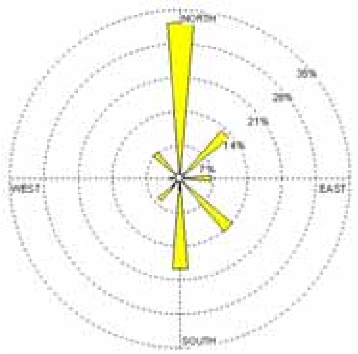
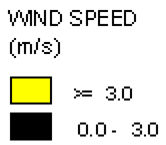
<table>
<tr><td colspan="2">Figure: Wind Rose Plots of Day Time Period for the Referenced Meteorological Station - Bureau of Meteorology - Coolangatta (2005-2009)</td></tr>
<tr><th>All Seasons</th><th>Summer (December – February)</th></tr>
<tr><td>
Average Wind Speed: 5.07 m/s
Axis Frequencies: 6%, 12%, 18%, 24%, 30%</td><td>
Average Wind Speed: 5.46 m/s
Axis Frequencies: 5%, 10%, 15%, 20%, 25%</td></tr>
<tr><th>Autumn (March – May)</th><th>Winter (June – August)</th></tr>
<tr><td>
Average Wind Speed: 4.83 m/s
Axis Frequencies: 8%, 16%, 24%, 32%, 40%</td><td>
Average Wind Speed: 4.36 m/s
Axis Frequencies: 7%, 14%, 21%, 28%, 35%</td></tr>
<tr><th>Spring (September – November)</th><th>Legend</th></tr>
<tr><td>
Average Wind Speed: 5.71 m/s
Axis Frequencies: 7%, 14%, 21%, 28%, 35%</td><td>
</td></tr>
</table>

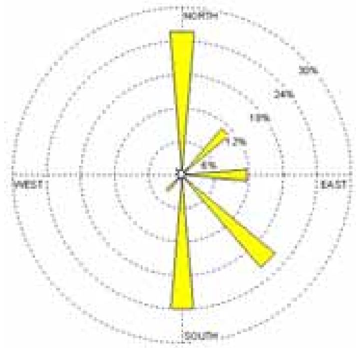
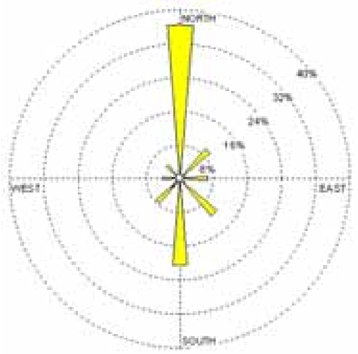
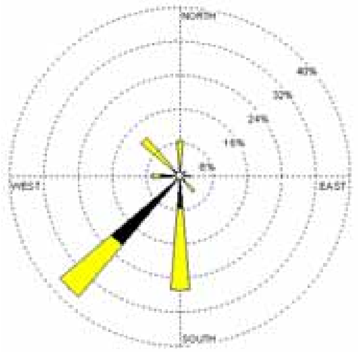
Figure: Wind Rose Plots of Evening Time Period for the Referenced Meteorological Station - Bureau of Meteorology - Coolangatta (2005-2009)	
All Seasons	Summer (December – February)
 Average Wind Speed: 4.32 m/s Axis Frequencies: 6%, 12%, 18%, 24%, 30%	 Average Wind Speed: 4.97 m/s Axis Frequencies: 6%, 12%, 18%, 24%, 30%
Autumn (March – May)	Winter (June – August)
 Average Wind Speed: 4.02 m/s Axis Frequencies: 7%, 14%, 21%, 28%, 35%	 Average Wind Speed: 3.53 m/s Axis Frequencies: 7%, 14%, 21%, 28%, 35%
Spring (September – November)	Legend
 Average Wind Speed: 4.81 m/s Axis Frequencies: 8%, 16%, 24%, 32%, 40%	WIND SPEED (m/s) >= 3.0 0.0 - 3.0

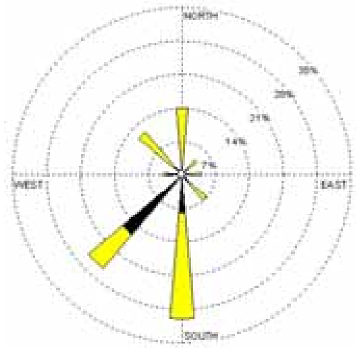
Figure: Wind Rose Plots of Night Time Period for the Referenced Meteorological Station - Bureau of Meteorology – Coolangatta (2005-2009)

All Seasons



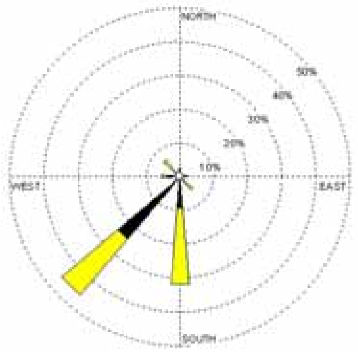
Average Wind Speed: 3.26 m/s
Axis Frequencies: 8%, 16%, 24%, 32%, 40%

Summer (December – February)



Average Wind Speed: 3.46 m/s
Axis Frequencies: 7%, 14%, 21%, 28%, 35%

Autumn (March – May)



Average Wind Speed: 3.20 m/s
Axis Frequencies: 10%, 20%, 30%, 40%, 50%

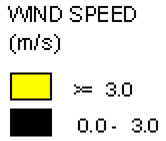
Winter (June – August)

Average Wind Speed: 2.91 m/s
Axis Frequencies: 10%, 20%, 30%, 40%, 50%

Spring (September – November)

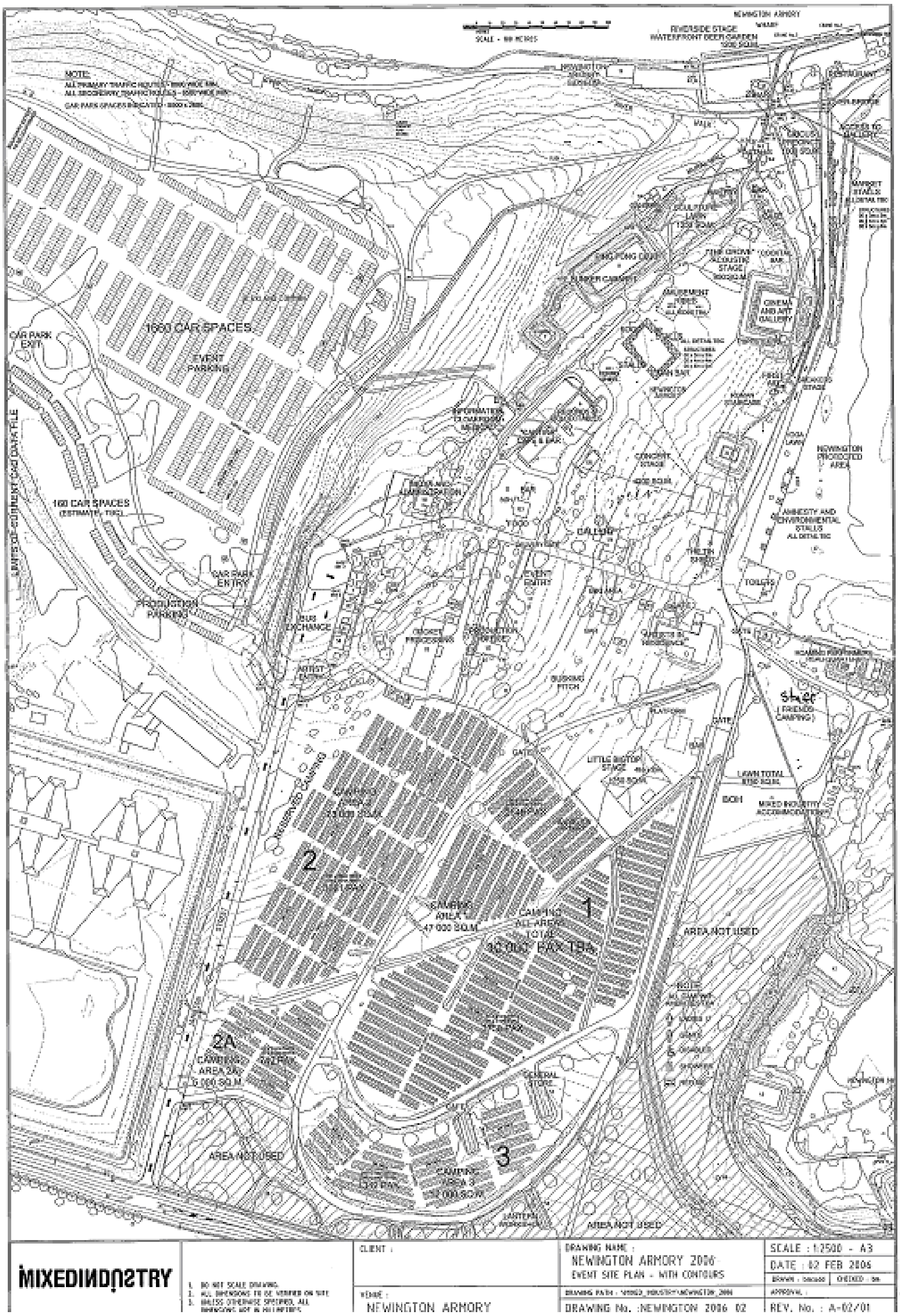
Average Wind Speed: 3.51 m/s
Axis Frequencies: 6%, 12%, 18%, 24%, 30%

Legend



Attachment 6: Site Layout and Aerial Photograph for the Newington Event's Site


NEWINGTON NATURE RESERVE
NEWINGTON NATURE RESERVE
NEWINGTON NATURE RESERVE
SYDNEY OLYMPIC PARK


NEWINGTON ARMORY
RIVERSIDE STAGE
WATERFRONT BEER GARDEN
RESTAURANT
NOTE:
SCULPTURE LAWN
PING PONG CLUB
THE GROVE ACOUSTIC STAGE
BUMPER CARNIVAL
AMUSEMENT RIDES
CINEMA AND ART GALLERY
1600 CAR SPACES
EVENT PARKING
CAR PARK EXIT
INFORMATION
160 CAR SPACES
CONCERT STAGE
NEWINGTON PROTECTED AREA
AMNESTY AND ENVIRONMENTAL STALLS
CAR PARK ENTRY
EVENT ENTRY
PRODUCTION PARKING
BUS EXCHANGE
TICKET PROCESSING
TOILETS
BUSKING PITCH
LITTLE BIGTOP STAGE
LAWN TOTAL
MIXED INDUSTRY ACCOMMODATION
RESERVED CAMPING
2
CAMPING AREA 1
47 000 SQ.M.
CAMPING ALL AREAS TOTAL
10,000 PAX TBA
1
AREA NOT USED
2A
CAMPING AREA 2A
GENERAL STORE
3
CAMPING AREA 3
AREA NOT USED
AREA NOT USED
MIXEDINDUSTRY
1. DO NOT SCALE DRAWING.
2. ALL DIMENSIONS TO BE VERIFIED ON SITE
3. UNLESS OTHERWISE SPECIFIED, ALL
CLIENT :
VENUE :
NEWINGTON ARMORY
DRAWING NAME :
NEWINGTON ARMORY 2006
EVENT SITE PLAN - WITH CONTOURS
DRAWING No. :NEWINGTON 2006 02
SCALE : 1:2500 - A3
DATE : 02 FEB 2006
APPROVAL :
REV. No. : A-02/01

Attachment 7: Examples of Cardioid Subwoofer Systems

TI 330
Cardioid Subwoofer Array – CSA (1.2 EN)
(CSA function within the d&b D12 amplifier)

d&b audiotechnik

1. Introduction

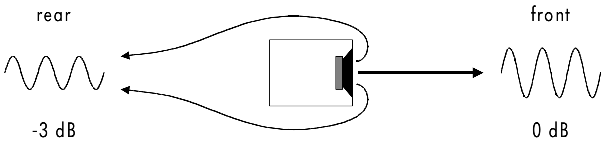
CSA enables the combination of three or a multiple of three subwoofer cabinets in an array to provide exceptional directivity at low frequencies. It can be applied to either d&b Q-SUB or B2-SUB cabinets, when driven by d&b D12 amplifiers. The Q-SUB and B2-SUB configurations in the D12 provide a selectable CSA function for these applications.

