



7 May 2012

Southern Highlands Regional Shooting Complex – (MP 06_232 MOD 4)

PROPOSAL

This application seeks approval to modify the following conditions of the Southern Highlands Regional Shooting Complex approval:

(a) Condition A9 - Firearm Noise Limits

- Increase the maximum permitted noise level of the 800m rifle range from 75dB(Lin) Peak Hold to 80dB(Lin) Peak Hold;
- Measure noise levels in arithmetic averages; and
- Require a specific methodology for noise monitoring to ensure consistency for future testing (including specific noise monitoring locations, minimum number of shots to be fired, and wind conditions).

(b) Condition D4 - Acoustic Shelters

Delete the requirement for acoustic shelters at the 800m firing point at the existing 800m range.

(c) Condition A6(d) - Use of the Existing Range

Increase the time period for noise compliance testing reports for the existing range to be placed on a website from 7 days to 14 days

The Proponent for this application is NSW Communities - Sport and Recreation.

BACKGROUND

The site is located on the southern side of Wattle Ridge Road, approximately 5.5km north-west of the centre of the village of Hill Top. The site lies within the Wingecarribee Shire local government area.

The site is surrounded by:

- the Bargo State Conservation Area to the north, east and south of the site;
- the Nattai National Park to the west (part of the greater Blue Mountains World Heritage Area); and
- the Wattle Ridge pastoral property along the north-western corner of the site.

The original application, which sought approval for the shooting complex, was approved on 9 February 2009 by the then Minister for Planning. This decision was challenged in the Land and Environment Court and was deemed invalid by the Court on 24 November 2009.

The application was then re-determined and approved by the then Minister for Planning on 1 March 2010.

The application was approved following advice from an Independent Hearing and Assessment Panel (IHAP). The IHAP was established on 2 May 2008 consisting of The Hon. Ian Armstrong (chair), Mr Najah Ishac (noise expert) and Mr Vince Berkhout (planning expert). The IHAP considered noise impacts, impacts on residential amenity, operations management of the shooting complex, and ongoing management and mitigation of environmental impacts.

A public hearing was held in Hill Top on 30 May 2008 and a report was submitted to the Department on 1 August 2008. The report included a number of recommendations to minimise the impacts of the proposal on the environment and surrounding residents including setting a maximum noise limit of 75dB(Lin) Peak Hold.

DELEGATION TO THE COMMISSION

The proposed modification was referred to the Commission on 11 February 2012 for determination under the terms of the Ministerial delegation dated 14 September 2011.

Dr Neil Shepherd AM and Mr Joe Woodward were nominated as the Commission members for the project. Dr Neil Shepherd AM chaired the Commission.

DEPARTMENT'S ASSESSMENT REPORT

On 11 February 2012, the Commission received the Director-General's Environmental Assessment Report. The report provided an assessment of key issues including:

- Averaging of noise
- Fire arms noise levels
- Noise monitoring methodology
- Acoustic Shelters
- Publication of noise monitoring reports.

The Department received a total of 41 submissions on the project comprising:

- 2 agency submissions;
- 3 submission expressing support; and
- 36 submissions objecting to the proposal.

The key issue of concern was noise and its impact on residential amenity. Other issues included impact on other users of the area including those engaged in passive recreation in conservation areas, impact on property values, independence of the noise consultant and the deletion of acoustic shelters.

It is noted that the proponent made the following changes to the original modification application in response to concerns raised during exhibition of the proposal:

Condition A9 - Firearm noise limits

- *Reduction of the proposed maximum noise level for the 800m rifle range from 85dB(Lin) Peak Hold to 80dB(Lin) Peak Hold.*
- *Change the proposed noise levels to be expressed as arithmetic averages rather than logarithmic averages.*
- *Specify the locations for the noise measurement to be undertaken on public rather than private land, using GPS coordinates, as well as number of shots to be fired and wind conditions.*

Condition A6(d) - Use of Existing 800m Range

Reduce the proposed time period for noise compliance testing reports to be placed on a website, from 30 days to 14 days.

The Department's assessment report concluded that the proposal was acceptable and recommended that the application be approved subject to amended conditions.

Meetings with Key Stakeholders

Proponent

On 20 March 2012, the Commission met with the proponent to discuss the proposal. The discussion focused on noise measurement, compliance monitoring, existing/future range criteria and amenity impacts on surrounding properties. The proponent also advised that they would submit a written response supporting their view that the range fell under the

existing range criteria for the purpose of the Environmental Noise Control Manual (ENCM) for shooting ranges.

