



WATSON MOSS GROWCOTT acoustics Pty Ltd
SUITE 7, 696 HIGH STREET, KEW EAST
VICTORIA, AUSTRALIA 3102
TELEPHONE: (03) 9859 9447
FACSIMILE: (03) 9859 5552
EMAIL: reception@wmgacoustics.com.au
PO BOX 201, KEW EAST, 3102

**OFF-ROAD MOTORCYCLE
RACING TRACK**

**85 MERRICKS TRACK
LEONGATHA SOUTH**

Acoustic Report:

Consideration of Noise Emissions Associated
with Proposed Use of Off-Road Motorcycle Racing Track

**A report
prepared on behalf of:**

Mr. David Fleming

Ref: 12208-1jg
18th April 2018



Table of Contents

- 1. Introduction3
- 2. Assessment Methodology4
 - 2.1 Noise Assessment Terminology4
 - 2.1 Measurement Equipment.....4
- 3. Site And Surrounding Environment5
- 4. Proposed Race Parameters And Track Arrangement7
- 5. Consideration Of Noise Emissions Associated With Proposal8
- 6. Noise Sources9
- 7. Environmental Noise Modelling10
 - 7.1 Noise Prediction Methodology10
 - 7.2 Noise Modelling Prediction Results10
- 8. Discussion11
- 9. Overview12



1. INTRODUCTION

The proposal includes off-road motorcycle racing to be carried on a designated track at the site described as 85 Merricks Track, Leongatha South.

Use of the track will be limited to a total of three days per calendar year as shown below in Table 1.

Table 1: Summary of Proposed Events at Subject Site

Nominated Event	Days during which track will potentially be in use	Times during which racing will potentially occur
Organised Race Event	Saturday and Sunday (2 days)	8:00am to 4:00pm
Organised Club Day	Saturday or Sunday (1 day)	8:00am to 4:00pm

During each of the events, a maximum of 50 motorcycles will be on the track at any one time.

The track will typically be occupied for in the order of 3 to 4 hours during the nominated event days and times.

The proposed track location is within approximately 350 metres of the closest noise sensitive residential locations.

As a result, there is potential for noise associated with motorcycles using the track to impact on the surrounding acoustic environment.

As part of the application for proposal, the South Gippsland Shire Council has shown concern with regards to noise emissions due to the motorcycle track.

In response to the concerns, Watson Moss Growcott Acoustics (WMG) has carried out an assessment of potential noise emissions due to the proposed use.



2. ASSESSMENT METHODOLOGY

2.1 NOISE ASSESSMENT TERMINOLOGY

The noise assessment terminology used within this report is summarised below in Table 2:

Table 2: Noise Assessment Terminology

<u>Reference</u>	<u>Description</u>
dB(A)	Decibels recorded on a sound level meter, which has had its frequency response modified electronically to an international standard, to quantify the average human loudness response to sounds of different character.
L_{eq}	The equivalent continuous level that would have the same total acoustic energy over the measurement period as the actual varying noise level under consideration. It is the noise measure defined by the EPA as the measure of the noise to use in assessing compliance with noise limits.
L₉₀	the level exceeded for 90% of the measurement period, which is representative of the typical lower levels in a varying noise environment. It is the noise measure defined by the EPA as the measure of the background noise level to use in determining noise limits.

2.1 MEASUREMENT EQUIPMENT

Noise measurement equipment used as part of the assessment is shown below in Table 3:

Table 3: Measurement Equipment

Equipment Designation	Use of Equipment
Rion NA27 Precision Sound Level Meter	Handheld Noise Measurements
1 x Ngara Real Time Sound Acquisition System	Fixed Position Noise Logging Measurements

The field calibration of the measurement equipment was checked with a Bruel & Kjaer Type 4230 Sound Level Calibrator at the commencement and completion of the noise measurements and found to be within the correct calibration range.



3. SITE AND SURROUNDING ENVIRONMENT

The land which will be used for the proposed motorcycle track will include 85 Merricks Track, and 945 Koonawarra-Inverloch Road, Leongatha South.

The land surrounding the subject site is zoned as Farm Zone, and includes a combination of vacant grass covered paddocks, residential dwellings, and the Leongatha Golf Club.

The land immediately surrounding the subject site is relatively flat, however the general area includes an incline toward the north of the subject site.