High directivity at low frequencies has two main effects on the sound reproduction.

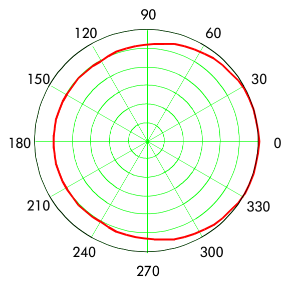
- In closed venues the diffuse sound field at low frequencies is reduced and acoustic room modes are excited to a much lower degree. The improved ratio of direct to diffuse sound in the systems' coverage area provides a much more precise low frequency reproduction.
- The low frequency level behind the subwoofer cabinets and thus its influence on stage sound is greatly reduced. The maximum gain before feedback will increase.

2. Directivity of subwoofer cabinets

To achieve a useful directivity, a sound source has to have at least the dimensions of the wave length it is radiating. Audio frequencies cover a 20 Hz to 20 kHz band which results in wave lengths from 17 m (56 ft) to 1.7 cm (0.7"). The typical operating range of subwoofer cabinets is 35 Hz to 120 Hz, the corresponding wavelength is 10 m (33 ft) to 3 m (10 ft). Therefore the directivity of a subwoofer or subwoofer array of a given size will depend on the frequency. The rejection to the rear for a single cabinet is very small. For a typical 18" subwoofer it is usually about 3 dB at 70 Hz.



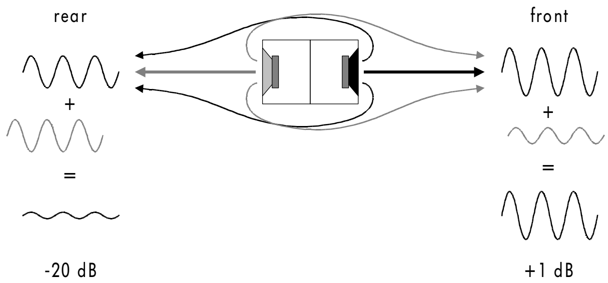
Larger arrays will increase the directivity. A stack of three subwoofers will give about 5 dB rejection, displayed in the polar diagram below.



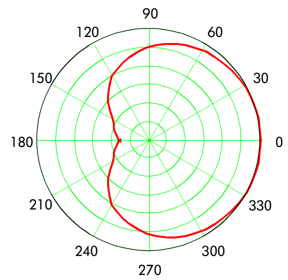
To achieve a useful directivity in both the horizontal and the vertical plane (e.g. to avoid interference by low frequencies behind the system), a very large (wide and high) subwoofer array is required.

3. Cardioid subwoofers

A cardioid subwoofer cabinet is a method of increasing directivity at low frequencies without the need for very large arrays. The principle is the introduction of a second sound source at a defined distance behind the main source which will cancel the sound energy radiated by it to the rear. To work effectively i.e. canceling the energy at the rear and not at the front, the length of the sound path from the rear source to the front has to be in the magnitude of a quarter of the wavelength to be controlled by the system. To achieve the desired cancellation of the sound, phase and level of the rear source have to be aligned by separate signal processing and amplification.



The resulting polar diagram shows a cardioid pattern.

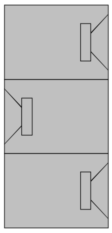


As the wavelength varies with frequency and the distance of the sources is constant, this principle will only work for a fraction more than an octave, just enough for the typical bandwidth of a subwoofer. Within this bandwidth there are frequency ranges where a tuning for best cancellation to the rear does not give the maximum possible output to the front. So the overall sensitivity to the front of a cardioid arrangement will naturally be lower than with a conventional setup of the same components.

4. Cardioid Subwoofer Array - CSA

Common cardioid subwoofer designs employ relatively large cabinets fitted with low drivers and/or ports at the front and rear. d&b has devised a method that uses either Q-SUBs or B2-SUBs in a so-called CSA (Cardioid Subwoofer Array) setup. The CSA generates an uncompromised cardioid behavior, which means that there is no need for special cabinets, enabling the use of the system's full efficiency when there are no particular requirements for low frequency directivity.

In its minimum configuration a CSA setup consists of a stack of three subwoofer cabinets. Due to the directivity of the cabinet arrangement only one subwoofer is needed to compensate for the energy of the other two radiating to the front. For reasons of symmetry the cabinet facing to the back should be located in the center of the column.



The front facing subwoofers are driven with D12 channels without any additional filtering. Two front facing Q-SUBs may be driven in parallel from one channel. The rear facing cabinet is driven by a separate channel with additional filtering (CSA circuit selected on D12).

The diagrams below show the vertical and horizontal isobar plots of the CSA. It produces a constant directivity with 180° dispersion and a minimum rejection of 15 to 20 dB to the rear.

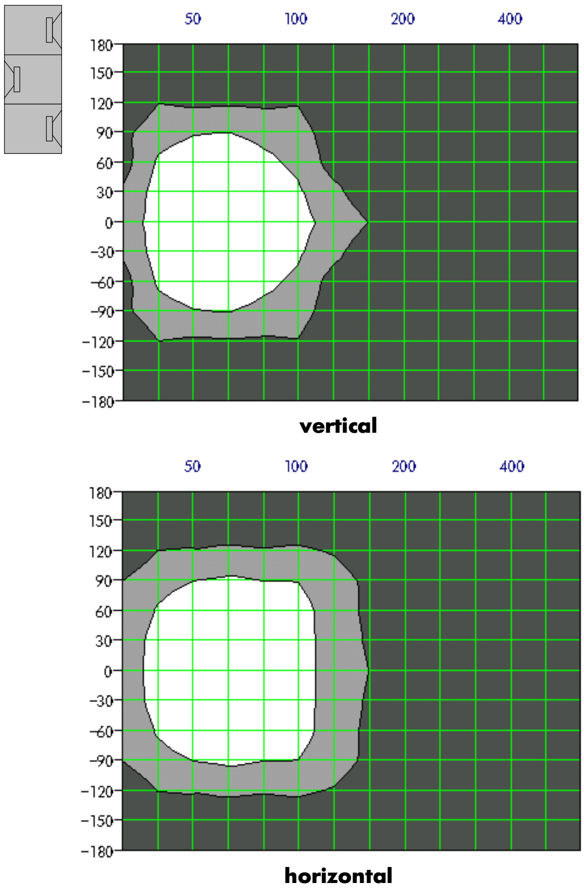
The phase response to the front of a CSA is almost identical to a standard setup so the crossover settings to the top cabinets will still work in the same way.

The contribution of the reversed subwoofer cabinet to the front radiated sound is only significant at very low frequencies (approx. +2 dB). So compared to a conventional setup the tonal balance of the CSA will be slightly shifted towards lower frequencies. Depending on the application this may be compensated for by selecting the higher crossover frequency on the subwoofer controllers.

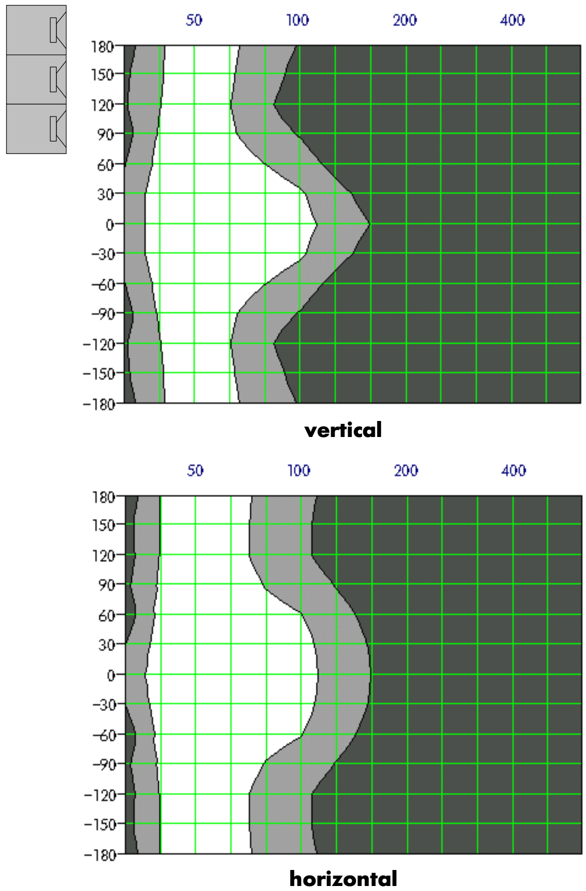
Q-SUB: standard = 130 Hz instead of 100 Hz.
B2-SUB: standard = 100 Hz instead of INFRA (70 Hz).

When placing the CSA stack keep a distance to walls or other obstacles of at least 60 cm (2 ft) in order not to affect the radiation of the reversed cabinet.

Please note that placing a CSA stack directly at the rear wall of a room is not useful. Use a conventional stack for this application.



Dispersion characteristics of a CSA of Q-SUBs. Isobars for -6 dB and -12 dB versus frequency (x) and angle (y).

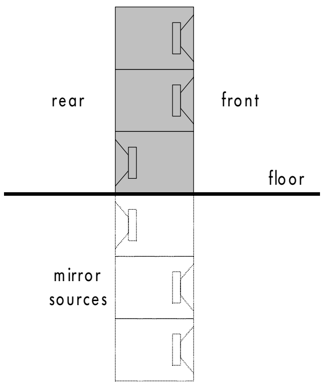


Isobar plots of a conventional 3 high array

5. System configuration

To achieve the best rejection to the rear, the mechanical setup of the system has to be very accurate. With Q-SUB systems, use the runners and recesses in the cabinet top and bottom panels to align the cabinets. All amplifiers driving the subwoofers have to be set to the same input gain and fed with the same input signal. Only the D12 channel driving the rear subwoofer has to be set to CSA. All other parameters of the amplifier channels have to be configured identically, including delay and equalization, if used.

