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**AMENDMENT C199 TO THE GREATER SHEPPARTON PLANNING SCHEME:
GOULBURN VALLEY HARNESS & GREYHOUND RACING PRECINCT**

Subject Land: Lots 1 and 2 on LP119599 and CA. 2085 and 2086 Parish of Kialla

Expert Witness Statement: Acoustics

Prepared for:
Greater Shepparton City Council
C/-
Russell Kennedy Lawyers Pty Ltd
Level 12
469 La Trobe Street
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11785-4ng.docx
23 June 2017



STATEMENT

- (a) Name and address
- NEVILLE A. J. GODDARD
 - Suite 7, 696 High Street, East Kew in the State of Victoria
- (b) Qualifications, experience and area of expertise:
- Qualifications: B.Eng. (Mech.) (Hons) Swinburne 1987
 - Professional Affiliations:
 - i) Member, Engineers Australia.
 - ii) Member, Australian Acoustical Society.
 - 29 years' experience in acoustics and noise control consulting, including noise assessments and provision of noise control advice in commerce, trade, industry and transport.
 - Areas of expertise:
Assessment of noise emission in accordance with State Environment Protection Policies and Guidelines and development of noise control solutions. This expertise has been developed over many years' experience applying the EPA noise assessment procedures and liaison with the EPA to clarify application of the Policies in different situations.
- (c) Expertise to make this report:
- Knowledge of noise assessment procedures together with familiarity with the subject site gained through site inspections, noise measurements and subsequent analysis.
- (d) There is no private or business relationship between me and the party for whom the report has been prepared, other than the business relationship that necessarily exists in relation to the preparation of this report.
- (e) Instructions that define the scope of the report:
- I was instructed in writing by Russell Kennedy Lawyers Pty Ltd to review submissions, prepare a Witness Statement and to appear at the Panel Hearing, further to my earlier preparation of a noise assessment report for the Greater Shepparton City Council.
- (f) The facts, matters and all assumptions upon which the report proceeds:
- These are covered in the report Ref 11785-2ng, which is attached to this statement.
- (g) Documents and other materials taken into account in preparing report:
- Goulburn Valley Harness and Greyhound Racing Precinct Feasibility Study and Master Plan, July 2016
 - Submissions to the C199 Amendment exhibition
 - NOISE FROM INDUSTRY IN REGIONAL VICTORIA Recommended Maximum Noise Levels from Commerce, Industry and Trade Premises in Regional Victoria
 - EPA Victoria Noise Control Guidelines (Publication 1254, October 2008).
- (h) All site testing, data analysis, noise modelling and review of submissions was carried out by me.
- (i) Statement of opinion:
- See body of report for summary of opinion.
 - The reports contain no provisional opinions.
 - To the best of my knowledge there are no questions relevant to the report that fall outside my expertise.
 - I do not believe the report to be incomplete or inaccurate in any respect.
- (j) I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance which I regard as relevant have to my knowledge been withheld from the Panel.


Neville Goddard



1. INTRODUCTION AND EXECUTIVE SUMMARY

My original instructions when initially engaged by the Greater Shepparton City Council in 2015 were to conduct an assessment of noise emission from the Goulburn Valley Equine and Greyhound Precinct to the Investigation Area, and identify an appropriate 'buffer distance' from the existing Kialla Paceway facility and the future expansion of new equine uses within the Investigation Area.

The assessment of noise emission, which involved work at the site on two occasions and subsequent analysis and noise modelling, resulted in a report dated 19 May 2016, Ref 11785-2ng. A copy of this report is attached to this statement.

I have reviewed the report and adopt it as the basis of my evidence.

In the report I have set out considerations leading to the adoption of target noise levels for noise emission from the equine and greyhound facilities, with a particular focus on noise due to Public Address systems, which was observed to be the dominant source of noise emission beyond Precinct A.

The assessment identified that resultant off-site noise levels would exceed the target noise levels for some of the proposed land uses in the investigation area with the existing loudspeakers.

Modifications to the harness racing facility Public Address system were developed in order to reduce noise emission beyond the racing precinct to a level consistent with the target noise levels, while maintaining effective communication in the immediate vicinity of the racing tracks.

I have subsequently been instructed to review submissions made in relation to Amendment C199 in order to identify any issues relevant to my area of expertise and prepare responses as appropriate.

2. ACOUSTIC REPORT

The acoustic report prepared in May 2016, and which forms the basis of my evidence, is attached.



3. REVIEW OF AND COMMENT ON SUBMISSIONS

The 24 submissions made in relation to Amendment C199 have been reviewed in order to identify any issues relevant to my area of expertise.

One of the submissions, Submission Number 12 on behalf of Basic Property Holdings Pty Ltd, was found to include a component relevant to my area of expertise. This is the only submission that raised an issue relevant to my area of expertise.

Submission Number 12 (part 2, amended submission) includes the following:

Acoustic Issues

12.1 In respect to the acoustic issues, attention is drawn to an email sent on 8 February 2016 by Neville Goddard, Senior Consultant, WatsonMossGrowcott, Acoustics Engineers to Sam Kemp of Council where he said:

“The weather conditions prevailing on the night of our attendance at the harness racing was such that the only way we could reach any conclusions regarding the spread of noise around the site was to use the results the noise measurements relatively close to the speakers where the wind did not influence the measured levels, and to set up a noise model”

12.2 This is an entirely unsatisfactory basis on which the acoustic characteristics which underpinned the Amendment have been assessed.

Direct measurement of noise levels at potentially affected receptor locations can be a valid means of identifying the resultant noise levels at those locations arising from a noise source, in this case the Public Address system at the harness racing component of the Goulburn Valley Harness and Greyhound Racing Precinct.

However direct measurement of noise levels is subject to a number of limitations:

- Measurements of resultant noise levels can only be conducted under the weather conditions prevailing at the time of the measurement. This has the following implications:
 - It is well established that at distances beyond several hundred metres, wind can significantly influence sound propagation, enhancing propagation when the wind is travelling in the same direction as the path of sound from the source to receiver and



conversely inhibiting propagation when the wind direction opposes the sound propagation path.

- As the wind speed increases beyond a light breeze, audible noise begins to be generated by the airflow interacting with natural and man-made obstructions such as grass, trees, fences, poles and buildings. This creates an elevated ambient noise level that can partially or completely mask the noise under consideration, rendering observations and measurements difficult or impossible.
- The presence of noise due to animals such as birds, insects and frogs in the environment can significantly impair the ability to accurately measure noise due to a specific source.

These factors are particularly relevant to the assessment of noise emission from premises that only operate occasionally.

For premises that operate every day, it is reasonably feasible to monitor weather forecasts and choose to conduct noise measurements under the desired calm to light breeze conditions.

However, for a use such as harness racing, which only occurs at the site during the evening approximately every two weeks, there is not the luxury of being able to choose the weather conditions under which to conduct a noise assessment.

On the occasion referred to in the submission, the weather forecast had indicated conditions with wind speeds low enough that it may have allowed off-site noise measurements to be conducted, but actual conditions on the night of the assessment were windier than forecast.

Fortunately, direct measurement of noise levels is not the only way in which to assess noise emission. The science of acoustics is well established and noise emission modelling packages have been developed that enable calculation of resultant noise levels at distant locations based on the source sound characteristics and the effects of distance, topography, the ground and atmospheric factors on sound propagation.

For new facilities at the planning stage and being developed, where it is not possible to measure noise directly because the noise source/s do not yet exist, noise modelling is commonly used to assess compliance with noise constraints and develop noise attenuation measures if required. Such noise modelling is used by this consultant and others on a regular basis to successfully design new facilities and modify existing ones.

