



Final Environmental Noise Report

Sydney City Limits
Brazilian Field, Centennial Park
February 24, 2018

Prepared for
Centennial Parklands Trust
Mrs Macquarie's Road,
Sydney

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A. Introduction

The P.A. People were engaged by The Centennial Parklands Trust to provide Environmental Noise Monitoring and Management Services for the Sydney City Limits Festival.

This document is the final report outlining the process and procedures employed by our Company to assist the venue and the event organiser to manage the environmental impact of this event on the surrounding residential areas of the Centennial Parklands. The document is intended to fulfil the requirements of the sound monitoring report as required by The Centennial Parklands Trust to comply with Clause 17 (a) through (h) of the Trusts Prevention Notice No 1002139, file No SR125 dated 26-Feb-2001. And, Variations of Prevention Notice No 1521549 File No EF13/8821 dated 18-Feb-2015.

To proactively prevent perimeter sound pressure levels exceeding the levels set by the regulator, The PA People provided *SPLnet* - a networked, real time sound pressure level monitoring system.

Sound pressure levels from five (5) fixed SPL data collectors located at key perimeter locations, along with three (3) fixed SPL monitors at the FOH mix positions were centrally monitored in real time. During the event two (2) additional mobile sound pressure level monitoring engineers supplemented the *SPLnet* system. These mobile monitors were used to patrol the perimeter, verify *SPLnet* measurements and to conduct location specific measurements in response to any received complaints.

This report comprises:

- An introduction
- Event Details
- Environmental Noise management approach
- Monitoring Details
- Results
- Appendices

The P.A. People prepared the report for this event, under the guidance of Chris Dodds M.A.A.S (Managing Director).

The report also draws extensively on our experience in other similar venues and our understanding of event operational requirements, coupled with our strong understanding of environmental noise issues as they relate to outdoor venues and live entertainment.

Please do not hesitate to contact us should you require clarification of any part of this report.

B. Event Details

B.1 Dates and Times

Sydney City Limits Festival was a multi stage music festival held on The Brazilian Field in Centennial Park, Sydney from 1200-2200 on Saturday 24th February 2018.

Sound system tests and rehearsals were held on Friday 23rd February 2018 from 1510-1745 and on the 24th February 2018 from 1000-1200.

The Trust reports that 14,171 people attended the event, of which 826 were minors.

The Trust confirms that music concluded at 2204pm, 4 minutes after the scheduled time.

The sound tests, rehearsals, and the event were all held within the licensed hours nominated and contained in the venue licence and the event plan.

B.2 Schedule of Acts

A complete schedule of acts can be seen below. In general, all acts conformed to this schedule.

Stage 1 "Harbour"		2 "House"		3 "Park"		4 "Big Top"	
Times	Artist	Times	Artist	Times	Artist	Times	Artist
1200-1230	Bad Dreams	1210-1310	LDRU	1200-1230	Pist Idiots	1200-1230	Ziggy Ramo
1310-1350	Tkay Maidza	1350-1430	Allday	1245-1315	Mallrats	1300-1330	Stella Donnelly
1430-1520	The Libertines	1520-1620	Dune Rats	1330-1410	Sigrid	1345-1430	The Head and Heart
1620-1720	Gang Of Youths	1725-1825	Vance Joy	1430-1515	Winston Surfshirt	1500-1545	Car Seat Headrest
1830-1930	Future	1935-2035	Beck	1535-1620	Thundercat	1615-1700	Alex Lahey
2040-1000	Justice			1645-1730	Oh Wonder	1730-1830	The Staves
				1800-1900	The Avalanches	1900-2000	Ocean Alley
				1930-2030	Grace Jones	2030-2130	Tash Sultana
				2100-2200	Phoenix		

B.3 Weather Conditions

On the rehearsal and the event day, when noise monitoring was carried out, the weather conditions, as obtained from the Sydney Airport Weather Station as it appears on the Bureau of Meteorology website, were mild with no rainfall.

