



Air Noise Environment
Environmental Monitoring and Assessment

Noise Management Plan for Small, Medium and Large Trial Events

North Byron Parklands

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The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Air Noise Environment Pty Ltd for the purposes of this project is both complete and accurate.



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1 Introduction

1.1 Overview

Air Noise Environment Pty Ltd were commissioned by North Byron Parklands (Parklands) to prepare a revised Noise Management Plan (NMP) for small, medium and large events held at North Byron Parklands¹. This revised The NMP incorporates changes in response to the modification of the conditions of approval for the venue as provided in modification MP09_0028 MOD 3 dated 22 April 2016.

The NMP is intended to provide the framework through which noise from small, medium and large events held at Parklands will be managed to achieve compliance with the requirements of the modified Conditions of Approval issued by the Planning Assessment Commission (PAC).

The Noise Management Plan applies to all concerts and other outdoor events with sound amplification equipment held at the North Byron Parklands.

1.2 About this NMP

This NMP has been developed in accordance with the requirements of Condition C16 of the 22 April 2016 PAC approval. Specifically, Condition 16 requires:

'C16 Noise Management Plan

A Noise Management Plan (NMP) outlining measures to manage and minimise potential noise impacts of events is to be prepared by a suitably qualified acoustic consultant. The NMP is to be prepared in consultation with Council and the RWG, and submitted to the Secretary for approval at least 60 days prior to any event where amplified music is a feature. The NMP is to be prepared having regard to the noise limits specified in Condition B3, the proponent's Environmental Health and Safety Management Manual; and, OEH's Noise Guide for Local Government 2010 and is to include, but not be limited to:

- (a) identification of all major sources of noise emitted during the carrying out of an event;*
- (b) identification of the zones and limits of the nearest sensitive receivers and the adjoining Billinudgel Nature Reserve;*
- (c) identification of noise limits within the site, including camping areas between midnight and 8:00 am to support peaceful rest during events;*
- (d) identification and implementation of best practice management techniques for the minimisation of noise from the site. For example, appropriate siting and orientation of performance stages and speakers, acoustic barriers, insulation/double glazing of sensitive receivers, etc.;*

¹ Air Noise Environment Pty Ltd (July 2014) 'North Byron Parklands - Noise Management Plan' prepared on behalf of North Byron Parklands.





(e) procedures and limits for carrying out sound checks prior to and during events and rehearsals to ensure compliance with the relevant noise criteria, and measures to be undertaken if any non-compliance is detected;

(f) requirements for sound engineers at each stage and their ability to enact noise mitigation measures;

(g) community consultation requirements;

(h) procedures for responding to any noise complaints received during an event. As much as is reasonable and feasible, the proponent must arrange for noise levels emanating the site to be monitored at the location of any complaints as soon as possible after a complaint has been received; and,

(i) measures to address and respond to the outcomes of a Performance report required under Condition B7, including updating plans for subsequent events.

Note: A NMP may cover or be submitted in support of more than one event, subject to it providing sufficient detail of each event.

The overall purpose of the NMP is to minimise noise, having regard to the limits provided in the PAC modified conditions of approval, and thereby minimise disturbance of residents and other noise sensitive receivers from events with sound amplification held at the Parklands venue.





2 Definitions

Accredited Acoustical Consultant means an acoustical consultant who is a member of one or more of the following organisations: The Association of Australian Acoustical Consultants; The Australian Acoustical Society; or the Institution of Engineers Australia.

Acoustic Consultant is an experienced acoustical consultant with responsibility for completing attended noise measurements during the event, and for setting up the unattended noise monitoring positions prior to the event.

Acoustic Manager: a Senior Acoustical Consultant with the responsibility for co-ordinating monitoring activity during the event, monitoring live stage noise levels, and communication and liaison with the Production Team and Parklands Management in relation to event noise management.

Community Hotline is the response centre provided by Parklands to respond to telephone and email communications from the community during the event.

dB(A) is a measure of the overall noise level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

dB(lin) is a measure of the overall noise level of sound across the audible spectrum with a linear frequency weighting (i.e. 'lin' weighting).

Ecological Sensitive Receptors means the three locations within the Billinudgel Nature Reserve as defined under the EPBC approval 2012/6475 dated 22 October 2012.

Event means an outdoor event whose primary purpose is entertainment involving continuous amplified musical performance taking place within the approved hours of operation.

Event Noise means noise from amplified entertainment noise measured as $L_{Aeq,10\text{-minutes}}$.

Event Stage Manager means the person at the sound mixing console (or sound desk), who is in control of the volume of noise emanating from the speakers installed at an event;

L_{Aeq} is the equivalent steady sound level in dB(A) containing the same acoustic energy as the actual fluctuating sound level over the given period. Noise levels often fluctuate over a wide range with time (as is often the case for concert noise). The L_{Aeq} is the equivalent continuous sound which would contain the same sound energy as the time varying sound. Many studies show that human reaction to level-varying sounds tends to relate closer to the L_{Aeq} noise level than any other descriptor.

$L_{eq,oct(63Hz)}$ is the equivalent steady sound level in dB(lin) in the 63Hz 1/1 octave band containing the same acoustic energy as the actual fluctuating sound level over the given period.

Noise Control Co-ordination Centre (NCCC) is the noise monitoring and management centre, staffed by experienced professional acoustic personnel, during the event.

Sensitive Receiver means a residence, education institution, health care and/or religious facility.

Sound Check means a sound check for a concert that is carried on outdoors where sound amplification equipment is used as part of the sound check.





Stages means a stage with a performance floor space greater than 100 square metres.

Venue means North Byron Parklands.





3 Major Sources of Noise

3.1 This Section

This section responds to the requirements of Condition C16 (a) of the Modified Conditions of Approval as provided below:

(a) identification of all major sources of noise emitted during the carrying out of an event;

3.2 Location and Uses

Parklands is located in an area characterised by predominantly rural uses. To the east and south-east of the site is the Billinudgel Nature Reserve, an area of ecological significance.

Events held at Parklands during the trial period are to 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 11 am and midnight (excluding New Year's Eve where event stages may operate until 1 am) with quieter music (secondary music sources) operating at other times.

3.3 Noise Sources

Key noise sources at events held at Parklands include sound amplification equipment, power generation equipment, lighting equipment and event patrons. For event stages key noise sources are likely to include front of house speaker arrays, stage monitors and crowd noise. Of these, noise from the sound amplification equipment (front of house speaker arrays and stage monitors) are likely to be the most significant in terms of noise emissions.

Other sources of noise include music amplification equipment and crowd noise at bars, cafes and food hall areas. Key noise sources at these areas are likely to be similar to those for the event stages however noise emissions are typically significantly lower than those of the event stages.

Other ancillary noise sources involved with events at Parklands include noise from camping areas and traffic noise.





4 Noise Limits

4.1 This Section

This section responds to the requirements of Condition C16 (b) of the Modified Conditions of Approval as provided below:

(b) identification of the zones and limits of the nearest sensitive receivers and the adjoining Billinudgel Nature Reserve;

4.2 Sensitive Receivers

4.2.1 Noise Limits

Noise limits for sensitive receivers in the area surrounding Parklands are provided in Condition B3 of the modified PAC Approval as follows:

- For Zone 1 (as shown in Schedule 4 of the approval and Figure 4.1):
 - i. between 11am and midnight amplified entertainment noise from the event at sensitive receivers must not exceed 60dB(A) $L_{Aeq,10\text{-minutes}}$ AND 70dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band; and
 - ii. between midnight and 2am, amplified entertainment noise from the event at sensitive receivers must not exceed 45dB(A) $L_{Aeq,10\text{-minutes}}$ AND 60dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band.
- For Zone 2 (as shown in Schedule 4 of the approval and Figure 4.1):
 - i. between 11am and midnight amplified entertainment noise from the event at sensitive receivers must not exceed 55dB(A) $L_{Aeq,10\text{-minutes}}$ AND 65dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band; and
 - ii. between midnight and 2am, amplified entertainment noise from the event at sensitive receivers must not exceed 45dB(A) $L_{Aeq,10\text{-minutes}}$ AND 55dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band.

4.2.2 Residential Uses

Table 4.1 and Figure 4.1 (below) identify the nearest sensitive receptors in the area surrounding Parklands.

For the purposes of this NMP, all events held at Parklands must comply with the event noise limits at all sensitive receptors identified in Table 4.1 below. It should be noted that event specific Acoustic Monitoring Programs (AMP) will include identification of those receptors likely to be most significantly impacted by noise from the event. Hence the AMP may, based on an assessment of potential impacts, define a subset of the receptors identified in Table 4.1 for routine noise monitoring during sound checks and events in accordance with the requirements of the modified condition of approval C17.





Table 4.1: Nearest Noise Sensitive Receptor Locations

Receptor ID ^{1.}	Address	Zone	Noise Limit 11pm - Midnight		Noise Limit Midnight - 2am	
			dB(A)	dB (63Hz)	dB(A)	dB (63Hz)
R1	26 Billinudgel Road, Billinudgel	1	60	70	45	60
R2	25 Yelgun Road, Yelgun	1	60	70	45	60
R3	84 Yelgun Road, Yelgun	2	55	65	45	55
R4	44 Yelgun Road, Yelgun	1	60	70	45	60
R5	14 Jones Road, Wooyung	1	60	70	45	60
R6	Pacific Highway, Yelgun	2	55	65	45	55
R7	Tweed Valley Way, Wooyung	1	60	70	45	60
R8	72 Wooyung Road, Crabbes Creek	1	60	70	45	60
R9	144 Wooyung Road, Wooyung	1	60	70	45	60
R10	204 Wooyung Road, Wooyung	1	60	70	45	60
R11	214 Wooyung Road, Wooyung	1	60	70	45	60
R12	237 Jones Road, Wooyung	1	60	70	45	60
R13	251 Jones Road, Wooyung	1	60	70	45	60
R14	38 Mia Court, Ocean Shores	2	55	65	45	55
R15	26 Flinders Way, Ocean Shores	2	55	65	45	55
R16	111 Balemo Drive, Ocean Shores	2	55	65	45	55
R17	Pacific Highway, Wooyung	1	60	70	45	60
R18	Pacific Highway, Wooyung	1	60	70	45	60
R19	7 Yelgun Road, Yelgun	1	60	70	45	60
R20	242 Middle Pocker Road, Middle Pocket	2	55	65	45	55
R21	749 The Pocket Road, The Pocket	2	55	65	45	55
R22	56 Pimble Valley Road, Crabbes Creek	2	55	65	45	55
R23	60 Bluegum Court, Crabbes Creek	2	55	65	45	55
R24	44 Hulls Road, Crabbes Creek	2	55	65	45	55
R25	210 Wooyung Road, Wooyung	1	60	70	45	60