On 3 May 2012, the proponent provided the Commission with an additional written submission (Appendix 1) responding to some of the material in the Department's Assessment Report concerning classification of the 800m range and interpretation of the ENCM guideline and its applicability to the 800m range. The submission also dealt with conditioning of shooting range complexes, location of noise monitoring sites and responded to suggestions made by the Residents Action Group's noise expert concerning averaging of noise impacts and noise auditing procedures.

Public Meeting

The Commission held a public meeting at Hill Top on 21 March 2012 to hear community views on the Department's Assessment Report and recommendation. Twelve people spoke at the Commission meeting including those speaking on behalf of resident groups (see Appendix 2). The key issues raised at the meeting included:

- Noise
- Impact on amenity
- Access/traffic
- Property prices
- Health impacts
- Measurement of noise
- Mitigation measures
- Enforcement
- Impact on natural environment
- Approval process
- Consideration of alternatives

Wingecarribee Shire Council

The Commission met with Wingecarribee Shire Council on 22 March 2012 at the Council offices. Council also invited the Hill Top Residents' Action Group (HTRAG) to attend the meeting. Council raised the following key issues at the meeting:

- Council do not support the proposal given the adverse noise impact on surrounding residential properties.
- Council advised that it is difficult to monitor, enforce or verify breaches of noise limits given the technical nature of the noise controls, lack of appropriate monitoring equipment and lack of technical expertise. Council considered that the conditions as recommended by the Department would be unenforceable.
- Council considers that the shooting range is a single complex. Monitoring of two different noise levels from a single shooting complex as currently recommended would be impractical.
- Council expressed a need for funds and equipment to enable appropriate monitoring of the facility if the application were to be approved as recommended by the Department.
- Council considers noise monitoring should continue to be carried out on private properties in accordance with the principles in the NSW Industrial Noise Policy.

COMMISSION'S COMMENTS

This modification application presented the Commission with significant and complex issues. The context is effectively described by the consultant planners (BBC) for the Residents' Action Group in their submission dated 15 July 2011 which is appended to the Department's Assessment Report. At pp. 2-3 they state:

'As required by the conditions of the approval, the proponent has undertaken noise monitoring of the use of the range and has found that the use of the range results in noise levels that do not comply with condition A9 that requires certain noise limits to

be met. The proponent's response to this is simple – change the noise limit and the way it is measured so that the non-compliance disappears. This is an extraordinary response from a proponent now known as the Office of Communities and one that the residents of Hilltop object strongly to. After taking the benefit of the consent, the proponent no longer wishes to abide by the terms of the consent and, without any consideration of whether the facility actually causes annoyance to the residents of Hilltop, seeks to change a burdensome element of the consent by changing the noise limit and the way it is measured in the condition to ensure compliance with the condition.'

The existing consent follows standard practice and consists of a number of conditions, one of which (A2) incorporates the proponent's statement of commitments into the approval. This statement of commitments includes:

- *'Noise Monitoring would be undertaken in different climatic conditions to confirm allowable operational usage in accordance with Chapter 164 the DECC's Environmental Noise Control Manual.*
- *The noise impacts, including traffic noise, of any proposal to increase site usage would be subject to detailed investigation once the new ranges have been built. This would involve noise measurements, at the nearest sensitive receivers, of all firearms (recreational and military) used and fired in their respective ranges. Measurement results may trigger additional measures such as:*
 - *Altering the acoustic design at the ranges;*
 - *Restriction of firearms used on the site; and*
 - *Restriction of the use certain firearms to specific ranges.*
- *Monitoring any new firearm with a potential to be louder than existing firearms used and proposed to be used on site to ensure it does not affect the allowable maximum site usage.*
- *Undertaking noise monitoring annually to confirm compliance with Chapter 164 of the DECC's Environmental Noise Control Manual.'*

This is consistent with the commonly accepted method of dealing with noise impacts in NSW. Noise limits set in consents are expected to be met and are also expected to result in an acceptable level of impact at sensitive receivers. The consent will often include mechanisms to deal with any persistent failure of the project to meet the noise limits. These mechanisms focus first on improving performance at source (by reducing noise generated, or by containing it on-site), second by reducing impact at the receiver (by sound-proofing buildings, erecting screens, etc) and third by purchase of the affected property.

