

JIMMY BARNES CONCERT AT FERNHILL ESTATE

NOISE MANAGEMENT PLAN

**REPORT NO. 13101-JB
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ACOUSTICS AND AIR

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GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

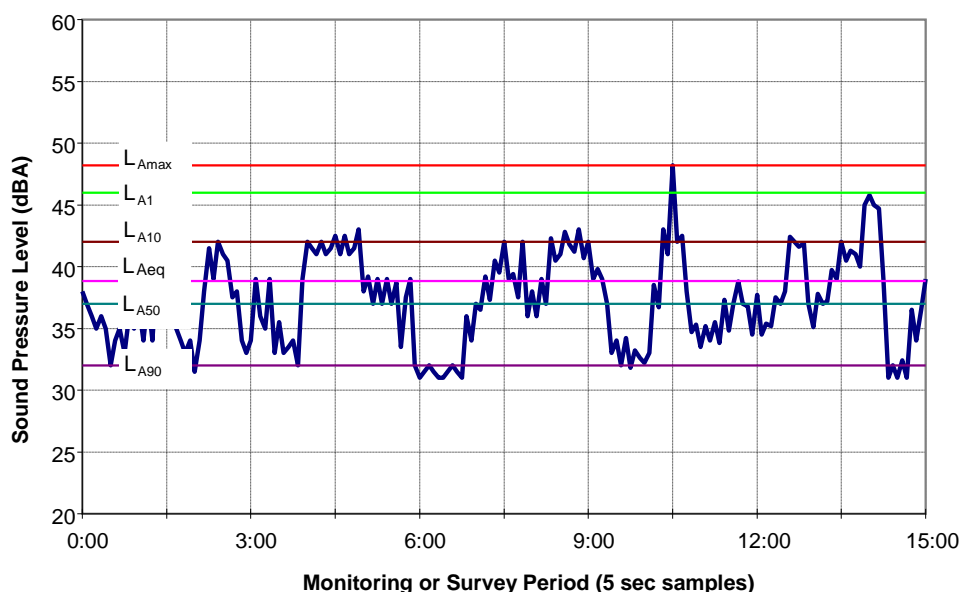
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



1 INTRODUCTION

Wilkinson Murray Report 13101-NMP of April 2014 was a noise management plan (NMP) for operations at Fernhill Estate, Mulgoa Road, Mulgoa.

A concert to be held in May 2017 will feature music by Jimmy Barnes and council have requested an event specific noise report (hereafter referred to as the Concert). This document applies the NMP to the concert.

2 PURPOSE

The purpose of this Operational Noise Management Plan (ONMP) is to outline methods available to manage noise during the use of the Site for the Concert which is the subject of DA 16/1375.

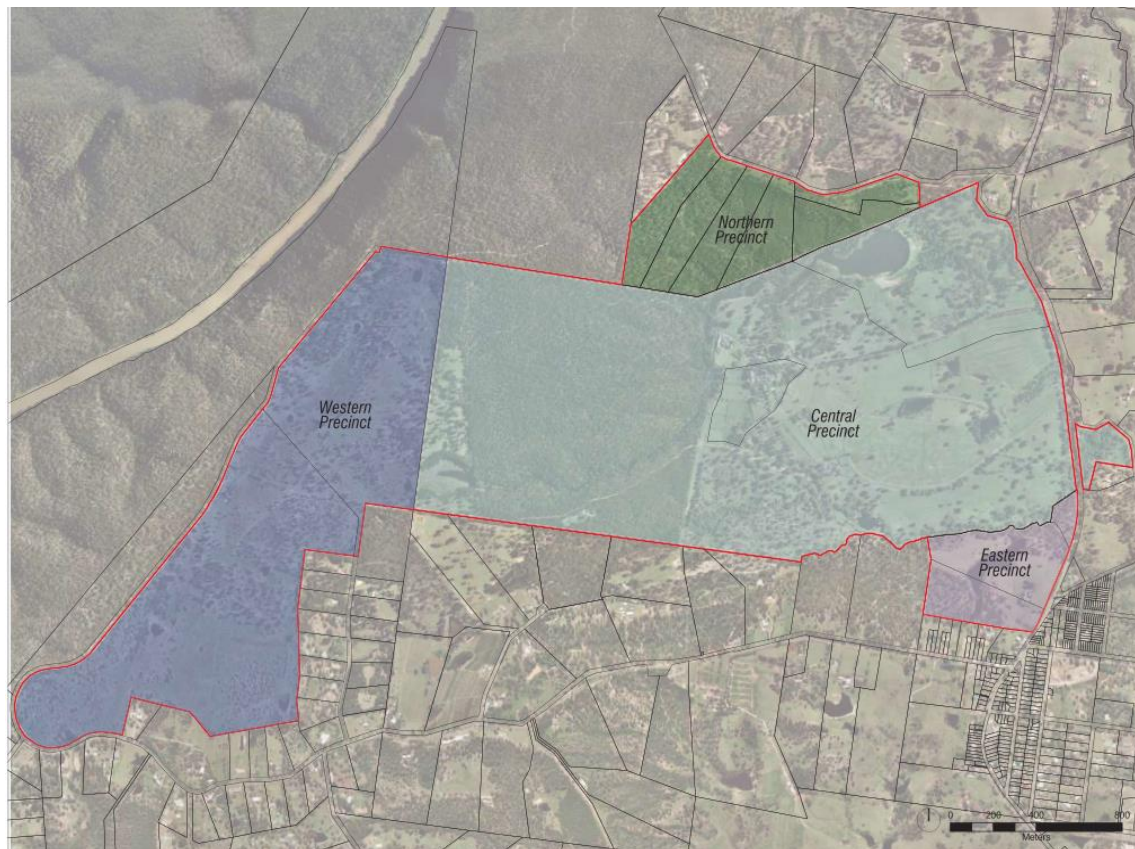
The ONMP covers:

- appropriate training of all staff in relation to noise issues;
- noise monitoring required the Event; and
- operational measures (e.g. restriction of function hours, location of activities, music levels etc).

3 SITE LOCATION

The land is located at Mulgoa Road, Mulgoa, and outlined on Figure 3-1. The Concert will take place in the Central Precinct of the site.

Figure 3-1 Site Outline¹



Note 1 – Central Precinct shown shaded light green.

4 NOISE CRITERIA – EMISSION FROM CENTRAL PRECINCT

4.1 Council Requirements

Council have not specified requirements for the Concert. For previous applications Council Conditions were consistent with requirements of the NSW EPA documents Industrial Noise Policy (INP) and Noise Guide for Local Government (NGLG). These requirements are described in the next section.

4.2 NSW Guidelines for Noise

Noise emission from the Central Precinct should be assessed according to the guidelines of the EPA's *NSW Industrial Noise Policy (INP)*.

The guidelines recommend limits for Intrusiveness is that noise should not exceed that background level by more than 5 dBA.

Sleep Disturbance is not covered by the INP, but recommendations are given in the Environment Protection Authority's (EPA) Noise Guide for Local Government (NGLG). The "screening" criterion given in the NGLG is that the $L_{A1,1min}$ should be less than the RBL background noise plus 15BA.

If alcohol is to be served then the noise should also comply with the guidelines of the Office of

Liquor and Gaming (OLGR). These are similar to the *INP* though require the background to be measured in octave bands, and operation after midnight should not exceed the background in any octave band.

4.3 Specific Noise Criteria

Unattended background measurements were done at four locations from 12 to 21 March 2014. The full results are given in Wilkinson Murray Report 13101-A Version C (April 2014).

Based on the long-term noise monitoring, four assessment zones have been assigned to the site, as shown in Figure 6-1. The noise criteria derived from the monitoring and applied to those zones are given in Table 4-1.

Table 4-1 Noise Criteria dBA

Assessment Zone	Daytime (7am-6pm)		Evening (6pm-10pm)		Night time (10pm-7am)		
	RBL	Intrusiveness, L _{Aeq,15min}	RBL	Intrusiveness, L _{Aeq,15min}	RBL	Intrusiveness, L _{Aeq,15min}	Sleep Disturbance, L _{A1,1min}
North East	37	43	38	43	32	37	47
North West	39	44	39	44	37	42	52
South East	37	42	37	42	37	42	52
South West	30	35	30	35	30	35	45

5 NOISE ASSESSMENT OF THE CONCERT

5.1 Event Description

The Concert will be held in the Central Precinct as shown on Figure 5-1. A more detailed view is shown in Figure 5-1 and Figure 5-2.