Receptor ID ^{1.}	Address	Zone	Noise Limit 11pm - Midnight		Noise Limit Midnight - 2am	
			dB(A)	dB (63Hz)	dB(A)	dB (63Hz)
R26	412 Wooyung Road, Wooyung	2	55	65	45	55
R27	93 Yelgun Road, Yelgun	2	55	65	45	55
R28	108 Yelgun Road, Yelgun	2	55	65	45	55
R29	175 The Pocket Road, Billinudgel	2	55	65	45	55
R30	39 Hardy Avenue, Ocean Shores	2	55	65	45	55
R31	101 The Tunnel Road, Billinudgel	2	55	65	45	55

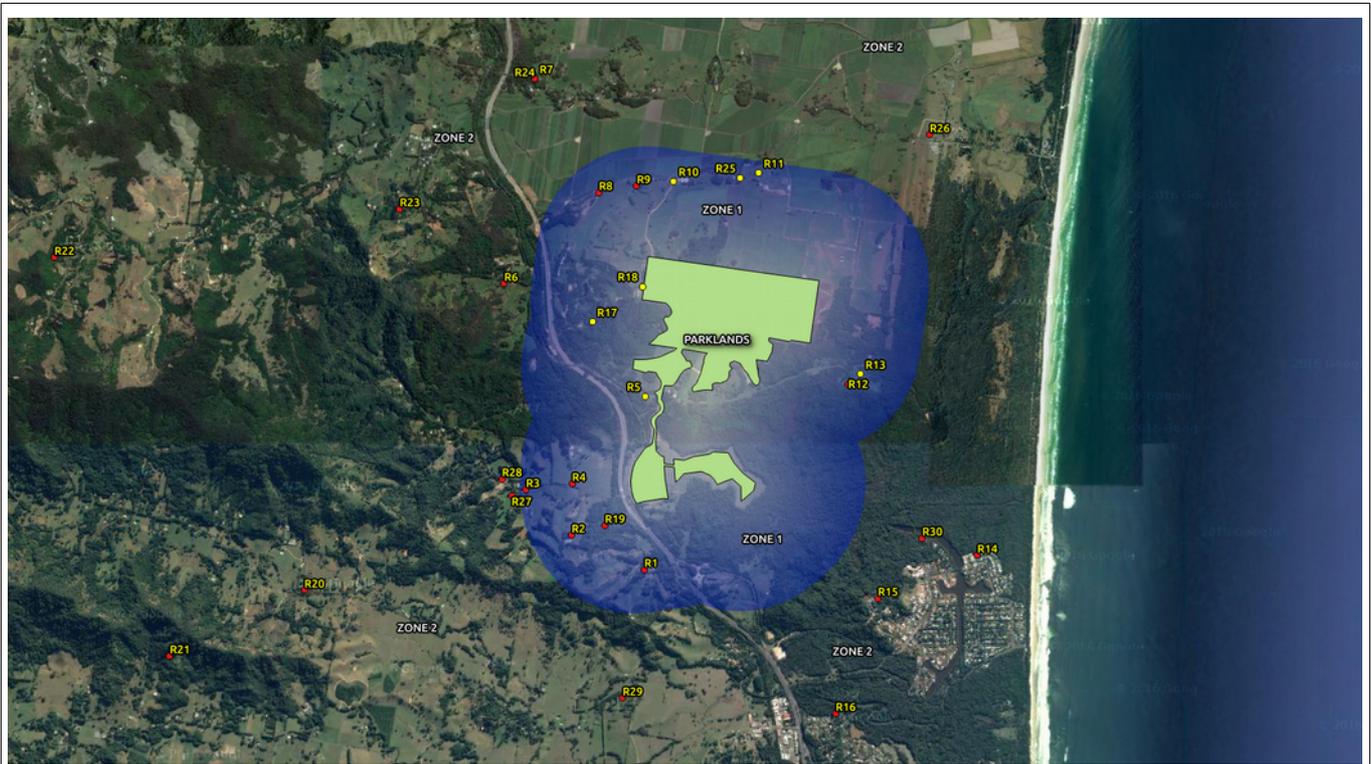


Figure 4.1: Site location and Receptor Locations

4.3 Sensitive Ecological Areas

The noise limits for the Billinudgel Nature Reserve are 65 dB(A) in accordance with the EPBC approval 2012/6475 dated 22 October 2012.





5 On-Site Noise Limits

5.1 This Section

This section responds to the requirements of Condition C16 (c) of the Modified Conditions of Approval as provided below:

(c) identification of noise limits within the site, including camping areas between midnight and 8:00 am to support peaceful rest during events;

5.2 Specific Requirements

Noise levels in the camping area between midnight and 8:00 am of each event day shall support peaceful rest for overnight patrons during events. To achieve this, a noise goal in camping areas of 55 dB(A) L_{Amax} not to be exceeded more than 10-15 times per night will be applied.





6 Best Practice Noise Management

6.1 This Section

This section responds to the requirements of Condition C16 (d) of the Modified Conditions of Approval as provided below:

(d) identification and implementation of best practice management techniques for the minimisation of noise from the site. For example, appropriate siting and orientation of performance stages and speakers, acoustic barriers, insulation/double glazing of sensitive receivers, etc.;

6.2 Introduction

In accordance with part (d) of modified condition C16, events held at Parklands will adopt best practice acoustic management techniques to achieve compliance with the noise limits and minimise the potential for adverse acoustic amenity in the surrounding community. To achieve this, events will incorporate a range of design and management measures.

Specific controls incorporated into the design of events held at Parklands are to be investigated during development of the stage layout and design of event PA systems. The investigations undertaken are to incorporate modification of the event design to optimise acoustic benefits for off-site receptors.

The following sections provide an overview of the design and management measures to be considered by events. It should be noted that the design measures discussed below are not intended to be exhaustive and would require review and assessment for each event held at Parklands to ensure they remain relevant and appropriate.

6.3 Design Measures

For events held at Parklands, best practice acoustic management techniques to be considered as part of the event planning process may include:

- where possible, public address speakers, event stages and speakers shall generally be directed away from sensitive receivers;
- where possible, speaker directivity shall be considered during design and selection of arrays to minimise spillage of noise beyond venue area;
- where possible, amplified noise is to be directed away from the Billinudgel Nature Reserve;
- where speakers are mounted on poles or otherwise elevated above ground, they are generally to be inclined downwards from the horizontal or otherwise designed to reduce noise spillage to the





surrounding environment;

- event stages and speakers shall be positioned to utilise any noise attenuation to sensitive receivers provided by the natural topography of the site and surrounding area;
- use fixed or portable barriers (e.g. shipping containers, hay bales) to construct acoustic barriers where necessary to limit noise emissions from event activities (e.g. behind stages);
- if available, use double tent wall sheets to contain noise emissions;
- where space and logistics allow, place trucks between and trailers behind stages to act as an acoustic barrier;
- work with stage and production staff to install optimised sub-arrays and optimised speaker arrays;
- if suitable, employ delay tower speaker systems;
- undertake an audit of all on-site mitigation measures by a suitably qualified acoustic engineer.

Details of specific acoustic management techniques incorporated to reduce noise emissions from events (including speaker directivity and setup, stage placement acoustic barriers) are to be provided in the event acoustic monitoring program for each individual event.

Prior to commencement of the event, the implementation of on-site noise management measures outlined in the event's AMP shall be audited and signed off by an accredited acoustic consultant. Any further modifications to the noise attenuation measures are identified by the noise consultants prior to the event are to be implemented subject to consultation with event organisers as necessary to ensure that the implications for the security and safety (of event staff, performers and patrons), emergency personnel access, fire and traffic have been effectively considered.

6.4 Operational Controls

In addition to implementation of design controls, a Noise Control Co-ordination Centre (NCCC) will be operated at the venue office located at Jones Road. The objectives of the NCCC are to provide:

- continuous monitoring of live noise levels from the main stages to allow pro-active management of noise levels and provision of rapid communication to Parkland Management and SITG Event Managers where noise level adjustments were considered appropriate; and
- a closer interaction with Parklands Management and Splendour in the Grass Event Managers and the personnel responding to calls made to the Community Hotline.

The following resources will be installed at the NCCC:

- live noise feed (instantaneous noise levels) from sound level meters installed at the main stages;
- 1 minute L_{Aeq} noise feed from a separate 10EaZy monitoring system installed by the production team for the main stages;
- access to the log of community hotline calls requesting noise monitoring, as well as other event





related data; and

- web access to Bureau of Meteorology monitoring data.

Throughout the event, the Acoustic Manager will review stage noise levels to confirm that the measured noise levels are within the pre-agreed target noise levels for the event. Where the Acoustic Manager identifies that noise levels are approaching, or exceeding target noise levels based on the observed instantaneous noise levels, the event production team will be notified and, if considered necessary, the Acoustic Manager will request a specific reduction in noise levels.

In determining whether a request to reduce stage noise levels is appropriate, the Acoustic Manager will consider the following key factors:

- noise levels currently occurring from each of the stages, particularly whether noise levels from an individual stage or more than one stage were approaching pre-agreed target noise limits;
- prevailing weather conditions, and whether the current wind direction has potential to propagate noise toward key groups of receptors;
- measured community noise levels, as reported by noise monitoring personnel; and
- type of performance occurring on each stage, and the expected duration of each performance;
- information provided by the Community Hotline relating to calls received from the community.

6.5 Responding to Adverse Meteorology

Under specific adverse meteorological conditions, enhanced propagation of noise from the venue may arise. To address this issue, live weather data will be monitored at the NCCC. When changes in meteorological conditions arise that have the potential to adversely affect sound propagation, the event production team will be notified.

In addition, at the commencement of each day of the event the weather forecast for the day will be reviewed by the Acoustic Manager. A short briefing will be forwarded via email to the production team and acoustic monitoring personnel. The email will summarise the following information:

- expected weather conditions for the day, for morning, evening and night;
- the receptor groups most likely to be affected for each period, hence the locations to be the focus of attended compliance monitoring;
- any potentially adverse conditions that are expected to result in enhanced sound propagation;
- recommended changes in stage sound levels that are expected to be applicable where adverse meteorological conditions are anticipated.





7 Sound Checks and Compliance

7.1 This Section

This section responds to the requirements of Condition C16 (e) of the Modified Conditions of Approval as provided below:

(e) procedures and limits for carrying out sound checks prior to and during events and rehearsals to ensure compliance with the relevant noise criteria, and measures to be undertaken if any non-compliance is detected;

7.2 Times of Events

In accordance with Condition B3 of the PAC approval, the following time restrictions apply to events held at Parklands:

- stages may operate from 11 am to midnight excluding New Year's Eve where stages may operate until 1 am;
- amplified music from bars, cafes and the dance floor can operate from 11 am to 2 am
- amplified music from bars, cafes and the dance floor must cease at 2 am.