The statement of commitments clearly contemplates that action may be required by the shooting complex to mitigate its impacts in the event that noise levels from the shooting complex exceed the consent limits. The Commission notes that these actions are precisely those that a regulator would expect to see implemented as a first step in dealing with non-compliance in such circumstances.

The proponent's suggestion in the submission of 3 May that the negative impacts on the planned operation of the shooting complex should override the protections for residents contained in the ENCM guideline restrictions for use of the 800m range must also be viewed in this context. The documented mitigation strategies available in the event of non-compliance are designed to deal with this type of conflict in the appropriate way.

Within this overall context the proponent's assertion that the 75dB(L) peak hold limit on the 2010 approval was based on flawed data requires specific comment. The implication is that, had all the more recently collected data been available, the noise limit would simply have been set higher to ensure the 800m range could be compliant.

There are a number of problems with this line of argument including:

- Noise limits are not set simply by reference to the loudest noise a proposed project may be capable of emitting. As the Resident Action Group's noise expert points out in his Report of 15 July 2011 included in the Appendices to the Department's Assessment Report:

'The purpose of a noise assessment is to derive noise criteria specific to the project taking into account generally accepted noise goals which are set out in, for example, the Industrial Noise Policy, Noise Guide for Local Government, Australian Standards, Council policy, legislation and common law principles. It is not to back fit noise criteria around the maximum noise likely to be generated by a project

...

Where noise from the project exceeds the criteria, the approach universally adopted in NSW is to modify the project so as to reduce the noise received at sensitive receptors, or if that cannot be done, to buy out the receptors.

...

It is not unusual in my experience for developments to commence operation and find the resulting noise levels or environmental impacts exceed the predictions in the environmental assessment. In those cases, noise mitigation works were undertaken to make the developments comply.'

- The noise limits in the March 2010 approval were based on assessment and advice from several experts including, GHD, Mr Najah Ishac, Acoustic Specialist, ERM Consultants, who was a member of the Independent Expert Panel, Norman Disney Young (recommended by the Independent Expert Panel) and DECC.
- The IHAP and the Department's Assessment Report for the 2010 approval took a carefully considered approach to residential impacts and concluded that a 75dB(L) peak hold limit was appropriate for the complex. There is no evidence to support the proposition that the Minister would have approved impacts above 75dB(L) peak hold even if additional data were available. Indeed, the inclusion of additional monitoring criteria for the 800m range in the approval indicates that the possibility of the 800m range exceeding 75dB(L) peak hold was foreseen. As noted above, the approval conditions contained mitigation options to deal with such eventualities for the complex.

The proposed modification also presents complex technical problems concerning the measurement, assessment and regulation of noise from shooting ranges. The Commission has therefore set out its reasons for decision in detail.

Some of the key issues considered by the Commission include:

- Existing vs. Future Range Classification for the 800m Range;
- Measurement of Shooting Range Noise;
- Whether the 800m Range is Compliant; and
- Can the 800m range be treated separately to the complex as a whole.

A Existing vs. Future Range Classification for the 800m Range

The former State Pollution Control Commission (SPCC) published the Environmental Noise Control Manual (ENCM) guideline for shooting ranges in 1985. The aim of the guideline was to balance noise impacts on residents by reducing the frequency of use of a range in response to increases in the allowable noise level. The guideline applied substantially different criteria to ranges classified as 'existing' and 'future use'. As a concession, existing ranges were allowed to operate for significantly more days each week than those classified as 'future' ranges (e.g. for a maximum residential noise limit of 75dB (Lin) Peak Hold an existing range could operate for 7 days per week and a future range for 4 days per week). However, the guideline also stated that alterations to existing ranges should result in movement to future range classification whenever possible.

It appears to be generally agreed (Department, proponent, OEH, Residents' Action Group, consultants, etc) that the ENCM guideline, although old, is still the appropriate standard to apply to shooting ranges in NSW.