Figure 5-3 presents preliminary detail of the patron and stage area. This is subject to change as the Concert organisation progresses. The stage and speakers will be oriented to the north west.

There will be no change to vehicle access to the site from previous approved events.

Approximately 5000 guests will attend the concert.

The Concert will take place between 5.00pm and 10.00pm on 7 May 2017.

Figure 5-1 DA Site Plan Overview

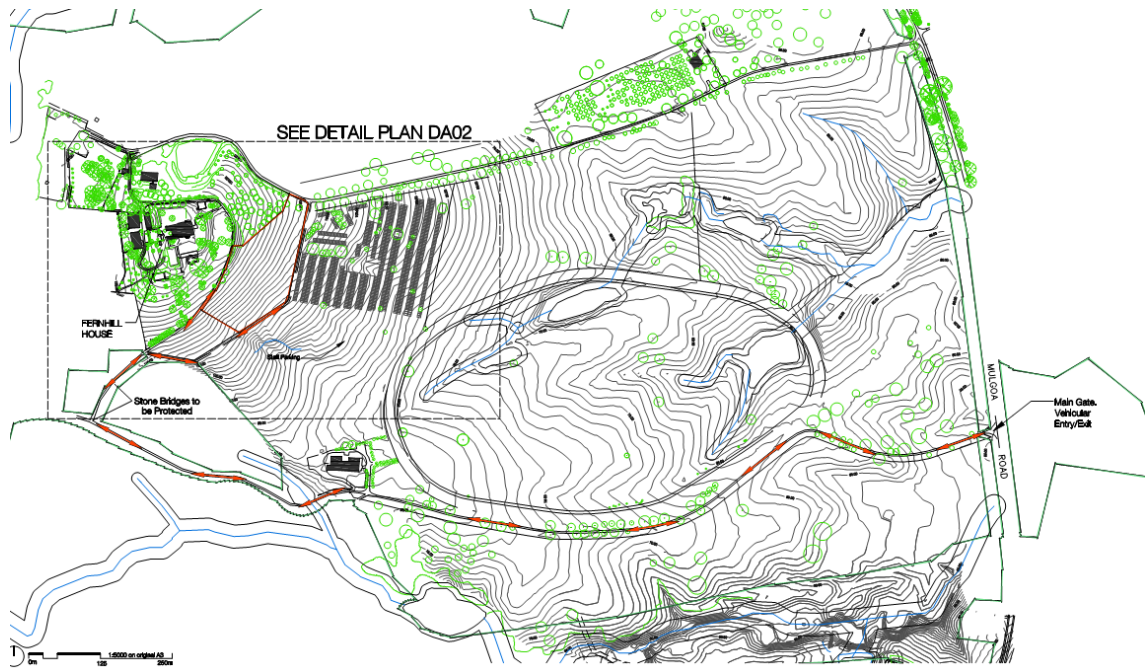


Figure 5-2 DA Site Plan Detail



Figure 5-3 Detail of Patron Area



5.2 Event Noise Levels

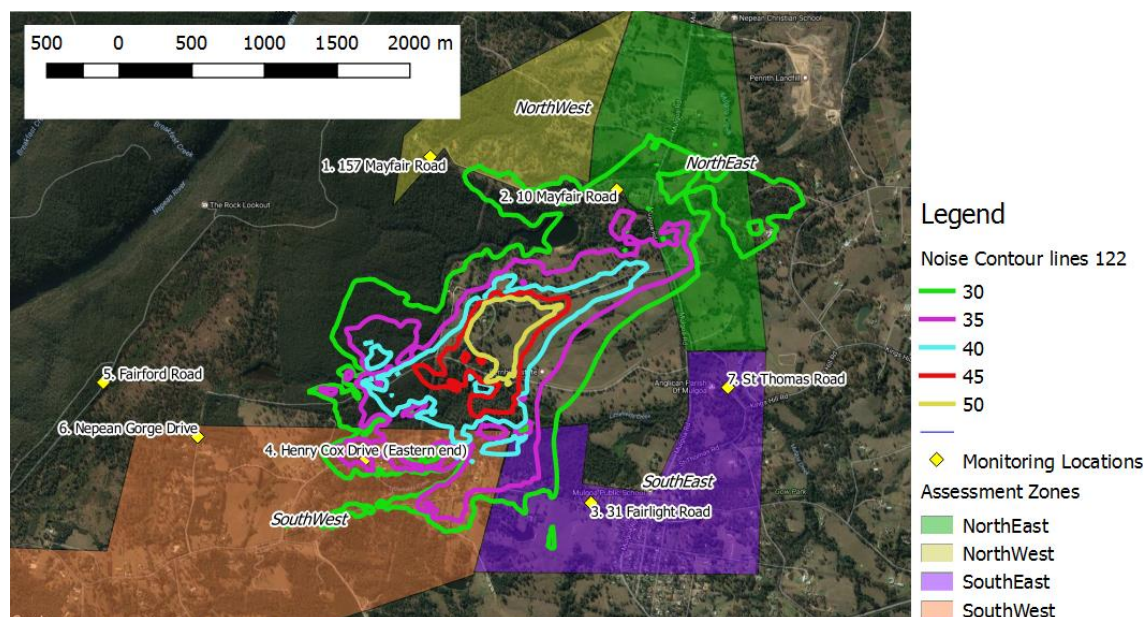
The Concert will include amplified music. The stage and speakers will be oriented to the north west. Noise modelling of the site has been undertaken to predict noise levels at surrounding residences. The modelling was done using CadnaA noise modelling software which takes into account the noise source, propagation over terrain, shielding by hills and objects, and meteorological influences.