7.3 Sound Checks and Rehearsals

For each event, attended noise monitoring will be undertaken during rehearsals and/or sound checks. During the attended monitoring, information collected shall be used to inform the event stage manager and sound engineers of the acceptable mixing desk source noise levels for each stage. That is, residential noise monitoring during the day will be used to quantify the internal volume settings (event noise level) so that all parties, acoustic engineers outside and audio engineers inside, are equipped with data prior to the main concert.

Where such rehearsals and sound checks are not proposed, a mandatory minimum 1-hour sound check will be imposed to test the system as described above.

Data that will be recorded and reported for pre-event noise monitoring includes $L_{Aeq,10\text{-minutes}}$ and $L_{eq,10\text{-minutes}}$ in the 63Hz 1/1 octave band noise levels at both sensitive receptors and the mixing desks.

7.4 Non-Compliance Measures

Where non-compliances are detected during the sound checks, event noise management techniques will be investigated and implemented where appropriate. Specific controls which are to be considered include:





- reduction of allowable pre-determined event stage noise levels;
- reduction of allowable stage noise levels in specific frequencies (e.g. to limit the impacts of low frequency noise on receptors); or
- changes to the amplification equipment to allow reduction of noise emissions from specific speakers or groups of speakers.





8 Requirements for Sound Engineers

8.1 This Section

This section responds to the requirements of Condition C16 (f) of the Modified Conditions of Approval as provided below:

(f) requirements for sound engineers at each stage and their ability to enact noise mitigation measures;

8.2 Specific Requirements

At all times North Byron Parklands will maintain the right to enforce the noise guidelines set out for the venue and thus may exercise their right to cease operations of a stage/entertainment area in the event where noise levels are not complying with the recommended noise limits due to the contributing stage/entertainment area and appropriate actions having not been carried out.

At all times throughout the event, an event stage manager shall be onsite and in direct contact with the acoustic consultant in case the noise level is required to be reduced. Event stage managers shall be authorised to override mixing desks if sound exceeds the noise limits (including removal of power if the music act's own sound engineer refuses to comply with direction from stage management).

The event stage manager if, directed by an authorised officer, the manager onsite, the acoustic consultant or the NSW Police Force, must have the authority to order the reduction of noise level, and shall comply with any such directions.

Controls implemented by event stage managers could include:

- reduction of overall stage noise levels;
- reduction of stage noise levels in specific frequencies (e.g. to limit the impacts of low frequency noise on receptors); or
- changes to the amplification equipment to allow reduction of noise emissions from specific speakers or groups of speakers.





9 Community Consultation

9.1 This Section

This section responds to the requirements of Condition C16 (g) of the Modified Conditions of Approval as provided below:

(g) community consultation requirements;

9.2 Notification

Prior to the commencement of any event, the proponent must notify the community via:

- i. publishing details of the Community Hotline on the Parklands website; and
- ii. a notice published in at least two (2) local newspapers a minimum of two (2) weeks prior to the event outlining traffic management arrangements and how complaints can be made through the methods outlined in Section 10.3 of the NMP.

9.3 Consultation

In 2013 a Regulatory Working Group (RWG) was formed to provide guidance to the project. The group comprises numerous agencies including Police, Roads and Maritime Services, National Parks and Wildlife, State Emergency Services, Office of Environment and Heritage, Rural Fire Service, Byron Shire Council, between three and five Community Representatives and representatives from North Byron Parklands.

The RWG meets to review the Parkland's performance with respect to environmental management and community relations for events held during a reporting period and where appropriate, make recommendations to the Director General on measures or strategies to improve performance for future trial events.

Consultation with community members and government and emergency services agencies (including Police, Roads and Maritime Services, National Parks and Wildlife, State Emergency Services, Office of Environment and Heritage, Rural Fire Service, Byron Shire Council) will be undertaken through the following:

- notification of future events in accordance with Section 9.2 of this NMP;
- meetings of the RWG; and
- engagement of a Community Manager by events who will consult with the local community commencing four (4) weeks prior to, during and 2 weeks after the event.

Further consultation with state and local agencies will be undertaken through face-to-face meetings





with each agency and phone contact as required.

9.4 Educational Material

For future events held at Parklands, specific educational material is to be developed and updated on the Parklands web site based on the expected meteorological conditions. The educational material is to include an overview of the sources of noise likely at the event, measurement and quantification of noise, the differences between A-weighted and C-weighted noise and the influences of meteorology on noise propagation.





10 Responding to Noise Complaints

10.1 This Section

This section responds to the requirements of Condition C16 (h) of the Modified Conditions of Approval as provided below:

(h) procedures for responding to any noise complaints received during an event. As much as is reasonable and feasible, the proponent must arrange for noise levels emanating the site to be monitored at the location of any complaints as soon as possible after a complaint has been received;

10.2 Introduction

This section provides the procedure to be applied by North Byron Parklands to record and respond to complaints received relating to events at Parklands.

Recording and responding to complaints received during events held at Parklands is the responsibility of North Byron Parklands. It is noted however that these responsibilities may be delegated to event management staff through the event Acoustic Monitoring Plan (AMP) providing the requirements of this procedure are complied with in full.

10.3 Community Hotline

A Community Hotline, postal address and email address shall be established for each event held at Parklands. Contact details for each of these shall be made available on Parklands' website for the duration of the trial. In addition, the telephone number, postal address and email address shall be advertised in at least two (2) newspapers circulating in the locality on at least one occasion prior to the commencement of each event.

A member of event staff shall be available throughout the event and responsible for managing and recording all calls and emails received.

It is important that the event staff member responsible for managing calls to the hotline is provided sufficient resources to effectively respond including:

- access to noise monitoring personnel; and
- access to site security and Police representatives responsible for event security.

10.4 Communication Record

All communication made with Parklands via the Community Hotline shall be recorded on a standard





template document, including contact made via telephone, email or in writing.

Information recorded for each communication shall include as a minimum:

- date and time;
- the method (e.g. phone, email or mail) through which the call or correspondence was received;
- contact details for the individual contacting the the Community Hotline including phone number, postal and email address if provided;
- location of the individual contacting the Community Hotline, noting that where the contact chooses not to give their exact address, a general indicative street location shall be recorded;
- event to which the communication relates;
- nature of the issue (e.g. noise, traffic etc.);
- any action undertaken in response to the communication including any follow-up contact made;
- the reply/response given; and
- if no action was taken in relation to the communication, the reason(s) why no action was taken.

10.5 Community Hotline Response Procedure

Where an individual contacts the Community Hotline via telephone or email, and believes that noise from the event is adversely impacting their acoustic amenity, Community Hotline staff will ask the following questions to determine what actions (if any) are required:

Q1. Can the Caller describe the noise being experienced (i.e. is the noise amplified music? Can the noise be heard inside the dwelling? If so, what are its characteristics (bass, vocals?), have noise levels increased recently?). The Community Hotline staff shall then check with the Acoustic Manager to determine if noise monitoring has recently been undertaken in the caller's area. If so, details of the noise levels measured will be discussed with the caller.

After discussing the above matters, does the Caller require noise monitoring to determine amplified entertainment noise levels at their property?

Yes: Go to Q2; or

No: Record details of the call (including caller information) in the Community Hotline Register.

Q2. Is the property located in a rural area (i.e. lot size > 1,000m²)?

Yes: Go to Q3;

No: The Acoustic Manager will issue the monitoring request to an Acoustic Consultant who will, as soon as practicable, undertaken noise monitoring at the boundary of the property, on public land.





Q3. If the property is located in a rural area (i.e. lot size > 1,000m²) does the caller require monitoring at the property boundary?

Yes: The Acoustic Manager will issue the monitoring request to an Acoustic Consultant who will, as soon as practicable, undertake noise monitoring at the boundary of the property, on public land;

No: If the monitoring is requested in proximity to the house, the caller must provide their name, full address and telephone contact number (landline and mobile). The caller must be available to meet with the Acoustic Engineer and provide safe access to the property for the purposes of completing the monitoring. The Acoustic Consultant will drive into the property and park as close to the house as possible. The Acoustic Engineer will knock on the door of the house, confirm the identity of the person that requested the monitoring and undertake noise monitoring within 30m of the home subject to the Acoustic Engineer confirming the monitoring location as safe and appropriate. If safety issues are a concern, the Acoustic Engineer will complete the monitoring adjacent to the entrance to the property.

Following receipt of the monitoring request by the Acoustic Manager, the Acoustic Consultant will (as soon as practicable):

1. Undertake attended monitoring of amplified entertainment noise levels during periods of amplified entertainment (i.e. not during breaks between acts on the main stages), noting any extraneous noise sources impacting on the monitoring location.
2. Where the measured amplified entertainment noise level exceeds the set noise criteria during the initial ten-minute noise monitoring sample, the Acoustic Consultant shall contact the Acoustic Manager as soon as practicable and request appropriate adjustments to frequency and/or decibel levels as deemed necessary to bring noise levels to within the set noise criteria.
3. Once the Acoustic Manager has confirmed the requested adjustments have been made, and no later than 20 minutes after the initial 10-minute noise measurement, the Acoustic Consultant shall conduct a further ten-minute noise monitoring sample to determine compliance (or otherwise) with the set noise criteria. If this second sample exceeds the set noise criteria then the reading shall be treated as a non-conformance and recorded as such in the Community Hotline Register.
4. In instances where there are several Community Hotline calls from residents in the same street or general location, the Acoustic Consultant will monitor the noise at a location deemed to be representative of those affected residents and undertake noise sampling per the requirements of points 1 to 3 above.
5. Provide details to Community Hotline staff of the measured noise levels and action taken by the Acoustic Consultant (via the Acoustic Manager) for inclusion in the Community Hotline Register.





Subsequently, the following actions will be taken:

6. Where requested by the caller, Community Hotline staff will contact the caller after the monitoring to confirm the actions taken in response to their initial call. Where the Acoustic Consultant does not speak directly with the caller at the time of the monitoring, a business card or calling card will be placed in their mailbox following completion of the attended noise monitoring.
7. Noise data from the unattended noise loggers at the five (5) sensitive receptors will be reviewed following completion of the event to determine specific receptor amplified entertainment noise levels and/or other non-event noise sources at the time of calls to the Community Hotline.
8. All attended monitoring exceedances and non-conformances will be recorded in any Noise Impact Report requested by the Department of Planning and Environment (per Condition C52) and in Parkland's annual Performance Report.