Therefore, on the night referred to in the submission, noise measurements were conducted on individual loudspeakers at the harness racing facility in order to obtain the source level information (sound pressure level and frequency spectrum) to be used as an input into the noise modelling.

The noise measurements were conducted typically 10-20 m from the loudspeakers, a distance at which the wind present at the time did not affect the resultant sound level. Source level measurements were also conducted in relation to other sources at the facility such as generator sets, the horses



racing, tractors smoothing the track and ambulances driving around the track, so that these sources could be included in the noise emission model.

The measured sound pressure levels were converted to sound power levels with the corresponding sound spectrum using conventional algorithms.

The source sound power levels thus derived were then placed in a three-dimensional electronic model of the surrounding area and the noise contours in the attached report generated under different wind conditions.

By this means it was established that the existing loudspeakers at the harness racing facility would result in noise levels above the off-site noise targets under some weather conditions, which prompted further work to develop a loudspeaker arrangement that would satisfy communication needs within the facility while minimising off-site noise effects.

Noise modelling for a modified loudspeaker arrangement confirmed the off-site noise reduction benefits.

Noise modelling has therefore been used to provide a much more useful outcome in relation to both off-site noise effects and functionality within the harness racing precinct than would have been possible by means of only direct noise measurements conducted in the investigation area.

4. CONSIDERATION OF THE MASTER PLAN AND PROPOSED AMENDED SUZ4 IN TERMS OF NOISE ASSESSMENT FINDINGS

The noise assessment has demonstrated that the land uses proposed in the Master Plan can co-exist without adverse noise impacts on future residential uses while maintaining effective operation of the equine and greyhound facilities.

The noise levels identified in the proposed amended SUZ4, which are the same as in the existing SUZ4, are consistent with the findings of the noise assessment and also with *State Environment Protection Policy (Control of Music Noise from Public Premises) No. N-2* (SEPP N-2).

Neville Goddard



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GOULBURN VALLEY EQUINE & GREYHOUND PRECINCT MASTER PLAN

Consideration of Noise Emission to Proposed Future Residential Areas

Prepared for:
Greater Shepparton City Council
90 Welsford Street
Shepparton VIC 3632

Ref. 11785-2ng.docx
19 May 2016



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5. INTRODUCTION

Greater Shepparton City Council is preparing a Master Plan for the Goulburn Valley Harness and Greyhound Racing Precinct and Investigation Area in Kialla, south of Shepparton, bounded by the Goulburn Valley Highway, River Road, Archer Road and Mitchell Road.

WMG Acoustics Pty Ltd has been requested to conduct an assessment of noise emission from the Harness and Greyhound Racing Precinct to the remainder of the investigation area. The purpose of the noise emission investigation is to ensure that adverse noise impacts on areas developed for residential purposes do not occur, and in turn to ensure that the viability of the Harness and Greyhound Racing Precinct is not threatened by complaints regarding noise emission from future residents of the investigation area.

The public address system at the harness racing facility is responsible for the highest level of audible noise emission beyond the boundaries of the racing precinct. The greyhound racing public address system is lower powered, producing sufficient level to be audible at the track, but not to generate audible off-site noise.

The only other noise sources that are clearly audible off-site are two generator sets, but noise emission from these is only audible in a relatively localised area north of the area between the two tracks.

Other sources such as vehicles driving around the tracks (tractors and trucks preparing the track, ambulance) and the greyhound lure are occasionally audible off-site at some locations, but not consistently audible enough to require specific consideration.

This report covers the following aspects:

- Consideration of appropriate noise level objectives for residential and equine related residential development in the investigation area.
- An overview of the findings of site investigations into noise emission from harness and greyhound racing events held at the precinct and ambient background levels in the investigation area.
- Prediction of resultant Public Address system noise levels in the investigation area using a three dimensional noise modelling software package, for the PA system as it presently exists and for a modified system providing sufficient audio coverage for the effective conduct of racing but less off-site noise emission.
- Recommendations to maximise the extent of residential development in the investigation area without resulting in adverse noise impacts on future residents or future constraints on the racing precinct arising from residential noise impacts.



6. NOISE ASSESSMENT TERMINOLOGY

The following terms are used in this report:

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.

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 recommended maximum noise levels.

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 noise emission to use in assessing compliance with recommended maximum noise levels.

In short, L₉₀ is the measure of background noise (in the absence of the noise under investigation or other intrusive noises) used in determining recommended maximum noise levels, and L_{eq} is the measure of noise emission used in assessing compliance with recommended maximum noise levels.

7. SUBJECT SITE AND SURROUNDS

The Goulburn Valley Harness and Greyhound Racing Precinct and Investigation Area is illustrated in the Plan attached at Appendix One.

8. AMBIENT BACKGROUND NOISE LEVELS IN THE VICINITY OF RESIDENTIAL LOCATIONS POTENTIALLY AFFECTED BY NOISE EMISSION FROM THE SUBJECT SITE

Unattended noise loggers were installed at two locations within the precinct area to monitor the ambient background level to assist in placing noise emission from the racing facilities in context. These locations are indicated on the aerial photo in Appendix Two. Noise monitoring occurred from 9 to 14 November 2015 at both locations.

Given that racing events occur during the day, evening and night periods on different occasions, it is the evening/night period that has the greatest potential to impact on future residents so this has been the focus of attention in this study.

Evening/night events typically run from approximately 6.30pm to approximately 11.00pm.

Ambient background levels were averaged over the period 6.30-11.00 pm at both locations, with the lowest average result during the monitoring period being 43dB(A) L₉₀ at logger location 1 and 40dB(A) L₉₀ at logger location 2.



9. CONSIDERATION OF NOISE LEVEL OBJECTIVES AT RESIDENTIAL RECEPTORS

There is no clear-cut State Policy limit for Public Address (PA) system noise on which to base decisions regarding the spread of noise around the precinct within the investigation area in relation to planning for residential development in the area. Therefore, consideration has been given to a number of sources of guidance in developing a framework for noise emission and resultant levels at different residential categories.

It was observed that for each harness race there were typically pre-race announcements about 5 minutes before the race with another announcement giving final odds about 2 minutes before the race, the race call and another announcement after the race confirming results.

The total duration of announcements was typically found to be in the range 8-9 minutes per race, with races occurring approximately every 30 minutes and an event comprising typically 10 races. This totals 80-90 minutes of announcements over an event duration of approximately 5 hours.

The non-continuous nature of the noise emission is relevant, as is the fact that there are only approximately 20-25 night/twilight harness events at the venue per year. Therefore the noise emission is far from continuous and the resultant off-site level is dependent on the weather conditions prevailing during an event, which will vary. These factors mitigate against the impact of noise emission.

A factor that would contribute to the potential for annoyance on the other hand, is the fact that the PA announcements are spoken words, which would be more noticeable and potentially annoying than a constant unidentifiable noise of the same overall level.

The harness and greyhound racing precinct occupies land zoned SUZ4. The definition of SUZ4 includes the following in relation to use of the land:

Amenity of the neighbourhood

A use must not detrimentally affect the amenity of the neighbourhood, including through the emission of noise:

- *Noise emission levels must not exceed the following levels:*
 - *Public Address Systems 55dB(A) L_{eq} .*
 - *Music or Concerts 65dB(A) L_{eq} measured outside any residential property.*

Indications are that the facility complies with this requirement for the Public Address system at present as it only applies at noise sensitive premises, that is, residential dwellings, of which there are few in the investigation area.

The Planning Permit for the use includes a Condition that refers to compliance with SEPP N-2, and the noise limit for outdoor venues under SEPP N-2, applicable to music, is 65dB(A) L_{eq} as identified in the SUZ4 definition.