Temperatures over the course of this event ranged from 27-31°C, and humidity levels ranged between 46% and 71%

Wind direction on the in the morning and early afternoon on the 24th of February was predominantly from the northeast, and later in the day and into the evening the wind was from the north-northeast. Wind speed over the duration of the event ranged between 13-44km/h.

C. Environmental Noise Management Approach

C.1 Mitigation before the Event

Live Nation, the event organisers for the Sydney City Limits Festival, are a well-established organisation with a good history of managing its noise emissions on event sites.

Audio system design has historically been carried out by the sound system contractors with the dual goal of reducing emissions, whilst maintaining acceptable performance for the artist's requirements. On this occasion we are satisfied that the systems provided for event was of an appropriate professional standard and level of performance.

The P.A. People reviewed the site layout plan prior to the event.

The organisers' Noise Management Plan forms the basis for sound monitoring for the Sydney City Limits Festival.

C.2 Mitigation during the Event

The *SPLnet* system was used to continuously monitor and log noise levels at the event site and on its perimeter.

The *SPLnet* engineer at event control was able to use this data, in combination with the subjective analysis of the information received from the mobile monitoring engineers, to identify the source of any sound pressure level exceedances at the event perimeter. Any perimeter exceedances detected by *SPLnet* or the mobile monitoring engineers caused by external factors were identified as such. Any potential exceedances caused by the Sydney City Limits Festival sound reinforcement systems were identified and immediately actioned by event control.

The *SPLnet* engineer at event control set dynamic SPL thresholds and exceedance indicators for each FOH position. These thresholds were based on the stage's effect on perimeter SPL conditions. Therefore, the sound engineer was able to proactively adjust the sound pressure level produced by the stage based on its effect on perimeter conditions at any given time.

C.3 Mitigation after the Event

The Trust, the P.A. People and the organisers of Sydney City Limits Festival regard the management of environmental noise for this event to be appropriate and in compliance with the venue License and the EPA Prevention Notice. It is proposed that this level of noise monitoring and management is implemented for future events of this nature at the Centennial Parklands.

D. Monitoring Details

D.1 Details of Measurement System

To monitor perimeter sound pressure levels for the Sydney City Limits Festival, The PA People provided *SPLnet* - a networked, real time sound pressure level monitoring system.

Key features of this system include:

- The centralised logging of SPL data includes information as to when stages are notified of exceedances or, to the best of our knowledge, impending exceedances, to ensure immediate action from the stages.
- When notified of a complaint, sound control can immediately identify readings at the perimeter so there is an immediate measurement in the vicinity at the time of the complaint before the roving sound monitor arrives at the complaint location. This allows more accurate and immediate response to the complainant, and if there is an exceedance this can be immediately rectified centrally while the mobile sound monitor is being dispatched to the residence.
- The communication lines between identifying an exceedance and notifying the offending stage are streamlined.
- Our logging meters work in all weather conditions. Most logging meters currently employed for event monitoring in Australia are affected by wet weather or cannot be used at all.

As noted previously, the *SPLnet* system is focused on proactively preventing perimeter sound pressure level exceedance.

Sound pressure levels for the Sydney City Limits Festival were centrally monitored and recorded from fixed SPL meters located at five (5) key perimeter locations, and centrally monitored from three (3) FOH mixing positions in real time. During the event two mobile sound pressure level monitoring engineers supplemented the *SPLnet* system. The mobile monitors were used to patrol the perimeter and verify the *SPLnet* measurements and to conduct location specific measurements in response to any received complaints.

The *SPLnet* system was used to continuously monitor and log noise levels at the event site. The *SPLnet* system continuously recorded data from each of the five (5) *SPLnet* perimeter data collectors for the duration of the event.

The engineer at event control was able to use this data, in combination with the subjective analysis of the mobile monitoring engineers, to identify the source of sound pressure level exceedances at the event perimeter. Any perimeter exceedances detected by the *SPLnet* system or the mobile monitoring engineers caused by external factors (i.e. not due to sound emanating from the event) were identified. Similarly, exceedances caused by the event sound reinforcement system could be identified and immediately actioned by event control.