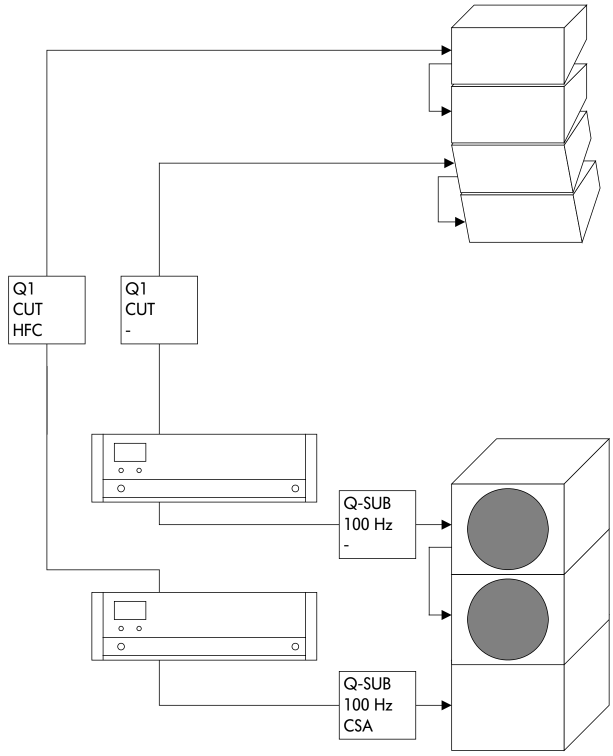
If the array is stacked directly on the ground, which reflects low frequencies, symmetry is also achieved by rotating the lowest cabinet in the column as shown below.



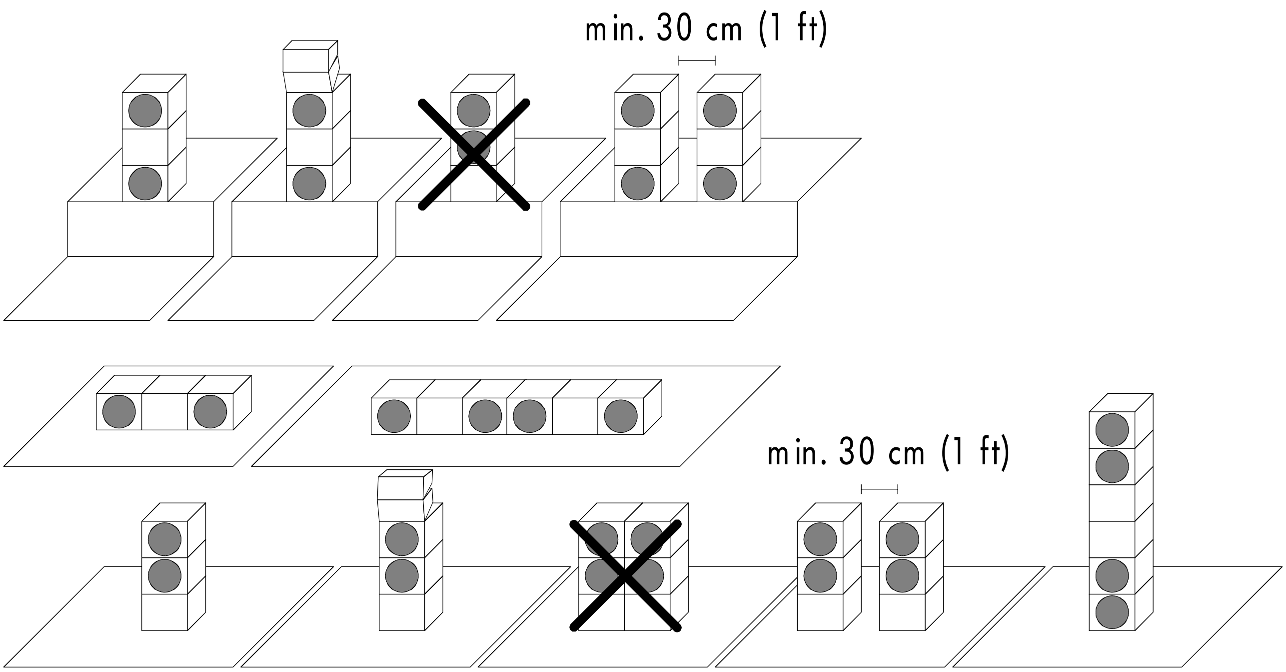
The CSA will also work in other mechanical configurations provided the effective path length from rear to front drivers is identical. For example, when the subwoofer cabinets are arrayed horizontally on the floor, vertical and horizontal directivity is provided without the need for high sub columns.

Q-SUB configurations

Possible setups using the CSA function are shown below (front of house view).
When wiring the system please note that front radiating subwoofers may not be daisy chained with reversed subwoofers. All reversed cabinets have to be driven from D12 channels set to Q-SUB and CSA mode, all others should be driven from channels without CSA selected. The gain and crossover settings (standard/100 Hz) have to be identical.



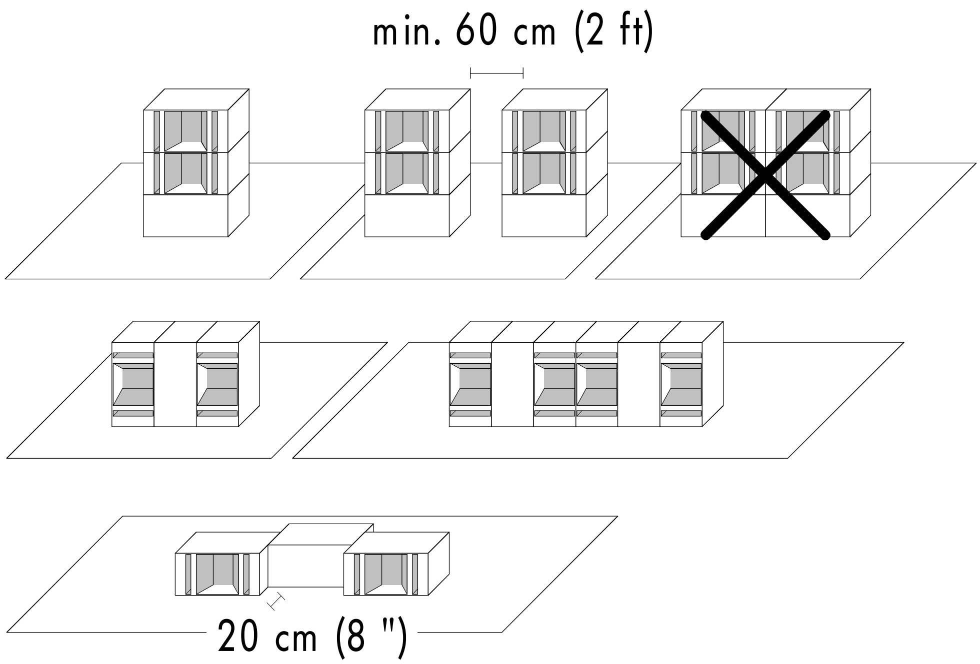
Q1/Q-SUB CSA wiring example



B2-SUB configurations

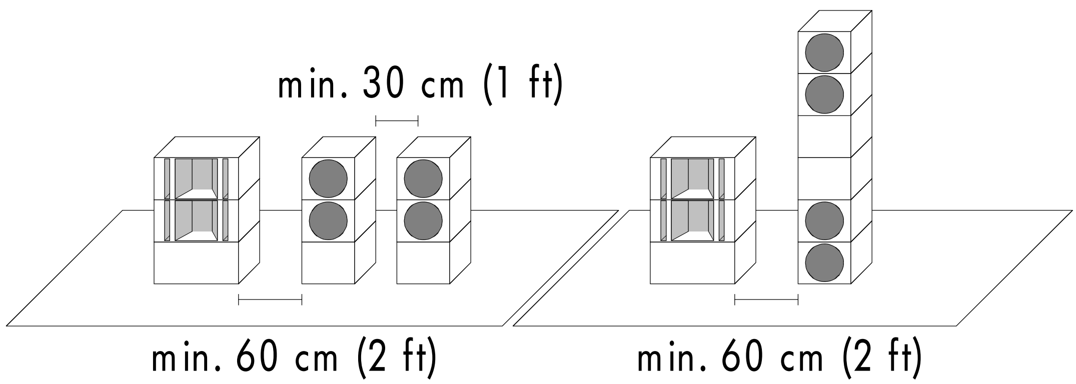
All reversed cabinets have to be driven from D12 channels set to B2-SUB/INFRA and CSA mode, all others should be driven from channels set to B2-SUB/INFRA configuration without CSA selected.

Please note that when extended bandwidth of a CSA using B2-SUBs is necessary the standard configuration may also be used (i.e. INFRA not selected, e.g. to support a Q1 system without Q-SUBs), raising the crossover frequency from 70 Hz to 100 Hz. The dispersion control above 70 Hz, however, will be less accurate than below.



Mixed configurations

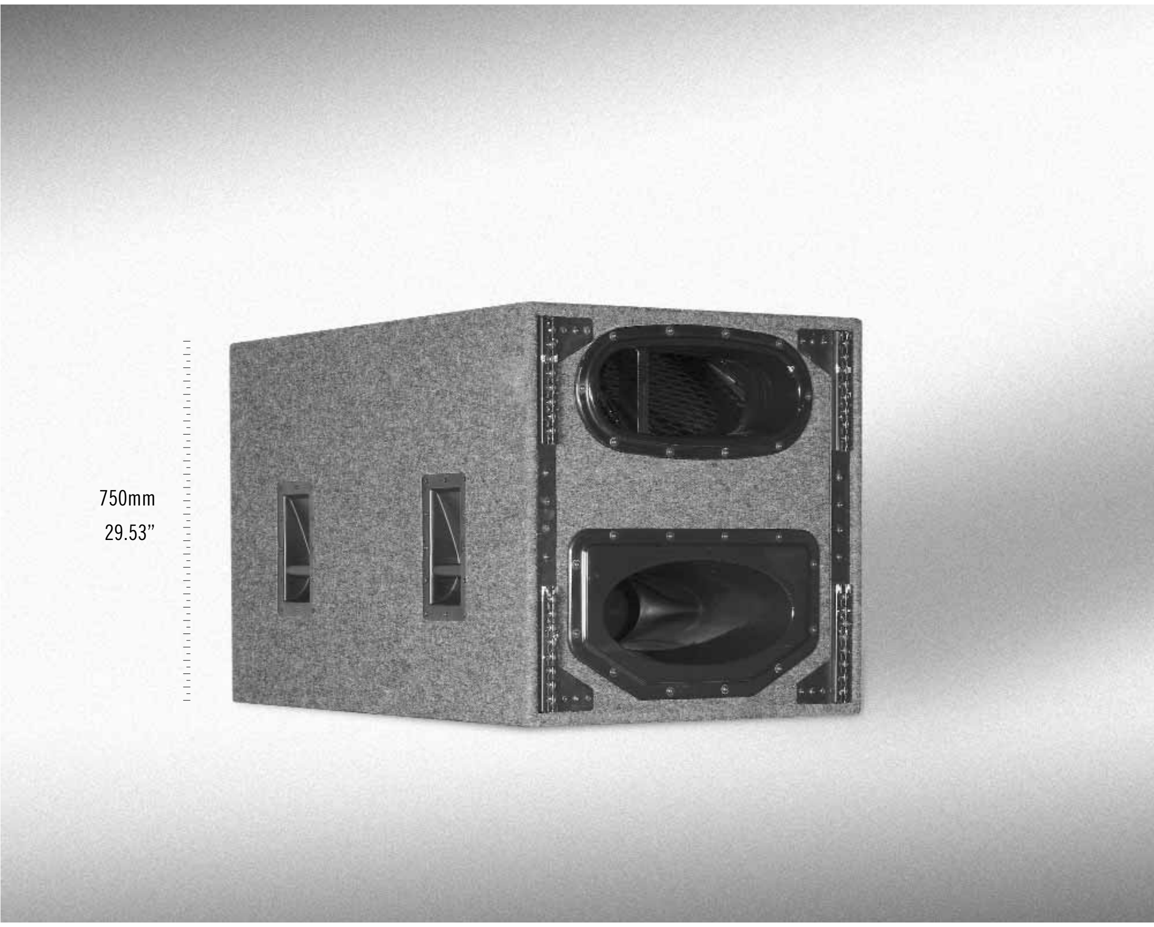
CSA stacks of B2-SUBs and Q-SUBs can be combined.
The recommended distance is 60 cm (2 ft).



d&b audiotechnik GmbH, Eugen-Adolff-Str. 134, D-71522 Backnang, Germany, Phone: +49-7191-9669-0, Fax: +49-7191-95 00 00

flexible coherent efficient scalable

CD18 CONTROLLED DIRECTIVITY SUBBASS



PRODUCT FEATURES

Unique directional subbass with cardioid or supercardioid pattern keeps subbass energy away from open microphones.