65dB(A) Leq is a relatively high noise level, a reflection of the fact that the outdoor venue noise limit under SEPP N-2 relates to an outdoor venue having no more than 6 'concerts' or events per year. Events typically happening twice a month, which appears to be the typical frequency of occurrence of night harness racing, would need to be at lower levels than concerts occurring only up to 6 times per year in order to avoid attracting complaints from people expecting normal residential amenity.

The fact that the way the Permit is worded and interpreted means that relatively high noise levels are allowed by the Permit at residential premises has not been an issue as there are relatively few residential premises in the vicinity of the facility, but this could change in future with residential development.

An event at an outdoor venue is only counted as a 'concert' under SEPP N-2 if the effective noise level exceeds 55dB(A) Leq outdoors at a measurement point in a noise sensitive area. This level is consistent with the 55dB(A) referred to in the definition of SUZ for PA system noise.

55dB(A) as a reasonable target for events occurring approximately 20-25 times per year during the evening, however, this is still a prominent level and the acceptability of it to residents would depend on the expectations of those residents.

Residents in the vicinity of a racing venue who have an expectation of some noise impacts from that venue may well find up to 55dB(A) Leq occurring for a cumulative total of up to an hour and a half per evening on approximately 20-25 evenings per year acceptable.

However, residents with a more purely 'residential amenity' expectation may not be satisfied by such levels. Therefore further consideration has been given to lower levels based on the EPA approach to general commercial, industrial and trade noise.

NOISE FROM INDUSTRY IN REGIONAL VICTORIA *Recommended Maximum Noise Levels from Commerce, Industry and Trade Premises in Regional Victoria* (NIRV) is the assessment framework for general noise emission to residential premises in regional Victoria.

Voices and noise from sporting events are not assessed by the NIRV guidelines, but it is considered useful to at least look at what the NIRV Recommended Maximum Noise Levels (RMNLs) would be in defining the extent of future residential development with an objective of avoiding adverse noise outcomes and land use conflict.

Recommended Maximum Noise Levels are determined under NIRV principally based on planning scheme zonings, with secondary consideration given to background levels in some circumstances. For a noise source in a Special Use Zone and a receptor in a Residential Zone, the zone RMNL for the evening period is 45dB(A).

NIRV includes some other subtleties in the derivation of RMNLs, but the lowest measured background level of 40dB(A) L₉₀ during the evening period is consistent with the 45dB(A) Recommended Maximum Noise Level without pursuing other factors.



The EPA-defined 'evening' period ends at 10pm and the last race is typically at more like 11pm, but considering the evening period NIRV RMNL is appropriate to the 'evening' nature of the event as it does not continue into the night beyond 11pm and only occurs a small number of times per month.

It is considered that 45dB(A) would represent a level consistent with a purely 'residential' expectation of amenity, as distinct from residents who have chosen to occupy land with a zoning of Equine Related Rural Living, where a level of up to 55dB(A) is considered to be reasonable.

Therefore, the following is proposed as a reasonable framework for considering the development of residential uses within the investigation area:

- <45dB(A) L_{eq} during use of Public Address system: Rural Living or Low Density Residential;
- 45dB(A) to 55dB(A) L_{eq} during use of Public Address: Equine Related Rural Living; and
- >55dB(A) L_{eq} during use of Public Address: Non-Sensitive land uses.

The EPA *NOISE CONTROL GUIDELINES* (Publication 1254, October 2008) also contain guidance regarding noise due to PA systems in Section 13 'PUBLIC ADDRESS SYSTEMS'. The full PA section of EPA Publication 1254 is attached at Appendix Three.

The Guidelines have as an objective PA system noise intrusion of not more than 5 dB(A) above background at any affected residences or other noise-sensitive locations. This is consistent with an objective of 45 dB(A) L_{eq} with a measured background level during the operational period of 40 dB(A) L_{90} .

The Guidelines suggest that corrections for tonal or impulsive noise usually are not necessary, and a further tolerance of up to 5 dB(A) may be allowed for unique or very infrequent activities with recognised social merit. This is consistent with allowing an additional 5 dB(A) for 'Equine Related Rural Living' in the context of the racing precinct, compared with Rural Living or Low Density Residential.

According to the Guidelines, amplifier level settings must be minimised whilst ensuring conveyance of information to audience or participants is adequate. The Guidelines note that restrictions on the times of use of public address systems should be considered, and noise from PA systems must not be audible inside a residential dwelling during normal sleeping hours.



10. SITE NOISE MEASUREMENTS

10.1 GREYHOUND RACING

A visit was made to the site and surrounds on the night of Monday 9 November 2015 to measure noise levels during a greyhound racing event. Weather conditions on the night of the visit were dry and calm, suitable for outdoor noise measurements.

Noise associated with the event was found to be localised and neither consistently audible nor measurable outside the racing precinct. A brief measurement during a lull in highway noise was possible just outside the southern boundary of the precinct due south of the track, where the PA system noise level was 51-52dB(A) L_{eq} .

At the track, PA system noise levels were found to be up to 69dB(A) L_{eq} at a distance 20m from the loudspeakers.

The generator set noise level was found to be 62dB(A) at 20m, but this reduced to 50dB(A) at the precinct boundary.

Overall, noise emission from greyhound racing was found to not present any constraints regarding the future development being considered within the investigation area.

10.2 HARNESS RACING

A visit was made to the site and surrounds on the night of Monday 14 November 2015 to measure noise levels during a harness racing event.

Actual weather conditions during the evening proved to be significantly windier than forecast, making it impossible to reliably measure off-site noise levels despite it being apparent that the PA system loudspeakers were generating significantly higher levels than the greyhound track loudspeakers.

The larger loudspeakers at the harness racing track were generating levels of 72-73dB(A) L_{eq} at a distance of 60m from the loudspeaker. This is equivalent to 82dB(A) L_{eq} at a distance of 20m, 13dB(A) higher than the greyhound track loudspeakers. To put this in context, a difference of 10dB(A) is usually considered to represent a doubling of perceived loudness.

Due to the weather conditions, the focus for the evening became measuring loudspeaker source noise levels close to the speakers to allow off-site noise levels to be calculated using noise modelling software, the results of which are the subject of the following section.



11. PREDICTED NOISE LEVELS DUE TO NOISE EMISSION FROM THE SUBJECT SITE

11.1 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). The ENM package, which runs in a 3 dimensional environment, has been successfully used to model noise emissions from sites at numerous locations within Victoria.

The noise modelling has allowed for the effects of light breezes from the noise sources to the investigation area enhancing sound propagation. Under other conditions, the resultant noise levels would be lower than predicted on this basis.

Apart from the reduction of sound due to distance and atmospheric effects, sound attenuation results from acoustic shielding. The model included solid fences and buildings within the precinct.

The model used as input the sound power level for 19 loudspeakers at the harness racing facility, based on the noise measurements conducted during the site visit

11.2 NOISE PREDICTION RESULTS

Modelling was initially conducted using the output of the loudspeakers as they presently exist for a range of breeze conditions with the potential to enhance sound propagation towards the investigation area.

Critical wind conditions for sound propagation are a light breeze only, up to approximately 10kph. Stronger winds also enhance sound propagation, but they increase the ambient background level significantly, reducing audibility of the sound in question.

The outputs of noise contour modelling for calm conditions and range of breeze conditions from southerly through westerly to northerly appear below superimposed over a plan of the development being considered for the investigation area.