Fast dB(A) and dB(C) SPL measurements for all *SPLnet* meters were simultaneously monitored by the engineer at event control.

Fast dB(A) and dB(C) SPL results for the stages were also monitored at the FOH mixing position by the sound engineers. Dynamic SPL thresholds and exceedance indicators were set for the FOH positions by event control. These thresholds were based on the stage's effect on perimeter SPL conditions. Therefore, the sound engineer was able to proactively adjust the sound system outputs to maintain predetermined sound pressure levels based on their effect on perimeter conditions at any given time.

D.2 Site Plan and Measurement Locations

The P.A. People reviewed The Centennial Parklands Trust prevention notice and noise management plan. This information assisted us in formulating the event monitoring strategy that was implemented for this event.

D.2.1 Perimeter Monitoring

As per the requirements outlined in The Centennial Parklands Trust prevention notice for this category of event five (5) perimeter locations were used for the installation of fixed sound pressure level monitoring instruments. At these locations the instrument was attached to a permanent structure, most commonly electricity or light poles, at a height of approximately three (3) metres.

The instrument cabinet comprises the following items:

- SPLnet M100 analyser complete with third octave analysis software
- SPLnet M121 Type 1 measurement microphone fitted in a weatherproof enclosure
- A Battery
- 4G mobile broadband modem

The five (5) fixed *SPLnet* data collectors were near the following locations.

- 60 Oxford St, Paddington
- 85 Darley Rd, Randwick
- 60 York Rd, Queens Park
- 12 Martin Rd, Moore Park
- 40 Lang Rd, Paddington

To proactively manage levels at the perimeter of the event site, the engineer uses the fixed location data collection units. If the engineer detects any exceedance of the limits set out in the prevention notice a mobile monitoring engineer is dispatched to the location to conduct location specific measurements and determine if the exceedance is a result of the amplified sound from the event.

These measurements are conducted using a class one portable analyser mounted on a tripod stand at a height between 1.2m-1.6m above ground, this meter when practical would be placed within 1m of the boundary of the nearest affected premises in relation to the fixed monitoring location.

D.2.2 Stage Monitoring

Three (3) systems were also located within the event boundary at Front of House mixing locations. At these locations instruments were attached to the supporting structure of the mix platform.

The instrument cabinet comprises the following items:

- SPLnet M100 analyser complete with third octave analysis software
- SPLnet M121 Type 1 measurement microphone fitted in a weatherproof enclosure