11 Modifying this NMP

11.1 This Section

This section responds to the requirements of Condition C16 (h) of the Modified Conditions of Approval as provided below:

(i) measures to address and respond to the outcomes of a Performance report required under Condition B7, including updating plans for subsequent events.

11.2 Specific Requirements

Parklands is required to submit a performance report to the secretary each year in accordance with Consent Condition B7. Where a performance report identifies opportunities for improvements associated with this NMP, Parklands shall address and respond to these outcomes and where necessary update this NMP for subsequent events.





Appendix A – Noise Management Plan Audit Checklist





Noise Management Plan - Audit Checklist

Requirement	Yes/No
Unattended noise monitoring is undertaken at the following locations R6, R12, R15, R24, R30, E1, E2 and E3 (see Figure 4.1). Monitoring commences a minimum of 48 hours prior to the event and continues until 48 hours after completion of the event.	
Attended noise monitoring is undertaken at each receptor location during installation of the unattended noise monitoring equipment	
Attended noise monitoring is completed at representative receptors during Sound Checks prior to commencement of the event.	
A minimum of two acoustic consultants are provided throughout the event to undertake attended noise monitoring.	
Where noise related calls to the Community Hotline are received, noise monitoring is undertaken at that sensitive receptor. Where no noise related calls have been received, noise monitoring is undertaken at the sensitive receptor locations shown in Table 4.1.	
The first 6 hours of the event are used to identify those receptors most likely to be impacted by amplified entertainment noise from the event,	
<p>Noise limits used for assessment of compliance for sensitive receivers are adopted as follows:</p> <ul style="list-style-type: none"> ● For Zone 1 (as shown in Schedule 4 of this approval and Figure 4.1): <ol style="list-style-type: none"> i. between 11am and midnight amplified entertainment noise from the event at sensitive receivers must not exceed 60dB(A) $L_{Aeq,10\text{-minutes}}$ AND 70dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band; and ii. between midnight and 2am, amplified entertainment noise from the event at sensitive receivers must not exceed 45dB(A) $L_{Aeq,10\text{-minutes}}$ AND 60dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band. ● For Zone 2 (as shown in Schedule 4 of this approval and Figure 4.1): <ol style="list-style-type: none"> i. between 11am and midnight amplified entertainment noise from the event at sensitive receivers must not exceed 55dB(A) $L_{Aeq,10\text{-minutes}}$ AND 65dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band; and ii. between midnight and 2am, amplified entertainment noise from the event at sensitive receivers must not exceed 45dB(A) $L_{Aeq,10\text{-minutes}}$ AND 55dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band. 	
Noise levels in camping areas must be managed to provide for peaceful rest between midnight and 8:00 am.	





Requirement	Yes/No
<p>When amplified entertainment noise levels exceeds the set noise criteria, the Acoustic Manager implements adequate noise reduction strategies to reduce the noise level. Further noise testing at the receptor is at the subject site is undertaken immediately after the noise mitigation action occurs, until amplified entertainment noise levels are reduced to within the limits.</p> <p>Details of the measured noise levels and action taken are provided to the Event staff member responsible for the Community Hotline.</p> <p>Where requested, the event staff member will contact them the caller to confirm the actions taken in response to their call. Where the noise monitoring personnel do not speak directly with the complainant at the time of the monitoring, a business card or calling card will be placed in their mailbox following completion of the attended noise monitoring.</p> <p>Noise data from the unattended noise loggers at the five (5) sensitive receptors will be reviewed following completion of the event to determine specific receptor amplified entertainment noise levels and/or other non-event noise sources at the time of noise related Community Hotline call.</p>	
<p>Event acoustic controls are audited by an Accredited Acoustic Consultant prior to commencement of the event to ensure compliance with the requirements of the Acoustic Monitoring Program (AMP).</p>	
<p>North Byron Parklands maintains the right to enforce the noise guidelines and exercise their right to cease operations of a stage / entertainment area if required.</p>	
<p>Prior to commencement of the event:</p> <ul style="list-style-type: none"> ● provide clear guidance on acceptable front of house noise limits are provided to all sound engineers ● confirm that on-site event stage managers have responsibility for the management of noise emissions from stages. 	
<p>Meteorological data collected by the on-site monitoring station is reviewed throughout the event</p>	
<p>Noise monitoring includes measurement of $L_{Aeq,10\text{-minute}}$ and $L_{eq,10\text{-minutes}}$ in the 63Hz 1/1 octave band.</p>	



Air Noise Environment
Environmental Monitoring and Assessment

Acoustic Monitoring Program - 2017

Splendour in the Grass

Date of Issue: 19 July 2017

Prepared by:

Air Noise Environment

ABN: 13 081 834 513





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The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Air Noise Environment Pty Ltd for the purposes of this project is both complete and accurate.



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1 Introduction

1.1 Overview

Air Noise Environment Pty Ltd were commissioned by Splendour in the Grass (SITG) to prepare an Acoustic Monitoring Program (AMP) for the 2017 event. SITG 2017 is to be held at the North Byron Parklands from 20 – 23 July 2017.

1.2 About this AMP

This AMP has been developed in accordance with the requirements of Condition C17 of the Planning Assessment Commission (PAC) modified approval¹. Specifically, Condition 17 requires:

'C17 Acoustic Monitoring Program

Prior to the commencement of any event where amplified noise is a feature, a qualified acoustic consultant must prepare and implement an Acoustic Monitoring Program (AMP) to monitor and assess the impact of noise generated by the event on the amenity of the area. The AMP must be prepared in consultation with the RWG and be consistent with the provisions and limits within the NMP and required under Condition B3, consistent with Condition C16 and consistent with the proponent's Environmental Health and Safety Management Manual (Standard 008). The AMP shall include, but not be limited to:

(a) locations (identified on a map) at which monitoring will be undertaken. As a minimum monitoring locations must include the most sensitive noise receivers (where no noise agreement is in place between the proponent and the receiver) and the adjoining nature reserve as identified in the Noise Management Plan;

(b) procedures and protocols in accordance with OEH's Noise Guide for Local Government 2010 and Australian Standard AS1055 Acoustics - Description of measurement of environmental noise (or any subsequent versions thereof);

(c) a program for periodic attended and unattended monitoring of noise at each of the set monitoring locations, including:

(1) Unattended monitoring must be undertaken at a minimum of eight monitoring locations (to be determined in consultation with the RWG) before, during and after each event;

(2) Attended monitoring must occur on at least one (1) occasion prior to the commencement (including during sound check) and during the operation of each event; and,

(d) procedures for the reporting of monitoring results to enable an assessment of the noise performance of the event.

¹ Planning and Assessment Commission Modification of Minister's Approval reference MP09_0028 MOD 3 dated 22 April 2016





The AMP must be submitted for the approval of the Secretary at least 60 days prior to the commencement of the event.'

The overall purpose of the AMP is to minimise amplified entertainment noise having regard to the limits provided in the modified conditions of approval and thereby minimise disturbance of residents and other noise sensitive receivers from events with sound amplification held at Parklands venue.





2 Definitions

Accredited Acoustical Consultant means an acoustical consultant who is a member of one or more of the following organisations: The Association of Australian Acoustical Consultants; The Australian Acoustical Society; or the Institution of Engineers Australia.

Acoustic Consultant is an experienced acoustical consultant with responsibility for completing attended noise measurements during the event, and for setting up the unattended noise monitoring positions prior to the event.

Acoustic Manager: a Senior Acoustical Consultant with the responsibility for co-ordinating monitoring activity during the event, monitoring live stage noise levels, and communication and liaison with the Production Team and Parklands Management in relation to event noise management.

Community Hotline is the response centre provided by Parklands to respond to telephone and email communications from the community during the event.

dB(A) is a measure of the overall noise level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

dB(lin) is a measure of the overall noise level of sound across the audible spectrum with a linear frequency weighting (i.e. 'lin' weighting).

Ecological Sensitive Receptors means the three locations within the Billinudgel Nature Reserve as defined under the EPBC approval 2012/6475 dated 22 October 2012.

Event means an outdoor event whose primary purpose is entertainment involving continuous amplified musical performance taking place within the approved hours of operation.

Event Noise means noise from amplified entertainment noise measured as $L_{Aeq,10\text{-minutes}}$.

Event Stage Manager means the person at the sound mixing console (or sound desk), who is in control of the volume of noise emanating from the speakers installed at an event;

L_{Aeq} is the equivalent steady sound level in dB(A) containing the same acoustic energy as the actual fluctuating sound level over the given period. Noise levels often fluctuate over a wide range with time (as is often the case for concert noise). The L_{Aeq} is the equivalent continuous sound which would contain the same sound energy as the time varying sound. Many studies show that human reaction to level-varying sounds tends to relate closer to the L_{Aeq} noise level than any other descriptor.

$L_{eq,oct(63Hz)}$ is the equivalent steady sound level in dB(lin) in the 63Hz 1/1 octave band containing the same acoustic energy as the actual fluctuating sound level over the given period.

Noise Control Co-ordination Centre (NCCC) is the noise monitoring and management centre, staffed by experienced professional acoustic personnel, during the event.

Sensitive Receiver means a residence, education institution, health care and/or religious facility.

Sound Check means a sound check for a concert that is carried on outdoors where sound amplification equipment is used as part of the sound check.





Stages means a stage with a performance floor space greater than 100 square metres.

Venue means North Byron Parklands.





3 Noise Limits

3.1 Sensitive Receivers

Noise limits for sensitive receivers in the area surrounding Parklands are provided in Condition B3 of the modified PAC Approval as follows:

- For Zone 1 (as shown in Schedule 4 of this approval and Figure 4.4):
 - i. between 11am and midnight amplified entertainment noise from the event at sensitive receivers must not exceed 60dB(A) $L_{Aeq,10\text{-minutes}}$ AND 70dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band; and
 - ii. between midnight and 2am, amplified entertainment noise from the event at sensitive receivers must not exceed 45dB(A) $L_{Aeq,10\text{-minutes}}$ AND 60dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band.
- For Zone 2 (as shown in Schedule 4 of this approval and Figure 4.4):
 - i. between 11am and midnight amplified entertainment noise from the event at sensitive receivers must not exceed 55dB(A) $L_{Aeq,10\text{-minutes}}$ AND 65dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band; and
 - ii. between midnight and 2am, amplified entertainment noise from the event at sensitive receivers must not exceed 45dB(A) $L_{Aeq,10\text{-minutes}}$ AND 55dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band.

3.2 Ecological Receptors

In accordance with approval 2012/6475 (dated 22 October 2012) issued by the Commonwealth government in accordance with the Environment Protection and Biodiversity Conservation Act 1999 (EPBC) for Parklands, noise levels at the nominated monitoring locations must not exceed 65 dB(A).