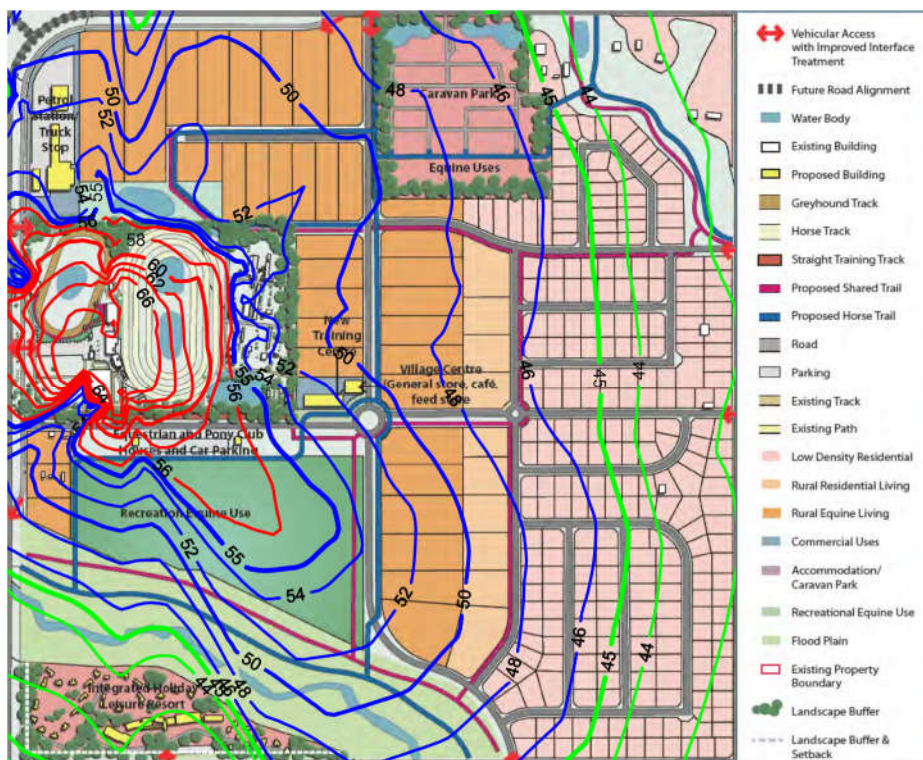


Figure One: PA system dB(A) L_{eq} . Calm conditions, existing loudspeakers.

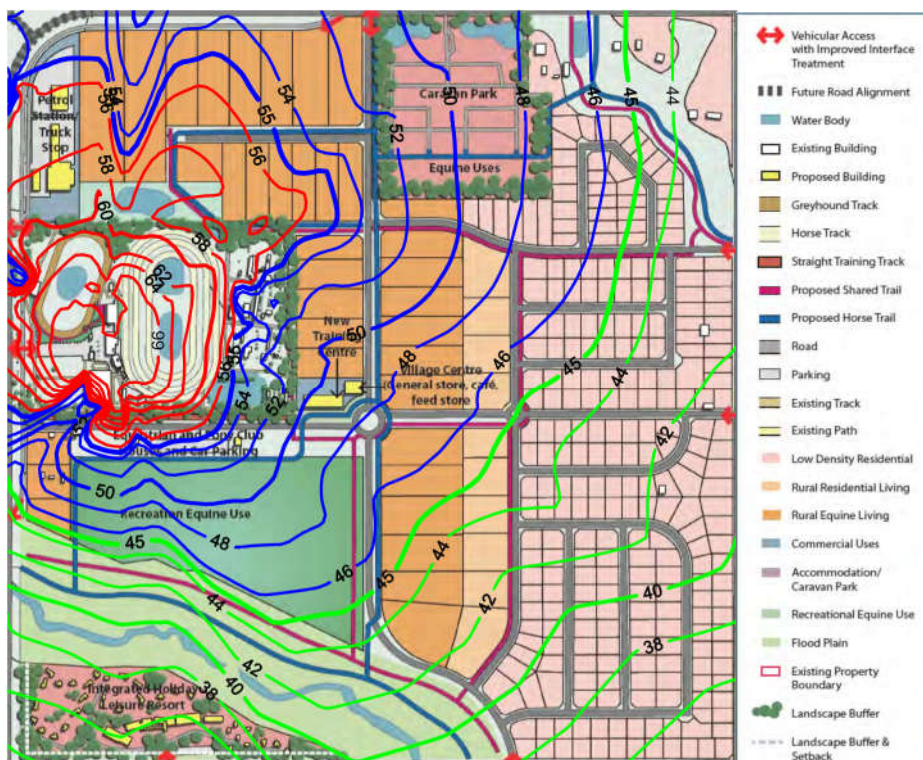


Figure Two: PA system dB(A) L_{eq} . Southerly breeze, 10kph, existing loudspeakers.

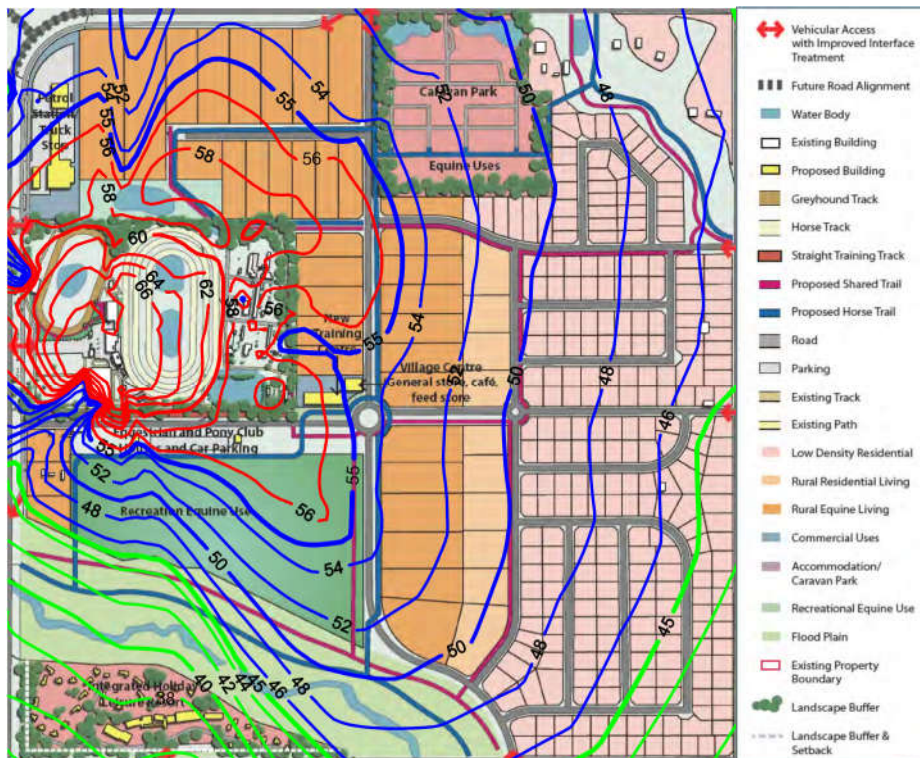


Figure Three: PA system dB(A) L_{eq} . South westerly breeze, 10kph, existing loudspeakers.