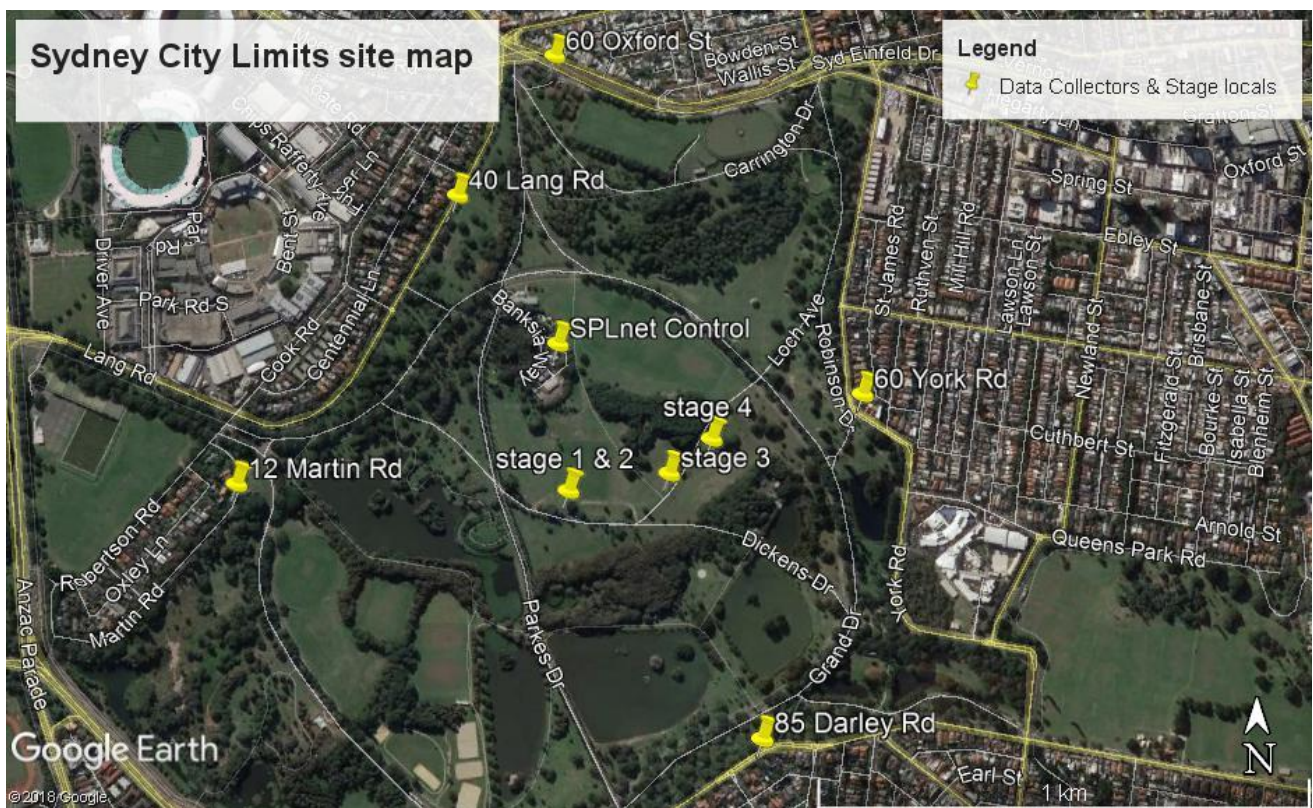
D.2.3 Mobile Monitor

Two mobile monitoring personnel were available to patrol the perimeter, corroborate the SPLnet measurements and to conduct location specific measurements in response to any received complaints or exceedances noted by the engineer.

The remote monitoring engineers were provided with a Type1 sound analyser complete with calibrator.

D.2.4 Site Plan

Below is a plan showing the relative position of the monitoring locations used for this event. It also shows the event site location.



D.2.5 Calibration

Each instrument was calibrated using either Bruel and Kjaer 4230 calibrator or a BWSA Type 660 calibrator prior to and after use.

No significant variations were noted between pre and post use measurements.

D.3 Use of Third Octave information

A feature of the *SPLnet* system is the capability for third octave analysis at all measurement locations, again in real time.

This capability is significant in that it allows the audio operators of each system to tailor the response of their system to maximise the perceived level of their system by adjusting spectral content of the music, rather than relying on level only.

This also reduces the annoyance factor of the noise by reducing dominant frequencies and smoothing the resultant frequency response.

D.4 Complaints Management

The Centennial Parklands Trust has adopted a comprehensive sound management program, which includes a detailed complaints management procedure.

The focus of The P.A.People and The Centennial Parklands Trust for this event was to proactively minimise complaints by monitoring perimeter sound pressure levels continuously in real time. In addition to continuous static perimeter monitoring two (2) mobile monitoring engineers were available to attend complainant locations personally.