The proponent's submission is that 'existing range' criteria should apply to the 800m range, a proposition reiterated in the submission dated 3 May 2012. The proponent advanced a number of arguments in support of this position (see p.8 of the Assessment Report) which were not accepted by the Department. The Department's reasons were:

The Department does not support the use of "existing range" criteria for a number of reasons. Use of this criteria would translate into use of the range for up to 7 days per week under the ENCM guidelines. The Council issued consent in 1986, after the ENCM guidelines were published in 1985. The consent restricted use of the range to 2 days per week and limited the number of shooters each day (25 shooters per day, and up to 36 shooters for competition days). Both the IHAP and the Department considered that firearms use was intensifying and therefore the "future range" criteria was appropriate. In any case, the ENCM guidelines states that existing use should transition to future use. For these reasons, the continued application of the future range criteria is considered to be justified and consistent with the ENCM guidelines.

The proponent has also argued (Response to Submissions) that establishment of the 800m range was a relocation of an existing range (Welby) and that there are precedents (Liverpool Rifle Club is cited) involving transfer of existing range status to a relocated range. The proponent reiterated this position in meetings with the Commission. Consultants for the residents have provided copies of the relevant documents for the Liverpool Rifle Club relocation. These documents do not support the proponent's position that Liverpool Rifle Club was afforded 'existing' range status. These consultants have also provided a copy of the 1986 Council consent for establishment of the 800m range which clearly demonstrates that the use approved in 1986 is significantly different to that applying in 2011 when the current modification application was lodged.

The Commission concurs with the Department's view that 'future' range criteria should be applied to the 800m range and finds that there is no credible evidence to support the proponent's contention that 'existing' range criteria should apply.

B Measurement of Shooting Range Noise

While the ENCM limits may be generally accepted as appropriate, there is no such agreement on how noise monitoring should be conducted or the results should be analysed and interpreted. The Department's Assessment Report deals with some of this complex material at pp.5-11. The Commission has been provided with further written and oral evidence from both the proponent and the objectors in response to the Assessment Report's conclusions on these matters.

The matters in contention include:

- i. Locations at which monitoring should occur and whether prevailing weather conditions should be considered.
- ii. The relevant scale to be used: (dB(Lin) Peak Hold vs dBA (weighted with an impulse penalty).
- iii. Whether testing is required for individual calibres or some (unspecified) mix of calibres.
- iv. The number of shots required.
- v. Whether all shots or some specified sub-sample of shots should be included in the analysis.
- vi. Whether results should be expressed as the absolute maximum, arithmetic averages, or logarithmic averages.

These are not trivial technical issues. How they are dealt with will make a substantial difference to the impact on residents and users of the surrounding area, the users of the range and the capacity of the regulators (Wingecarribee Shire Council and DoPI) to enforce conditions of consent.

Before dealing with these six issues individually it is necessary to note some of the current policy context. The 1985 ENCM guideline is silent on all but the measurement scale (Linear Peak Hold) and that monitoring should occur at the worst affected location. The subsequent (1993) internal EPA memo refers to arithmetic averaging, the number of shots required being the number sufficient to determine a noise 'that is representative of the type of firearm being used', that this number is commonly 50, and that measured levels that are 'clearly not representative should be excluded'.

This 1993 memo raises more questions than it answers. It does not specify whether the noise measurement is for the purpose of breach detection, setting noise limits or environmental auditing. The wording implies that testing is required for each type of firearm (i.e. independently), but the proponent's noise expert advised the Commission that the current practice is to measure whatever mix of firearm types are in use on the range on the day of testing. However, this interpretation was not supported by the noise expert advising the Resident Action Group. The wording on excluding non-representative shots is also vague.

(i) The locations at which monitoring should occur and whether prevailing weather conditions should be considered

Consents usually specify noise monitoring at the most affected residences. However, where this is not specified, reference is often made to compliance with the NSW Industrial Noise Policy (INP). The INP states that noise should be monitored at the most affected noise sensitive location. This is defined as '*locations that are most affected (or that will be most affected) by noise from the source under consideration as per Note 2 in Section 2.2.1. In determining these locations, the following need to be considered: existing background levels, noise source location/s, distance from source/s (or proposed source/s) to receiver, and any shielding (for example, building, barrier) between source and receiver. Often several locations will be affected by noise from the development. In these cases, locations that can be considered representative of the various affected areas should be monitored.*'

Section 2.2.1 states *inter alia*, '*In assessing noise levels at residences, the noise level is to be assessed at the most- affected point on or within the residential property boundary or, if this is more than 30 m from the residence, at the most-affected point within 30 m of the residence.* Although the INP is primarily for industrial noise sources, the principle is consistent for other activities. The noise monitoring locations in the March 2010 approval for the Hill Top Shooting Complex are consistent with this policy.