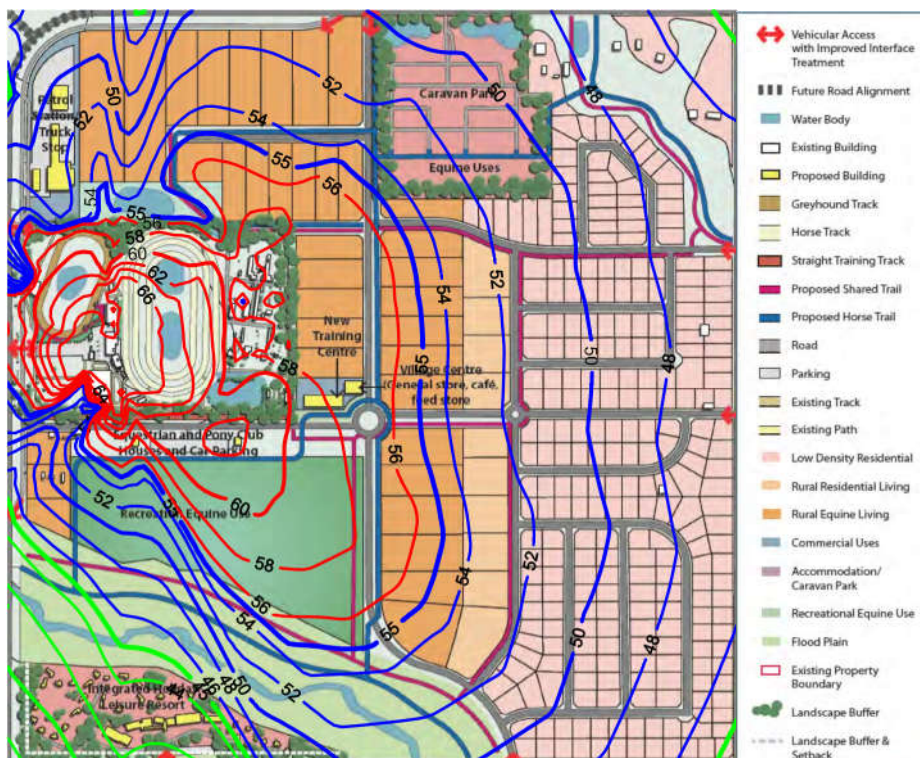


Figure Four: PA system dB(A) L_{eq} . Westerly breeze, 10kph, existing loudspeakers.

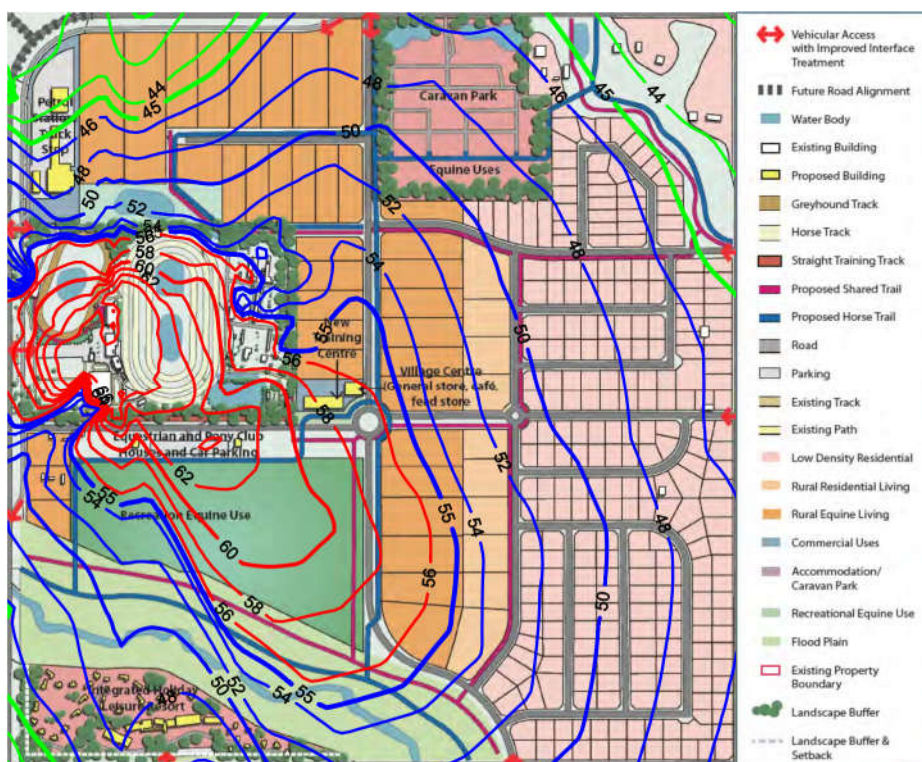


Figure Five: PA system dB(A) L_{eq} . North westerly breeze, 10kph, existing loudspeakers.

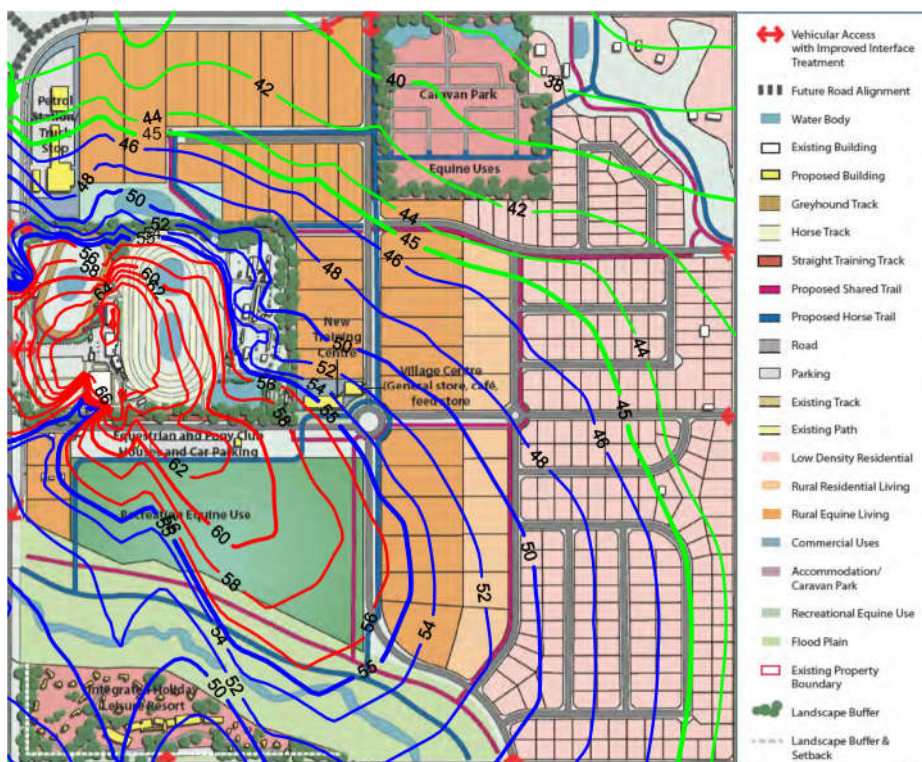


Figure Six: PA system dB(A) L_{eq} . Northerly breeze, 10kph, existing loudspeakers.



The noise modelling results therefore show:

- resultant noise levels exceeding 45dB(A) L_{eq} during use of Public Address system in areas currently being considered for Rural Living or Low Density Residential use; and
- resultant noise levels exceeding 55dB(A) L_{eq} during use of Public Address in areas currently being considered for Equine Related Rural Living use.

If accepted, the extent of the PA noise levels higher than the adopted framework levels would substantially limit the extent of residential development currently being considered in the investigation area.

Given that PA levels within the harness racing facility were observed to be higher than required for effective communication, this provides scope to reduce the output of loudspeakers to reduce noise emission beyond the racing precinct boundaries, while maintaining effective communication locally at the harness track and immediate vicinity.

Contact has been made with the company responsible for the PA system at the racing precinct and modifications to the PA system developed, which will reduce off-site noise emission, maintain adequate communication at the facility and reduce power consumption.

The PA system modifications proposed, which have been accepted by the racing club, are:

- Turned the two long throw speakers that point west down by about 15dB as they did not need to emit such a high level and are on a separate circuit to the rest of the speakers.
- Replace the three long throw speakers facing east and south east with short throw speakers, probably angled down a bit more. These are also expected to reduce sound power output by at least 15dB(A).
- Add a switch so that the 6 loudspeakers in the north-south grandstand along the finish straight do not operate for all except one event per year, which is the only time they are required.