3.3 Parkland Uses

In accordance with Condition C40 of the PAC approval, noise levels in the camping area between midnight and 8:00 am of each event day shall support peaceful rest for overnight patrons during events.





4 Receptors and Monitoring Locations

4.1 Noise Sensitive Receivers

4.1.1 Residential Uses

Table 4.1 and Figure 4.1 identify noise sensitive receptors in the area surrounding Parklands, and the relevant Zone as defined in the PAC Modified Approval.

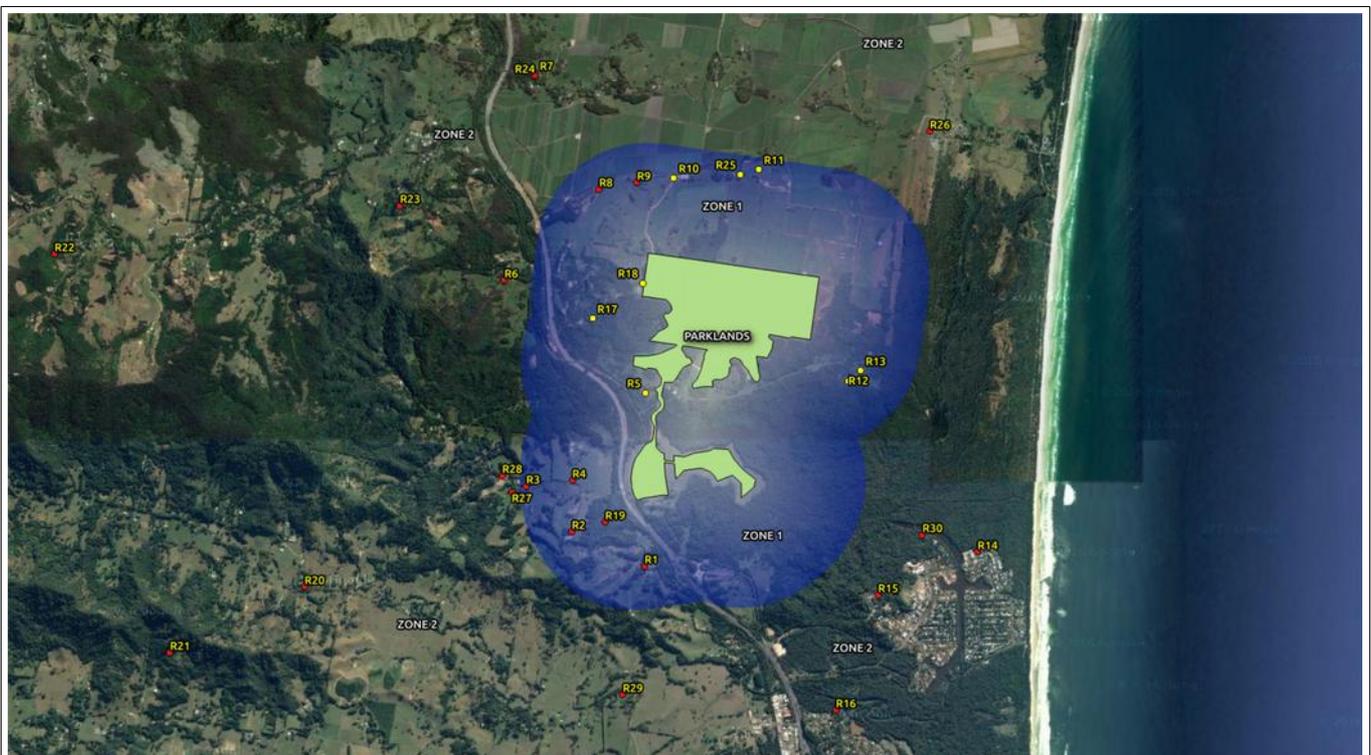


Figure 4.1: Site location and Receptor Locations

Notes:

Receptors 5, 7, 10, 11, 12, 13, 17, 18 and 25 are not considered sensitive receptors for the purposes of this AMP.





Table 4.1: Noise Sensitive Receptor Locations

Receptor ID	Address	Zone	Lot	Plan Number	Easting	Northing
R1	26 Billinudgel Road, Billinudgel	1	2	708466	550545	6848276
R2	25 Yelgun Road, Yelgun	1	2	590451	549809	6848586
R3	84 Yelgun Road, Yelgun	2	2	581144	549272	6849152
R4	44 Yelgun Road, Yelgun	1	2	856229	549885	6849350
R6	Pacific Highway, Yelgun	2	271	755687	549200	6850879
R8	72 Wooyung Road, Crabbes Creek	1	11	868148	549911	6851539
R9	144 Wooyung Road, Wooyung	1	1	359521	550382	6851787
R14	38 Mia Court, Ocean Shores	2	73	1036242	553475	6848405
R15	26 Flinders Way, Ocean Shores	2	15	1016444	552578	6848002
R16	111 Balemo Drive, Ocean Shores	2	852	240400	552197	6846959
R19	7 Yelgun Road, Yelgun	1	1	217025	550110	6848674
R20	242 Middle Pocker Road, Middle Pocket	2	1	597810	547389	6848120
R21	749 The Pocket Road, The Pocket	2	2	248142	545003	6846851
R22	56 Pimble Valley Road, Crabbes Creek	2	3	807334	545133	6851118
R23	60 Bluegum Court, Crabbes Creek	2	13	855550	548256	6851560
R24	44 Hulls Road, Crabbes Creek	2	126	1003400	549427	6852646
R26	412 Wooyung Road, Wooyung	2	4	604748	553046	6852236
R27	93 Yelgun Road, Yelgun	2	7	717125	549266	6848944
R28	108 Yelgun Road, Yelgun	2	3	544291	549179	6849099
R29	175 The Pocket Road, Billinudgel	2	6	623865	550265	6847093



Receptor ID	Address	Zone	Lot	Plan Number	Easting	Northing
R30	39 Hardy Avenue, Ocean Shores	2	17	872205	552970	6848562
R31	101 The Tunnel Road, Billinudgel	2	1	952096	551603	6846410

4.1.2 Sensitive Ecological Areas

In addition to the noise sensitive receptors identified in Section 4.1.1 above, the management of noise emissions from events at Parklands also needs to consider impacts on the adjacent Billinudgel Nature Reserve. As part of this AMP, unattended noise will be completed in accordance with the EPBC approval 2012/6475 dated 22 October 2012.

4.2 Selection of Monitoring Locations

4.2.1 Overview

A total of 8 major events have been held at the Parklands venue since 2012. During this time, monitoring has been completed at a range of community receptor locations. These locations were selected on the basis of

- site inspections and monitoring during events by ANE personnel;
- community hotline calls for previous events; and
- prediction of receptor noise levels for the event design.

A discussion of these investigations is provided in the following sections.

4.2.2 Site Inspection

An inspection of sensitive receptor locations (from the property boundary) in the area surrounding Parklands was undertaken during May 2014. During the inspection, a qualified acoustic consultant assessed the suitability of sensitive receptors for noise monitoring based on the following:

- existing ambient noise levels and representativeness of groups of receptors;
- potential for external influence on noise monitoring (e.g. nearby localised noise sources such as generator or pumping equipment);
- any significant terrain shielding in the area which could impact on the monitoring data; and
- willingness of the landholder to allow noise monitoring (either attended or unattended).





4.2.3 Predictive Noise Modelling

For the purposes of predicting impacts from amplified music during the concert, an environmental noise model of the sources and surrounding region was developed. The model package was developed using the proprietary software Cadna/A (Computer Aided Noise Abatement Model) developed by DataKustik.

Cadna/A has the ability to generate noise contours and graphical representations of noise propagation in the area surrounding the proposed venue. The model incorporates influences of meteorology, terrain, ground type and air absorption in addition to source characteristics to predict noise impacts at receptor locations.

The modelling included all receptor positions identified in Table 4.1. The noise modelling has also been utilised to consider the cumulative impact of all stages performing simultaneously to allow identification of the worst-case cumulative impacts on the acoustic amenity of nearby sensitive receptors.

Based on the predictive noise modelling, the following represent the receptors most likely to experience noise levels at or near to the noise limits:

- R1;
- R2;
- R3;
- R4;
- R6;
- R7
- R8;
- R9;
- R12 (no longer a sensitive receptor);
- R13 (no longer a sensitive receptor);
- R17 (no longer a sensitive receptor); and
- R18 (no longer a sensitive receptor).

Further development of the sound system and event layout for the SITG 2017 may result in changes to the above list.

4.2.4 Selected Monitoring Positions

Table 4.2 below presents a summary of the monitoring locations selected for both attended and unattended noise monitoring during major events held at Parklands. These receptors are considered representative of those receptors (where no noise agreement is in place) that are likely to be most





sensitive (due to their location) to noise emitted from the venue during SITG 2017.

Table 4.2: Selected Receptors for Noise Monitoring

Receptor ID	Address	Selected for Noise Monitoring	
		Unattended	Attended
R1	26 Billinudgel Road, Billinudgel	No	Yes
R2	25 Yelgun Road, Yelgun	No	Yes
R3	84 Yelgun Road, Yelgun	Yes	Yes
R4	44 Yelgun Road, Yelgun	No	Yes
R6	Pacific Highway, Yelgun	Yes	Yes
R8	72 Wooyung Road, Crabbes Creek	No	Yes
R9	144 Wooyung Road, Wooyung	No	Yes
R14	38 Mia Court, Ocean Shores	No	Yes
R15	26 Flinders Way, Ocean Shores	Yes	Yes
R16	111 Balemo Drive, Ocean Shores	No	Yes ^a
R19	7 Yelgun Road, Yelgun	No	Yes
R20	242 Middle Pocket Road, Middle Pocket	No	Yes ^a
R21	749 The Pocket Road, The Pocket	No	Yes ^a
R22	56 Pimble Valley Road, Crabbes Creek	No	Yes ^a
R23	60 Bluegum Court, Crabbes Creek	No	Yes ^a
R24	44 Hulls Road, Crabbes Creek	Yes	Yes ^a
R26	412 Wooyung Road, Wooyung	No	Yes ^a
R27	93 Yelgun Road, Yelgun	No	Yes
R28	108 Yelgun Road, Yelgun	No	Yes
R29	175 The Pocket Road, Billinudgel	No	Yes ^a
R30	39 Hardy Avenue, Ocean Shores	Yes	Yes
R31	101 The Tunnel Road, Billinudgel	No	Yes ^a

^a Monitoring will be completed at these receptor locations where the position is downwind of the venue, and noise from the venue is clearly audible at intervening receptor positions.