For regular compliance monitoring these locations ought to be consistent between tests and the methodology should be standardised.

In most cases, rigorous application of these principles requires access to the worst affected properties for the purposes of monitoring. The proponent objects to this and wishes instead to substitute monitoring locations that are located on public land. The proponent alleges that access has not been available to the relevant private lands. The residents strongly dispute this. The proponent's alternative position put in the submission of 3 May is that coordination of testing would be difficult if approval to enter private land were required.

While the existing consent (condition A9) applies the standard principles for controlling noise impacts in NSW, the proposed modification introduces a new concept, which is to

control the noise impact at specified locations on public land. No argument is presented in the Assessment Report to support this significant change in policy direction. Also, no scientific evidence was presented to the Commission to show that measurements undertaken at these proposed locations would be consistent with measurements taken at the worst affected residences. Inspection of one proposed site by the Commission (A4a opposite the entrance of the rural property) suggested that it was unlikely to be representative of the residential impacts.

Without clear evidence that measurements at the proposed locations are an accurate reflection of the impacts at the worst affected residences, or that a robust set of calibration factors can be derived that deliver an equivalent outcome, the Commission is unable to support the proposed monitoring locations.

The existing consent at condition A9 clearly specifies that the noise limits are to be applicable under prevailing weather conditions. This is consistent with the standard approach to noise management in NSW, since prevailing conditions may significantly affect the noise impacts at sensitive receivers. The proposed modification deletes this requirement but, as no argument is advanced to support this significant change in approach, the Commission is unable to support it.

(ii) The measurement scale to be used

Noise from firearms has different characteristics to noise from industrial activities. In many jurisdictions, including NSW, it is measured using the Linear Peak Hold scale rather than the more common dB(A) scale. However the noise expert for the Resident Action Group advised that international best practice may be moving toward use of the dB(A) scale with inclusion of an impulse penalty.

The Commission's view is that the current application must be considered on the basis of the Linear Peak Hold scale. However, any advance in methodology for measuring noise from shooting ranges that would reduce complexity and reliability would be worth exploring for any future applications.

(iii) Is testing required for each individual calibre to be used or for a mix of calibres (unspecified) in use on the range on any day

The testing results in Table 2 (p.6 of the Assessment Report) were derived using a mix of calibres. At a meeting with the Commission the proponent's noise expert supported this as normal practice in compliance monitoring of shooting ranges.

However, the 1993 EPA internal memo specifies that testing is required to be representative of the type of firearm being used, suggesting that separate testing of each calibre is required. This is supported by the planning consultants for the Resident Action Group (BBC) and by the noise expert for the Resident Action Group.

The Commission has given careful consideration to this issue. It is common ground that different calibres produce different noise levels. If the objective is to determine the maximum impact at the most sensitive receivers for the calibres allowed to be used on the range then it follows that the noisiest calibres should be tested individually. However, if the objective is to determine the impact from a typical range day then a mix of calibres typical of those allowed to be used could be tested. The problem with the latter is that there is no evidence before the Commission to indicate whether a 'typical' mix of calibres (or indeed a 'typical' range day) exist. The Commission also notes that if this approach is taken two other problems arise: the number of shots from each calibre would have to be standardised if any form of averaging is to be used in analysis of the results, and the mix of calibres would need to be standardised for repeat testing.

In draft condition A9(d) of the recommended conditions of approval, the Department appears to favour the testing of individual calibres ('using the loudest firearms ...'), but this isn't beyond doubt given the proponent's view that this could be met by testing the mix of firearms in use on the day, so long as the loudest firearms were included in that mix. This view is consistent with the proponent's approach to testing on 29 April 2012 as reported by the proponent in its submission of 3 May 2012.

The Commission considers that the true potential noise impact on sensitive receivers can only be determined by testing the noisiest calibres individually and assessing the impact from use of those calibres at the maximum permissible level for the range (i.e. number of firearms and duration of firing).

- (iv) The number of shots required and (v) whether all shots fired should be included in the analysis

The 1993 memo suggests up to 50 shots and that measurements that are 'clearly not representative' should be excluded. Just what is meant by 'clearly not representative' is a contentious issue. The proponent's noise expert contends that all shots fired (both audible and inaudible) should be included in the analysis and that the 'non-representativeness' refers to measurements from non-firearm sources (e.g. wind, birds, etc) that may appear in the reading due to the particular sensitivities of the instruments used to measure Linear Peak Hold.