120° x 120° dispersion, usable output from 29 Hz to 180 Hz.

Dual-ported 18 inch woofers fire in opposite directions and are driven in reverse polarity.

Requires NX241 Digital TDController and two amplifier channels: each woofer is processed individually.

Internally braced Baltic Birch cabinet minimizes in-band resonances.

Available in structured black coating or dark grey carpet covering.

Integrated flying system for use with curved vertical tangent arrays of GEO T Series modules.

Cabinets designed for stable gound stacking.

GEO T SERIES APPLICATIONS

Mobile or installed sound reinforcement for arenas, clubs, A/V, theater and themed attractions.

High output music applications for large public spaces: transport hubs, outdoor venues, theme parks, etc.

GEO T Series Tangent Array Modules

T4805
Vertical

T2820
Horizontal/Vertical

▶ **CD18**
Hypercardioid Subbass

NX241 Digital TDController

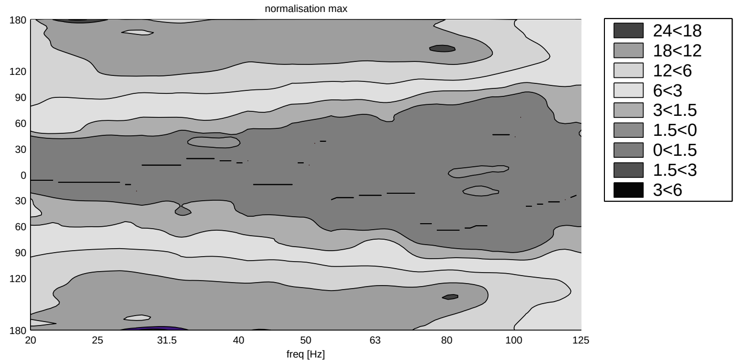
The CD18 uses an innovative approach to the control of long wavelength low frequency acoustic energy. Sophisticated signal processing algorithms, individually applied to each of the dual-ported 18 inch woofers, produce substantial forward gain and more than 12 dB attenuation at the rear. The CD18 puts subbass energy where it is needed and keeps it away from open microphones and reverberant surfaces.

The GEO T & S Series are the result of a three year intensive R&D project that has produced three fundamental patent applications in loudspeaker technology. The performance advantages produced by GEO innovations are easily measurable and clearly audible. With two full range tangent array modules and a hypercardioid subbass, the T Series offers total flexibility to design and deploy horizontal or vertical tangent arrays with coherent output. From high-definition musical reproduction to high output paging systems, GEO Technology delivers optimal performance in venues of all shapes and sizes.

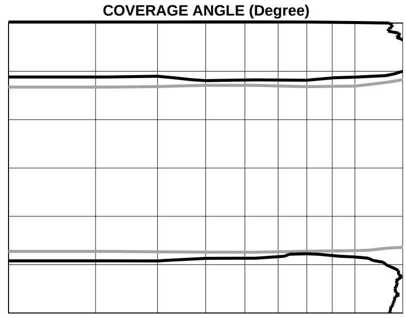
GEO Tangent Array Modules can be used in horizontal or vertical arrays, with or without the CD18 Controlled Directivity Subbass

NEXO
INNOVATE

CD18 Cardioid Mode

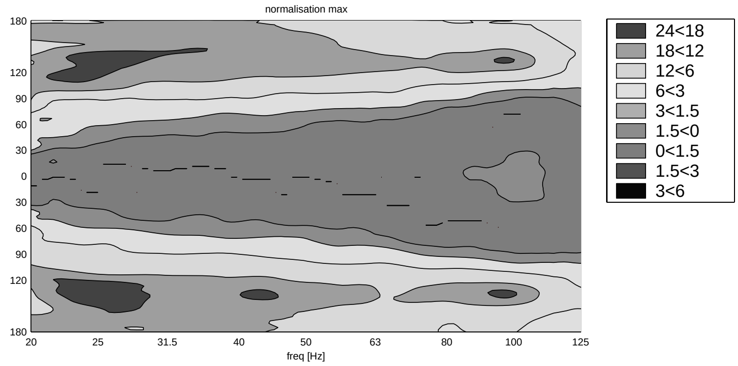


COVERAGE ANGLE (Degree)

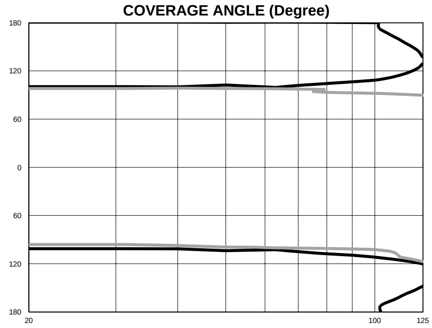


Horizontal (dark) and vertical (light) coverage angles between -6 dB points: cardioid mode.

CD18 Supercardioid Mode

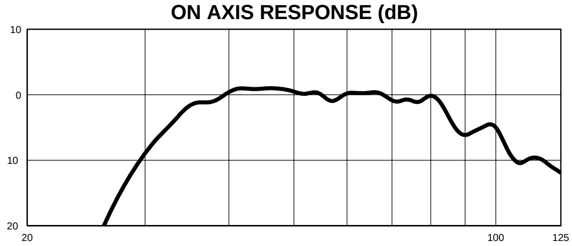


COVERAGE ANGLE (Degree)



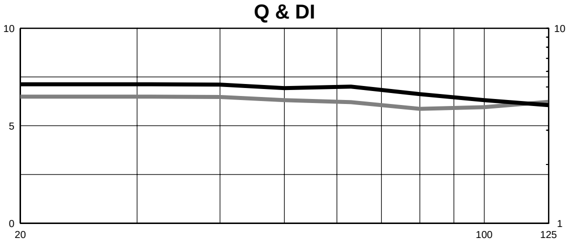
Horizontal (dark) and vertical (light) coverage angles between -6 dB points: supercardioid mode.

ON AXIS RESPONSE (dB)



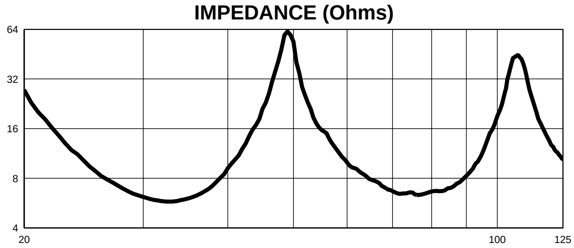
dB vs. frequency on axis. Actual results depend on NX241 settings.

Q & DI



Directivity Index (left scale, dB) and Q (right scale) in supercardioid (light) and cardioid (dark) modes.

IMPEDANCE (Ohms)



Impedance in Ohms vs. frequency

All measurements made with dedicated NX program. Measurements conditions: far field, half space below 400Hz; anechoic above 400Hz.
Directivity Index and factor: computer synthesized from coverage. Coverage: 1/3 octave band synthesized from FFT measurements.

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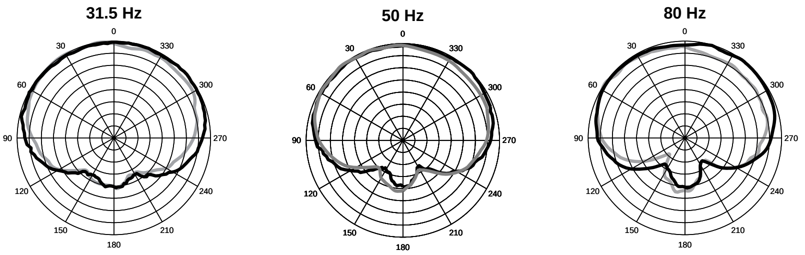
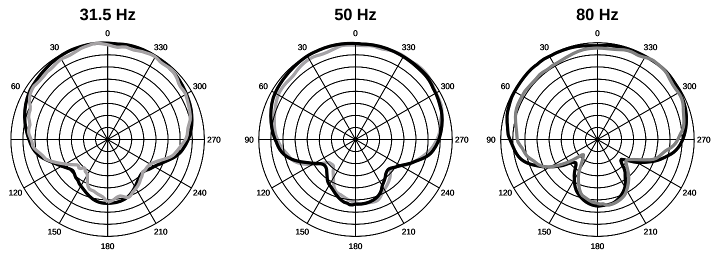
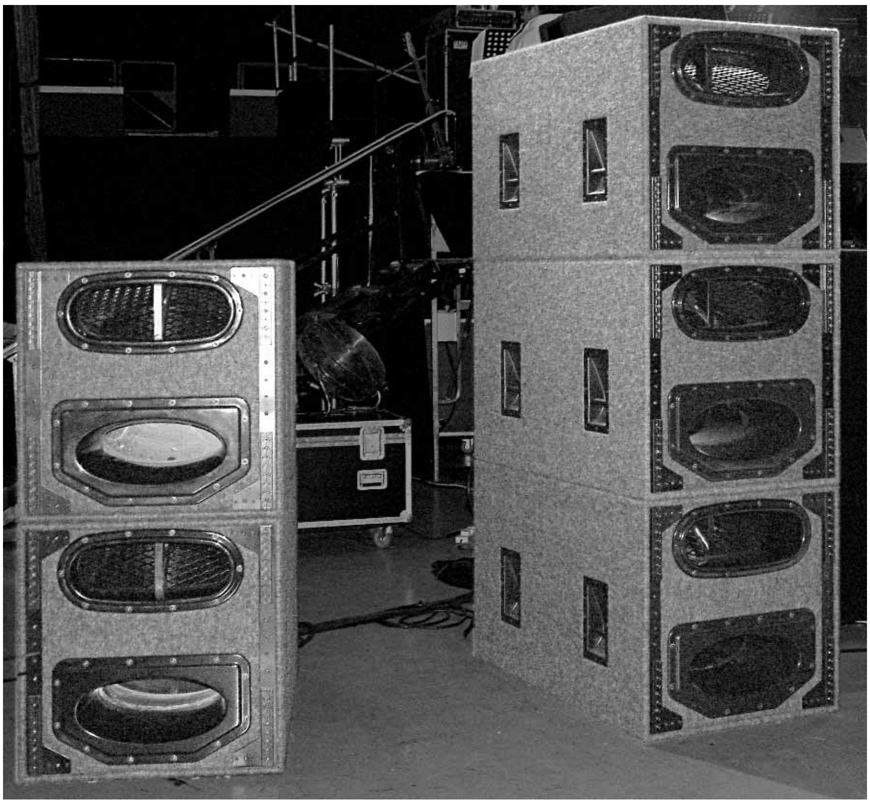


Horizontal (dark) and vertical (light) polar plots: cardioid mode. 3 dB/division.