The source files in the noise model were modified to reflect these changes and the model re-run, with the results set out below.

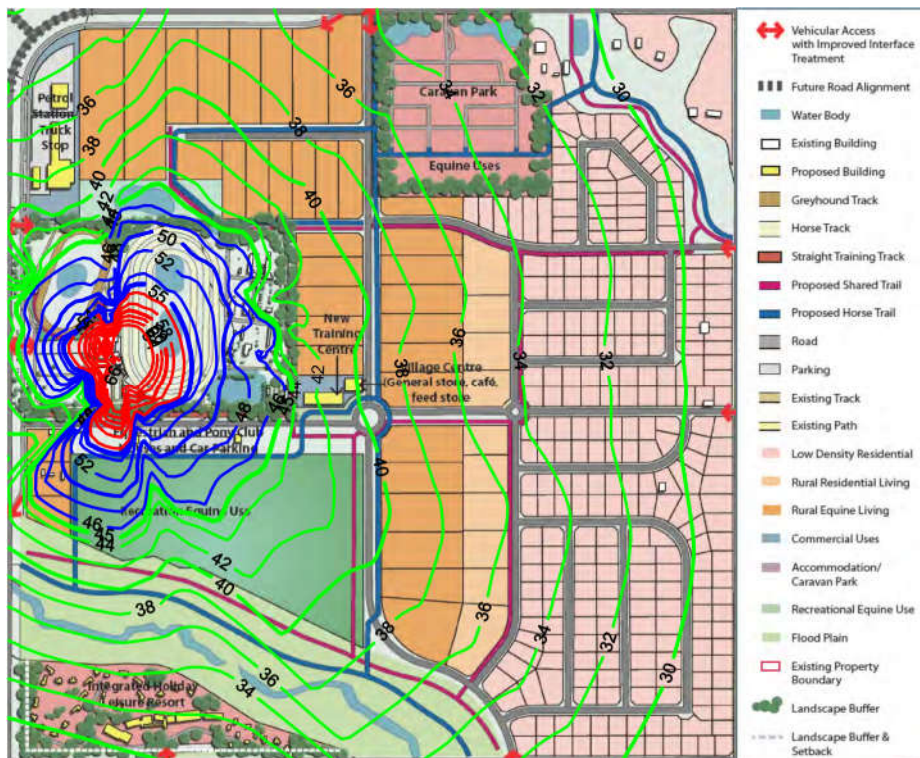


Figure Seven: PA system dB(A) L_{eq} . Calm conditions, modified loudspeakers.

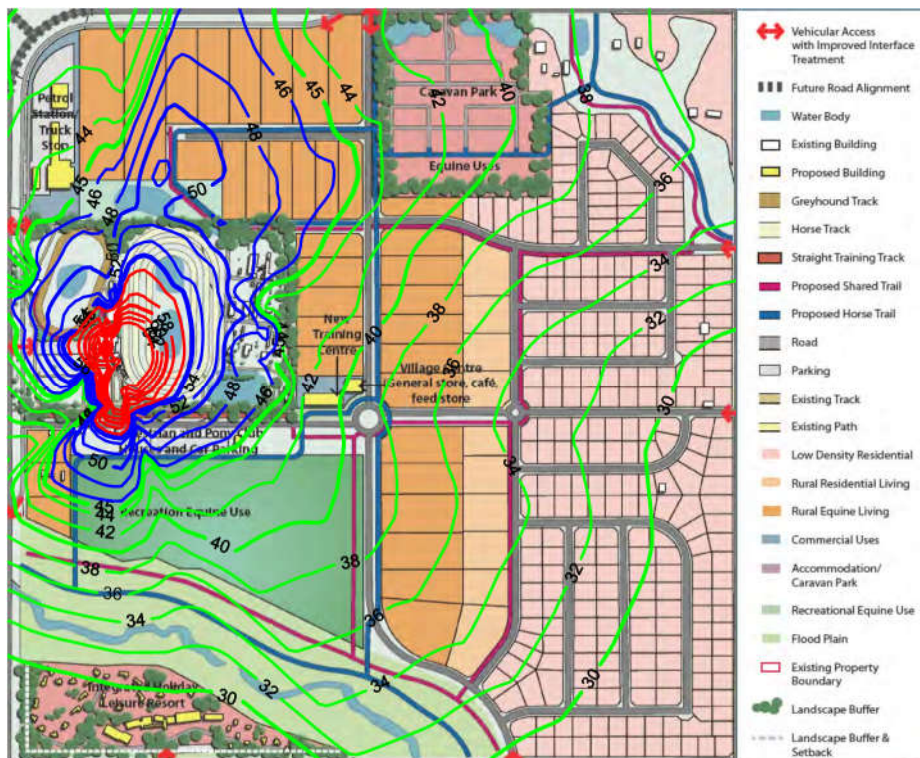


Figure Eight: PA system dB(A) L_{eq} . Southerly breeze, 10kph, modified loudspeakers.

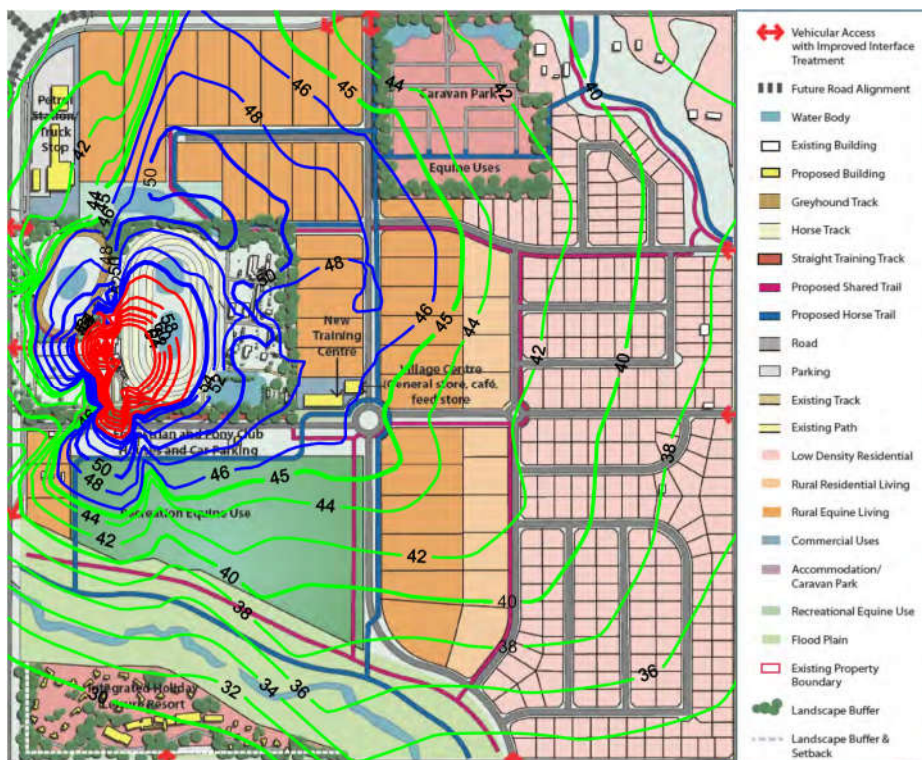


Figure Nine: PA system dB(A) L_{eq} . South westerly breeze, 10kph, modified loudspeakers.