Active noise management during the event will focus on monitoring results at these key receptor locations. This will provide a means of benchmarking community noise impacts and will be used for



the purposes of determining compliance. Attended noise monitoring will be completed at these locations during the event. More frequent monitoring will be completed at those receptors most likely to receive audible noise from the venue during the event, based on the predicted noise levels for forecast weather conditions.

Additional continuous unattended noise monitoring will be completed at the positions identified in Figure 4.4.

4.2.5 Ecological Receptor Monitoring Locations

In accordance with the EPBC approval for Parklands, unattended noise monitoring is to be undertaken at positions E1, E2 and E3 as identified in Table 4.3 and Figure 4.2.

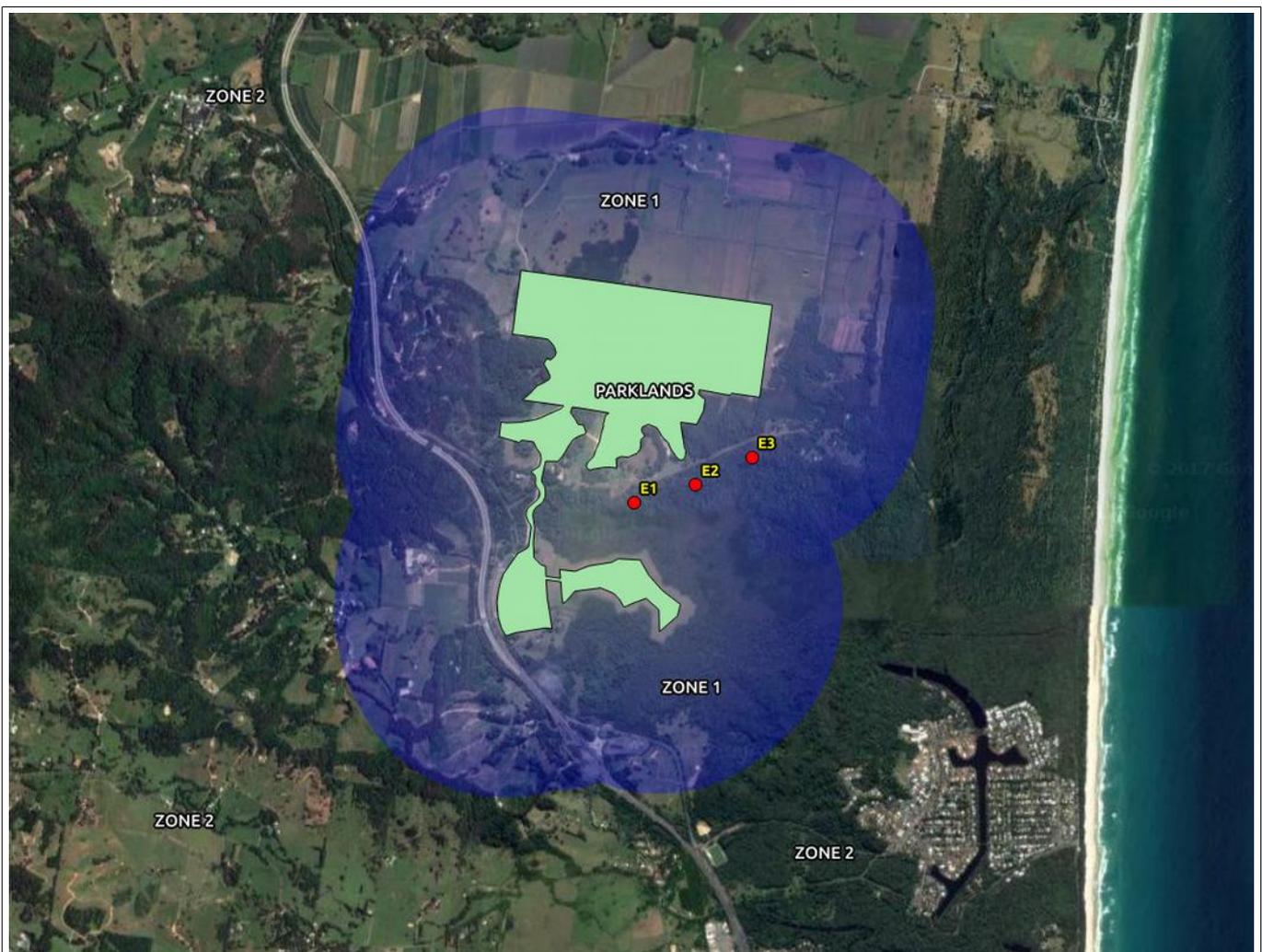


Figure 4.2: Ecological Receptor Locations





Table 4.3: Ecological Receptors - Unattended Noise Monitoring Locations

Location ID	Address
E1	Situated along Jones Road (representative of Billinudgel Nature Reserve)
E2	Situated along Jones Road (representative of Billinudgel Nature Reserve)
E3	Situated along Jones Road (representative of Billinudgel Nature Reserve)

4.3 Attended Noise Monitoring

Attended monitoring will occur on at least one (1) occasion prior to the commencement of the event and once during the operation of the SITG 2017 event at each of the nominated sensitive receptor positions identified in 4.3.

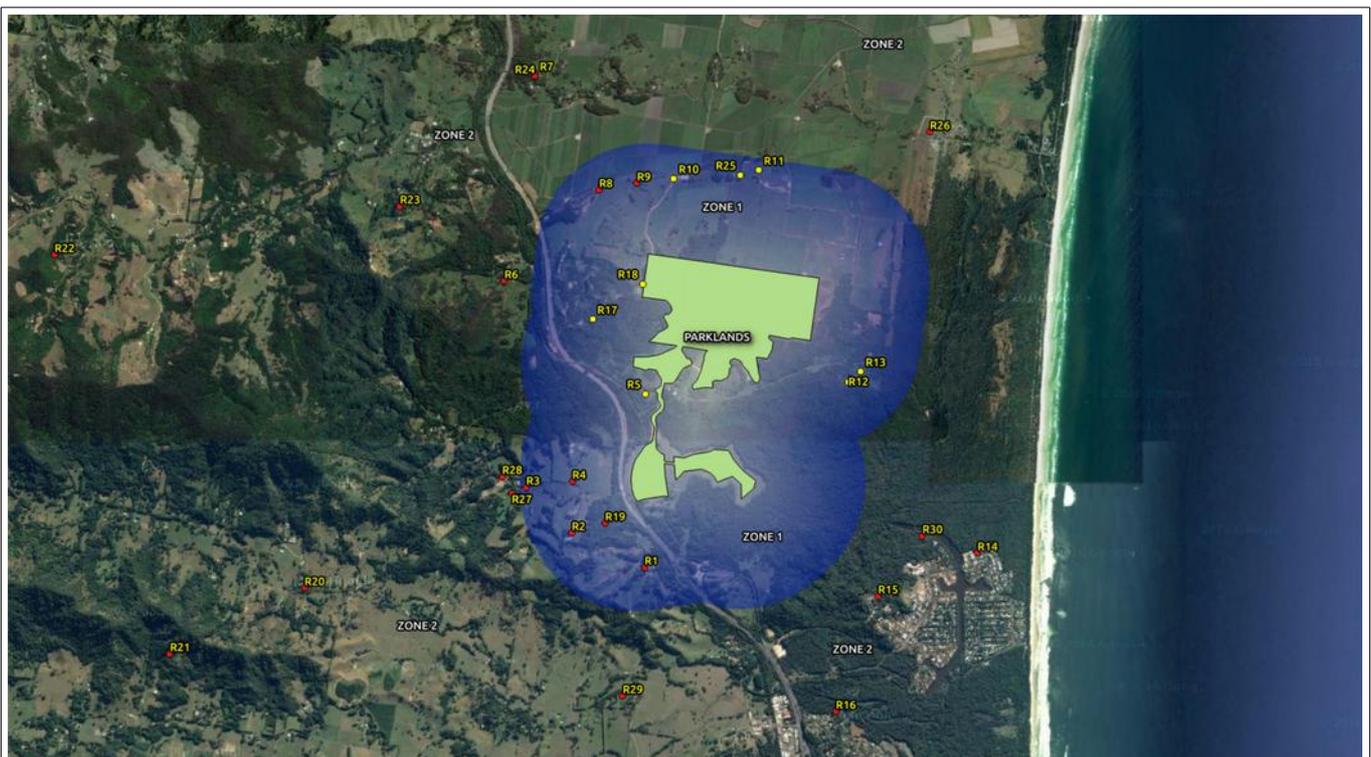


Figure 4.3: Attended Noise Monitoring Positions

Notes:

Receptors 5, 7, 10, 11, 12, 13, 17, 18 and 25 are not considered sensitive receptors for the purposes of the SITG 2017 monitoring program, due to agreements with Parklands being in place.

Attended noise monitoring will be undertaken at sensitive receptor locations in the following manner:



- where no noise related calls to the Community Hotline have been received noise monitoring will be undertaken at the sensitive receptor locations identified in Table 4.2 above;
- where noise related calls to the Community Hotline are received, attended noise monitoring will be undertaken at that sensitive receptor subject to availability of the acoustic engineer and other existing monitoring equipment; and
- where noise related Community Hotline calls are received from multiple sensitive receptors over a short period of time, attended monitoring may be undertaken at each receptor premises (subject to availability of the acoustic engineer) or a location representative of these premises (in instances where premises are in reasonable proximity to each other).

It should be noted that where noise related Community Hotline calls are received from multiple sensitive receptors, attended noise monitoring will be undertaken preferentially at those receptors without continuous unattended noise monitoring equipment in place.

The attended noise monitoring undertaken in response to this AMP will, in the absence of any noise related Community Hotline calls, focus on the above receptor locations. It should be noted that during the first 6 hours of each day of the event, noise levels at the receptors identified in Table 4.2 above will be monitored with the aim of determining those most likely to be impacted during evening and night periods. This will allow noise monitoring during evening and night periods, in the absence of calls to the Community Hotline, to focus on those receptors identified as most likely to be adversely impacted by noise from the event.

In addition, attended monitoring will also be completed during sound checks prior to commencement of the event. Monitoring will be completed at positions representative of key groups of receptors, in accordance with the requirements of consent condition C17(c) 2). The duration of sound checks is generally 1 – 2 hours, hence it is not practicable to complete attended noise monitoring at each sensitive receiver identified in Figure 4.4 during this limited time period.

Routine noise measurements (ie, not in relation to a call to the Community Hotline) will be completed at the property boundary. For rural properties (> 1,000 m³ lot size), where the residence is located in excess of 30 m from the property boundary, the potential for the measurement position to under- or over-estimate noise impacts from the event will be considered by the acoustic consultant. Where appropriate, the consultant will estimate an adjustment to the measured noise level to assess whether the measured noise level approaches the assessment criteria, and whether action is necessary to address the potential for non-compliance to occur.