Horizontal (dark) and vertical (light) polars: supercardioid mode. 3 dB/division.



NEXO INNOVATE

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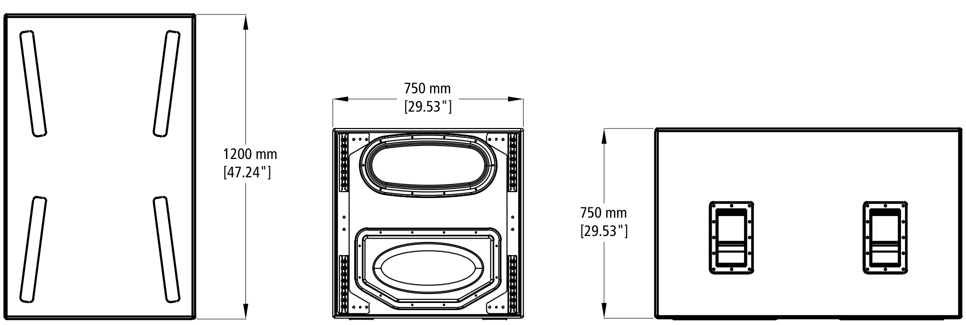
CD18 CONTROLLED DIRECTIVITY SUBBASS

PRODUCT FEATURES	
Components	2 x 18” (46cm) long excursion neodymium 8 Ohm drivers
Height x Width x Depth	750 x 1200 x 750 mm (29 1/2” x 47 1/4” x 29 1/2”)
Shape	Rectangular
Weight: Net	116 kg (256 lbs)
Connectors	2 x NL4MP SPEAKON 4 pole (In & Through)
Construction	Baltic birch ply finish with structured black coating. Dark grey carpet finish also available.
Flying points	Integral flying system.
SYSTEM SPECIFICATIONS CD18 with NX241 TDController	
Frequency Response @-3dB [a]	32 Hz – 80 Hz
Usable Range @-6dB [a]	29 Hz – 180 Hz
Sensitivity 1W @ 1m [b]	105 dB SPL Nominal
Peak SPL @ 1m [b]	145 dB Peak
Dispersion [c]	Cardioid or supercardioid pattern over the entire useable bandwidth depending on the NX241 Digital TDController set up.(two channels of the NX241 are used for the process).
Directivity Index [c] and supercardioid mode.	Q=4.3 I DI=6.3 dB and Q=5.3 I DI=7.2 dB over the entire useable bandwidth for respectively cardioid
Crossover Frequency	80 Hz active through NX241 Digital TDController.
Nominal Impedance	2 x 8 Ohms
Recommended Amplifiers	2 amplifier channels are required for cardioid operation, each rated at 1500 to 3000 Watts into 4 ohms per channel. Up to 2 complete CD18s per channel may be connected to a two channels amplifier.
SYSTEM OPERATION	
Electronic Controller	The NX241 Digital TDController presets are precisely matched to the CD18 and include sophisticated protection systems. Using CD18 sub-bass without a properly connected NX241 Digital TDController will result in poor sound quality and can damage components.
Speaker Cables	The front loudspeaker of the CD18 is wired 2+ & 2- while the rear loudspeaker is wired 1- & 1+. The CD18 must use separate cables to the main system.
Rigging System [d]	Please refer to the user manual before any operation.
SHIPPING & ORDERING	
Packaging	CD18s are packaged individually. Order as CD18-C (finished in grey carpeting) or CD18-P (finished in black structured coating).
Shipping Weight & Volume	1x CD18 = 131.5 kg (263 lbs), .98 cu m (34.4 cu ft)

As part of a policy of continual improvement, NEXO reserves the right to change specifications without notice.
[a] Response curves and data: anechoic far field above 400 Hz, half-space anechoic below 400 Hz. Usable range data: frequency response capability with TD crossover slopes removed. [b] Sensitivity & peak SPL: will depend on spectral distribution. Measured with band limited pink noise. Refers to the specified +/- 3 dB range. Data are for speaker + processor + recommended amplifier combinations. [c] Directivity curves and data: 1/3 octave smoothed frequency response, normalized to on-axis response. Data obtained by computer processing of off-axis response curves. [d] Please refer to the user manual.

CE *approved product*



LIMITED WARRANTY
Nexo loudspeakers and electronics are covered against defects in workmanship or materials for a period of two (2) years from the original date of purchase. At the option of Nexo, the defective item will be repaired/replaced with no charge for materials/labor. The item is to be adequately packaged and dispatched, pre-paid, to a Nexo authorized distributor/service center. Unauthorized repair shall void the warranty. This Nexo warranty does not cover cosmetics or finish and does not apply to any items which in Nexo's opinion have failed due to user abuse, accidents, modifications or any type of misuse.

NEXO is a world leader in the design and manufacture of loudspeaker systems for sound reinforcement. Since 1979 we have pursued practical solutions by addressing problems at fundamental levels. Each new design is generated using proprietary computer simulation software. Extensive modeling and simulation of critical parameters enables us to translate conceptual breakthroughs into significant cost and performance gains.

Nexo's comprehensive line includes the breakthrough GEO Series, based on fundamental wavesource patents, the compact, versatile PS Series, the world standard Alpha System and the Alpha*e* Series. Loudspeakers, analogue and digital control electronics and amplification are all designed to deliver
Sonic Innovation That Works.

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INNOVATE

VT4883 Subcompact Dual 12" Cardioid-Arrayable Subwoofer

VERTEC® Series

Application:

The VT4883 Subcompact Dual 12" Cardioid-Arrayable Subwoofer Line Array Element is a companion low frequency extension for the VT4886 subcompact 3-way enclosure. Designed to deliver high quality sound reinforcement of sub-low frequencies for a wide variety of live music and A/V support applications, typical uses include concert audio and multi-media presentations of all types.

Key Features:

- Advanced Technology Components: Differential Drive®, technology, Dual Neodymium Magnets, Dual Voice Coils, Direct Cooled™
- Reverse-arrayable for implementation of gradient cardioid subwoofer configurations
- JBL PlyMax® engineered wood materials provide rigid, yet lightweight enclosure
- Rugged DuraFlex™ exterior finish; weather-resistant components
- Patented, integrated S.A.F.E.™ suspension system with premium heat-treated alloys

The VT4883 is a subcompact subwoofer housing two 12" long-excursion, Differential Drive® low-frequency transducers. These advanced components, each fitted with dual voice coils and dual magnets, provide an exceptionally high output power-to-weight ratio.

The PlyMax® enclosure features: unique vented bandpass topology with optimized component density and minimal footprint; large area corner ports with laminar flow design for reduced turbulence noise and optimized linearity; integral rubber feet, keyed for aligning surfaces and preventing slippage of stacked systems; pole mount socket for use with optional extension rod.

VERTEC suspension systems are engineered for maximum support strength and flexibility. The VT4883's suspension hardware relies on quick-release pins and side-mounted suspension tubes to couple units together in rigid arrays, either front-firing or rear-firing for implementation of gradient cardioid configurations.

Suspension tubes are made from premium-grade heat-treated aluminum, hinge bars are plated high tensile steel and quick-release pin restraining lanyards are plastic-coated stainless steel to resist corrosion.

Subwoofer Line Arrays:

The low-frequency capabilities of a multi-enclosure VT4883 array will be determined by the total number of units coupled. The directivity of a subwoofer line array at any given frequency is proportional to the product of frequency and length of the array. The beamwidth will be inversely proportional to the product of the array's length and the frequency of interest, typically 20-80 Hz for subwoofer applications.

The more subwoofer elements that are used in the array, the greater directivity will be at lower frequencies, enabling better pattern control. Medium to large arrays can generate extreme amounts of sub-low frequency energy.

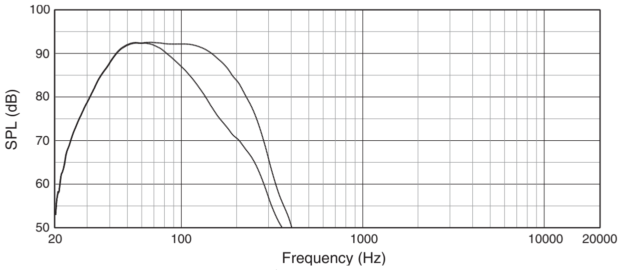
Specifications:

System	
Frequency Range (-10 dB):	35 Hz - 300 Hz
Frequency Response (±3 dB):	40 Hz - 300 Hz
Recommended Bandpass:	35 Hz - 200 Hz
System Input Power Rating:	2000 W Continuous, 8000 W Peak (AES / 2 hour) 1600 W Continuous, 6400 W Peak (100 hr)
System Sensitivity:	95 dB, 1 W (per driver) @ 1m (averaged 40 - 140 Hz)
Maximum Peak Output[1]:	139 dB SPL, 1m (2π, half-space, ground-based application) 133 dB SPL, 1m (4π, free-space, suspended application)
Recommended Amplification:	(2 x) 1600 - 2000 W into 8 ohms (transducers powered individually) 3200 - 4000 W into 4 ohms (transducers powered in parallel)
Recommended Signal Processing:	Crown® I-Tech HD, Crown I-Tech, dbx® DriveRack® 4800, BSS Audio™ FDS-366T Omnidrive™, BSS Audio Soundweb™ London
Transducers	
Low Frequency:	2 x 2263H-1, 305 mm (12 in) dia., 75 mm (3 in) Dual Coil, Dual Magnet, neodymium Differential Drive®, Direct Cooled™
Nominal Impedance:	2 x 8 ohms
Input Power Rating (each transducer)[2]:	1000 W Continuous, 4000 W Peak (AES / 2 hour) 800 W Continuous, 3200 W Peak (100 hour)
Enclosure	
Cabinet Construction:	Rectangular enclosure. PlyMax™ engineered wood composite structure, DuraFlex™ finish, 4 handles, integral pole mount adapter (M20 thread)
Suspension System:	Patented S.A.F.E.™ hardware, integral hinge bars nest in suspension tubes on enclosure sides. Quick release pins with restraining lanyards. Set of 4 hinge bars included. Reverse-arrayable for gradient cardioid configurations. Suspend with VT4886-AF Array Frame.
Grille:	Black perforated steel, foam backed
Input Connectors:	Rear panel: Neutrik® Speakon® NL-4 and NL-8 (2x each) Front panel: Neutrik® Speakon® NL-4 (1x) for gradient cardioid configurations. All connectors in parallel, internal wiring; transducers circuited individually 1±, 2± (2 x 8 ohm) (NL4 and NL8)
Dimensions (H x W x D):	398 mm x 579 mm x 643 mm (15.7 in x 22.8 in x 25.3 in)
Net Weight:	29.5 kg (65 lbs)
Shipping Dimensions (W x H x D):	584 mm x 457 mm x 699 mm (23" x 18" x 27.5")
Shipping Weight:	35.4 kg (78 lbs)
Optional Accessories	
VT4886-AF	Array frame for suspension of VT4883, VT4886, or mixed VT4883/VT4886 arrays. Can also be used for ground stacking.
VT4886-AB	Adapter bar for attachment of multiple VT4886-AF array frames
SS4-BK2	Adjustable extension rod with M20 thread for attachment to VT4883, hand crank height adjustment and patented expanding mandrel system for secure, vibration-free attachment of optional VT4886-UB accessory and up to 3x VT4886

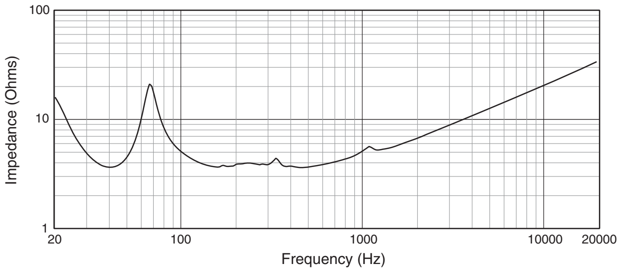
[1] Calculated maximum SPL based on rated peak power and measured sensitivity
[2] AES Standard, one decade pink noise with 6 dB crest factor within device's operational band, free air. Standard AES 2 hr rating plus long term 100 hr rating.