As part of investigation works for the proposal, WMG has carried out unattended ambient noise monitoring at a location representative of the acoustic environment within the surrounding area.

The unattended noise monitoring was carried out during the period Friday 23rd March to Monday 26th March 2018.

Based on analysis of the audio files recorded by the unattended noise logging device, the lower levels of the ambient noise during the day period when the proposed motorcycle racing will be occurring is in the order of 28-30 dB(A) L₉₀.

The measured values are consistent with the previous experience of this firm within rural areas in Victoria.

Based on observations during the site visit and a review of the aerial photograph, a summary of the most relevant noise sensitive receiver locations surrounding the subject site is shown below in Table 4.

Table 4: Summary of Relevant Assessment Locations

Noise Assessment Location	Address of Assessment Location
1	125 Millars Road, Pound Creek
2	35 Millars Road, Pound Creek
3	155 Stewarts Road, Pound Creek
4	110 Lyons Court, Pound Creek
5	93 Wintles Road, Leongatha South
6	125 Wintles Road, Leongatha South
7	150 Holgates Road, Leongatha South
8	166 Holgates Road, Leongatha South
9	122 Holgates Road, Leongatha South

The assessment locations are the most relevant due to their distance separation from the proposed off-road racing track.

Noise sensitive locations at greater distances from the proposed off-road racing track will be exposed to lower levels of noise than the locations described in Table 4.

Figure 1 below identifies the subject site and the noise sensitive receivers listed in Table 4.