E. Results

E.1 Perimeter Results

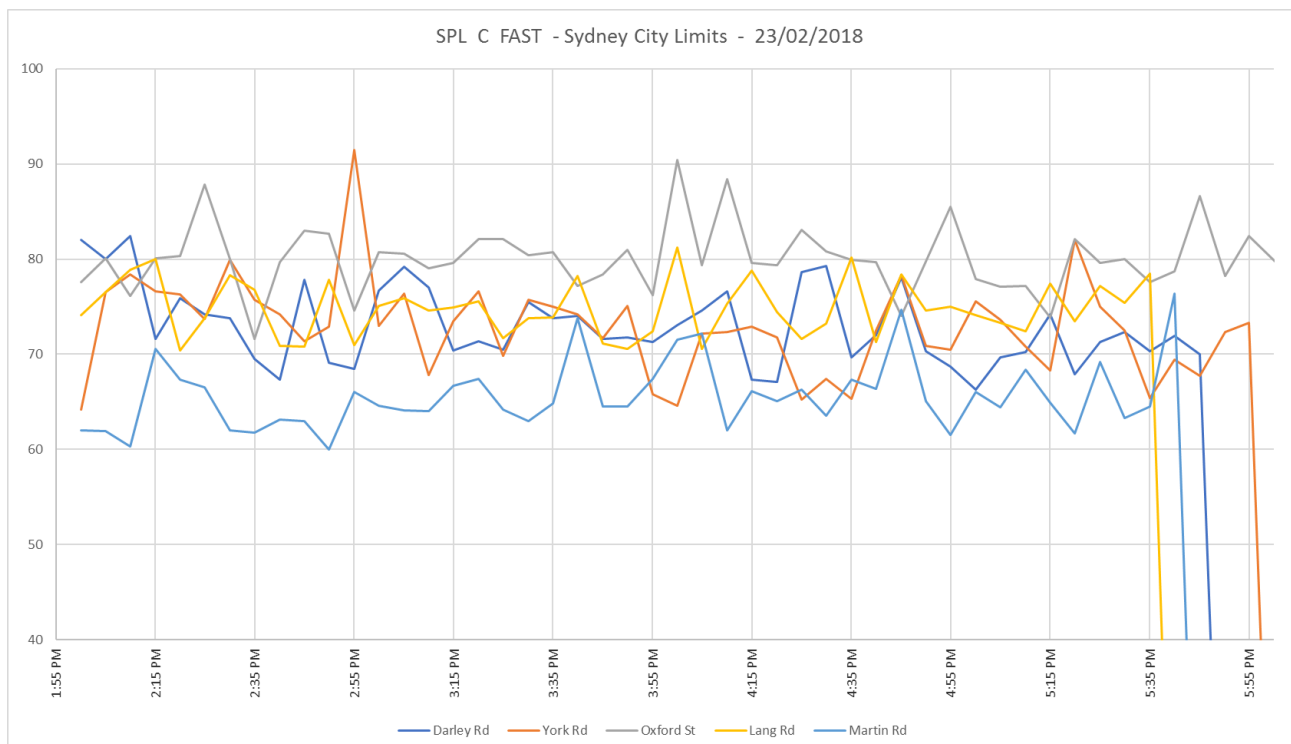
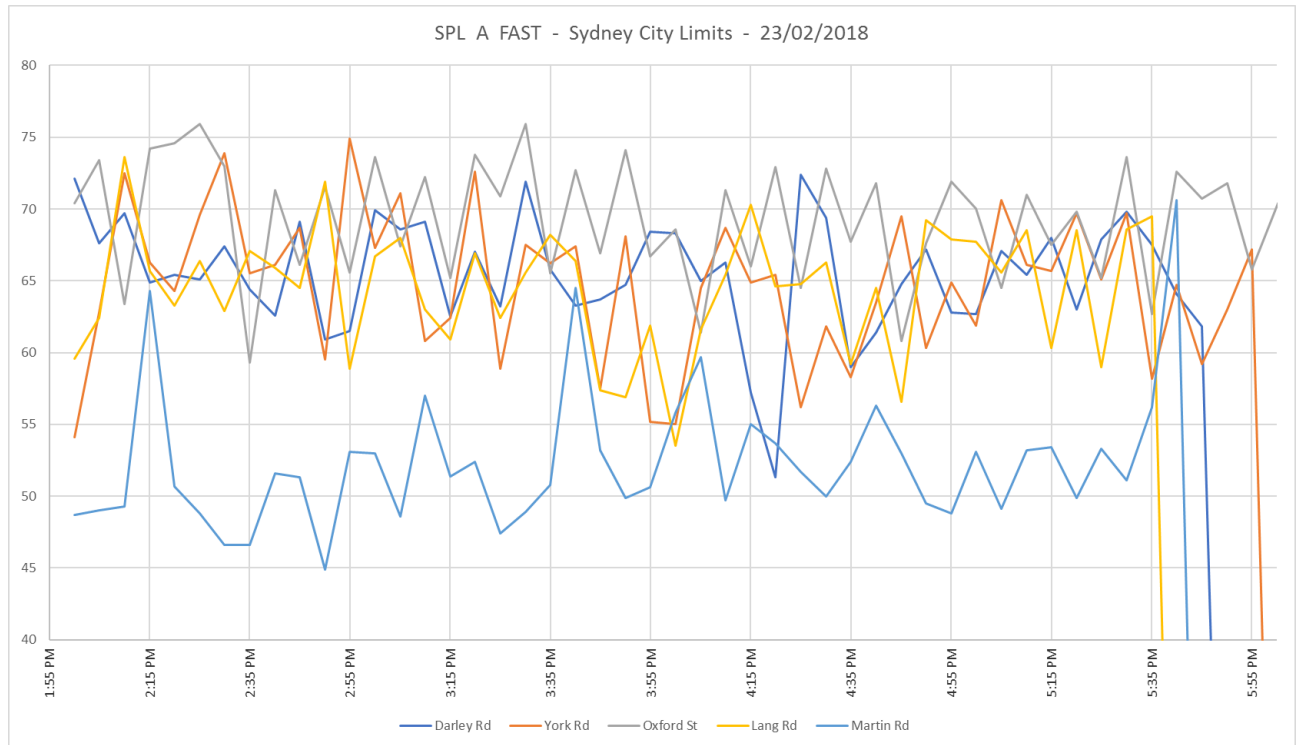
The *SPLnet* system employed for this event provides a significant amount of data.