4.4 Unattended Noise Monitoring

Unattended noise monitoring is to be completed at the receptor locations and ecological monitoring positions identified on Figure 4.4. As required by the Conditions, unattended noise monitoring will commence prior to the event and continue until 48 hours after completion of the event.

Unattended noise monitoring will be undertaken in accordance with the requirements of the Australian Standard AS1055-1997 'Acoustics - Description and measurement of environmental





noise'. All instruments will be field calibrated using a NATA calibrated calibrator prior to and following completion of the noise monitoring and the results (along with serial numbers for the instrument and calibrator) recorded on the Event Noise Monitoring Fieldsheet. An averaging time of 10 minutes is to be adopted for the measurements.

In accordance with the modified conditions of approval, additional attended monitoring will be undertaken during installation of the unattended noise monitoring equipment prior to commencement of SITG 2017.

Data from the continuous unattended noise monitoring positions is not available until after the completion of the event. Therefore, these data are relied upon to provide supplementary information to assist in interpreting the results of the attended compliance monitoring during post-event analysis of the noise datasets. As monitoring at these positions commences prior to the event, and ceases after the event, the data are particularly useful in providing an indication of the changes in average noise levels during an event compared to typical community noise levels in the local area.

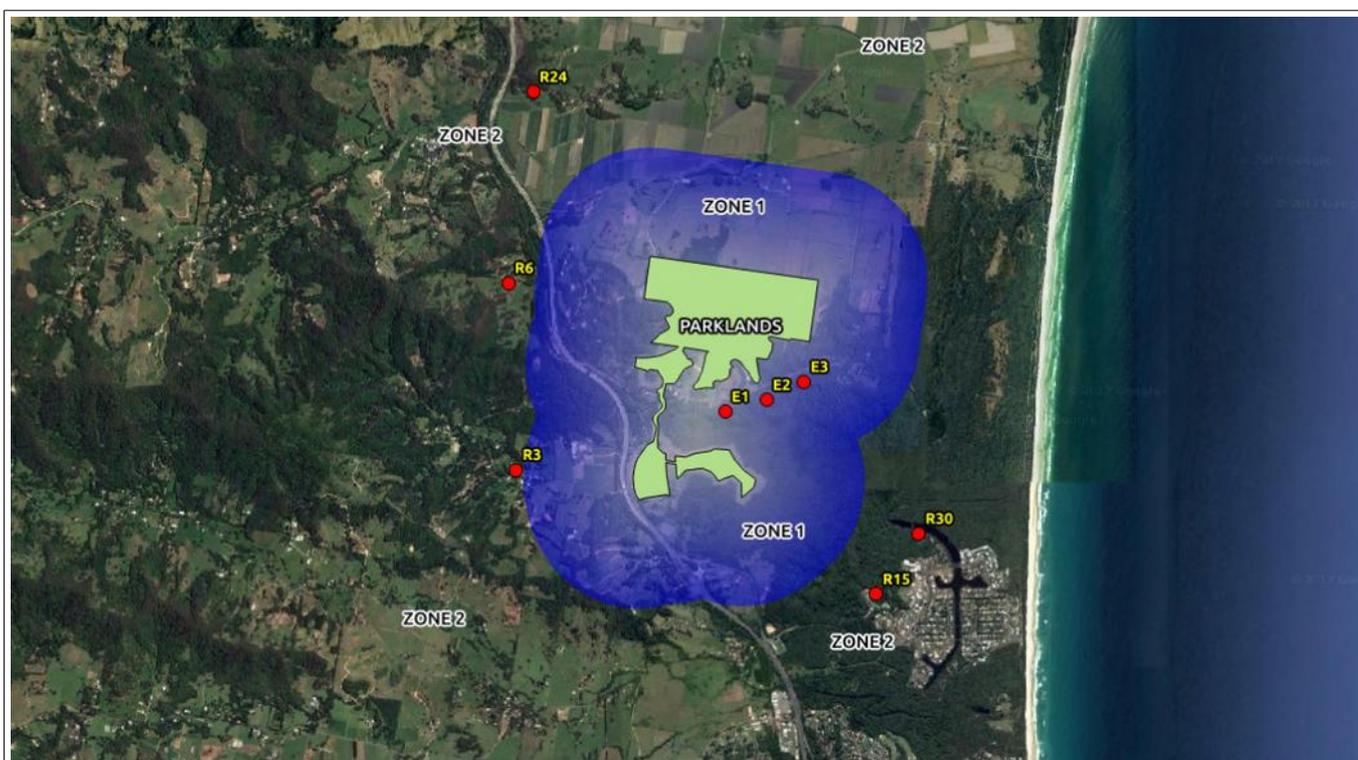


Figure 4.4: Unattended Noise Monitoring Locations



5 Noise Monitoring Methodology

5.1 Monitoring

5.1.1 Event Noise Monitoring

All attended and unattended noise monitoring will be undertaken in accordance with the procedures and protocols as described in OEH's *Noise Guide for Local Government 2010* and *Australian Standard AS1055:1997 Acoustics - Description of measurement of environmental noise*.

Noise levels will be recorded for each ten (10) minute period throughout the period from 11 am to 2 am of each day of the event. Observations recorded shall include as a minimum:

- for unattended noise monitoring data: $L_{Aeq,10\text{-minutes}}$ and $L_{eq,10\text{-minutes}}$ in the 63Hz 1/1 octave band noise levels;
- for attended noise monitoring data: $L_{Aeq,10\text{-minutes}}$ and $L_{eq,10\text{-minutes}}$ in the 63Hz 1/1 octave band noise levels and subjective observations of audible noise sources (including any extraneous (not event related) noise sources impacting on the measurements).

In addition, a detailed record of the meteorological conditions prevailing at the time of noise monitoring as recorded at the nearest representative meteorological station shall be kept and included in the noise impact report.

Meteorological data collected by the on-site monitoring station will be reviewed throughout the event (at 11 am, 6 pm and 10 pm) to determine the requirement for further specific acoustic controls. The further controls, where required, would be adopted to mitigate, as far as practicable, the influence of the local meteorological conditions on the propagation of noise from the event.

5.1.2 Post-event Monitoring

In accordance with Condition C17(c)(1) of the approval unattended noise monitoring will continue for a period of 48 hours following completion of the event.

5.2 Sound Checks and Rehearsals

Attended noise will be undertaken during rehearsals and/or sound checks at sensitive receptor locations. During the attended monitoring, information collected shall be used to inform the event stage manager and sound engineers of the acceptable mixing desk noise level for each stage. That is, residential noise monitoring during the day will be used to quantify the internal volume settings (event noise level) so that all parties, acoustic engineers outside and audio engineers inside, are equipped with data prior to the main concert.

Data that will be recorded and reported for pre-event noise monitoring includes $L_{Aeq,10\text{-minutes}}$ and $L_{eq,10\text{-minutes}}$ in the 63Hz 1/1 octave band noise levels at sensitive receptors and the mixing desks, weather conditions (e.g. wind speed and direction).





5.3 Responding to Community Hotline Calls

Where a caller to the Community Hotline believes that they are being adversely impacted by amplified entertainment noise, Community Hotline staff will ask the following questions to determine what actions (if any) are required:

Q1. Can the Caller describe the noise being experienced (i.e. is the noise amplified music? Can the noise be heard inside the dwelling? If so, what are its characteristics (bass, vocals?), have noise levels increased recently?). The Community Hotline staff shall then check with the Acoustic Manager to determine if noise monitoring has recently been undertaken in the caller's area. If so, details of the noise levels measured will be discussed with the caller.

After discussing the above matters, does the Caller require noise monitoring to determine amplified entertainment noise levels at their property?

Yes: Go to Q2; or

No: Record details of the call (including caller information) in the Community Hotline Register.

Q2. Is the property located in a rural area (i.e. lot size > 1,000m²)?

Yes: Go to Q3;

No: The Acoustic Manager will issue the monitoring request to an Acoustic Consultant who will, as soon as practicable, undertake noise monitoring at the boundary of the property, on public land.

Q3. If the property is located in a rural area (i.e. lot size > 1,000m²) does the caller require monitoring at the property boundary?

Yes: The Acoustic Manager will issue the monitoring request to an Acoustic Consultant who will, as soon as practicable, undertake noise monitoring at the boundary of the property, on public land. Where the residence is located in excess of 30 m from the property boundary, the potential for the measurement position to under- or over-estimate noise impacts from the event will be considered by the acoustic consultant. Where appropriate, the consultant will estimate an adjustment to the measured noise level to assess whether the measured noise level approaches the assessment criteria, and whether action is necessary to address the potential for non-compliance to occur;

No: If the monitoring is requested in proximity to the house, the caller must provide their name, full address and telephone contact number (landline and mobile). The caller must be available to meet with the Acoustic Engineer and provide safe access to the property for the purposes of completing the monitoring. The Acoustic Consultant will drive into the property and park as close to the house as possible. The Acoustic Engineer will knock on the door of the house, confirm the identity of the person that requested the monitoring and undertake





noise monitoring within 30 m of the home subject to the Acoustic Engineer confirming the monitoring location as safe and appropriate. If safety issues are a concern, the Acoustic Engineer will complete the monitoring adjacent to the entrance to the property.

Following receipt of the monitoring request by the Acoustic Manager, the Acoustic Consultant will (as soon as practicable):

1. Undertake attended monitoring of amplified entertainment noise levels during periods of amplified entertainment (i.e. not during breaks between acts on the main stages), noting any extraneous noise sources impacting on the monitoring location.
2. Where the measured amplified entertainment noise level exceeds the set noise criteria during the initial ten-minute noise monitoring sample, the Acoustic Consultant shall contact the Acoustic Manager as soon as practicable and request appropriate adjustments to frequency and/or decibel levels as deemed necessary to bring noise levels to within the set noise criteria.
3. Once the Acoustic Manager has confirmed the requested adjustments have been made, and no later than 20 minutes after the initial 10-minute noise measurement, the Acoustic Consultant shall conduct a further ten-minute noise monitoring sample to determine compliance (or otherwise) with the set noise criteria. If this second sample exceeds the set noise criteria then the reading shall be treated as a non-conformance and recorded as such in the Community Hotline Register.
4. In instances where there are several Community Hotline calls from residents in the same street or general location, the Acoustic Consultant will monitor the noise at a location deemed to be representative of those affected residents and undertake noise sampling per the requirements of points 1 to 3 above.
5. Provide details to Community Hotline staff of the measured noise levels and action taken by the Acoustic Consultant (via the Acoustic Manager) for inclusion in the Community Hotline Register.

