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# **Noise Management Plan**

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## Foreword

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This Noise Management Plan concerns itself with those activities planned for the annual event Tanglewood Music and Arts Festival held at 969 Goulburn Valley Highway, Thornton, Victoria. Taking place from the 30th of December to the 2nd of January.

The event planned is an outdoor music event, held on land usually zoned for farming. This document is in support of a planning permit proposal to identify issues raised by this temporary change in the use of land associated with a music festival hosting a wide range of amplified and non-amplified activities. Noise management strategies will be outlined to ensure there is no impact on the rural farming zone, danger to patrons and employees or loss of amenity to surrounding properties or residents.

**This Noise Management Plan was prepared by:**

Dave Swinton Sound Production

Developed in consultation with:

Daniel McKay, Sound Engineer and Project Manager at Melbourne Arts Centre

Independent contractor, Darren Tardio, Enfield Acoustics, noise, vibration.

Title	Version	Date	Author	Reviewed by
Noise Management Plan	V2	03 August, 2021	Dave Swinton	Shannon Gobira, Production Manager, Tanglewood Festival
Noise Management Plan	V1.5	02 August, 2021	Dave Swinton	Imogen Hobbs, Safety & Event consultant
Noise Management Plan	V 1.0	July 2021	Dave Swinton	Darren Tardio, Noise Consultant
Noise Management Plan	V 0.5	July 2021	Dave Swinton	Steph Born, Director, Tanglewood Festival



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## 1. Overview

Tanglewood Festival has the capacity for 3000 patrons and up to 700 staff, contractors, volunteers, and artists.

Tanglewood Festival is a music event that is designed to support local up and coming musicians and artists giving the opportunity to have exposure on a stage in front of a large audience. It caters for a wide range of music styles.

The types of entertainment present at the event will be live bands and DJ's spread across two stages with a full PA system always controlled by a sound engineer and the market area, which will have some buskers and workshops throughout the event period these will be either acoustic or low volume amplification.

The running times proposed are:

Area	Type of work	Date	Time	Approx. People
Stage 1 Bump in	Site Preparation	Late Nov – 24 <sup>th</sup> Dec		5 - 20
Stage 2 Bump in	Festival Build	26 Dec – 29 Dec		120
Stage 3 Bump in (markets, volunteers)	Festival Build	29 <sup>th</sup> December		400
Event Opening	Gates Open to Public	30 <sup>th</sup> December	9:00am	3000 –3500
Event Closing	Entertainment finishes	1 <sup>st</sup> January	1:00am	3000
Event clear of Patrons	Public off site	2 <sup>nd</sup> January	12:00pm	400
Stage 1 Bump out	Pack down / clean	3 <sup>rd</sup> of January	12:00pm	120
Stage 2 Bump out	Pack down and bump out	3rd Jan – 10 <sup>th</sup> Jan		10
Stage 3 Bump out	Final clean/ inspection	30 <sup>th</sup> January		5

30<sup>th</sup> of December 2:00pm – 12:00pm

12:00am – 2am Low-level Volume entertainment, small performance areas, cinema, market space.

31<sup>st</sup> of December 10:00am – 6:00am (January 1<sup>st</sup>)

Music volume reduced at 1am and Low-level Volume from 3am, reduced to half capacity output.

1<sup>st</sup> of January 10:00am – 11:00pm

11pm – 1:00am Low-level Volume entertainment, small performance areas, cinema, market space

### **2<sup>nd</sup> of January – No music, Patrons departing**

A full program will be completed before the event and can be obtained on the website

## 2. Scope

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This Noise Management Plan shall:

- Outline the proposed site plan.
- Prescribe community consultation and complaint response procedures to be implemented.
- Prescribes noise level targets to be achieved and a
- Noise monitoring program to assess and monitor at designated sites in the community.

It is important to note that, while the Tanglewood Festival has the potential to produce noise, other sources of noise are present during this time of year in the area including:

- Music noise from pubs, holiday parks and local parties.
- Nearby flight path.
- Hunting
- Fireworks in the area.
- Traffic on the Goulburn Valley Hwy with heavy trucks and engine breaks.
- Nature, birds' insects.
- Weather events including wind and thunderstorms.

## 3. Glossary of Terms

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**'A' Weighted:** Frequency filter designed to adjust the absolute sound pressure levels to correspond to the subjective response of the human ear.

**dB(A):** Unit of 'A' Weighted overall sound pressure levels.

**L90:** The noise level exceeded for 90% of the measurement period. This measure is commonly described as the 'background' noise of an environment.

**Leq,T:** Energy averaged noise level over the measurement period 'T'. This measure is commonly used when assessing environmental noise.

**Lmax:** The maximum noise level in a measurement period.

**Ambient Sound:** All sound at a point being a composite of sounds from near and far.

**L10:** A statistical measure that is equivalent to the sound level that is exceeded for 10% of the measurement period. This level represents the loudest noise level that occurs.

#### **4. Noise Monitoring Guide**

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The following will be used as a guide to monitoring noise emitted from the event site and surrounds to reduce or eliminate any impact to nearby residents during the Tanglewood Festival and remain compliant with EPA guidelines regarding noise.

Trained audio engineers will be responsible for monitoring and managing all noise within the event site during operational periods. All efforts will be made to work with key stakeholders and community residents surrounding 969 Goulburn Valley Highway, Thornton, to create a fun and culturally significant event whilst causing minimum amount of impact.

As such during the event times music noise emissions will be in accordance with the Environmental Protection Regulations 2021 and EPA Publication 1826 (Noise Protocol), as follows:

- Not greater than 65 dB(A) within noise sensitive areas (as defined by the EP Regulations), generally being within 10m of residential dwellings during the prescribed Standard Operating Hours (as defined by the EP Regulations, Clause 128 and 129), generally being until 11pm.
- Inaudible within noise sensitive areas (as defined by the EP Regulations), outside of the Standard Operating Hours, except where a permit stating different conditions has been granted by the EPA, in accordance with Clause 130 of the EP Regulations.

#### **5. Site Assessment**

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A site inspection was conducted to assess the brief as well as the proposed location of the stages, speaker direction and their proximity to the noise sensitive areas. The event was carried out in 2015/16 without any noise complaints however, in 2017 and 2018 some noise issues were brought to the organiser's attention, prompting further assessment of the site layout, speaker direction and topography of the surrounding area.

A secondary site inspection was also carried out to determine a normal dB range that can be expected in this area. These tests were carried out over a 24-hour period for a minimum of a 15-minute duration on a calm day (with no rain, wind or other environmental issues such as insects.) over sensitive times that the festival proposes to run.

To ensure Tanglewood Festival would not impact surrounding properties, Organisers also engaged an independent noise consultant to conduct testing and develop acoustic mapping for the proposed event. Positioning a noise monitoring device on a neighbouring property that collected data at 15-minute intervals for the duration of the event and pack down.

Where the festival statistics and data showed that the organisers had maintained levels set out in noise management plan the report offered new strategies to further mitigate the risks of noise disturbance.

The event site layout has been organised into one of the back SE paddocks of the property furthest away from surrounding boundary properties and dwellings. The speaker direction faces away from residential and farming areas and into bush land and scrub.

Although some sound has been mapped to travel through the surrounding valleys, through monitoring this proved to be minimal and with the cancelation of some subwoofers at designated times (low end bass) noise levels were no longer detectable with monitoring equipment.

## 6. Control Measures

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Control mechanisms that have been considered in the event planning include:

- Proximity to noise sensitive dwellings
- Proximity to patron camping areas
- Site layout and stage locations
- Speaker direction
- Effect on nearby farming, animals, and wildlife.
- The topography of the land and way noise travels during meteorological conditions
- Reference noise levels at FOH stage positions so that amplification levels can be monitored in real-time

The Front of House (FOH) sound system includes calibrated noise monitoring so that sound engineers can continuously monitor noise levels and carry out adjustments as necessary.

A professional Turbo Sound PA system is used for the event.

The speakers are directional and professional equipment allows for engineers to better control the sound output.

The picture below shows the basic set up for a speaker stack that is used for the event and an event site map (see Appendix C) showing the layout of event site, entertainment, camping, stages, and speaker direction. Speaker direction is pointed away from most populated areas



## 7. Noise Monitoring

### Noise Limits

During the event noise limits must not exceed:

#### Standard Operating Hours

65dB(A) Leq,15-min at noise sensitive areas.

#### Outside of Standard Operating Hours

Inaudible or as prescribed by the EPA permit conditions if granted.

### General Information

Measurements and calculations are performed in accordance with the EP Regulations and Noise Protocol, which specifies the Government's objectives for the control of music noise from public premises.

The policy is designed to protect normal domestic and recreational activities, particularly sleep in the night period, in residential areas. Where these requirements are complied with, the noise emissions are deemed to be acceptable.

### Noise Levels and Compliant Music Levels

A series of measurements were performed in and around the site. Octave band data was adjusted for distance, speaker orientation, operational scenario, attenuation, and monitor operation to calculate the highest music level at the sound desk that will enable compliance with the noise limits at the most effected noise sensitive location.

The calculated sound desk music levels and typical performance types that will achieve compliance at the noise sensitive locations are given below. The octave band data has been simplified and presented as "A" and "C" weighted desk noise limits. The "A" limit controls the vocals and mid to high frequencies while the "C" limit controls the bass frequencies. Although this simplification introduces some uncertainty into the results it also means that a more pragmatic procedure can be implemented at each stage.

Figure 1.

Operational Scenario	Typical Performance that will Comply	Compliant FOH Desk Noise Levels	
		(LA <sub>eq</sub> )	(LC <sub>eq</sub> )
Night performances after 22:00	Amplified band, DJ, (brass, drums and guitar amps may have to be restricted)	96	104
Late Night performances finishing after 24:00 No drums, guitar amps or large monitors.	DJ at limited levels	89	86
Late Night / after 03:00 Stage OR Low Level Entertainment. Movies, Bar, cinema, Workshops, Market, Art Gallery, and small performance spaces.	Low level amplification	<85	<85



The following controls will be implemented to ensure that music levels remain compliant:

- Band and act selection must be based on the recommendations appropriate for each operational scenario as per figure 1.
- Professional high quality Turbo Sound PA System to be used on site and sound tested and tuned prior to the event to achieve best results.
- No live music (DJ's only) will be permitted to perform after 24:00.
- A self-monitoring procedure will be implemented to ensure music levels are compliant.
- Technical personnel will be nominated to be responsible for carrying out the self-monitoring test and checking that the above requirements have been met prior to and during each event. The self-monitoring will not be undertaken by the band or band's sound engineer.