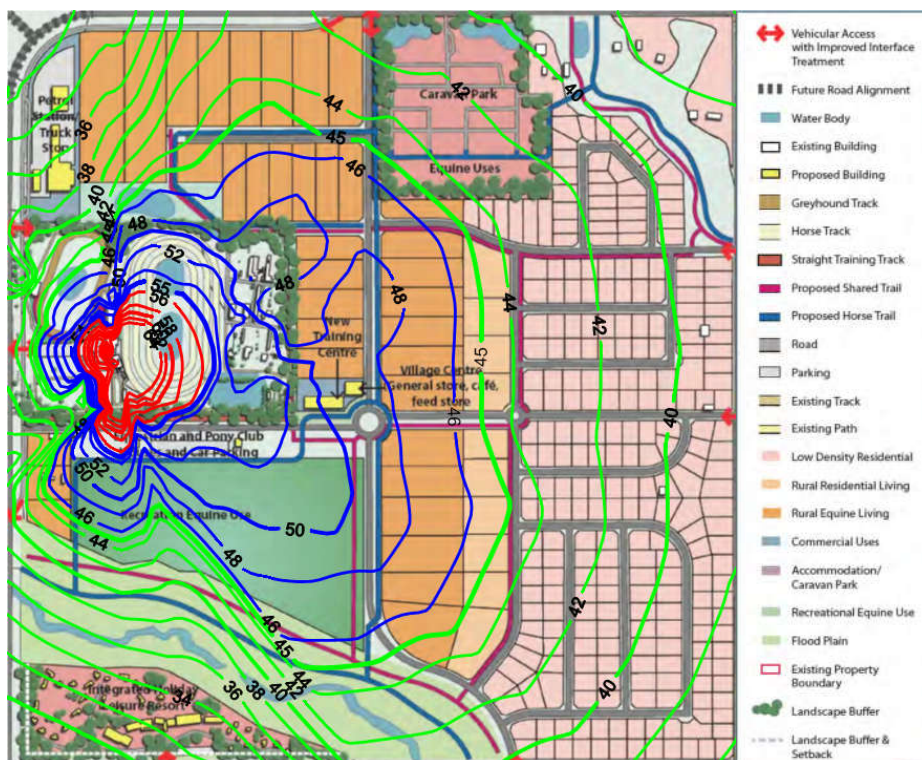


Figure Ten: PA system dB(A) L_{eq} . Westerly breeze, 10kph, modified loudspeakers.

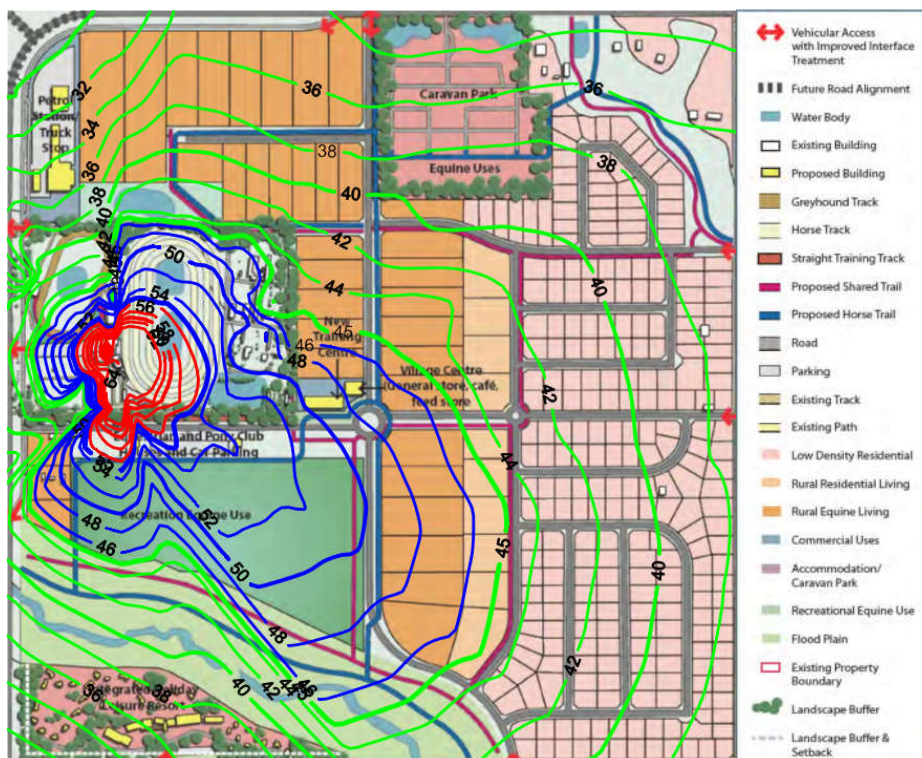


Figure Eleven: PA system dB(A) L_{eq} . North westerly breeze, 10kph, modified loudspeakers.

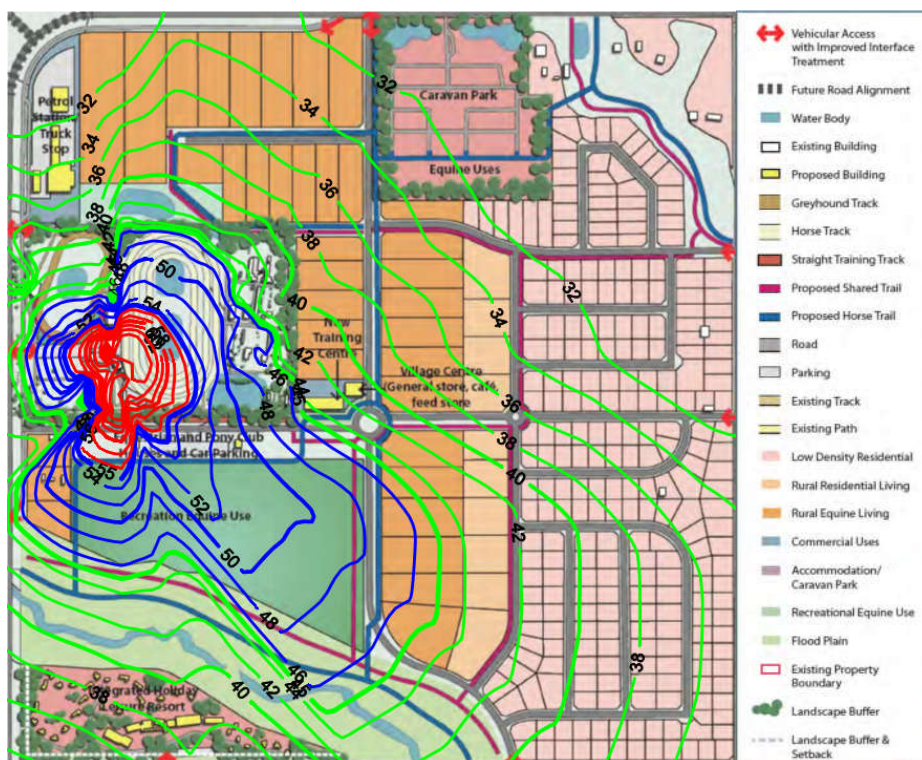


Figure Twelve: PA system dB(A) L_{eq} . Northerly breeze, 10kph, modified loudspeakers.



The noise contour plots indicate achievement of the suggested framework for PA system noise emission under all conditions with the exception of:

- Predicted noise levels up to 46dB(A) L_{eq} at the proposed caravan park under south westerly breeze conditions. This is considered to be of negligible significance, particularly in view of the transitory nature of the occupation of a caravan park.
- Predicted noise levels up to 46dB(A) L_{eq} at the proposed 'Rural Residential Living' under westerly and north westerly breeze conditions. This is also considered to be of negligible significance, as the framework that has been developed is not a 'black and white' pass/fail criterion. It is a framework to provide guidance, and under all conditions other than westerly and north westerly breezes the resultant levels would be lower.

12. NOISE CONTROL MEASURES

The noise modelling results together with overall consideration of noise emission from the racing precinct imply that the proposed modifications to the PA system at the harness racing facility are the only noise control measures required in order for the residential development under consideration for the investigation area to proceed without adverse noise impacts at the future residential premises.