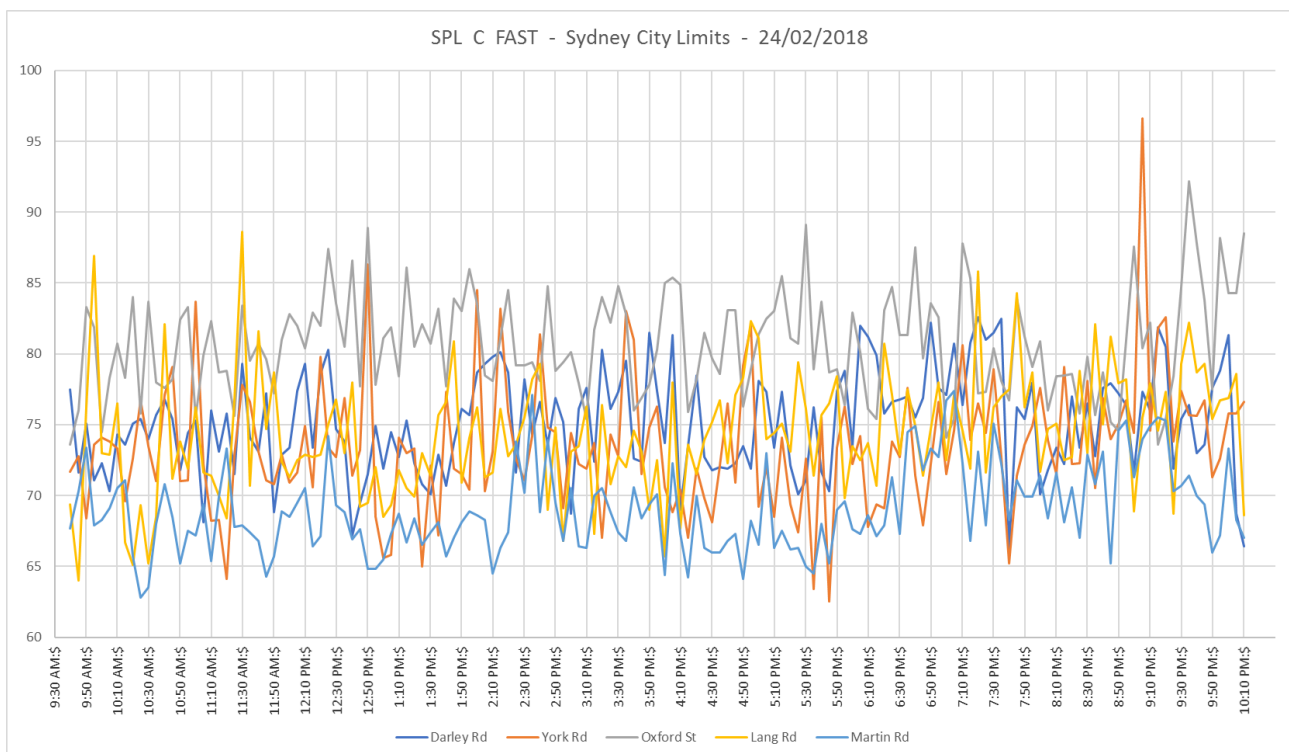
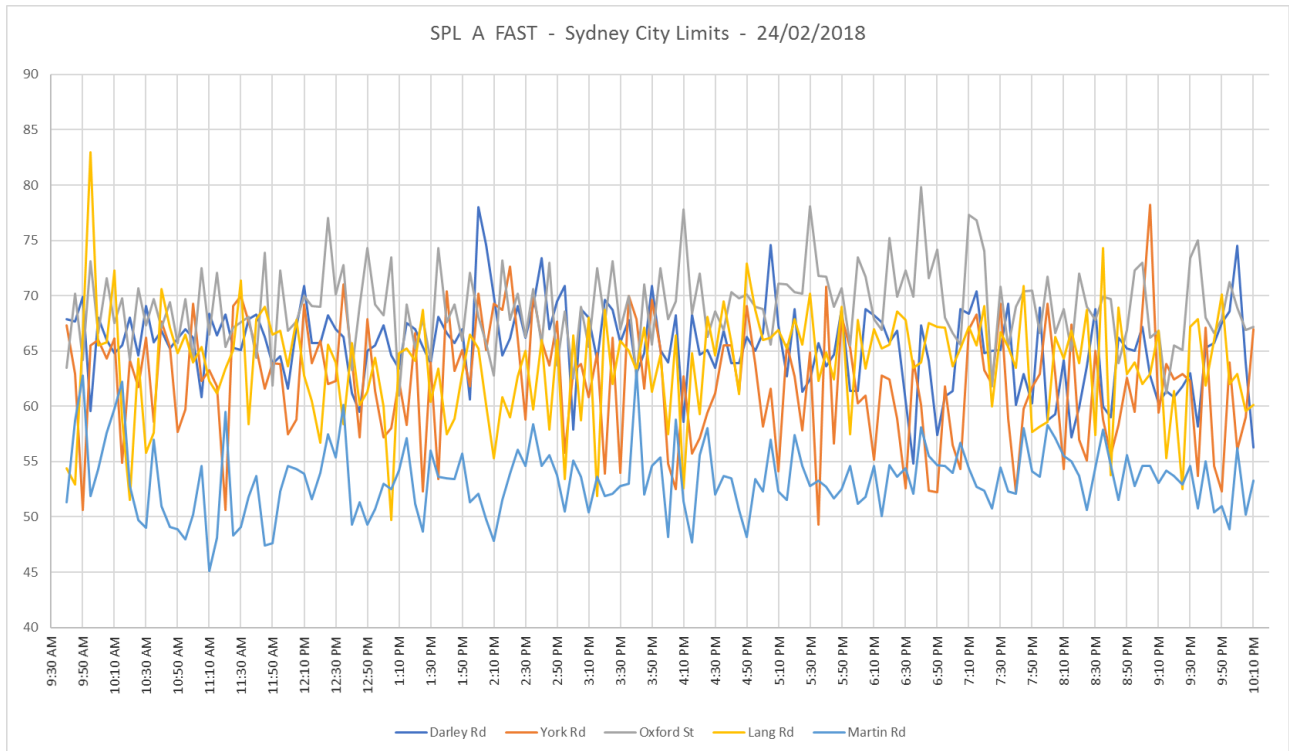
Because of the significant amount of data from, and the continuous monitoring of all perimeter data collectors, one might expect that this would reveal an increase in the number of exceedances identified. This has not proven to be the case, due mostly to the proactive approach of using this same information to adjust the indicative thresholds provided to each stage used to maintain levels below the limits described in the Prevention Notice.