## **8. Self-Monitoring**

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Self-monitoring involves the following:

- Use a basic analogue calibrated Sound Level Meter to monitor music levels (Type 2 sound level meter, SL102 as provided by Noise Consulting or equivalent).
- Set the meter to "A" weighted and use SLOW or "S".
- Use the high or auto range.
- Hold the meter at shoulder height, well away from the body and point it at the speakers.
- At the sound desk, the average level should be no more than the limits appropriate for each operational scenario given in Figure 3
- Check the levels at 1-hour intervals throughout the act and insist that reductions in the music levels are made when required.
- The use of monitoring device/s to be left at a noise sensitive area and collect data.

### **Record keeping**

- Results of the self-monitoring should be recorded and stored.
- Ensure that bands and DJs are made aware of these conditions and are contractually bound by them.
- Where noise exceedances are demonstrated at noise sensitive areas, either through monitoring or complaint, music levels shall be reduced to the compliant level.

## **9. Noise Sensitive Dwellings**

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Mitigation of effect on noise sensitive dwellings include:

- Data collection from past events
- Noise management plan outlining noise limits and controls
- Acoustic mapping of landscape and topography
- Scheduling times and reduction in volumes in sensitive times
- Reduce speakers to half in noise sensitive times
- Speaker direction
- Independent noise monitoring at noise sensitive areas during the festival.
- The use of a 24-hour event site phone that neighbours and residents can contact if issues with noise arise.
- Reduction in volume if noise complaint is made even if the levels are within limits

Tanglewood Festival organisers have implemented higher frequency noise monitoring and included more monitoring locations as a result of information gathered from previous events. Although the scheduling of the event intends to play until 06:00 on the first of January, (outside of the Standard Operating Hours of the EPA Regulations) a specific application for a permit will be made to the EPA and this is acceptable pending EPA approval.

Regardless of this, the levels will be reduced at 01:00 after the New Year's Eve celebration on January first, and noise output will be reduced to half capacity at 03:00 reducing the volume even further.

Past monitoring and data collection shows that when the largest subwoofer speakers were turned off, an inaudible reading was achieved proximate to noise sensitive areas.

## **10. Contact**

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Neighbouring residences and key stakeholders will be contacted in writing of the event at least 4 weeks prior to the event, outlining:

- Name of the event
- Duration of the event
- Contact details of site manager, operations manager, security manager and event organiser during the event

This will also include details supplied with the contact details of the on-duty site management and informed that if they have any problems or wish to make a noise complaint to please contact the site manager so the sound levels can be adjusted accordingly.

If complaints are received and the sound levels are within the acceptable range outlined in this plan, sound engineers will adjust the sound level to satisfy any complaints throughout the duration of the event.

Qualified audio engineers will monitor the noise levels from each sound desk, the nearest residential dwelling, and the front gate.

Sound engineers will also conduct testing on Goulbourn Valley Hwy, Taggerty Thornton Road and Rubicon road.

Upon the request of residents this will also be done at their properties. This will be logged, and records maintained for assessment and debrief after the event.

See Appendix D Letter to Residence

## 12. Effects on Surrounding Areas

The properties, both residential and agricultural, surrounding 969 Goulburn Valley Highway have been assessed for potential noise induced nuisance created by Tanglewood festival.

These properties have been assessed using a risk-based approach using information gathered from previous events.

The table below highlights the areas of concern.

#	Address	Distance from stage	Notes
1	668 Goulbourn Valley Hwy	Approx. 3.2km	No complaints, and no levels over 60dB recorded
2	561 Goulbourn Valley Hwy	Approx. 2km	No complaints, and no levels over 60dB recorded
3	901 Goulbourn Valley Hwy	Approx. 1.2km	No complaints, and no levels over 60dB recorded. Shares a boundary with Tanglewood Festival
4	931 Goulbourn Valley Hwy	Approx. 1.2km	No complaints, and no levels over 60dB recorded. Shares a boundary with Tanglewood Festival
5	1080 Goulbourn Valley Hwy	Approx. 2.4km	No complaints, and no levels over 60dB recorded
6	1089 Goulbourn Valley Hwy	Approx. 2.7km	No complaints, and no levels over 60dB recorded
7	1087 Goulbourn Valley Hwy	Approx. 2.8km	Complaint recorded; noise monitoring device set up on this property for the duration of the Festival.
8	1134 Taggerty Thornton Road	Approx. 2.5km	No complaints, and no levels over 60dB recorded. Shares a boundary with Tanglewood Festival
9	171 Rubicon Road, Rubicon	Approx. 2.2km	No complaints, and no levels over 60dB recorded
10	441 Rubicon Road, Rubicon	Approx. 2.5km	No concerns of noise, shares a boundary with Tanglewood Festival. Is not a residential premises farm shed only.
11	1235 Taggerty Thornton Road	Approx. 3.5km	Noise complaint received, in the past unable to collect data from dwelling. Front gate readings of 45dB at time of complaint.
12 - 16	Properties on Taggerty Thornton Road	Approx. 3.3km	No complaints, and no levels over 60dB recorded in the area.
17 - 25	Properties on Rubicon Road	Approx. 2.2km	No complaints, and no levels over 60dB recorded in the area.

931 Goulbourn Valley Hwy is the closest residential dwelling to the Tanglewood Festival site at 1.2km away. As the closest residential dwelling, Tanglewood organisers have worked hard to ensure regular sound level measurements are taken at this location.

Areas with clusters of residential dwellings have also been highlighted as areas to perform routine noise monitoring at scheduled times during the event.

Other measurements are taken at dwellings where complaints (see Considerations) have been made and are assessed on a case by case basis.

Appendix B shows the Noise Management Map for noise monitoring based on the table above.

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## **13. Considerations**

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### **Previous Noise Complaints and Monitoring**

Past recorded noise complaints came from:

- 1235 Taggerty Thornton Road.
- 1087 Goulbourn Valley Hwy

1235 Taggerty Road Thornton did not permit sound engineers on the property to conduct noise testing and a noise reading from the resident's driveway taken on several occasions indicated that noise was inaudible at this location. Organisers worked with the complaint and although noise limits were within the noise management plan and EPA guidelines levels were still adjusted to satisfy complaint.

1087 Goulbourn Valley Hwy residence organisers were able to leave the noise monitoring device for the duration of the event, this data was used in further development of noise management plan and showed that limits set out in the plan appropriate and not exceeded throughout the event.

### **Effects of Noise Levels on Wildlife and Farm Animals**

There is no record or evidence of wildlife and livestock being affected by the event or any event taking place. The landowner can continue farm practices as normal, with 250 head of cattle grazing in the paddock next to the festival entertainment. The landowner has not experienced any incidents of frightened or stressed animals, broken fences, poor health, effects on breeding or issues over the time of the event or residually to the event taking place.

The event is situated on the site with large distances between neighbouring properties. Where one of the boundary fences runs closer to patron camping, a 6ft fence is erected and covered with hessian to create a physical and visual boundary. Security and emergency vehicles that use the inside lane to travel would be no different to a farm vehicle working on the property.

Further to this there are no fireworks at the event, the music is generally of a lower frequency, music is consistent over time and speakers pointing away from livestock. It is much less disruption than highway traffic, truck exhausts, gunshots, an overhead flight path, mining operations, logging operations and other sounds the animals are exposed to regularly in this area.

A case study carried out by Huybregts (paper titled 'Protecting Horses from Excessive Music Noise' 2008) indicated that horses exposed to music noise emissions from large festivals, such as the BIG DAY OUT and other major events at the Flemington showgrounds were not impacted at noise levels higher than would occur from this site at Tanglewood Festival.

A 2001 study, out of the University of Leicester in the U.K. findings goes further to show that cow's milk production was increased by 3 percent while listening to music.

Objectors have raised specific concerns regarding impacts on deer in the past. There is no evidence that deer have been impacted by the festival in the past. The distance is great enough that they would not be impacted and academic studies indicate that deer are less sensitive to low frequency noise than humans.

## **15. Recommendations**

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The allowable music level at night is basically dictated by the low frequency range (often described as sub-bass and generally in the range of 50Hz to 150Hz). If sound levels in this range can be reduced, the overall music level can be higher. Given this is an outdoor event it is difficult to provide adequate sound treatment as high mass treatment would be required for these frequencies. Because it is the lower frequencies that travel, it may be more pragmatic that sub frequencies can be turned off in the later hours avoiding sound traveling to neighbouring dwellings.

By facing the stages both pointing into areas of dense bushland and by both stages facing the least densely populated areas will ensure the event has the lowest impact possible on all adjoining residents.

If this fails to meet the requirements, we can deploy a cardioid sub array to further focus the sound and reduce nuisance frequencies bleeding into the problematic residential area behind the stage.

Also, by providing the self-monitoring and noise complaint hotline any issues caused by the event can be easily established and documented for future planning and be adjusted immediately to satisfy complaints.

With all measures in place, regular monitoring, communication and the reduction of sub frequencies, a reduction in the number of speakers used after 11pm and further at 3am dwelling and noise sensitive areas will not be affected by noise from Tanglewood Festival.

Following this a further report will be compiled after the event providing the readings taken throughout as specified in this report. Further to this any neighbouring properties that are affected by the noise of the event even within limits will be supplied with contact details so it can be resolved in a timely manner and no loss of amenity is caused to the local community.