In order to align expectations with reality, there would be benefit in including a notice on titles to the effect that Rural Equine Living land will be subject to audible noise emission from the racing precinct at times.



13. OVERVIEW

A noise assessment has been conducted in order to investigate potential adverse noise impacts associated with the racing precinct on areas within the investigation area being considered for residential development.

The following is proposed as a reasonable framework for considering the development of residential uses within the investigation area:

- <45dB(A) L_{eq} during use of Public Address system: Rural Living or Low Density Residential;
- 45dB(A) to 55dB(A) L_{eq} during use of Public Address: Equine Related Rural Living; and
- >55dB(A) L_{eq} during use of Public Address: Non-Sensitive land uses.

It has been concluded that, with the existing Public Address system at the harness racing facility, there is potential for adverse noise impacts at locations within the investigation area being considered for residential development under some weather conditions.

Modifications to the harness racing facility Public Address system have been identified, which would reduce noise emission beyond the racing precinct to a level consistent with residential occupation, while maintaining effective communication at the harness racing track and immediate vicinity.

Resultant noise levels within the investigation area have been confirmed by noise modelling.

The noise modelling results, together with overall consideration of noise emission from the racing precinct, imply that the proposed modifications to the PA system at the harness racing facility are the only noise control measures required in order for the residential development under consideration within the investigation area to proceed, without adverse noise impacts at the future residential premises.

In order to align expectations with reality, there would be benefit in including a notice on titles to the effect that Rural Equine Living land will be subject to audible noise emission from the racing precinct at times.

NEVILLE GODDARD
WATSON MOSS GROWCOTT
acoustics pty ltd

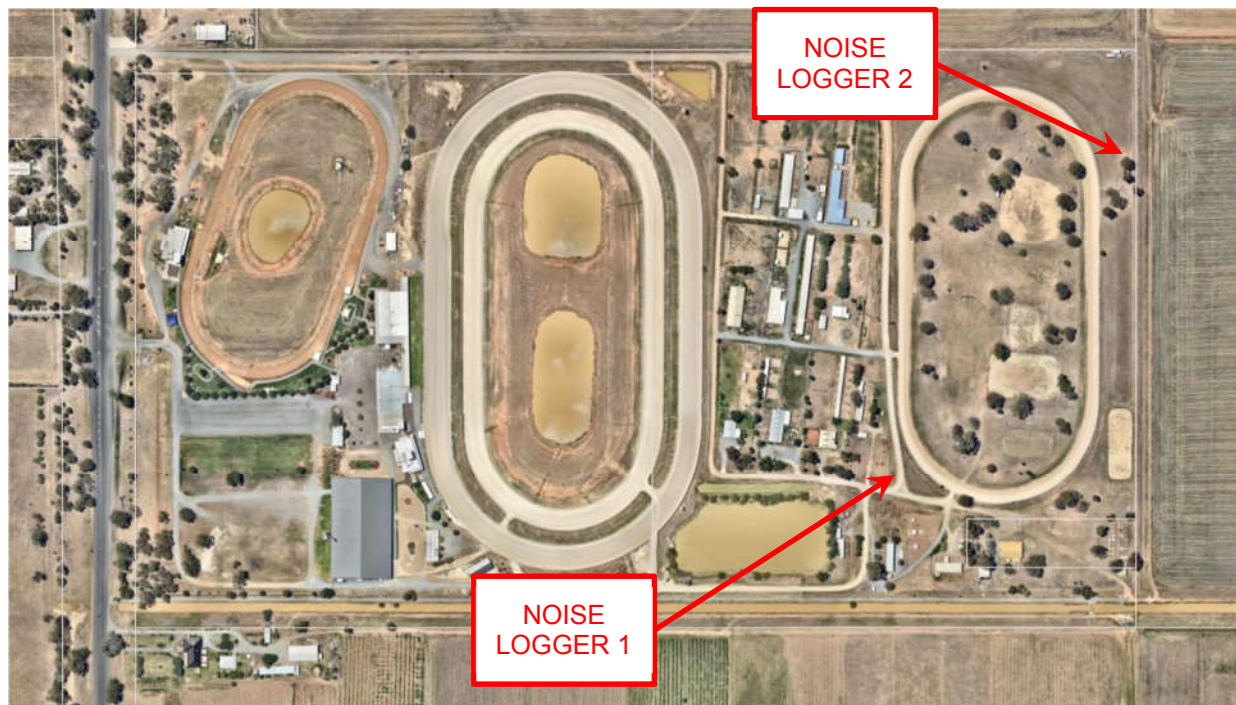


APPENDIX ONE: SITE LAYOUT PLAN SHOWING GOULBURN VALLEY HARNESS AND GREYHOUND RACING PRECINCT AND INVESTIGATION AREA





APPENDIX TWO: AERIAL PHOTO ILLUSTRATING AMBIENT NOISE MONITORING LOCATIONS





APPENDIX THREE: EPA NOISE CONTROL GUIDELINES PUBLICATION 1254 OCTOBER 2008

13 PUBLIC ADDRESS SYSTEMS

Public address systems are commonly used in conjunction with outdoor entertainment and sporting activities and can cause annoyance if used inappropriately. For the purpose of this guideline public address systems may be divided into two categories: low-power units needed for control of persons engaged in the activities or events; and high-power units used for making public commentaries and announcements.

Objectives

In all cases, the environmental objective should be noise intrusion of not more than 5 dB(A) above background at any affected residences or other noise-sensitive locations. Corrections for tonal or impulsive noise usually are not necessary, and further tolerance of up to 5 dB(A) may be allowed for unique or very infrequent activities with recognised social merit. Amplifier level settings must be minimised whilst ensuring conveyance of information to audience or participants is adequate. Restrictions on the times of use of public address systems should be considered. Noise from PA systems must not be audible inside a residential dwelling during normal sleeping hours.

Low-power systems for event control

These are usually small systems such as are used for controlling competitors in events like BMX bike races and go-kart races. Where such systems may cause noise annoyance, the following criteria should be applied:

- *The public address system must only be used to control the event, not for giving commentaries, advertising or playing music.*
- *Speakers may only be installed in the essential control areas, such as marshalling sites.*
- *Speakers should be small, low-power horn units no more than 20 cm across the horn opening and operated by an amplifier of no more than 30 watts.*
- *Horn units are to incline downwards at an angle of approximately 45°, point in the appropriate direction and be mounted on poles approximately three metres tall, in such a way that the speaker is held firmly and cannot be rotated.*
- *A sound level limiting circuit should be incorporated in the amplifier to control the signal amplitude to a fixed level, regardless of the loudness of the operator's voice.*
- *Once the control knobs have been set to the correct positions, they should be removed and the potentiometer spindles covered with a fixed metal channel attached to the front panel of the amplifier.*
- *The spare microphone inputs should be covered with metal plates securely fitted to the rear or front panel of the amplifier, as the case may be.*

High-power systems for commentaries and announcements

These are usually much larger systems used, for example, to give a running commentary during a sporting event or race meeting, to keep spectators entertained or for carnival-type advertising.

- *Most of the criteria for lower power systems are applicable.*
- *Rather than use high-powered speakers placed in a few locations, it is preferable to place more low-powered speakers to cover the entire perimeter of the grounds, each pointing downward and inward towards the ground where the event is taking place.*

Note:

1. *Consideration should be given to substitution of sound systems by visual displays such as electronic scoreboards and video screens for large operations.*
2. *PA systems used for paging staff and patrons in business and catering operations may also be replaced where they adversely affect residences. In business, two-way radios or pocket beepers may be used. In hotels, meal ticket numbers may be presented on digital display boards instead of being announced.*