JBL continually engages in research related to product improvement. Some materials, production methods and design refinements are introduced into existing products without notice as a routine expression of that philosophy. For this reason, any current JBL product may differ in some respect from its published description, but will always equal or exceed the original design specifications unless otherwise stated.

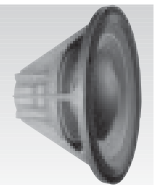
VT4883 Subcompact Dual 12" Cardioid-Arrayable Subwoofer



Processed VT4883 frequency response
(140 Hz LPF, 80 Hz LPF)



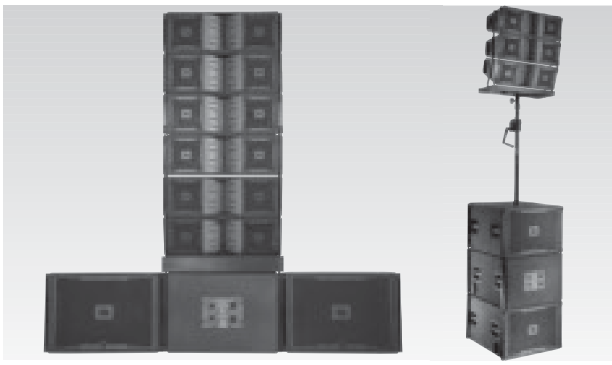
VT4883 electrical input impedance

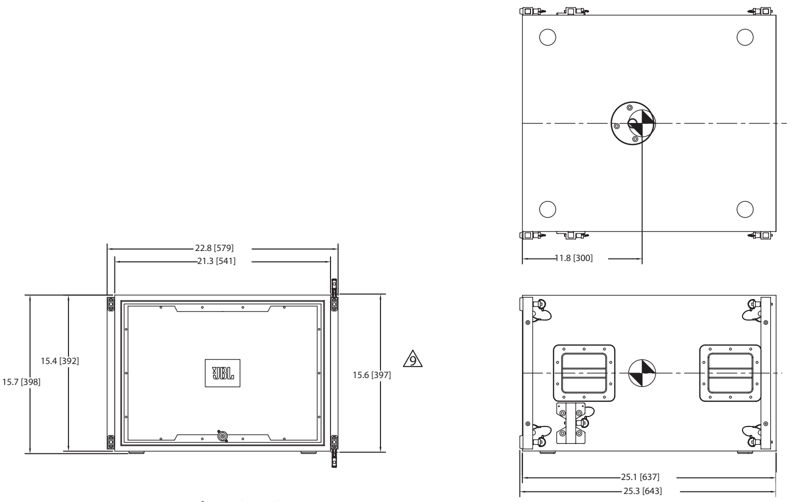


2263H-1 Long Excursion 305 mm (12") Transducer

- Dual Neodymium Magnets
- Dual 75 mm (3") diameter, 1.1" winding length voice coils
- Vented Gap Cooling™
- Ultra Robust Composite Cone
- Thermoset Fiberglass Composite Voice Coil Former
- Edgewound Aluminum Voice Coils
- Heavy Duty Suspension for High Excursion and Enhanced Durability
- 25 mm (1") Peak-to-Peak Maximum Excursion
- 1000 W cont, 4000 W peak (AES) Power Handling, each transducer

Flown cardioid configurations (3x VT4883 + 6x VT4886)
The VT4883 can be used in suspended arrays of multiple units or combined with VT4886 line array elements in the same array. Pictured above is a VT4886-AF supporting three VT4883 subwoofers in a gradient cardioid configuration over six VT4886 subcompact line array elements. Ground stacked configurations are shown below





Dimensions in inches (mm)

JBL Professional
8500 Balboa Boulevard, P.O. Box 2200
Northridge, California 91329 U.S.A.
A Harman International Company

www.jblpro.com

SSVT4883
CRP
01/10

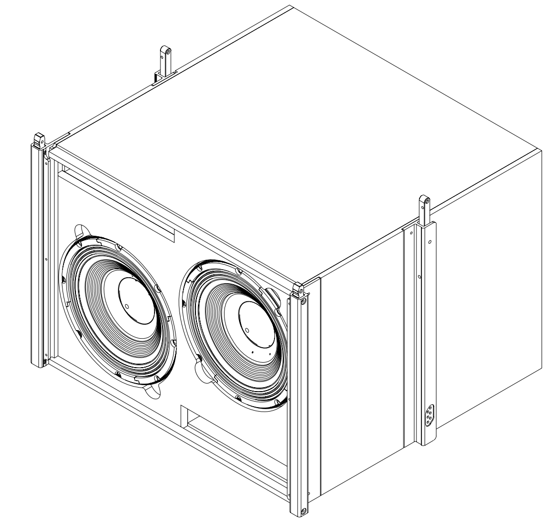
LINE
VERY
COMPACT™

XCS312

Triple 12” Cardioid Compact Controlled-Coverage Bass Element

Key Features:

- Triple 12” Cardioid Very Compact Line-Array Bass Element
- Three DVX3120 12” Low Frequency Transducers
- 1500 Watt Continuous, 6000 Watt Peak
- Versatile Integration in Main Arrays
- Self-contained Rigging Hardware
- LAPS Aiming and Prediction Software Compatible



General Description:

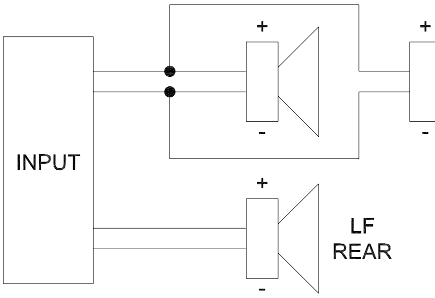
The Electro-Voice® XCS312 is designed for high-level low frequency extension to 40 Hz in a cardioid configuration. It uses three DVX3120 forced air-cooled 12” transducers capable of long, linear excursion and high power handling in a two channel configuration. XCS312’s are designed to be used with a ratio of four XLD281 or XLD291 full range systems for each XCS312 subwoofer. The XLVC family consists of two full-range Line Array Elements with dual woofers, two full-range Line Array Elements with single woofers and a two subwoofer systems. The dual-woofer Line Array Element includes the XLD281 with a 120° horizontal coverage pattern and the XLD291 with a 90° horizontal coverage pattern. The single-woofer Line Array Element includes the XLE181 with a 120° horizontal coverage pattern and the XLE191 with a 90° horizontal coverage pattern. The XCS312 cardioid subwoofer module has the same rigging footprint as the XLD281 and XLD291 allowing it to be directly arrayed above, or below XLD281 or XLD291 full range systems. LAPS modeling software quickly provides array configurations and rigging information. XCS312 subwoofers can be used as the base for ground-stack applications, or by using EV’s XGS-4 Ground-stack Kit for XLVC. XLVC delivers unprecedented performance in applications ranging from live reinforcement to performing arts venues, to houses of worship.

Technical Specifications:

Freq. Response (-3 dB)[1]:	45 Hz
Freq. Range (-10 dB)[1]:	40 Hz
Max Calculated SPL[1]:	130 dB Cont., 136 dB Peak
Rigging:	Fully Captive Aluminum, 1° Increments, 8 Elements with 8 to 1 Safety Factor
Power Handling:	1500W Cont., 6000W Peak (1 channel 1000W, 1 channel 500W)
Sensitivity[1]:	100 dB
Highpass Freq.[2]:	40 Hz
Recommended Crossover Freq:	100 Hz
Coverage:	200°
LF Front: LF Rear: Recommended Amplifier:	2 x 12” (305mm) DVX3120, 4 ohms 1 x 12” (305mm) DVX3120, 8 ohms EV CP3000S
Connectors:	2 x NL8
Enclosure Material:	Birch Plywood w/EVCoat™
Grille:	Galvannealed Steel with Powdercoat Paint
Environmental Spec:	IEC 529 IP24, MIL 810
Dimensions (H x W x D):	508mm x 726mm x 677mm (20.00” x 28.58” x 26.64”)
Net Weight:	67.1 kg (148 lbs)
Shipping Weight:	73.0 kg (161 lbs)

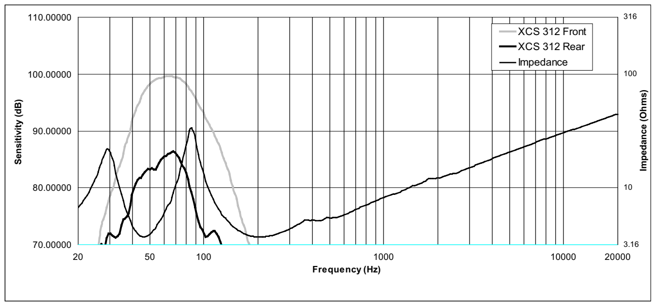
[1] Half Space Measurement. SPL Adjusted for 1W at 63 Hz at 1m.
[2] Use EV or KT Signal Processing or Download Presets from Electro-Voice Website.

Block Diagram:

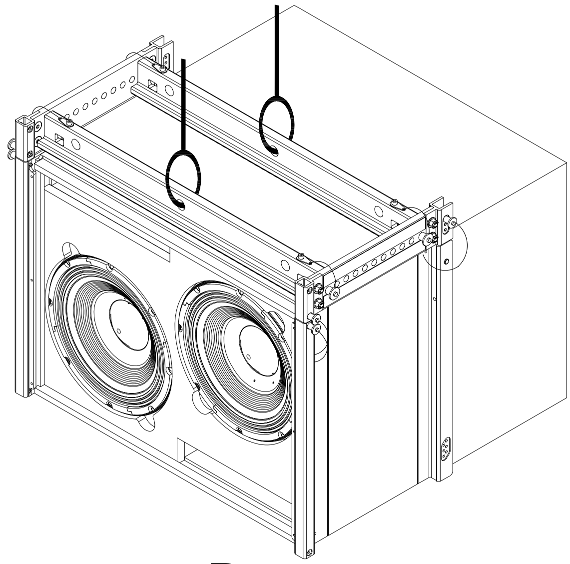


Connections	
Pins 1	LF Front
Pins 2	LF Rear (Steering Element)
Pins 3, 4	Pass Through

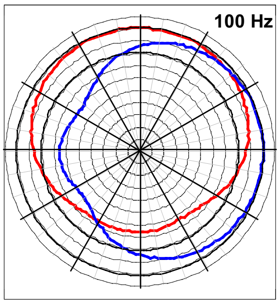
Frequency Response/Impedance:



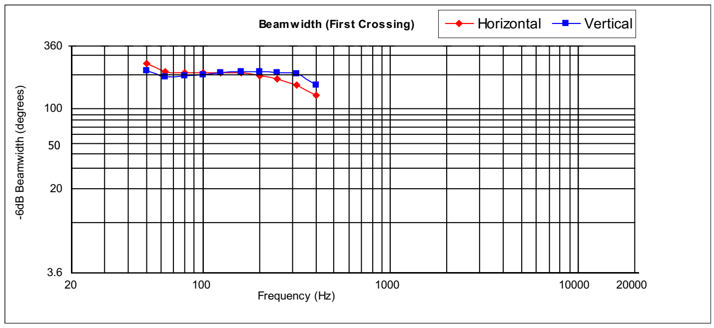
Grid Drawing:



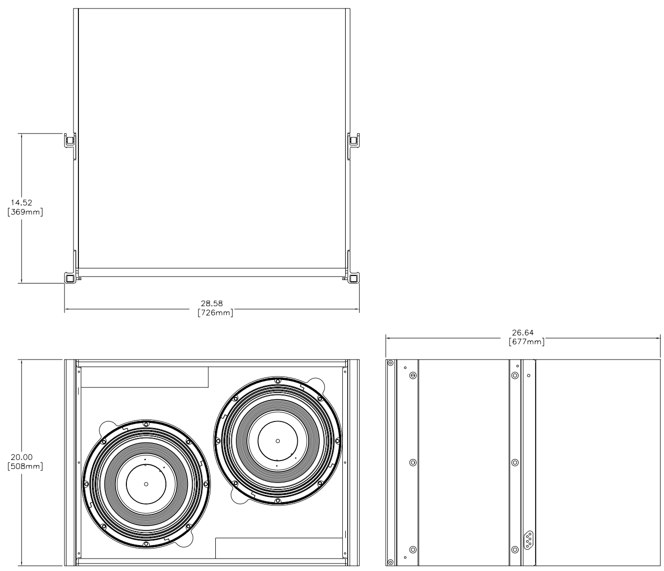
Polar:



Beamwidth:



Dimension Drawings:



Performance Match:

- XLD281 120° Full-Range Line Array Element
- XLD291 90° Full-Range Line Array Element
- XLE181 120° Two-Way Line Array Element
- XLE191 90° Two-Way Line Array Element
- TG5 Tour-Grade Power Amplifier
- CP3000S Precision Series™ Power Amplifier
- P3000RL Precision Series™ Remote Control Power Amplifier
- DC-One Digital Loudspeaker Controller
- Dx38 Digital Sound System Controller
- DN9848 Digital Sound Controller
- XLVC Grid Grid for Hanging XLVC Line-Arrays
- AGSE Grid Adapter Grid for Integrating XLE Systems
- XGS-4 Groundstack Kit for XLVC Line-Arrays

XCS312 Part Numbers:

- PRD000151-001 XCS312-BLK, Black Finish
- PRD000151-002 XCS312-WHT, White Finish

Electro-Voice®

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Phone: 952/884-4051, Fax: 952/884-0043

www.electrovoice.com

Part Number LIT000157 Rev 4

U.S.A. and Canada only. For customer orders, contact Customer Service at:
800/392-3497 Fax: 800/955-6831
Europe, Africa, and Middle East only. For customer orders, contact Customer Service at:
+ 49 9421-706 0 Fax: + 49 9421-706 265
Other Internatonal locations. For customer orders, Contact Customer Service at:
+ 1 952 884-4051 Fax: + 1 952 887-9212
For warranty repair or service information, contact the Service Repair department at:
800/685-2606
For technical assistance, contact Technical Support at: **866/78AUDIO**

Specifications subject to change without notice.

SC8

SENSOR CONTROLLED SUBWOOFER WITH VERSATILE PATTERN CONTROL

FEATURES:

- 4 x Coda Audio 18” extreme high output subwoofer
- Velocity sensors for feedback loop control
- Extended frequency range down to 20 Hz (-6 dB), 25 Hz (-3 dB)
- Ultra low distortion
- Fast transient response, the upper and the ultra low frequency are time aligned
- Cardio, Hypercardio or Omni directional mode
- Optional rigging hardware for flown or ground-stacked arrays
- Reduced truck space for reduced labor and transport costs

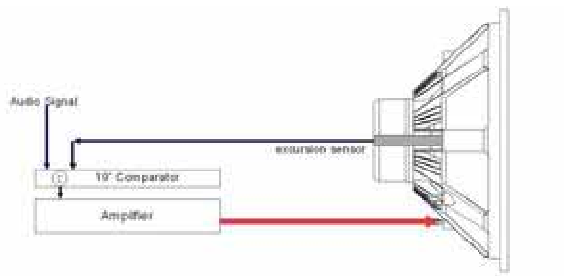
SC8 KEY TECHNOLOGIES:

- The advanced design aligns several new technologies for outstanding performance.
- Feedback loop control – ultra low distortion, very extended and controlled response
- Versatile pattern control – Cardio or Omni mode in one cabinet
- Long excursion drivers with integrated velocity sensor

The Feedback loop controlled subwoofer has clear advantages over conventional amplifier / subwoofer solutions when it comes to sonic performance, output and size.

The SC8 subwoofer
Description: Sensor controlled subwoofer with versatile directional characteristic (Cardio or Omni) incorporating four 18” long excursion woofers. The SC8 subwoofer provides perfectly flat response down to 20 Hz (-6 dB) and very high output and low distortion.

What is Velocity Feedback Loop Comparator?
The new designed 18” driver includes a built in “velocity sensor” that measure precisely the movement of the voice coil.
The “velocity sensor” sends information to the Comparator about velocity, excursion and speed of the voice coil (using XLR cable).
The comparator compares the original input signal to the movement measurement from the “velocity sensor” and adjusts the amplifier driving voltage and/or current so that the diaphragm moves the way it should move. This compensates in real time for the non linearity of the speaker/cabinet.



MAIN ADVANTAGES OF THE ACTIVE FEEDBACK LOOP COMPARATOR:

Total Harmonic Distortion is reduced significantly
THD drops 80 - 90% at low frequency (about 20dB less distortion at 20Hz compared to the same driver without velocity sensor).

Extended Frequency response
Using this technology the frequency response of the speaker can be modified without equalizer. The comparator is adjusted to compensate not only the loudspeaker nonlinearities, but its frequency response as well. The flat frequency response goes down to 25 Hz (-3 dB). No high pass

filters or equalizers are required.

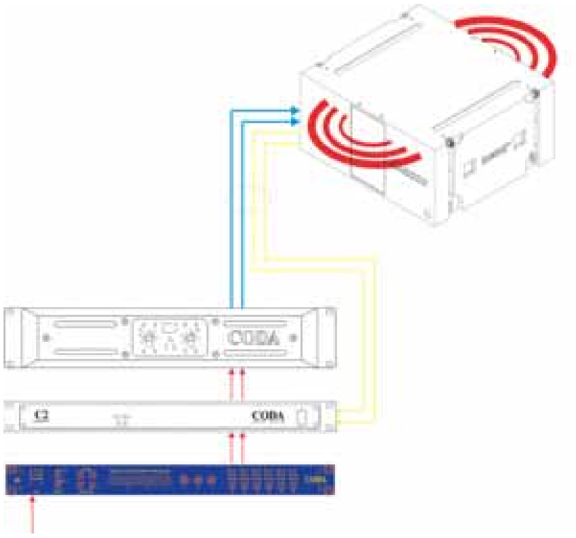
Reduced group delay
This is a big issue that is most often overlooked in conventional designs. The feedback comparator technology offer great advantages in the time domain. In fact the upper bass and the very low frequency are time aligned w hich means they are reproduced at the same time resulting in extremely accurate and musical bass reproduction.

Reduced truck space
The sealed enclosure ensures best output to size ratio reducing up to 50% the cabinet volume.
Therefore the SC8 - 4 x 18" cabinet has similar size as a conventional double 18" subw oofer. (For example the 18" drivers in the SC8 are w orking in 93 liter each w hile a port loaded cabinet needs 150 to 180 liter net volume and the port adds additional around 30 liter more for each driver).

TRANSDUCERS

The SC8 is equipped w ith four extremely long excursion 18" neodymium ultra low distortion w oofers w ith integrated velocity sensor that measure, compare and control cone movements. The neodymium motor delivers extreme high magnetic flux for increased efficiency. The 4" voice coil is 50 mm high, ensuring ultra linear excursion of 40 mm / pp at consistent magnetic force. State of the art carbon-fiber cone ensure maximum stiffness and low moving mass. Three aluminum shorting rings reduce inter-modulation distortion; minimize induction variation w hile reducing thermal compression. This design reduces dramatically the distortion of a typical subw oofer at longer excursion levels, and improves the overall sound quality and performance characteristics of the cabinet. The sensor is in fact an additional voice coil connected to the loudspeakers voice coil in a high precision, magnetically shielded system.

ELECTRONICS AND CABLING



C2 - 19" Comparator
The **C2** Comparator is the active electronic loop control unit for the SC8 subw oofer. The unit includes tw o balanced audio inputs and tw o outputs as w ell as tw o sensor control loops connected to a 5-pol Neutrik XLR input. The Comparator's electronic circuit loop measures the voice coil excursion of the SC8 subw oofer and corrects the signal, significantly decreasing distortion. The unit is set for flat frequency response dow n to 25 Hz (-3 dB).

Speaker connection
The SC8 subw oofer includes double 4-pol Neurik Speakon inputs and one 5-pol Neutrik XLR for the tw o sensor control outputs.
The cabinet should be connected to the C2 Comparator and a stereo amplifier (2 x 3000 W @ 8 Ohm) using a hybrid cable (tw o loudspeaker cable + tw o symmetric control signals in one cable)

DIRECTIVITY

The SC8 can be configured for different polar patterns:
Cardio / Hypercardio or Omni directional w hen the cabinet is rotated at 90°.

Cardioid Mode

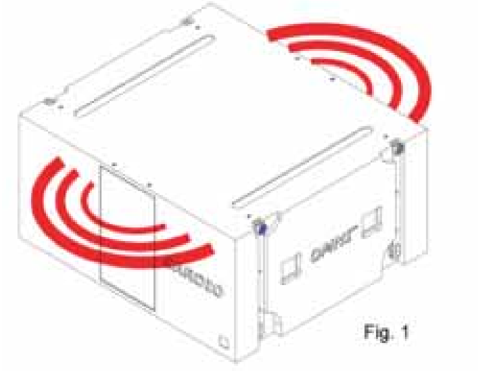
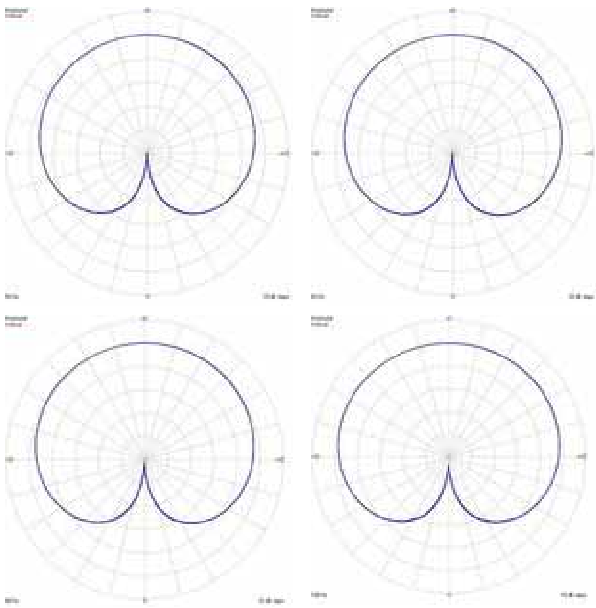