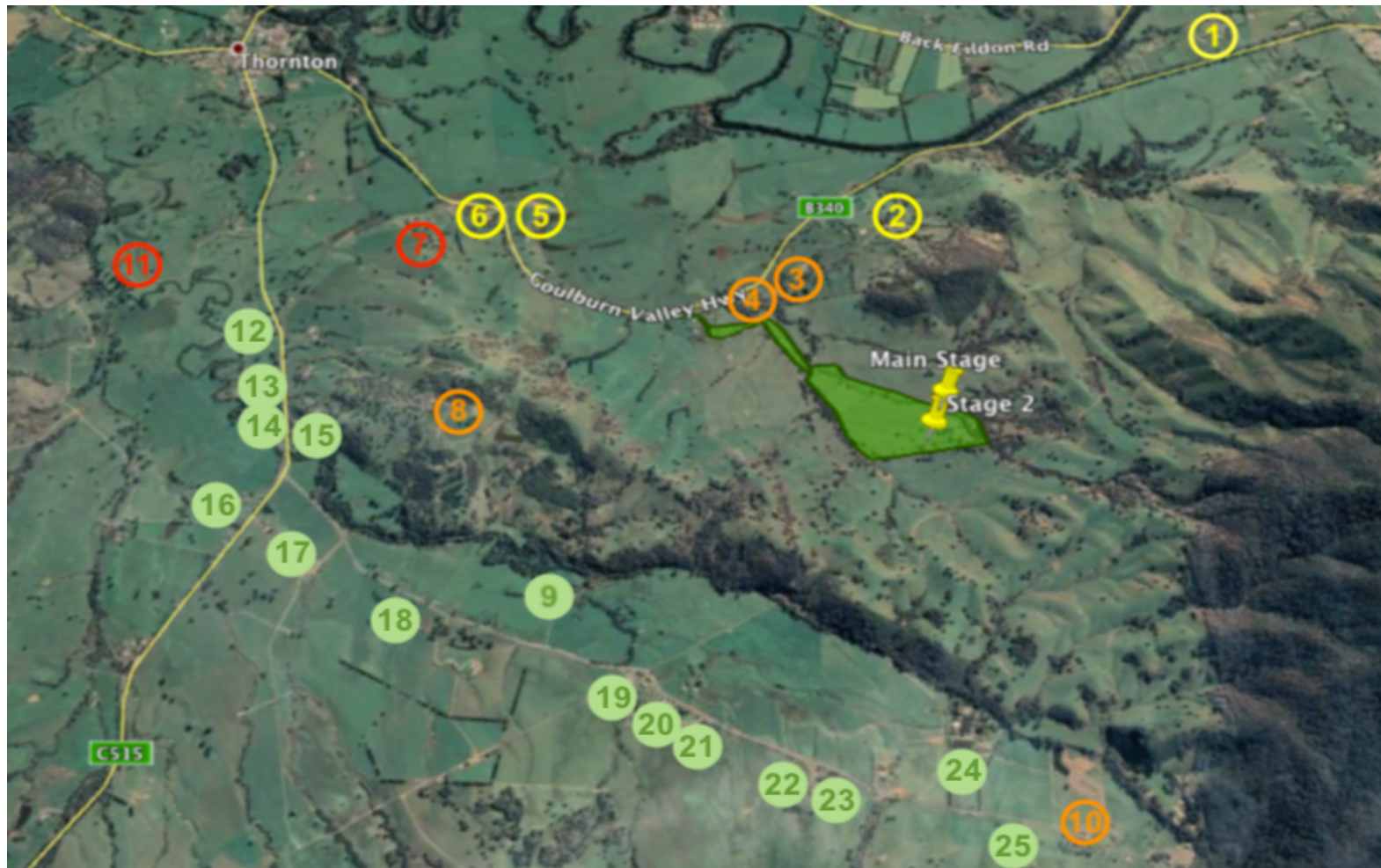
**Tanglewood Festival  
Noise Management Plan**

**17. Appendix A – Event Schedule**

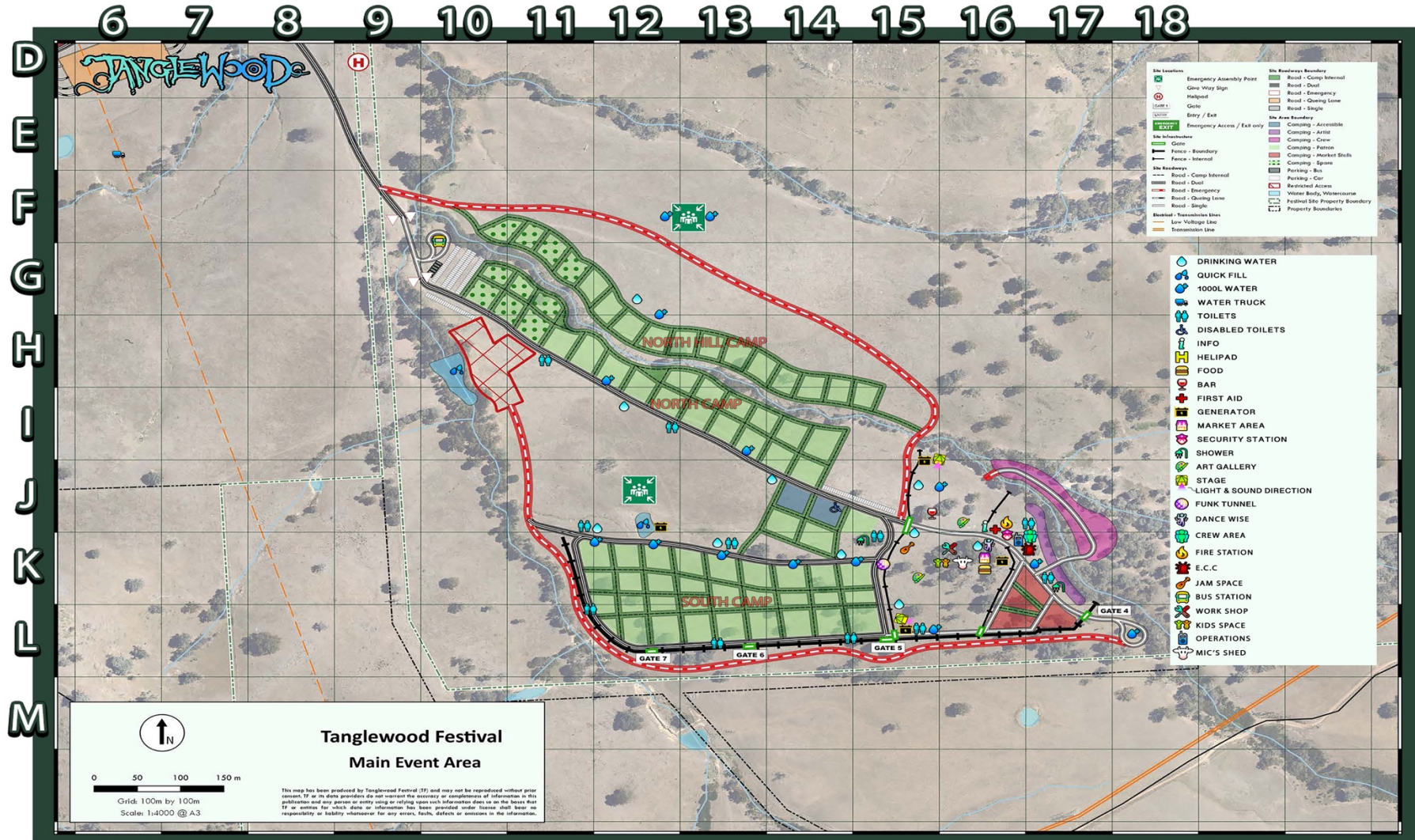
Area	Notes	29th Dec	30th Dec	31st Dec	1st Jan	2nd Jan	3rd Jan
Stage 1	Live bands	Sound tests	14:0 – 00:00	10:00 – 06:00	03:00am – 06:00 Low Volume 10am – 11pm	Closed	Closed
Stage 2	DJ's	Sound Tests	14:00 – 00:00	10:00 – 06:00	03:00 – 06:00 Low volume 06:00 Closed Cinema 20:00 – 01:00	Closed	Closed
ECC	Emergency services	12:00 – 21:00	24hrs	24hrs	24hrs	Until 21:00	Closed
Medical		09:00 – 21:00	24hrs	24hrs	24hrs	Until 18:00	Closed
Dancewize	Crowd care	Closed	TBC	TBC	TBC	Closed	Closed
Operations	Site, Production & event management	08:00 – 21:00	07:00 – 01:00	07:00 – 03:00	07:00 – 01:00	07:00 – 21:00	08:00 – 21:00
Volly HQ / Info	Volunteer manager & event info	08:00 – 21:00	07:00 – 23:00	07:00 – 23:00	07:00 – 23:00	7:00 – 21:00	08:00 – 21:00
Market/Food Stalls	Food & craft market	Bump In 08:00 – 21:00	09:00 – 00:00	08:00 - 04:00	8:00 – 01:00	08:00 – 12:00	Closed
Bar	Festival bar	Closed	12:00 - 00:00	12:00 – 04:00	12:00 -22:00	Closed	Closed
Market / Micks Shed	Market entertainment. Low-level volume. Open mic, spoken word	Closed	10:00 – 01:00	10:00 - 04:00	10:00 – 01:00	20:00 – 01:00 (no patrons)	Closed
Funk Tunnel	Chill space and low-level volume performer space.	Closed	10:00 – 02:00	10:00 - 04:00	10:00 – 01:00	20:00 – 01:00 (no public)	Closed
Jam Space	Chill space & acoustic jam space	Closed	10:00 – 01:00	10:00 - 04:00	10:00 – 23:00	Closed	Closed
Art Gallery	Chill, mini cinema, library & gallery. Low-level volume	Closed	10am – 1am	10:00 - 04:00	10:00 – 23:00	Closed	Closed
Workshop Space	Educational & health workshops Chill, Low-level volume.	Closed	07:00 – 22:00	07:00 – 22:00	7:00 – 22:00	7:00 – 21:00	Closed
Children's Space	Children's activities and workshops	Closed	12:00 – 19:00	09:00 – 19:00	09:00 – 19:00	Closed	Closed
Community Kitchen	Family space kitchen facilities, access to power.	Closed	16:00 – 19:00	07:00 – 10:00 16:00 – 19:00	7:00 – 10:00 16:00 – 19:00	07:00 - 10:00	Closed

### 19. Appendix B – Noise Management map

The map below outlines the risk-based approach to noise monitoring for possible effected noise sensitive dwellings/areas. Priority of testing locations is determined by past data and research, past noise complaints received and proximity to the event or sharing a boundary fence line.



20. Appendix C - Site Map





## **21. Appendix D – Letter to Residence**

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Date



Dear Resident,

We would like to inform you that Tanglewood Festival will be held between from the 30<sup>th</sup> of December to the 2<sup>nd</sup> of January at 969 Goulburn Valley Hwy Thornton VIC.