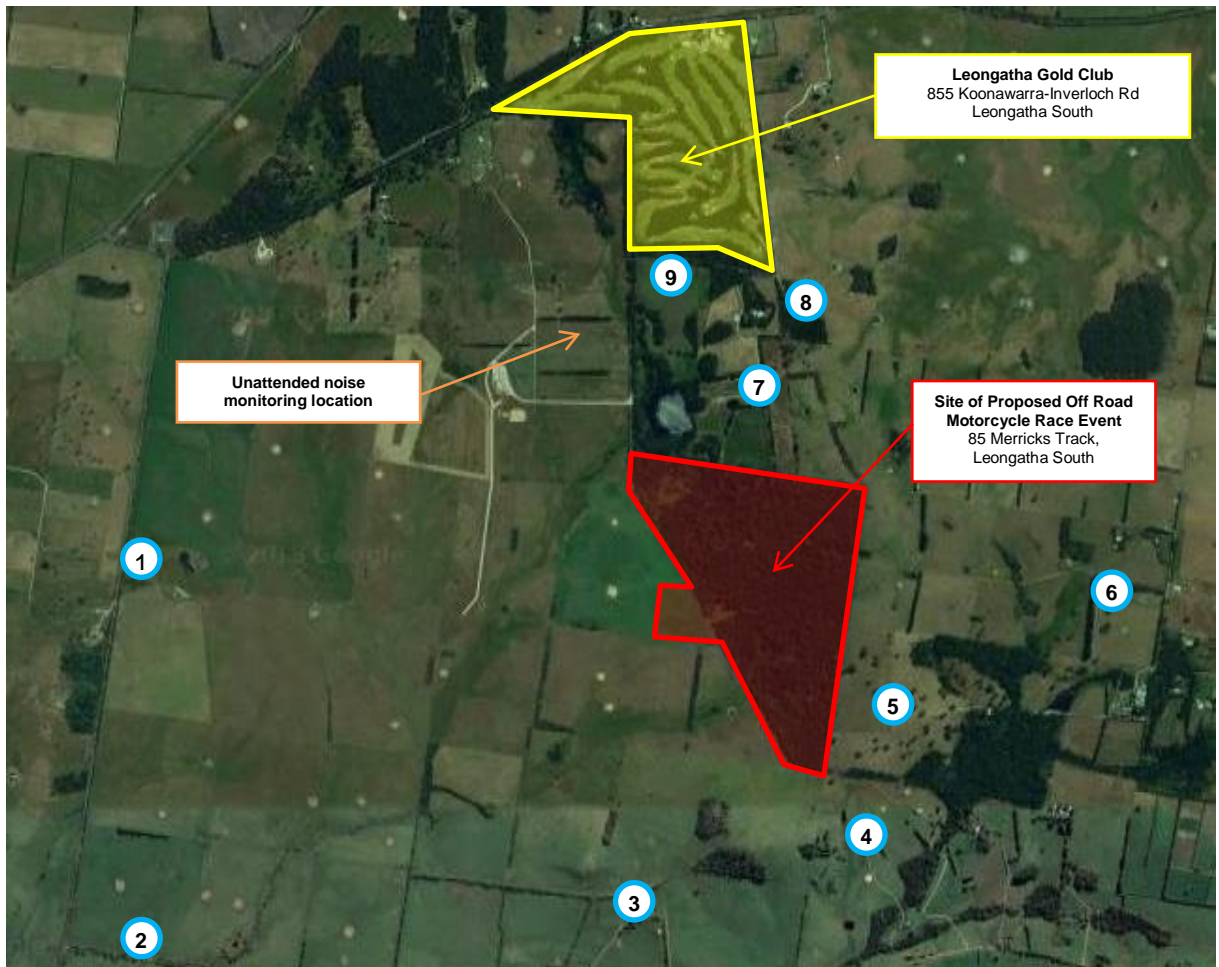


Figure 1: Aerial Photograph of Subject Site and Surrounding Noise Sensitive Receivers



4. PROPOSED RACE PARAMETERS AND TRACK ARRANGEMENT

The main race track is located within dense bush area at the subject site.

The track arrangement includes a short section external to the dense bush area where riders will commence the race and organise themselves in order prior to entering the main track.

The intent of this short external section is to minimise the need for the faster riders to overtake within the tight constraints of the narrow main track area.

Once within the dense bush area, the track arrangement includes a significant number of turns which limit the duration of which the riders are accelerating under full power.

As a result, the times during which maximum noise levels associated with the bikes occur will be minimised.

It has been indicated that a maximum of 50 bikes will be located on the track at any one time.

The track length is in the order of 8 kilometres, and average track lap times are in the order of 20 minutes. As a result, the average speed around the track of the motorcycles is in the order of 24km/h. The racing events will occur continuously for in the order of 3-4 hours.

The proposed track arrangement for the subject site is shown below in Figure 2.

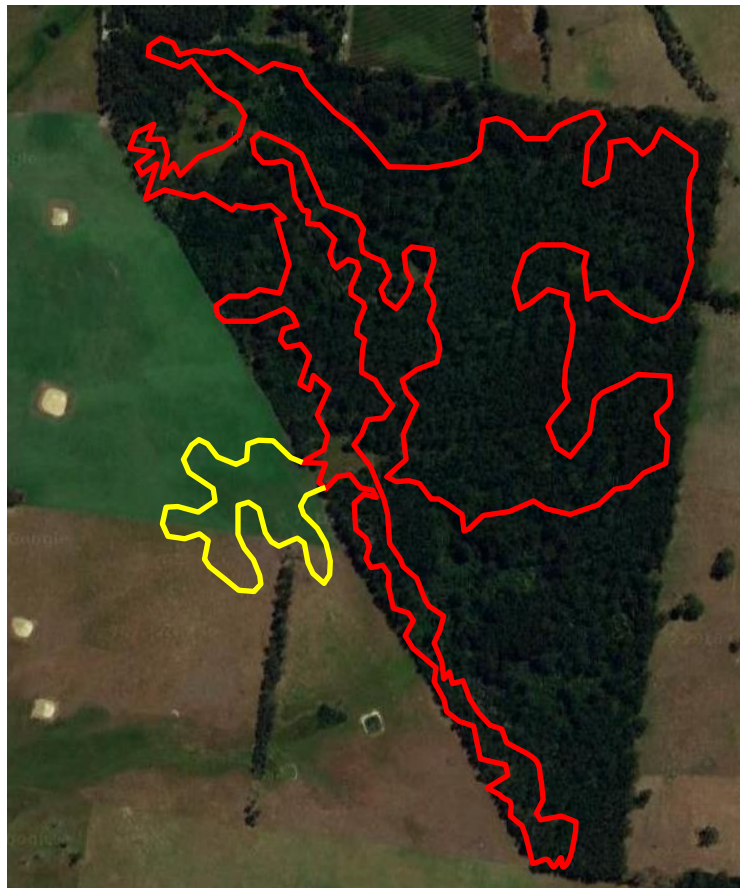


Figure 2: Aerial Photograph of the Subject Site showing proposed track arrangement



5. CONSIDERATION OF NOISE EMISSIONS ASSOCIATED WITH PROPOSAL

There are currently no regulated noise limit values described in environmental noise legislation in Victoria for motor sporting events.