Below are four (4) graphs outlining the levels at each perimeter location over the duration of the event, please note that these graphs are of limited use in, and of, themselves as they record absolute levels due to all environmental factors, not only levels that are associated with the sound generated by the Sydney City Limits Festival stages.

During this event the mobile monitoring engineers reported there was consistently high levels of ambient noise at all monitoring locations except Martin Road, Moore Park. An observation supported by the data recorded at each collector.

Each plot represents samples taken at 5-minute intervals of a total some 3600 points per hour, per measurement location.





E.2 Exceedances

As noted previously we have collected a substantial amount of data pertaining to the noise levels at the perimeter of Centennial Park during this event.

E.2.1 Rehearsals and Sound Tests

There were zero (0) exceedances of the 65db LAMax and 85db LCMMax levels caused by the amplified sound

E.2.2 Main Event

There were zero (0) exceedances of the 65db LAMax and 85db LCMMax levels caused by the amplified sound noted during the event at the perimeter.

E.3 Complaints

As confirmed by The Centennial Parklands Trust, there were two (2) sound-related complaints to the telephone hotline during the rehearsal day and the event day of Sydney City Limits Festival.

Complaint 1.

At 1650 on February 23rd, 2018 the Centennial Park event hotline received a complaint call from a resident in York Rd, Queens Park.

The complainant reported very loud bass music. A mobile monitoring engineer was sent to the address in York Rd and arrived at 1701. By this time the sound check had finished, and no measurement was recorded by the mobile monitoring engineer.

The hotline operator telephoned the complainant and informed them that the sound system had finished for the day.

The SPLnet Engineer at control noted no indication of excessive levels from the York Rd data collection unit and although the mobile monitoring engineer had reported hearing music from the event PA earlier levels were not above the limits of 65dBA and 85dBC.

The offer was made to have a mobile monitoring engineer visit the address of the complainant at the beginning of the event the next day to monitor noise levels. This offer was accepted, and the mobile monitoring engineer visited the address at 0955 on the morning of the 24th February. He stayed at the address in York Rd until 12:00pm taking 3 separate measurements and reported that noise from the sound system was inaudible during his time at this location.

Complaint 2.

At 1946 on February 24th, 2018 the Centennial Park event hotline received a complaint call from a resident near the corner of Darley Rd and Govett St, Randwick.

The complainant asked for the loud bass music to be turned down.

A mobile monitoring engineer was sent to the corner of Govett St & Darley Rd, Randwick and arrived at 2001.

Upon arrival the engineer started taking measurements and reported that the sound from the event sound system/s was audible, but measurements were below the limits described in the Prevention Notice.

The engineer was instructed to remain in the area and continue to monitor noise levels. The engineer recorded five measurements between 2001 and 2114. None of which indicated an exceedance of the LAMax or LCMMax levels described in the Prevention Notice.

E.4 Management Process for Exceedances

With the *SPLnet* system SPL levels at all perimeter points were centrally monitored in real time from event control. The system is designed so that upon the detection of a perimeter exceedance deemed to be the result of the Sydney City Limits Festival reinforcement systems, event control would immediately contact the front of house sound control position and, or the event organiser to request a level decrease or adjustment of the spectrum.

In general, communications between event control and the stages were prompt and effective in preventing and correcting any perimeter breeches.

The dynamic sound pressure level thresholds set for the stage were effective in preventing perimeter exceedances.

F. Summary

Overall, we believe that the implementation of the *SPLnet* system as part of the environmental noise management plan for Sydney City Limits Festival has improved the quality of noise management for the event and ensured overall compliance with the EPA Prevention Notice.