The festival operating hours will be:

**29<sup>th</sup> December** – Bump in 8am – 9pm

**30<sup>th</sup> December** – Gates open public 9am / 2:00pm - 12:00am (12:00am - 2:00am low level)

**31<sup>st</sup> of December** - 10:00am - 6:00am(/1<sup>st</sup>) Music lowered at 1am (3am – 6am low level)

**1<sup>st</sup> of January** 10:00am – 11:00pm (11:00pm – 1:00am low level)

**2<sup>nd</sup> of January** – Gates closed 12pm and bump out.

Tanglewood Music and Arts Festival will be appropriately monitored both internally and externally by our security company and we expect minimal disturbance from our patrons. The event will strictly adhere to Murrindindi Shire Councils, liquor Licensing requirements for safety, emergency management and planning and noise levels will be independently monitored throughout the event. The event organisers are also working very closely with local authorities and the event will have its own independent onsite fire protection services and medical, ambulance staffed with paramedics and doctors to ensure no strain on local resources.

To ensure that there is minimal disruption to the surrounding residential areas, the following measures will be implemented:

1. Continual monitoring of sound levels to ensure that sound emissions from the site comply with Murrindindi Shire Council and EPA Noise Mitigation Standard for Events.
2. Sound systems will be directional and appropriately sized for venue and usage to minimise sound spilling outside of venue.
3. Venue will be oriented as much as possible to direct any inadvertent sound spill from sound systems away from residential areas.
4. All relevant event staff and contractors have been fully briefed and understand the Murrindindi Shire Council and EPA Noise Mitigation Standard for Events that govern this event.
5. Music will be lowered in later evening hours to ensure it does not cause annoyance beyond the event site.
6. Sound engineers available throughout the entire event to monitor and adjust noise levels if noise complaints are received, this is applicable when the noise limits are within those limits set out in the Noise Management Plan.
7. Event plans and supporting documents developed to mitigate all risks.
8. Security, Medical and Fire management staff, and resources provided by the event organiser to ensure no burden to local resources.
9. Traffic Management plan for the Goulbourn Valley highway, in place from 7am 29<sup>th</sup> December – 8pm 2<sup>nd</sup> of January.
10. A 24-hour site phone will be operational for duration of the event. For any issues, please contact this number **0418 140 742**



While you may hear music from our event, all sound should be within Murrindindi Shire Council and EPA guidelines. Although we may be within the guidelines if you have an issue with the sound coming from our event at any time you are welcome to contact our hotline and we will adjust it accordingly to satisfy any complaint.

Upon receipt of a complaint our sound engineer will test the sound level in your immediate area to ensure it complies with Murrindindi Shire and EPA Noise Mitigation Standard for Events, as set out in our noise management plan. If the sound level breaches any part of these standards, the offending music will be reduced to comply. You will be notified of the result of our investigations and the course of action undertaken.

Tanglewood Festivals on duty site manager can be contacted on **0418 140 742** at any time during the event to report any noise related issues or any problems you may be experiencing in relation to the event.

Alternatively, you can contact Murrindindi Shire Council on (03) 5772 0333 or [msc@murrindindi.vic.gov.au](mailto:msc@murrindindi.vic.gov.au)

Tanglewood Music and Arts Festival organisers will take all necessary precautions to ensure the local community is not adversely affected by the event in your precinct.

If you have any concerns in the lead up to the event, please contact myself on the details provided below.

Sincerely,

Steph Born  
Festival Director  
[info@tanglewoodfestival.com.au](mailto:info@tanglewoodfestival.com.au)  
0418 140 742



# TANGLEWOOD FESTIVAL, 2018/2019

## Acoustic Report

For

TANGLEWOOD FESTIVAL

DOC. REF: V064-01-C ACOUSTIC REPORT (R0)  
7 MAY 2019

Enfield Acoustics Pty Ltd  
ABN 15 628 634 391  
Ph: +61 3 9111 0090  
PO Box 920  
North Melbourne, VIC 3051

Project Tanglewood Festival, 2018/2019  
Subject Acoustic Report  
Client Tanglewood Festival  
Document Reference V064-01-C Acoustic Report (r0).docx  
Date of Issue 7 May 2019

*Disclaimer:*

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# 1 Introduction

Enfield Acoustics was engaged by Tanglewood Festival to assess the music noise emissions from their 2018/2019 event which operated between 30 December 2018 and 2 January 2019 (Festival) on the Subject Land of 969 Goulburn Valley Highway, Thornton.

## 2 Festival Permits

The Festival was permitted by Murrindindi Shire Council in accordance with Permit 2016/113 which is due for re-application for future events. As part of that re-application process, it is understood that Council has requested information with regard to the noise emissions that occurred during the 2018/2019 event.

The Permit includes the following conditions:

- (3) Music from the events may occur between the hours of 3pm and midnight on 30 December 2018, from 10am on 31 December to 6am on 1 January and 10am till 11.00pm on 1 January.
- (7) Noise generated from the use hereby permitted for normal operating hours must not exceed 96 dB(A) on the main stage and 92 dB(A) on Stage 2, measured at 30 metres from front of the stage, and for late night noise levels must not exceed 89 dB(A) on the main stage and 86 dB(A) on Stage 2, measured at 30 metres from front of the stage as detailed in the noise management plan. Should a complaint be received about the noise level, the sound engineer must check levels and adjust accordingly.
- (17) The emission of noise from the property including the surrounding environment and carpark areas either during or immediately after the hours permitted, must not cause annoyance to persons beyond the site.

## 3 Document Scope

Enfield Acoustics attended the 2018/2019 event on 30 December 2018 and left unattended noise monitoring equipment proximate the Subject Land for the remaining event dates. This document provides the following:

- Results the engineer's noise measurements and observations made during attendance;
- Results of the unattended noise monitoring data;
- Verification regarding whether the event complied with the relevant Planning Permit conditions;
- Noise contour mapping over the broader and surrounding area, based on measurements and observations made during the event; and

- Recommendations to minimise noise impacts at future events.

## 4 Observations

The event was attended by Enfield Acoustics between approximately 3pm on 30 December 2018 to 1am on 31 December 2018. Spot noise measurements and observations were carried out at several locations over the course of the evening to identify the level and audibility at surrounding residential lands.

The measurement locations inspected are depicted in Appendix A.

It is understood that the resident of 1235 Taggerty-Thornton Road has registered complaints during previous years events. Because of this, the resident was contacted during our attendance to investigate if noise was audible or measurable at their property, however access to the land was not granted by this complainant during our attendance. Monitoring was instead undertaken at this resident's property boundary.

Throughout the event, the following observations were made:

- Sub-bass (primarily within the 63Hz Octave Frequency Band) was audible on occasion at some the residential locations monitored;
- Music noise was most audible at Location 2, being Blue Range Cl;
- While conditions were generally calm, a slight wind from the north may have explain the slightly elevated noise levels at Location 2;
- Music noise was just audible at Location 3, being Taggerty-Thornton Road;
- Sub-bass was generated by 18" and 21" speakers. Turning off amplification to the 21" speakers effectively resulted in inaudibility of music noise at the residential locations; and
- At the respective front-of-house monitoring locations for each stage, the festival sound engineer was also noted to be monitoring noise levels using a calibrated microphone to ensure levels did not exceed those stated on the Permit.

## 5 Permit Compliance

Noise levels were checked at 30m from each of the main stages. It was noted that because festival sound engineer was also monitoring noise levels at front-of-house locations, the levels were operating within the levels deemed allowable on the Permit, with measurements indicating the following levels:

- 96dB(A) at the Main Stage
- 91dB(A) at Stage 2

The main stages ceased operation after midnight and therefore music noise emissions were effectively nil on the night of attendance.

Refer to Appendix B for detailed noise monitoring traces.

With respect to the observations and measurements made during attendance, the event complied with the Permit at the front-of-house reference locations.

## 6 Audibility at Residential Locations

Because sub-bass was audible proximate some of the residential locations tested, it is difficult to determine if this resulted in annoyance. Based on our observations and measurements during attendance, complaints not registered from residents proximate to Location 2 (Blue Range Cl) would indicate that the event did not cause any significant annoyance.

We note that *State Environment Protection Policy No. N-2* generally requires inaudibility after 11pm for outdoor music events however in practice, this requirement is typically waived for New Year's Eve events or where the event is of special social significance. Regardless, it is recommended that the Festival applies to the EPA for special social significance status to avoid ambiguity with respect to inaudibility and annoyance for music operations after 11pm.

Prior to 11pm, SEPP N-2 allows music noise levels up to 65dB(A). The highest dB(A) noise emission recorded from the festival at all the monitoring locations, including the unattended noise logger, was 48dB(A). On this basis, the festival comfortably complies with SEPP N-2 for normal hours of operation.

## 7 Unattended Noise Logging

An unattended noise logger was installed at Location 5, being 1087 Goulburn Valley Hwy. The site location was on a hill elevated above the festival with good acoustic line-of-sight to the stages.

Consistent with the attended measurements carried out on 30 December, sub-bass noise was just identifiable and audible in the unattended noise logging data, between:

- 12pm 31 December 2018 and 6am 1 January 2019
- 12pm and 10pm 1 January 2019

On 30 December, no music noise was audible at the monitoring location after 12am.

It is understood that the resident of 1235 Taggerty-Thornton Road lodged complaints at the following times:

- 7:25pm, 30 December
- 1:31am, 31 December
- 2:30am, 1 January

On review of the noise levels at the monitoring location, which was situated closer than the complainant's property but in the same direction relative to the festival, the times of complaint do not appear to be consistent with actual noise emissions from the festival. In particular, the unattended noise monitoring indicates music noise was inaudible from the festival at 1:31am on



31 December. Because of this, there appears to be some uncertainty regarding the validity of some of the complaints.

Refer to Appendix B for detailed noise monitoring traces.

## 8 Noise Mapping

Noise contour mapping has been generated and calibrated using the measured data taken on site. The noise mapping includes the effects of the local terrain, with 3D elevation contours being imported into the model, and assumes favourable propagation due to wind in all directions.

Under the most favourable conditions for noise propagation (i.e. downwind), the contour mapping indicates that low frequency noise (at 63Hz) can generally be expected to range between 40dB and 60dB at residential properties within a 10km radius. Noise levels between approximately 55-65dB at 63Hz can still be expected to be audible but not necessarily cause annoyance.