Based on typical large events, it was assumed that the sound power level of the sound system would be L_{Aeq} 125 dBA. With main speakers at the stage, and some smaller speakers distributed through the audience area, this would allow a sound level of 80 to 90dBA in the audience area.

The predicted noise contours are shown in Figure 5-4. Under the assumptions stated the noise is predicted to comply with the noise limits for evening at all locations.

Previous noise monitoring for during rock music concert after the Picnic Race Day showed compliance with the limits and give confidence that the noise predictions are conservative.

Figure 5-4 Predicted Noise Levels



5.3 Procedures

The Concert will have a nominated Event Manager.

- The Event Manager and Security staff will be made-aware of the Noise Management Plan for the venue.
- The Event Manager and Security Staff should be made aware that noise nuisance can be due to vehicle movements, crowd movements or the PA system.
- Neighbours within 500m of Fernhill Estate should be notified of event occurrence by letterbox drop. This requirement may be changed to include more or fewer residents based on the noise disturbance recorded during events. The notification should include the contact number for noise complaints.
- Large events require noise monitoring at the locations specified in this plan. Monitoring is required by Council Condition 2.47.
- The noise complaint number will be monitored by the Event Manager responsible for the function. In accordance with Council Condition 2.49 the Event Manager *if so required by an authorised officer, the acoustic consultant or the NSW Police Force, must have the authority to order the reduction of noise level produced.*
- The Event Manager will be authorised to take the appropriate action if there is a noise complaint.
- An Event Acoustic Report is to be submitted to Penrith City Council within 28 days of the event in accordance with Council Condition 2.47.

- Notification of the event will be done according to Council Condition 2.35 *One (1) week prior to the any functions being held on the site, details of the noise complaint hotline (including landline and mobile phone), the dates and times of the events are to be distributed to residents within 1km of the property boundaries of the site. Details of the function to be held on the site are also to be displayed within the Mulgoa Progress Association Notice Board, located within the Mulgoa Village Shopping Centre.*
- Where possible, orient loud speakers so that noise projection is away from residential areas.

6 NOISE MONITORING PROCEDURES

On-site noise monitoring may be undertaken during large events. See requirements for Regular, Medium and Large events. Noise monitoring and reporting shall be undertaken in compliance with the following proposed regimen.