Subsequently, the following actions will be taken:

6. Where requested by the caller, Community Hotline staff will contact the caller after the monitoring to confirm the actions taken in response to their initial call. Where the Acoustic Consultant does not speak directly with the caller at the time of the monitoring, a business card or calling card will be placed in their mailbox following completion of the attended noise monitoring.
7. Noise data from the unattended noise loggers at the five (5) sensitive receptors will be reviewed following completion of the event to determine specific receptor amplified entertainment noise levels and/or other non-event noise sources at the time of calls to the Community Hotline.
8. All attended monitoring exceedances and non-conformances will be recorded in any Noise





Impact Report requested by the Department of Planning and Environment (per Condition C52) and in Parkland's annual Performance Report.





6 Event Acoustic Controls

6.1 Design Controls

Specific controls incorporated into the design of the SITG 2017 event have been adopted based on previous analysis and acoustic control development. The controls adopted for the event are as follows:

- i. alignment of event stages to improve shielding by existing terrain features (specifically for the Amphitheatre stage and GW McLennan stage);
- ii. installation of distributed sound amplification equipment (rather than a single front of house system) including delay towers approximately 55 m from the Amphitheatre stage to reduce the overall sound coming from the front of house sound system;
- iii. optimisation of speaker directivity to reduce noise emissions to off-site locations including flying speakers higher aimed down toward the audience allowing sound to be directed to within the event stage area thereby reducing spill from the event; and
- iv. use of innovative technologies such as end-fired sub arrays or cardioid sub arrangements to reduce noise emissions to the rear of the stage;
- v. placement of silage bales (500 kg each, one deep and two bales high) around the rear and sides of stages (hay bales placed to maximise attenuation of low frequency emissions from the sub woofer array) or, alternatively, where space limitations apply placement of hay bales to a similar height and depth; and
- vi. use of truck bodies (where possible) parked adjacent to stages to provide additional acoustic attenuation in these directions.

The investigations undertaken have resulted in the iterative modification of the event design to optimise acoustic benefits for off-site receptors. The above controls will be implemented (where possible) and the event design optimised as far as practicable to reduce potential receptor noise impacts in accordance with the requirements of the NMP.

Figure 6.1 below presents the layout for SITG 2017 and identifies specific acoustic controls to be adopted for the stages and bar areas.





6.2 Operational Controls

In addition to completing the attended and unattended noise monitoring, as for the operational controls adopted for the SITG and Falls Festival 2016 events, a Noise Control Co-ordination Centre (NCCC) will be operated at the venue office located at Jones Road. The objectives of the NCCC are to provide:

- constant monitoring of live noise levels from the main stages to allow pro-active management of noise levels and provision of rapid communication to Parkland Management and SITG Event Managers where noise level adjustments were considered appropriate; and
- a closer interaction with Parklands Management and Splendour in the Grass Event Managers and the personnel responding to calls made to the Community Hotline.

The following resources will be installed at the NCCC:

- live noise feed (instantaneous noise levels) from sound level meters installed at the Ampitheatre, McLennan and Tiny Dancer stages;
- 1 minute L_{Aeq} noise feed from a separate 10EaZy monitoring system installed by the Splendour in the Grass Production Team for the Ampitheatre, McLennan and Tiny Dancer stages. This will also provide data to Parklands Management and Splendour in the Grass Event Managers;
- connection to the Chronosoft liaison software² implemented for logging of responses to community hotline calls requesting noise monitoring, as well as other event related data; and
- web access to Bureau of Meteorology monitoring data.

Throughout the event, the Acoustic Manager will review stage noise levels to confirm that the measured noise levels are within the pre-agreed target noise levels for the event. Where the Acoustic Manager identifies that noise levels are approaching, or exceeding target noise levels based on the observed instantaneous noise levels, the SITG Production Team will be notified and, if considered necessary, the Acoustic Manager will request a specific reduction in noise levels.

In determining whether a request to reduce stage noise levels is appropriate, the Acoustic Manager will consider the following key factors:

- noise levels currently occurring from each of the stages, particularly whether noise levels from an individual stage or more than one stage were approaching pre-agreed target noise limits;
- prevailing weather conditions, and whether the current wind direction has potential to propagate noise toward key groups of receptors;
- measured community noise levels, as reported by noise monitoring personnel; and
- type of performance occurring on each stage, and the expected duration of each performance;
- information provided by the Community Hotline relating to calls received from the community.

² This software is typically used by emergency services to manage responses to emergency dispatch of personnel.





6.3 Responding to Adverse Meteorology

Experience at previous events confirms that, under specific adverse meteorological conditions, enhanced propagation of noise from the venue may arise. Enhanced sound propagation has been associated with a low level temperature inversion on one occasion, and low lying cloud accompanied by a storm and continuous rain on a second occasion. During these circumstances, enhanced downwind propagation of low frequency sound occurred, and significant reductions in stage noise levels were required to achieve external compliance.

To address this issue, live weather data will be constantly monitored at the NCCC. When changes in meteorological conditions arise that have the potential to adversely affect sound propagation, the SITG Production Team will be notified.

In addition, for SITG 2017, at the commencement of each day of the event the weather forecast for the day will be reviewed by the Acoustic Manager. A short briefing will be forwarded via email to the Production Team and acoustic monitoring personnel. The email will summarise the following information:

- expected weather conditions for the day, for morning, evening and night;
- the receptor groups most likely to be affected for each period, hence the locations to be the focus of attended compliance monitoring;
- any potentially adverse conditions that are expected to result in enhanced sound propagation;
- recommended changes in stage sound levels that are expected to be applicable where adverse meteorological conditions are anticipated.

The recommended changes in stage sound levels will be determined on the basis of acoustic modelling completed for the specific forecast meteorological conditions. This modelling will be completed by the Acoustic Manager at the NCCC during the event, if required.





7 Reporting

For continuous improvement purposes, within 30 days of the completion of the SITG 2017 event, a post-event noise monitoring report will be prepared by a suitably qualified acoustic consultant. The report will include, as a minimum:

- i. The name address and telephone number of the person who prepared the report;
- ii. The relevant date(s) and the commencement and completion times of the test(s), rehearsal(s) and concert(s) on each day;
- iii. The times and location(s), including a site plan, at which the noise measurements were taken;
- iv. Details of the equipment and methods used to take measurements;
- v. Records of noise levels and data from acoustic monitoring;
- vi. Details of meteorological conditions during the period of noise measurement;
- vii. A statement of any time(s) at which the noise level limits in Section 3 were exceeded and why, the level(s) and duration of any exceedence(s);
- viii. Details of any noise related calls to the Community Hotline or requests received and actions taken; and
- ix. Any other information relevant to the consideration of the noise impact from the event on residents or other sensitive receivers.





Appendix A: Acoustic Monitoring Program – Audit Checklist





Acoustic Monitoring Program - Audit Checklist

Requirement	Yes/No
Unattended noise monitoring is undertaken at the following locations R6, R12, R15, R24, R30, E1, E2 and E3 (see Figure 3.3). Monitoring commences a minimum of 48 hours prior to the event and continues until 48 hours after completion of the event.	
Attended noise monitoring is undertaken at each receptor location during installation of the unattended noise monitoring equipment	
Attended noise monitoring is completed at representative receptors during Sound Checks prior to commencement of the event.	
A minimum of two acoustic consultants are provided throughout the event to undertake attended noise monitoring.	
Where noise related calls to the Community Hotline are received, noise monitoring is undertaken at that sensitive receptor. Where no noise related calls have been received, noise monitoring is undertaken at the sensitive receptor locations shown in Table 4.2.	
The first 6 hours of the event are used to identify those receptors most likely to be impacted by amplified entertainment noise from the event,	
<p>Noise limits used for assessment of compliance for sensitive receivers are adopted as follows:</p> <ul style="list-style-type: none"> ● For Zone 1 (as shown in Schedule 4 of this approval and Figure 4.3): <ol style="list-style-type: none"> i. between 11am and midnight amplified entertainment noise from the event at sensitive receivers must not exceed 60dB(A) $L_{Aeq,10\text{-minutes}}$ AND 70dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band; and ii. between midnight and 2am, amplified entertainment noise from the event at sensitive receivers must not exceed 45dB(A) $L_{Aeq,10\text{-minutes}}$ AND 60dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band. ● For Zone 2 (as shown in Schedule 4 of this approval and Figure Error: Reference source not found): <ol style="list-style-type: none"> i. between 11am and midnight amplified entertainment noise from the event at sensitive receivers must not exceed 55dB(A) $L_{Aeq,10\text{-minutes}}$ AND 65dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band; and ii. between midnight and 2am, amplified entertainment noise from the event at sensitive receivers must not exceed 45dB(A) $L_{Aeq,10\text{-minutes}}$ AND 55dB(lin) $L_{eq,10\text{-minutes}}$ in the 63 hertz 1/1 octave band. 	





Requirement	Yes/No
Noise levels in camping areas must be managed to provide for peaceful rest between midnight and 8:00 am.	
<p>When amplified entertainment noise levels exceeds the set noise criteria, the Acoustic Manager implements adequate noise reduction strategies to reduce the noise level. Further noise testing at the receptor is at the subject site is undertaken immediately after the noise mitigation action occurs, until amplified entertainment noise levels are reduced to within the limits.</p> <p>Details of the measured noise levels and action taken are provided to the Event staff member responsible for the Community Hotline.</p> <p>Where requested, the event staff member will contact them the caller to confirm the actions taken in response to their call. Where the noise monitoring personnel do not speak directly with the complainant at the time of the monitoring, a business card or calling card will be placed in their mailbox following completion of the attended noise monitoring.</p> <p>Noise data from the unattended noise loggers at the five (5) sensitive receptors will be reviewed following completion of the event to determine specific receptor amplified entertainment noise levels and/or other non-event noise sources at the time of noise related Community Hotline call.</p>	
Event acoustic controls are audited by an Accredited Acoustic Consultant prior to commencement of the event to ensure compliance with the requirements of Figure 6.1.	
North Byron Parklands maintains the right to enforce the noise guidelines and exercise their right to cease operations of a stage / entertainment area if required.	
<p>Prior to commencement of the event:</p> <ul style="list-style-type: none"> ● provide clear guidance on acceptable front of house noise limits are provided to all sound engineers ● confirm that on-site event stage managers have responsibility for the management of noise emissions from stages. 	
Meteorological data collected by the on-site monitoring station is reviewed throughout the event	
Noise monitoring includes measurement of $L_{Aeq,10\text{-minute}}$ and $L_{eq,10\text{-minutes}}$ in the 63Hz 1/1 octave band.	