Refer to Appendix C for the noise mapping contours.

## 9 Recommendations and Conclusion

Based on observations and measurements carried out for the 2018/2019 event:

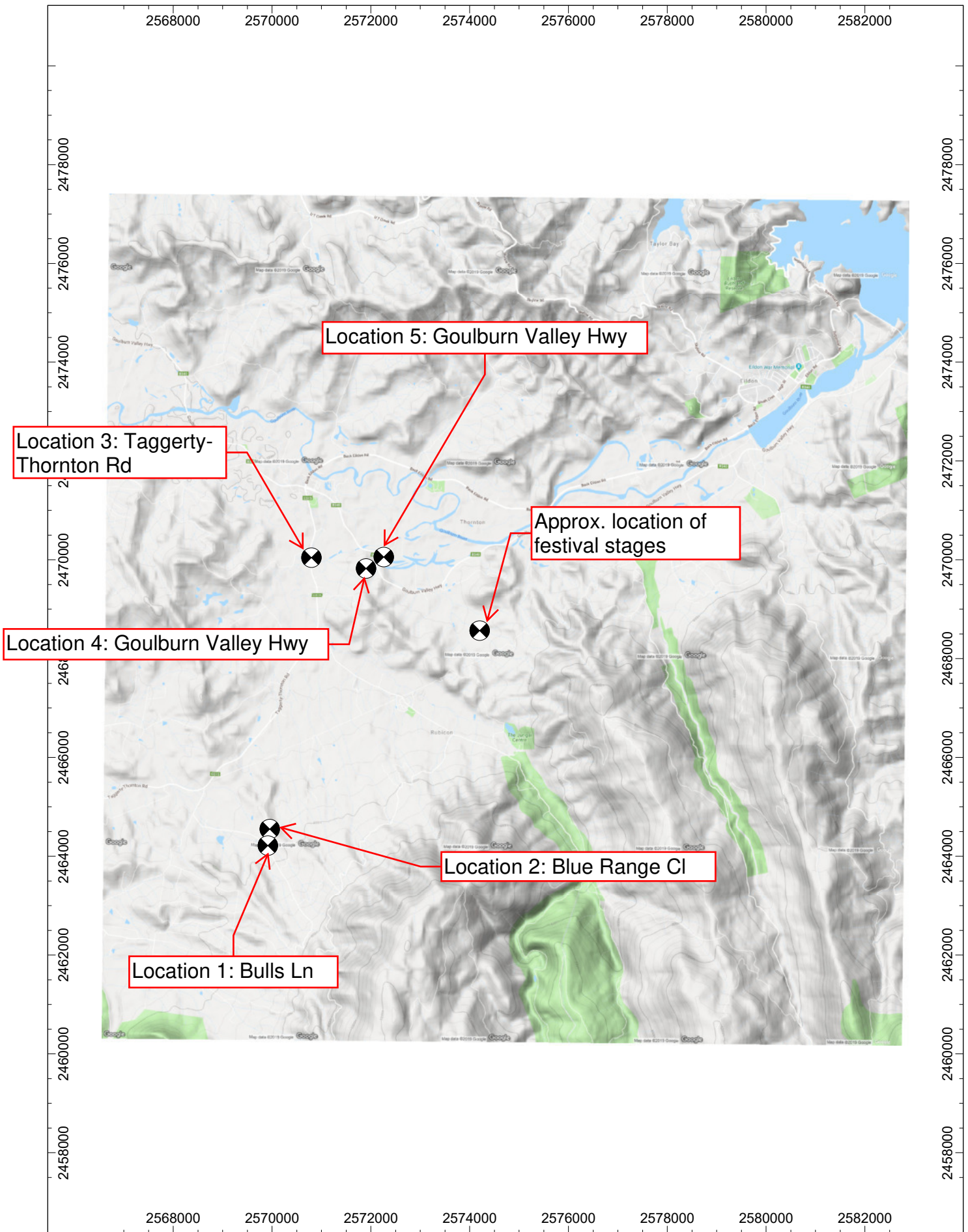
1. The festival complied with the prescriptive noise conditions on the planning permit.
2. The festival complied with SEPP N-2 during the normal operating hours.
3. Sub-bass noise was audible at the boundaries of some residential properties, but typically ranged between 50dB and 60dB at 63Hz. This range typically results in audibility in rural areas but not necessarily correlation with annoyance. Levels higher than 65dB at 63Hz would be much more likely to result in annoyance.
4. The sub-bass noise was essentially mitigated by turning off amplification to the 21" loudspeakers.

Noise mapping indicates that:

1. Depending on the wind direction, generally residents within an approximate 10km radius from the site would experience similar noise emissions, ranging just audible to audible.
2. Noise emissions are generally <60dB at 63Hz and therefore unlikely to result in significant annoyance given the temporary nature of the festival.

If required to minimise noise emissions further, the most practical option would be to reduce the amplification through the 21" loudspeakers after 11pm, however we recommend that this is only enforced where complaints are registered.

## Appendix A: Noise Monitoring Locations

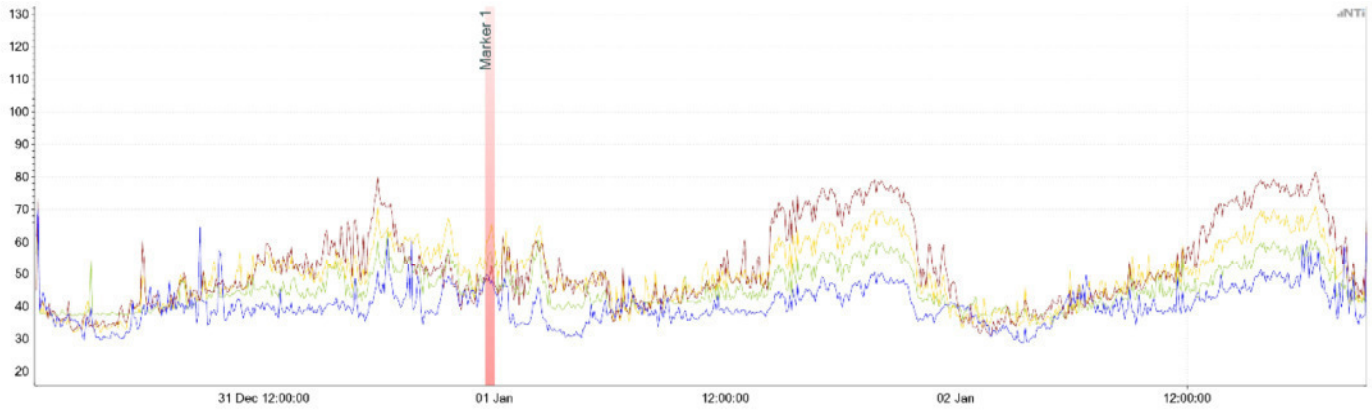


## Appendix B: Noise Monitoring Data

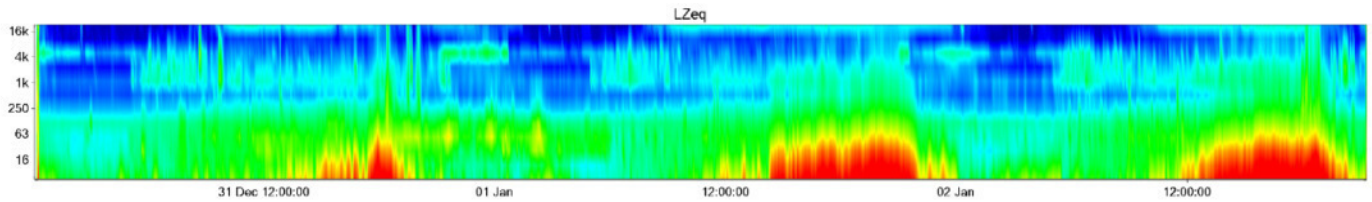
# Unattended Noise Logging

Start: 2018-12-31 00:09:52

End: 2019-01-02 21:18:36



— LAeq\_dt    
 — LZeq@31.5\_dt    
 — LZeq@63.0\_dt    
 — LZeq@125.0\_dt



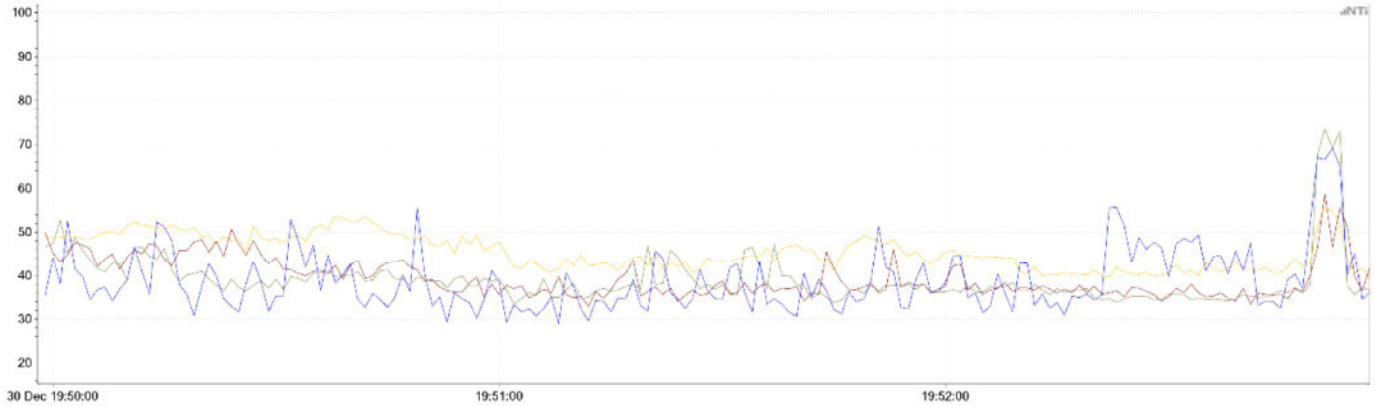
## Configuration

Device Info: XL2, SNo. A2A-14796-E0, FW4.03  
 Mic Type: NTi Audio M2230, SNo. 7655, Factory adjusted  
 Mic Sensitivity: 42.0 mV/Pa  
 Range: 0 - 100 dB