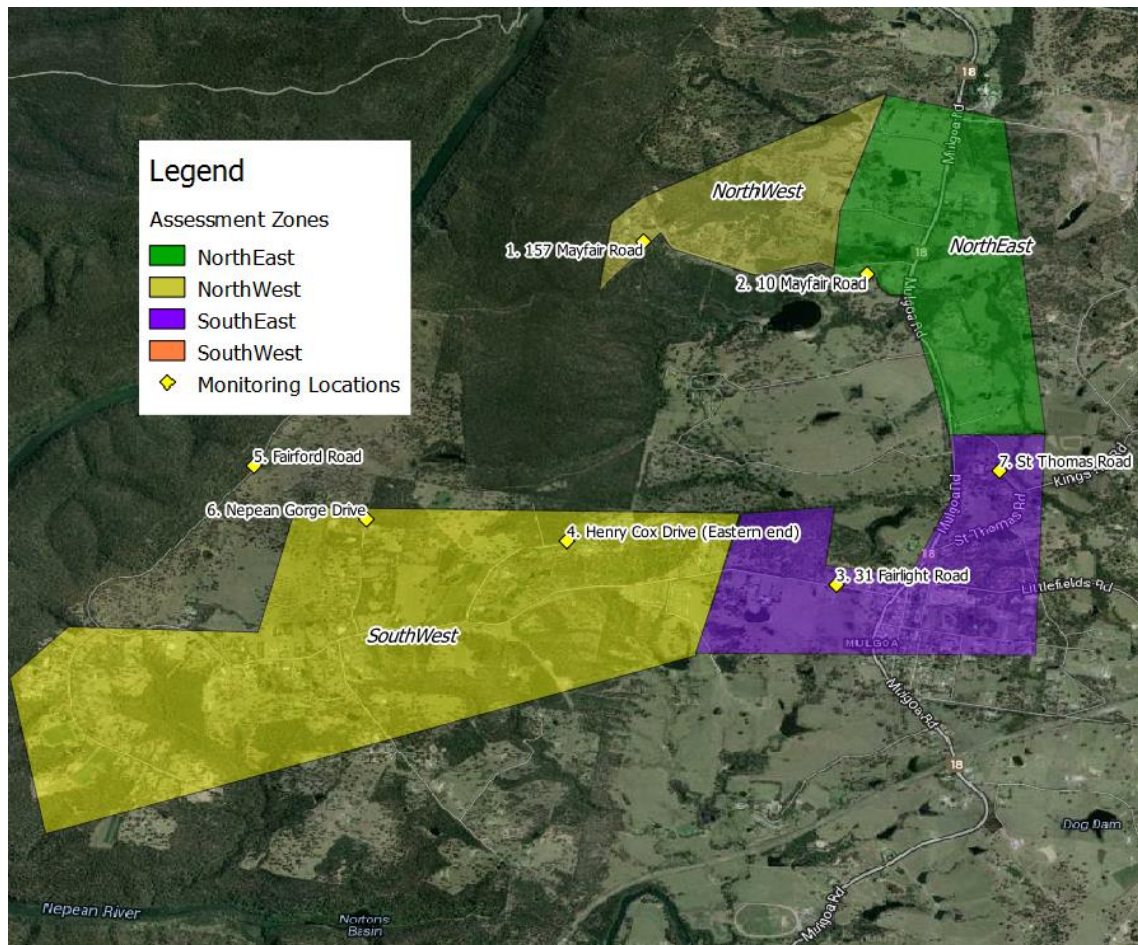
6.1 Monitoring Locations

The compliance monitoring shall be undertaken at the following locations if relevant (Location 5 and 6 are only relevant if sporting activities occur in the Western Precinct. Location 5 is only relevant if dwellings have been built in the Western Precinct).

1. 157 Mayfair Road;
2. 10 Mayfair Road;
3. 31 Fairlight Road;
4. Henry Cox Drive (Eastern End)
5. ~~Fairford Road~~ (not required for this event);
6. ~~Nepean Gorge Drive~~ (not required for this event);
7. St Thomas Road.

These locations are identified in Figure 6-1. The assessment zone of the monitoring location determines the noise criteria from Table 4-1.

Figure 6-1 Monitoring Locations



6.2 Noise Limits

All event noise including (but not limited to) PA systems and music from performances shall not exceed the $L_{Aeq,15min}$ noise limits set out in Section 4.2.

6.3 Noise Monitoring Protocol

For events where monitoring is required, monitoring will be done by a suitably qualified and experienced acoustic consultant who shall work in liaison with the event manager and sound engineer(s). If noise levels approach within 5 dB of the zone limits, the acoustic consultant will immediately inform the event sound engineer and event organiser (or nominated individual reporting to the event organiser) to make them aware of the situation.

Noise monitoring should take into account noise emission from vehicle movements, crowd movements and the PA system. In the event of any exceedance of the zone noise limits, the acoustic consultant will immediately inform the event sound engineer and event organiser (or nominated individual reporting to the event organiser). In this instance the sound engineer will be required to immediately reduce sound levels (with consideration to overall and octave band levels, as advised by the acoustic consultant). The acoustic consultant would then perform further measurements to demonstrate on-going compliance.