Fig. 1



Omni directional Mode

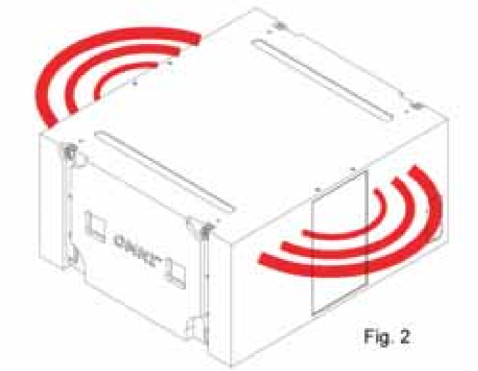
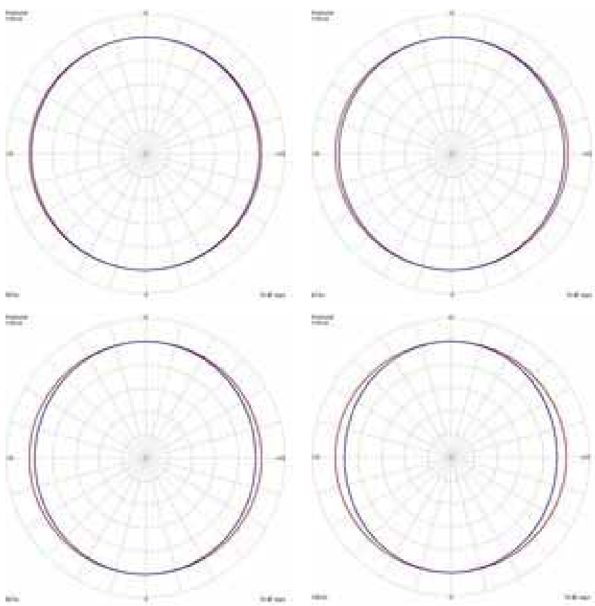


Fig. 2



RIGGING HARDWARE

The SC8 and can be ordered w ith or w ithout flying hardw are. The SC8F (SC8 including flying hardw are) is compatible to AIRLINE LA12 Frame for easy flying or ground stacking in various combinations.

APPLICATION

Primarily designed for integration into **AIRLINE LA12** line arrays, the SC8 is also suited for variety of applications in touring and installations w here high precision, deep bass w ith directivity control is needed.

DOWNLOADS:

Product Data
White Paper
Preset for DNC260
CAD Draw ing 2D
CAD Draw ing 3D

SYSTEM COMPONENTS:

C2 Comparator
DNC260 19" Controller
AIRLINE LA12 Line Array System

NOMOS XLC

KLING & FREITAG
SOUND SYSTEMS

- 3 x 18" High performance subwoofer for 2 channel operations
- Cardioid and/or hypercardioid directivity with high rear attenuation
- For use with K&F SystemRack
- Frequency range starting at 28 Hz (-10dB)
- Very high max. SPL of 140 dB (SPL peak / 1m / full room)

The K&F NOMOS XLC is a cardioid 3x18" subwoofer for a multifunctional variety of high-performance uses. Its possibilities of use range from theatre and opera to disco, club, live, and large open air events.

With its innovative construction and unique design, the K&F NOMOS XLC is also extremely well-suited for use as a sub-low speaker or a classic bass system. It unites enormous and precise low bass with the necessary punch. The extremely broadband, balanced, fast, and precise bass playback justifies an entirely new generation of subwoofers. From a mechanical and acoustic perspective, the K&F NOMOS XLC is extremely resonance-free and is designed with the lowest possible group delay time.

Because of the reduced interference and the directional bass share of the front sound coverage, working with the cardioid is efficient and simple. NOMOS XLC reduces the rear sound pressure broadband by -12dB to -24dB without any limitations in the performance capabilities and the sound characteristics. As a result, the sound level of the stage monitors can, for example, be significantly reduced.

In designing the NOMOS XLC, special attention was paid to good handling in daily use, thus saving work-hours and time. The minimal weight, compact dimensions, and well thought-out design as well as adhering to the trucking dimensions save storage and transport volume.

The NOMOS XLC is easily set-up using "Plug & Play" via the K&F SystemRack. With the Break Out Box BOB-C, up to three NOMOS XLC can be operated from one K&F SystemRack.

The sum of all of these features makes the K&F NOMOS XLC a notably musical, professional, and cost-saving tool that makes room for what is truly important: the targeted and creative crafting of acoustic impressions.

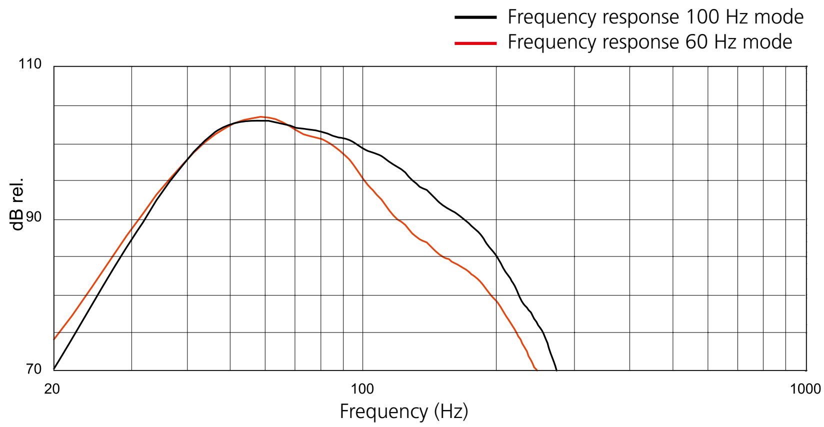
Design	Bass reflex system
Crossover frequency	100 Hz / 60 Hz
(2-Way-Active / 60 Hz)	
Lower cut-off frequency	33 Hz / 28 Hz
(-3 dB / -10 dB)	
Coverage	Cardioid / Hypercardioid
Power handling (front / rear)	2000 W / 1000 W nominal[1]
	4000 W / 2000 W program[2]
Max. SPL	140 dB (SPL Peak / 1 m / free field)
Components	3 x 18" long excursion chassis, 100 mm voice coil
	with double centering, internal and external ventilation,
	double demodulation ring for minimal distortion
Impedance (nominal) front	4 Ω
rear	8 Ω
Wiring	2 x Speakon 4-pin NLT4MP
	front speakers: 1+ / 1-
	rear speaker: 2+ / 2-
	IN parallel into OUT
Enclosure	Frame reinforced enclosure, 15 mm multiplex
	with highly resilient Polyurea synthetic black
	coating,
	8 ergonomical butterfly handles,
	8 nnon-abrasive plastic sliders,
	8 stacking grooves for save stacking of identical
	enclosures,
	4 x 100 mm transport castors,
	2 locking profiles for transport optional transport
	cover,
	ball-proof steel grille with exchangeable black
	acoustic foam
Dimensions (W x H x D)	1200 x 600 x 903 mm (including Castors)
Weight	95.0 kg / Transport Cover: 8.7 kg (optional accessorie)
Accessories	see catalogue or visit www.kling-freitag.de

[1] Pink Noise 40 - 250 Hz, 2 h [2] as [1] but with 50% duty cycle

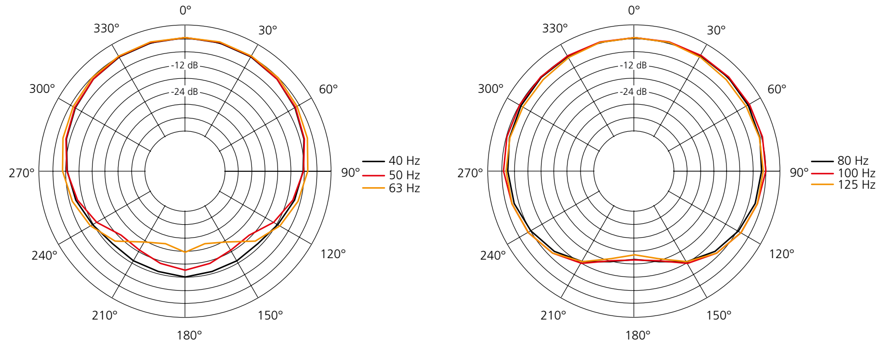
The K&F SystemRack is required for the use of K&F NOMOS XLC.

KLING & FREITAG SOUND SYSTEMS

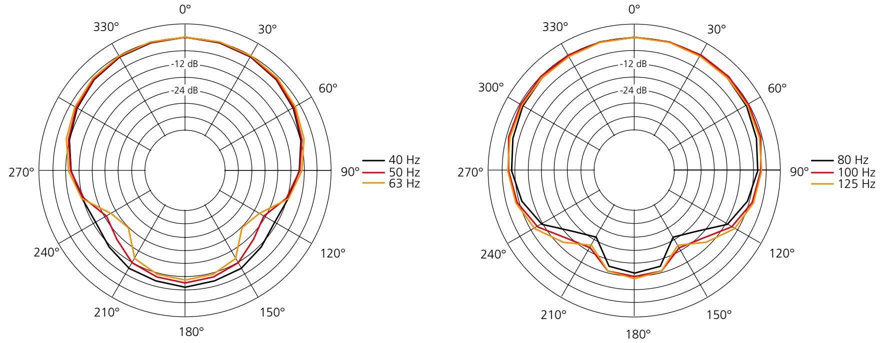
NOMOS XLC



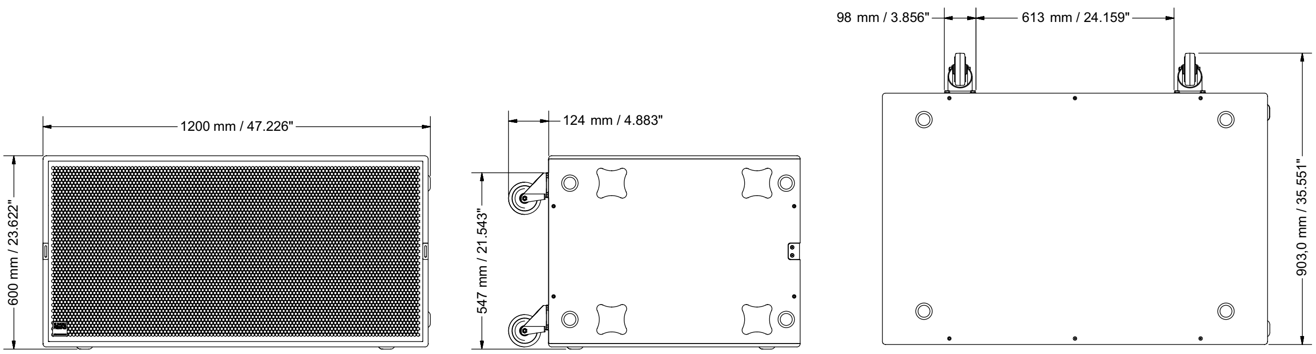
Cardioid



Hypercardioid



All measurements under free field conditions. Frequency patterns 1/6 octave averaged. Coverage and polar pattern 1/3 octave averaged. The manufacturer reserves the right to make product alterations to improve product quality without prior notice. Errors excepted.



Further information and data like specifications, manuals, technical drawings as DWG, DXF and PDF files as well as data files for acoustic simulations with Ease and Ulysses are available on our web site
www.kling-freitag.de

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