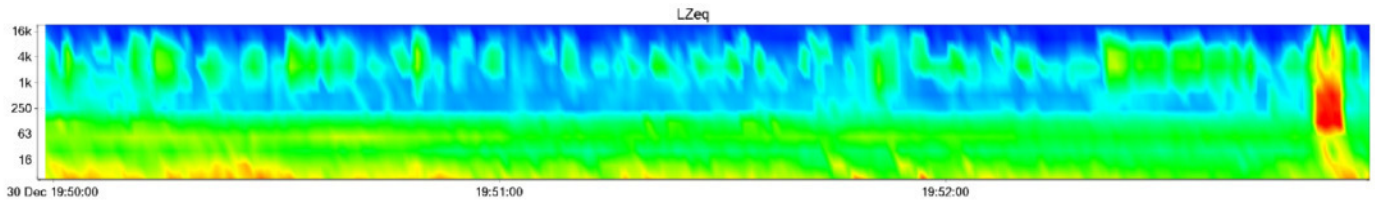
## Location 1

Start: 2018-12-30 19:49:58

End: 2018-12-30 19:52:56.6



— LAeq\_dt      — LZeq@31.5\_dt      — LZeq@63.0\_dt      — LZeq@125.0\_dt



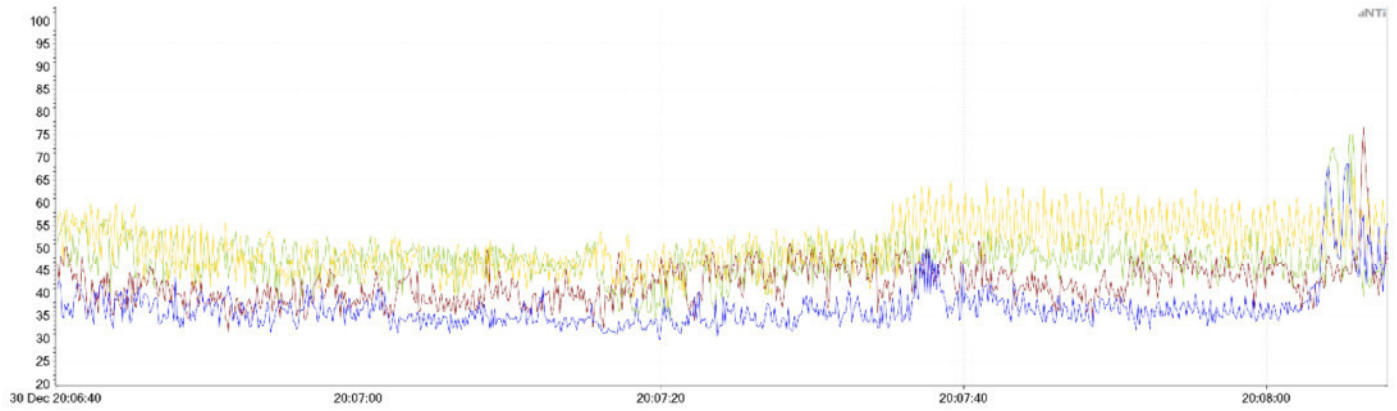
### Configuration

Device Info: XL2, SNo. A2A-15017-E0, FW4.03  
 Mic Type: NTi Audio M2230, SNo. 7817, Factory adjusted  
 Mic Sensitivity: 44.6 mV/Pa  
 Range: 0 - 100 dB

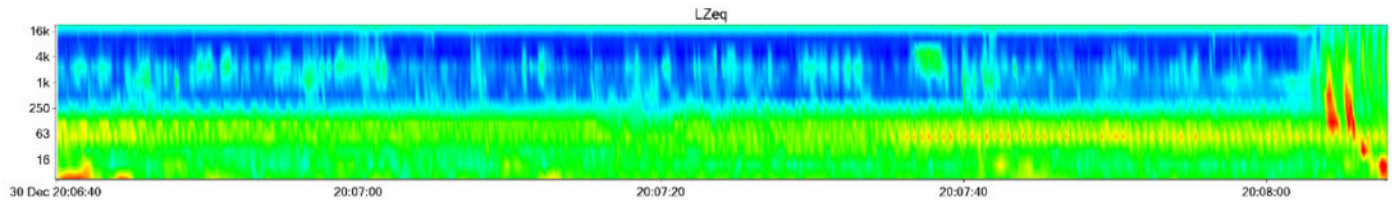
## Location 2

Start: 2018-12-30 20:06:40

End: 2018-12-30 20:08:08



— LAeq\_dt    — LZeq@31.5\_dt    — LZeq@63.0\_dt    — LZeq@125.0\_dt

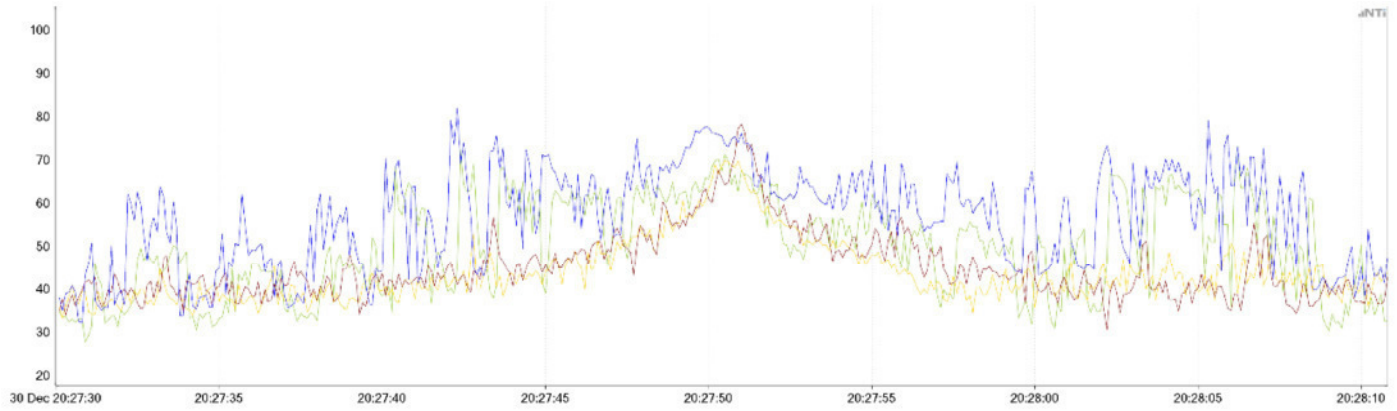


### Configuration

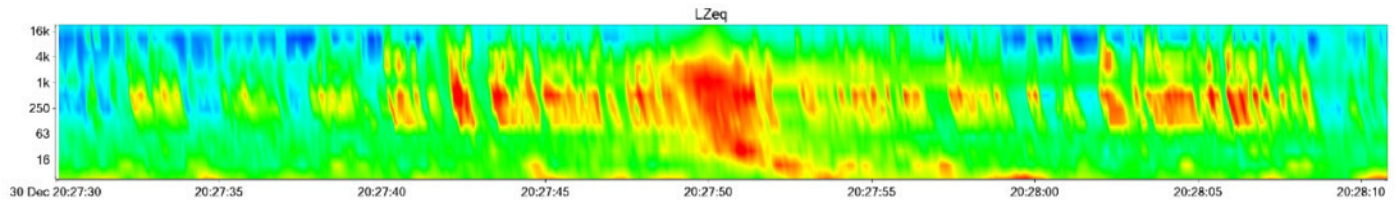
Device Info: XL2, SNo. A2A-15017-E0, FW4.03  
 Mic Type: NTi Audio M2230, SNo. 7817, Factory adjusted  
 Mic Sensitivity: 44.6 mV/Pa  
 Range: 0 - 100 dB

### Location 3

Start: 2018-12-30 20:27:30  
 End: 2018-12-30 20:28:10.8



— LAeq\_dt      — LZeq@31.5\_dt      — LZeq@63.0\_dt      — LZeq@125.0\_dt



### Configuration

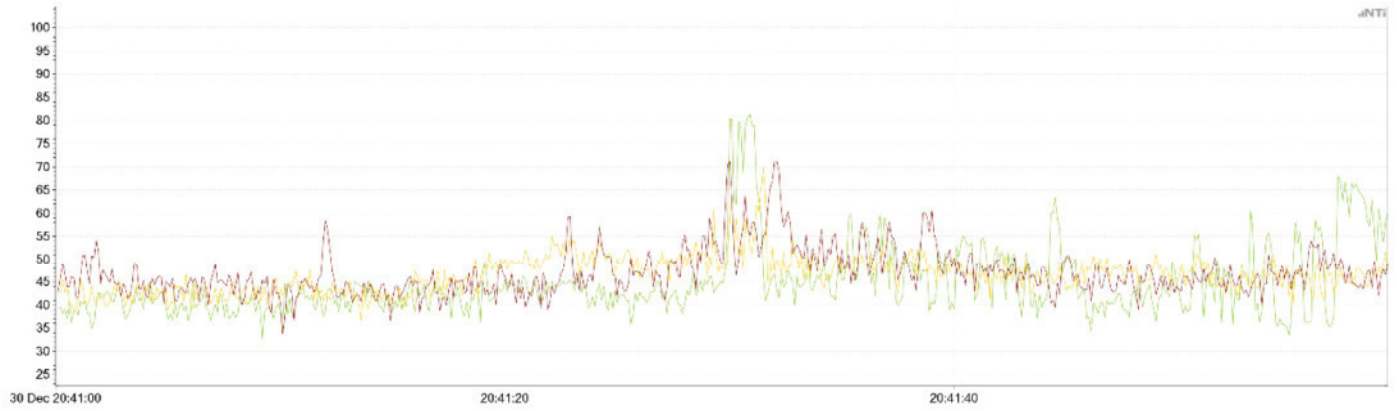
Device Info: XL2, SNo. A2A-15017-E0, FW4.03  
 Mic Type: NTi Audio M2230, SNo. 7817, Factory adjusted  
 Mic Sensitivity: 44.6 mV/Pa  
 Range: 0 - 100 dB