Further to this, the community hotline will be responding to any noise complaints and adjustments made accordingly on the night.

6.4 Monitoring Frequency

Monitoring will be done as required by Council or as a result of a complaint.

6.5 Personnel

Measurements should be undertaken by a suitably qualified and experienced acoustic consultant.

6.6 Equipment

Sound measuring equipment for attended measurement should conform to Australian Standard 1259 *Acoustics – Sound Level Meters* as a Type 1.

Sound measuring equipment for long-term measurement should conform to Australian Standard 1259 *Acoustics – Sound Level Meters* as a Type 2 or Type 1.

The sound level must incorporate an octave band filter capable of recording noise levels in octave bands from 31.5Hz to 8Hz.

6.7 Procedures

Measurement should be undertaken in accordance with the procedures of Australian Standard 1055 – *Acoustics-Description and Measurement of Environmental Noise*. In particular,;

- Measurements should be A-weighted and the time weighting of equipment set to “Fast”; and
- Equipment should be calibrated in the field before and after measurement.

6.8 Records

As a minimum the following will be recorded and incorporated into a Compliance Summary Report, which shall be submitted to Penrith City Council within 28 days of the event:

- Pre and post calibration status of the sound level meter(s);
- Prevailing meteorological conditions during measurements;
- Measurement period;
- L_{Amax} , L_{A1} , L_{A10} , L_{A90} and L_{Aeq} levels over the measurement period;
- Additionally the L_{A10} octave band levels should be recorded;
- Statement of compliance and any non-compliances; and
- Qualitative assessment of the noise environment – The principal noise sources influencing the measured noise levels should be noted and the dominant noise source(s) identified. Where the contribution from event noise sources is not accurately determinable due to the influence of other extraneous sources, the event noise level should be estimated.

7 NON-COMPLIANCE

Non-compliant noise levels may be determined by noise monitoring or as a result of a complaint. Table 7-1 outlines actions to be taken for non-compliances.

Table 7-1 Mitigation Measures

Non-Compliance	Action	Responsibility
	Consider appropriate mitigation measures:	
Exceedance of noise limits determined from noise monitoring	<ul style="list-style-type: none"> Where event PA or music levels exceed the identified noise limit(s), these levels will be reduced to within the relevant limit(s) immediately. Compliance to be confirmed by further noise measurements at the identified monitoring sites. Patron noise to be managed by on site event staff as appropriate. Details of all exceedances to be noted in Compliance Summary Report, submitted to Penrith City Council. 	Event Organiser or nominated individual reporting to Event Organiser
Noise complaint	<ul style="list-style-type: none"> Investigate and if substantiated consider appropriate mitigation measures, such as further noise monitoring. Event Organiser or nominated individual should respond back to complainant within 2 hour of complaint. Details of all complaints to be noted in Compliance Summary Report, submitted to Penrith City Council. 	Event Organiser or nominated individual reporting to Event Organiser
Operation outside allowed hours (determined from complaint or operational procedure)	<ul style="list-style-type: none"> Investigate and report details in Compliance Summary Report, submitted to Penrith City Council. 	Event Organiser or nominated individual reporting to Event Organiser

8 NOTIFICATION

Notification of the event will be done according to Council Condition 2.35 *One (1) week prior to the any functions being held on the site, details of the noise complaint hotline (including landline and mobile phone), the dates and times of the events are to be distributed to residents within 1km of the property boundaries of the site. Details of the function to be held on the site are also to be displayed within the Mulgoa Progress Association Notice Board, located within the Mulgoa Village Shopping Centre.*

The notice shall include the following:

- date and nature of the event;
- the hours of operation for the event and expected numbers;
- proposed outdoor activities; and
- the name and contact number for the event organiser (or nominated responsible representative for any complaints). The representative must be on site for the entire event.

9 COMPLAINTS HANDLING

Noise complaints will be managed through a 24-hour complaints hotline to be operated by the event organiser. The hotline telephone number shall be included on the notification to residents and on the event website.

Records of all received noise complaints shall be recorded and included in the Compliance Summary Report, submitted to Penrith City Council.

All complaints shall be investigated immediately and where validated by subjective assessment and/or by noise measurement action should be taken to reduce noise levels as appropriate. A response shall be provided to all complainants within 2 hours of the complaint.