During May 1992, the Environment Protection Authority (EPA) Victoria introduced a discussion paper which considered the potential for adverse noise impacts associated with motor sporting events on noise sensitive receptors, in particular residential dwellings.

The discussion paper includes the following statements with regard to noise emissions associated with motor sport events:

- A. The maximum acceptable noise level for day time circuit racing should be approximately 65 dB(A) outdoors;
- B. For frequent circuit racing during the day, a noise level of approximately 50 dB(A) is unlikely to cause significant intrusion upon residents.

Other values known to the writer's firm have been incorporated in various planning guidelines and have included very low values and relatively high values.

In 2001 an application to create a new "green field" motorcar and bike drag racing track combined with a boat, car and bike sprint circuit track was considered at a VCAT hearing.

Prior to the VCAT Hearing, meetings were held with Noise Consultants who were acting on behalf of various parties to consider suitable noise levels at noise sensitive receptors.

Marshall Day Acoustics, and Watson Moss Growcott Acoustics acted for different residential land developers, whilst Burton Acoustics acted for the Applicant proposing to operate the track.

The consensus noise value reached in the meetings for the new 'green-field' circuit race track when assessed at residential dwellings was approximately 55 dB(A) L₁₀ and 52 dB(A) L_{eq}.

In other instances, the Responsible Authority has requested consideration of noise emissions in accordance with EPA document Noise from Industry in Regional Victoria (NIRV).

For the 'green field' race track application, and for scenarios where NIRV has been considered appropriate, the proposed motor racing facilities included regular daily and weekly operation throughout the calendar year.

Given that the subject site facility will include only three events per calendar year, residual noise levels at noise sensitive receptors greater than the 50-52 dB(A) L_{eq} would be considered reasonable.



6. NOISE SOURCES

The proposal will include a maximum of 50 motorcycles occupying the designated track area at any one time.

The operator of the track has indicated that 2 and 4 stroke enduro style motorcycles will be used at the track, and will primarily include KTM (EXC) model, and Yamaha (WR) model bikes.

The described motorcycles will be road registered and will therefore be subject to controlled noise emissions in accordance with the legal requirements enforced throughout Victoria.

WMG has used previous measurements of off-road motorcycles operating in similar conditions as the basis for this assessment.

The adopted noise levels were derived from site measurements of groups of seven enduro style motorcycles travelling around an off-road training track. Measurements were recorded at varying setbacks from the track arrangement.

Observations during the site testing concluded that the acoustic environment at the off-site measurement locations was typically dominated by the noise associated with the motorcycles on the closest parts of the race track.

Based on consideration of the above, the sound power levels adopted for this assessment are shown in 5 below:

Table 5: Adopted Sound Power Level for a group of seven off road motorcycle participating in racing activities at the subject site

<u>Adopted Sound Power Level Information</u> <u>Octave Band Centre Frequency Hz (dB)</u>							
<u>63Hz</u>	<u>125Hz</u>	<u>250Hz</u>	<u>500Hz</u>	<u>1000Hz</u>	<u>2000Hz</u>	<u>4000Hz</u>	<u>Overall dB(A)</u>
85-89	100-104	99-103	91-95	103-107	109-113	104-108	112-116



7. ENVIRONMENTAL NOISE MODELLING

7.1 NOISE PREDICTION METHODOLOGY

Modeling of operational noise emissions has been conducted using the Australian developed computer software package known as the Environmental Noise Model (ENM).

As part of the noise prediction methodology, ENM considers the following attenuation measures:

- Geometrical spreading;
- Atmospheric absorption;
- Ground attenuation;
- Meteorological effects;
- Source/Receiver height effects;
- Barrier attenuation due to the surrounding environment including existing buildings/structures.

The ENM package, which runs in a 3-dimensional environment, has been used for many years and continues to be used because of its special features in relation to its algorithms addressing the reduced noise reduction capabilities of barriers and land undulation due to breeze effects.

This feature of the software remains state of the art and continues to provide good correlation with measured results in real-world scenarios.