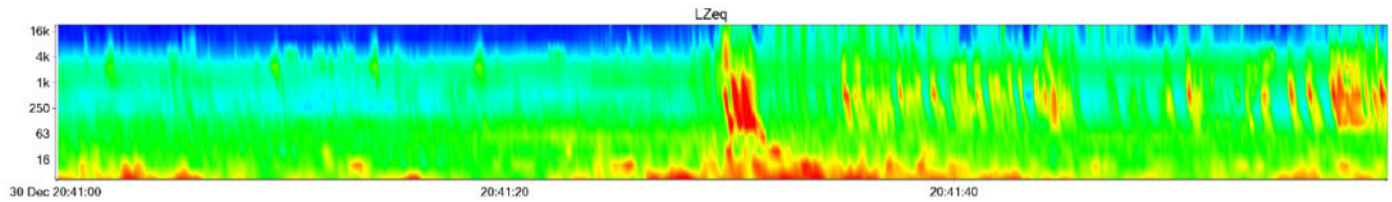
## Location 4

Start: 2018-12-30 20:41:00

End: 2018-12-30 20:41:59.3



— LZeQ@31.5\_dt    — LZeQ@63.0\_dt    — LZeQ@125.0\_dt



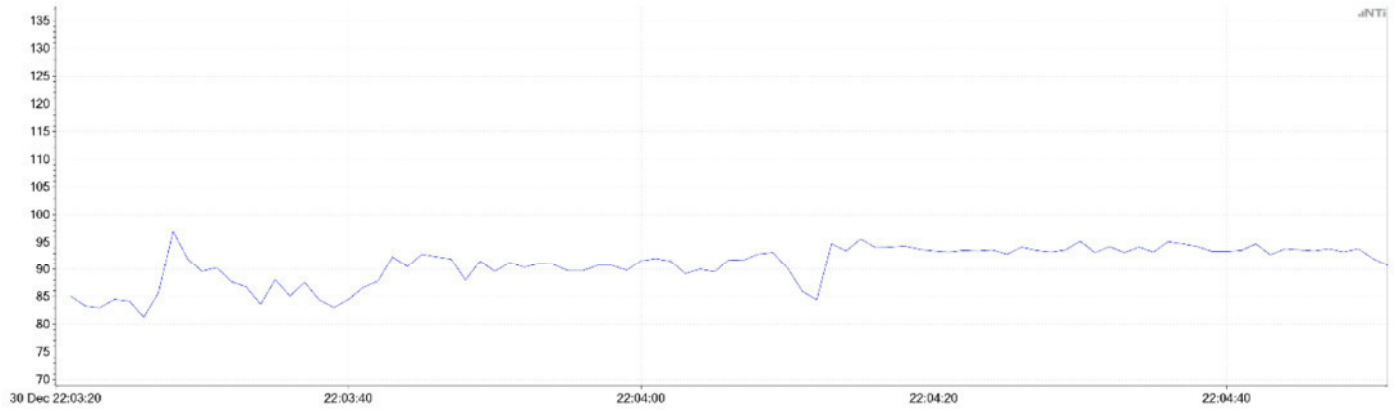
### Configuration

Device Info: XL2, SNo. A2A-15017-E0, FW4.03  
Mic Type: NTi Audio M2230, SNo. 7817, Factory adjusted  
Mic Sensitivity: 44.6 mV/Pa  
Range: 0 - 100 dB

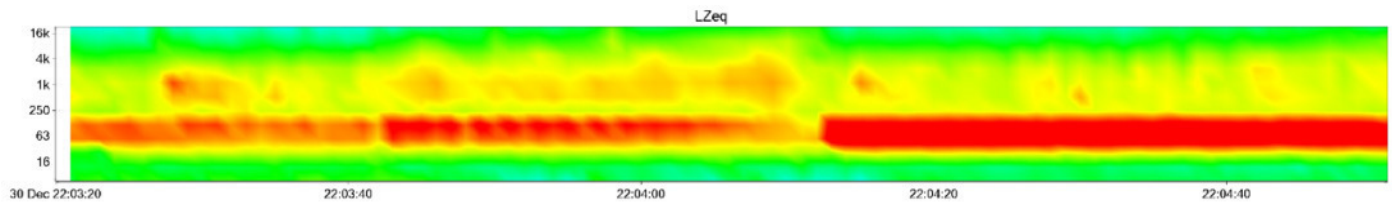
## 30m from Main Stage

Start: 2018-12-30 22:03:20

End: 2018-12-30 22:04:51



— LAeq\_dt



### Configuration

Device Info: XL2, SNo. A2A-15017-E0, FW4.03  
 Mic Type: NTi Audio M2230, SNo. 7817, Factory adjusted  
 Mic Sensitivity: 44.6 mV/Pa  
 Range: 40 - 140 dB

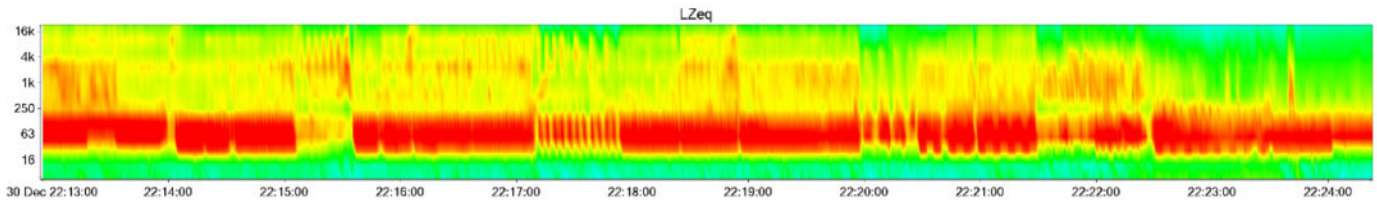
## 30m from Stage 2

Start: 2018-12-30 22:12:54

End: 2018-12-30 22:24:23



— LAeq\_dt      — LZeq@31.5\_dt      — LZeq@63.0\_dt      — LZeq@125.0\_dt



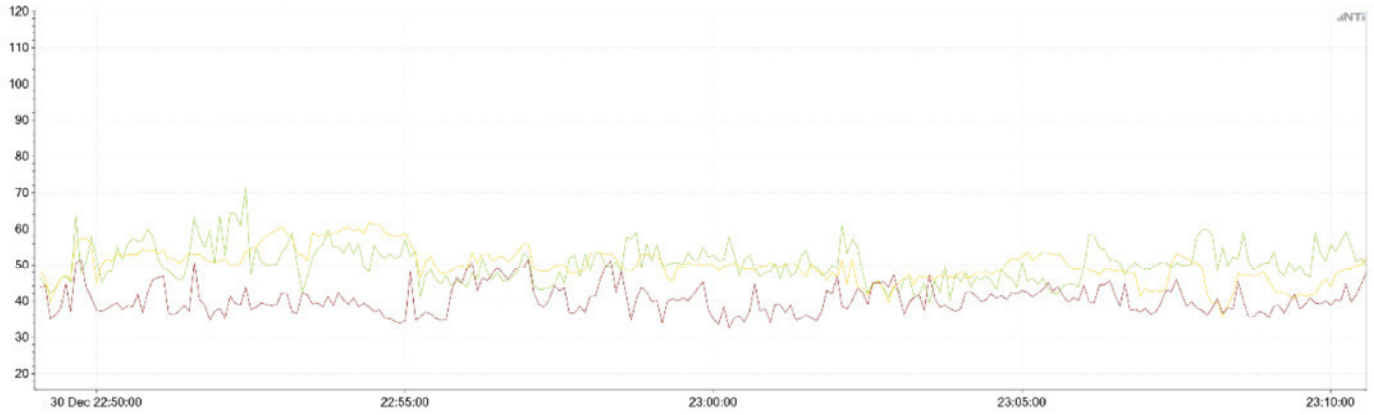
### Configuration

Device Info: XL2, SNo. A2A-15017-E0, FW4.03  
 Mic Type: NTi Audio M2230, SNo. 7817, Factory adjusted  
 Mic Sensitivity: 44.6 mV/Pa  
 Range: 40 - 140 dB

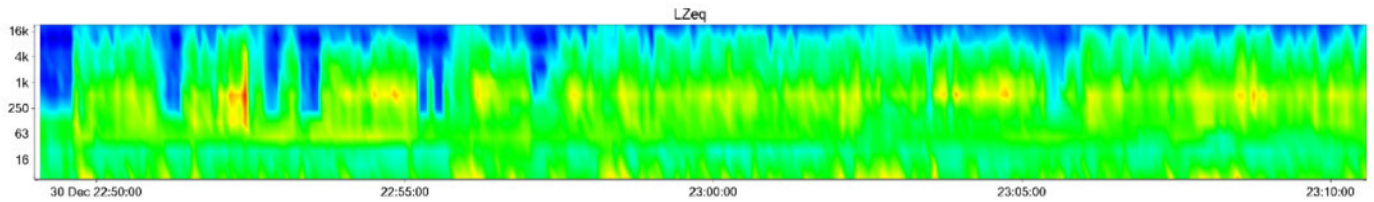
## Location 2

Start: 2018-12-30 22:49:00

End: 2018-12-30 23:10:32



— LZeQ@31.5\_dt    — LZeQ@63.0\_dt    — LZeQ@125.0\_dt



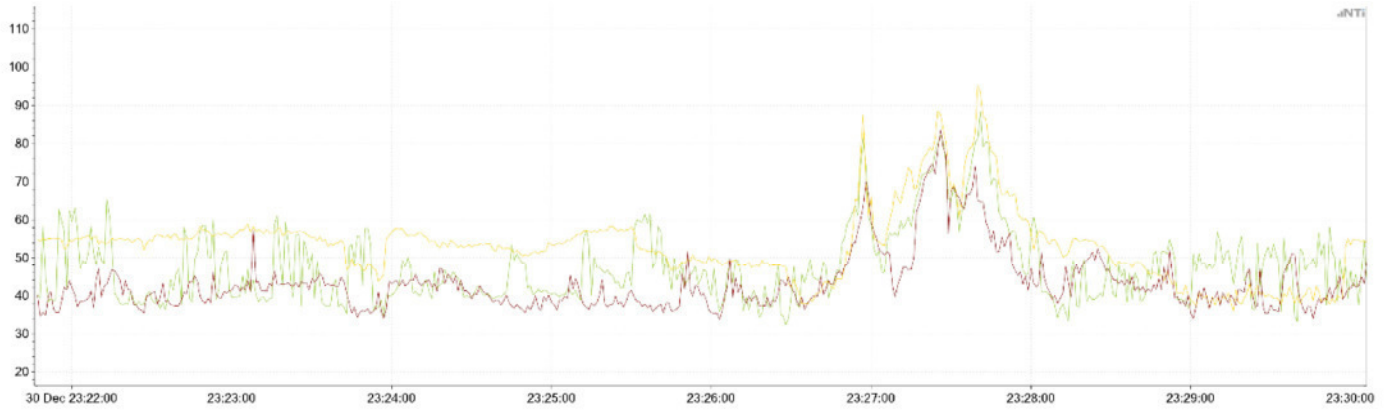
### Configuration

Device Info: XL2, SNo. A2A-15017-E0, FW4.03  
Mic Type: NTi Audio M2230, SNo. 7817, Factory adjusted  
Mic Sensitivity: 44.6 mV/Pa  
Range: 0 - 100 dB