7.2 NOISE MODELLING PREDICTION RESULTS

The noise modelling input parameters have been adjusted to reflect the Environmental Protection Authority (EPA) assessment methodology requirements. These include:

1. Residual noise levels at noise sensitive receivers have been considered when weather conditions assist with propagation of noise emissions in the direction of the relevant noise sensitive receivers;
2. Predicted noise level impacts have been assessed over a continuous 30-minute assessment period.

Based on consideration of the above, the predicted noise levels at each of the off-site noise sensitive receptor locations during times when the designated track is occupied is summarised below in Table 6.

Table 6: Predicted Noise Levels at Noise Sensitive Receptors

Noise Assessment Location	Address of Assessment Location	Predicted Noise Level with breezes assisting propagation of noise in the direction of the noise sensitive receptor
1	125 Millars Road	23-27 dB(A) L_{eq}
2	35 Millars Road	21-25 dB(A) L_{eq}
3	155 Stewarts Road	32-36 dB(A) L_{eq}
4	110 Lyons Court	38-42 dB(A) L_{eq}
5	93 Wintles Road	42-46 dB(A) L_{eq}
6	125 Wintles Road	27-31 dB(A) L_{eq}
7	150 Holgates Road	44-48 dB(A) L_{eq}
8	166 Holgates Road	33-37 dB(A) L_{eq}
9	122 Holgates Road	33-37 dB(A) L_{eq}



8. DISCUSSION

The results of the noise modelling indicate that residual noise levels due to the proposed use will be in the range 21-48 dB(A) L_{eq} when considered at surrounding noise sensitive receptors under assisting propagation breeze conditions.

At assessment location 1, 2 and 6 the predicted noise levels indicate that under assisting propagation breeze conditions residual noise due to the motorcycles will be either inaudible or faintly audible on occasion.

At each of the other assessment location, noise due to motorcycles occupying the off-road track will likely be audible under assisting propagation breeze conditions.

The highest noise levels will occur at assessment location 4, 5 and 7 which are located within the closest proximity of the track arrangement.

The extent of the proposed track arrangement will be in the order of 1.2km north to south, and 700 metres east to west.

Due to the size of the off-road track arrangement, WMG has concluded the following:

1. The predicted noise levels at the noise sensitive receptors will be due to motorcycles located on the nearest components of the off-road track arrangement;
2. During times when motorcycles are located at the opposing end of the track arrangement to the noise sensitive receivers, noise due to the distance motorcycles will not be contributing with the predicted values;
3. Due to the large number of motorcycles occupying the track at any one time, there will likely be a consistent number of motorcycles occupying the nearest components of the off-road track arrangement;
4. Based on this, it is anticipated that the predicted noise levels will be relatively consistent during times when breezes are assisting propagation in the direction of the noise sensitive receiver.

In consideration of the above comments, the infrequent use of the track, and the commentary provided by the EPA regarding motor sport noise levels, the assessment has concluded that noise levels at the surrounding noise sensitive receivers are unlikely to cause significant intrusion upon residents.



9. OVERVIEW

WMG has carried out an assessment of the potential noise emissions associated with off-road motorcycle racing on a designated track at the site described as 85 Merricks Track, Leongatha South.

The proposal includes racing activities to be carried out on three days per calendar year and will be limited to Saturday and Sundays between 8:00am and 4:00pm.

Up to 50 motorcycles will occupy the designated track area at any one time.

As part of the assessment, WMG has carried out the following:

1. Attended the subject site and measured existing ambient noise levels;
2. Carried out noise modelling to determine the potential noise impacts associated with the proposed use at the subject site;
3. Considered predicted noise levels in accordance with documentation provided by the EPA, and previous experience with similar investigations.

The results of the noise modelling indicate that residual noise levels due to the proposed use will be in the range 21-48 dB(A) L_{eq} when considered at surrounding noise sensitive receptors under assisting propagation breeze conditions.

At assessment location 1, 2 and 6 the predicted noise levels indicate that under assisting propagation breeze conditions residual noise due to the motorcycles will be either inaudible or faintly audible on occasion.

At each of the other assessment location, noise due to motorcycles occupying the off-road track will likely be audible under assisting propagation breeze conditions.

Based on the predicted noise levels due to the operation of the proposed racing track and commentary provided by the EPA with regard to motor sport noise levels, the assessment has concluded that noise levels at the surrounding noise sensitive receivers are unlikely to cause significant intrusion upon residents.

JORDAN GROWCOTT
WATSON MOSS GROWCOTT
acoustics pty ltd