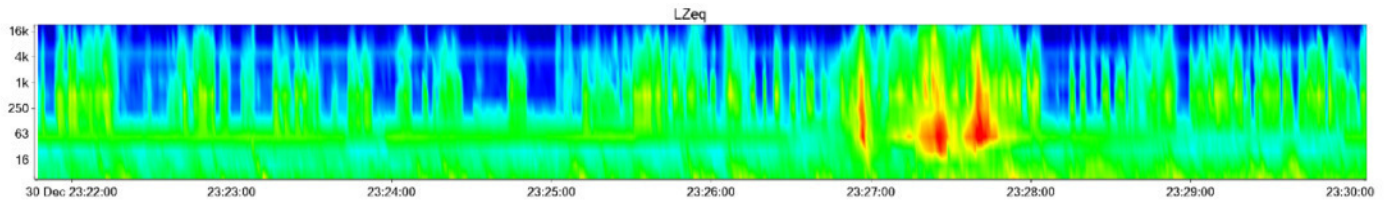
### Location 3

Start: 2018-12-30 23:21:46

End: 2018-12-30 23:30:06



— LZeq@31.5\_dt    — LZeq@63.0\_dt    — LZeq@125.0\_dt



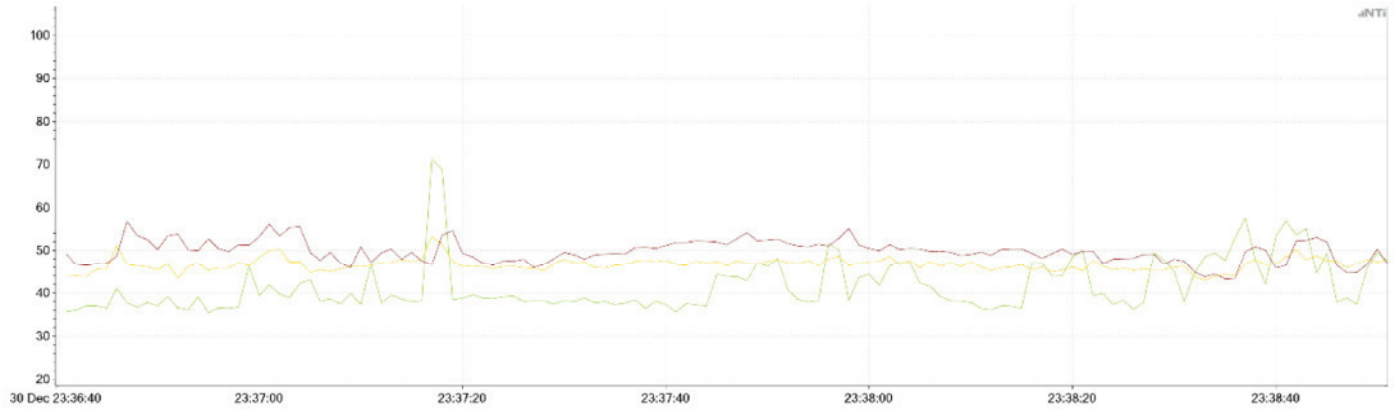
### Configuration

Device Info: XL2, SNo. A2A-15017-E0, FW4.03  
 Mic Type: NTi Audio M2230, SNo. 7817, Factory adjusted  
 Mic Sensitivity: 44.6 mV/Pa  
 Range: 0 - 100 dB

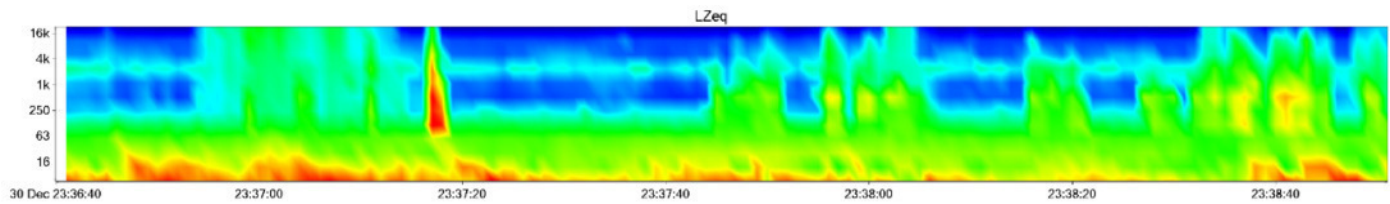
## Location 4

Start: 2018-12-30 23:36:40

End: 2018-12-30 23:38:51



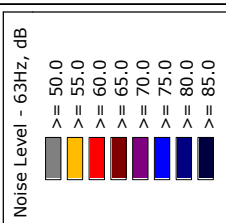
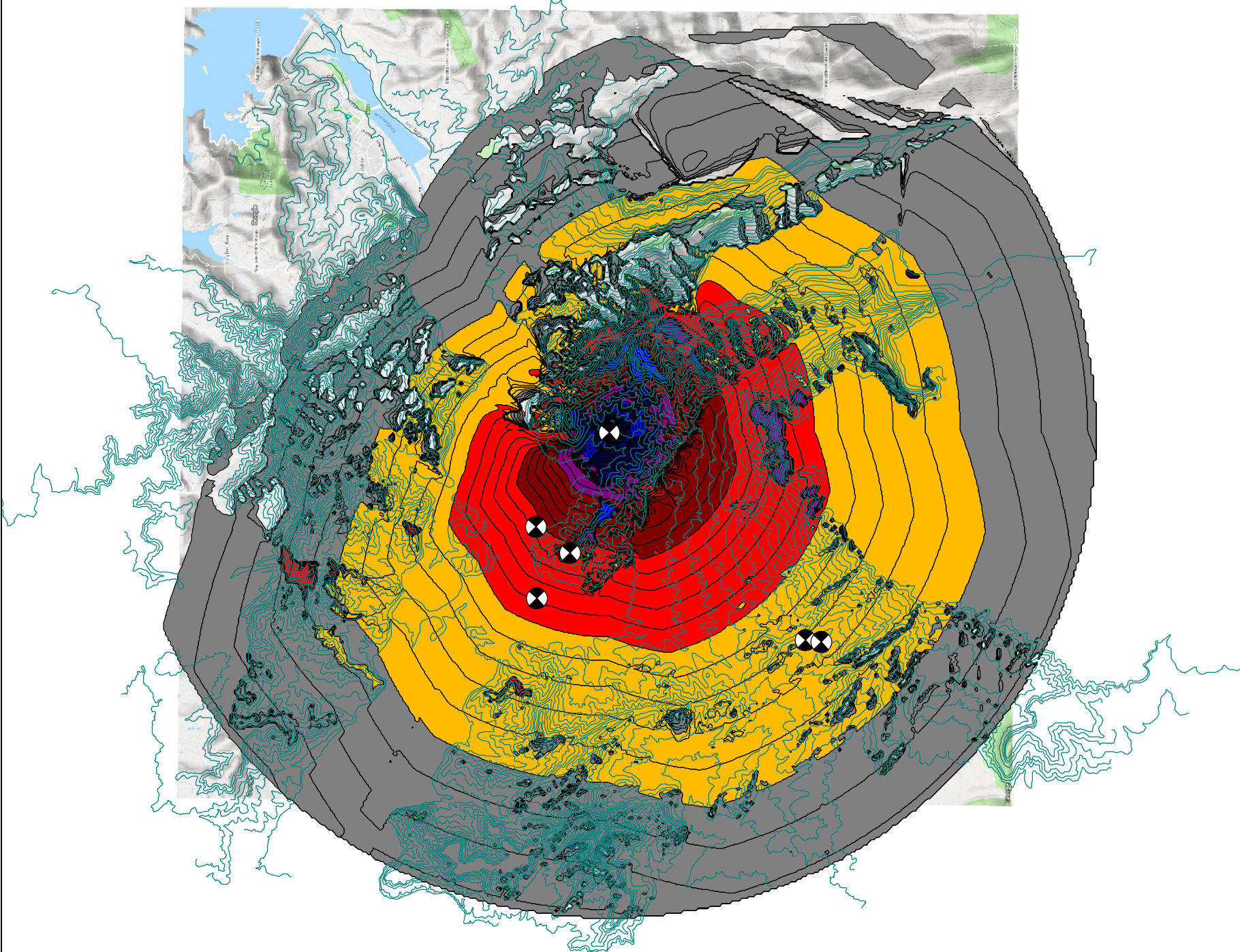
— LZeQ@31.5\_dt    — LZeQ@63.0\_dt    — LZeQ@125.0\_dt



### Configuration

Device Info: XL2, SNo. A2A-15017-E0, FW4.03  
 Mic Type: NTi Audio M2230, SNo. 7817, Factory adjusted  
 Mic Sensitivity: 44.6 mV/Pa  
 Range: 0 - 100 dB

## Appendix C: Noise Mapping Contours



**ENFIELD**  
ACOUSTICS  
NOISE  
VIBRATION

PO Box 920  
North Melbourne, VIC 3051  
P: 03 9111 0090

**TANGLEWOOD FESTIVAL**  
Noise emission levels  
Leq, 63Hz dB

Project No. V064 (SHEET 01)

25.03.2019

A3

NOTES:

- \*Propagation in accordance with ISO9613
- \*Model includes reflections
- \*Model includes terrain data
- \*Model assumes downwind conditions in all directions
- \*Contours 1.5m RL



Scale: 1: 105522