This interpretation is disputed by the Resident Action Group's noise expert who concludes that:

'The EPA Memo also states that "measured levels that are clearly not representative should be excluded". I interpret this to mean that abnormally high or abnormally low noise levels that are not close to the arithmetic average should be excluded. I understand that the EPA Memo contemplates that the variation in the noise levels measured for each firearm at each firing location ought to be within a narrow range to enable the averaging to include only "representative" noise levels. As stated in the EPA Memo "this relies on the person conducting the assessment having a level of acoustic expertise".'

An interpretation that abnormally high or low readings should be excluded from the analysis would be consistent with analytical procedures often applied to results expected to be distributed normally in order to reduce the impact of a few individual 'outlier' results on the calculated average.

The Resident Action Group's noise expert went further in a supplementary report provided to the Commission at the public meeting. In this report he argued that a minimum of 150 contiguous shots be recorded and only the loudest 50 shots should be included in the average.

There are obvious problems with using inaudible shots in the analysis. First, including inaudible shots requires simultaneous data recording at the source and the receptor. These are separated by up to approximately 3.5km, measured from the 800m firing point and are not line-of-sight. Proper regulatory oversight involving unannounced monitoring at the receptor (either in response to complaints or on the regulator's own initiative) cannot occur in these circumstances, a point made strongly to the Commission by the regulator, Wingecarribee Shire Council. Second, inclusion of inaudible shots fails to acknowledge that the primary purpose of measurement is to assess residential impact. Residential impact is a function of the maximum noise level, the average noise heard, the number of shots heard and the duration of the exposure. Inaudible shots are irrelevant. If there is no noise from the range then objections to the range reduce considerably.

The proposal for only using the loudest 50 out of 150 shots in the analysis of the arithmetic average has some merit in that it seeks to obtain a more realistic assessment of impact on receivers compared to the proponent's suggested use of data from all shots fired. However, it also suffers from the problems of non-specificity in relation to firearm type, the possibility that the mix of firearms being used is not representative, and the need for at least 150 shots to be recorded for any form of breach investigation or compliance monitoring. The proponent also notes that requiring 150 shots may be beyond the capacity of small shooting clubs.

Draft condition A9(d) specifies a minimum of 50 shots over a half hour period, but is silent on how non-representative shots are to be dealt with. However, the specification in A9(e) that the monitoring is to be under still or light wind conditions suggests that the proponent's argument that non-representativeness of measurements is due to instrument sensitivity has been accepted. There are several problems with this approach: wind is not the only sensitivity problem for these instruments (hence the 1993 EPA memo caveat concerning acoustic expertise of the person conducting the noise assessment); removing testing under prevailing wind conditions is a major departure from noise testing practice and may significantly alter assessment of residential impact; and inclusion of inaudible shots in the results may affect the average significantly.

The Commission's view is that the analysis should be based only on audible shots and that only the loudest firearms should contribute to the results.

For future assessment of noise impacts and ongoing environmental auditing the suggestions by Dr Tonin concerning a standardised methodology for collection, analyses and interpretation of results warrant careful consideration. These suggestions are found in Dr Tonin's acoustic reports dated 15 July 2011 and 21 December 2011, available on the Department's website and Dr Tonin's submission to the Commission at Appendix 3 dated 21 March 2012. However, the Commission notes that the proponent does not support Dr Tonin's approach.

(vi) Whether results should be expressed as absolute maximum, arithmetic averages or logarithmic averages

Each of these has different implications for measurement methodology, analysis, impact at receivers and regulatory oversight.

The noise limit in the current consent is expressed as a maximum noise level (75dB(Lin) Peak Hold) with no mention of averaging. Legal Counsel for the Resident Action Group advised the Commission that this should be interpreted as the maximum level allowed for any individual shot. This position is consistent with the reference to 'outright 75dB(L) Peak Hold limit' in the proponent's modification application (at Attachment A p.2). The proponent originally requested logarithmic averaging be applied to the new levels sought in this application, but has conceded to the use of arithmetic averaging in response to advice from OEH. OEH acknowledges that arithmetic averages will generally be lower, but never higher, than logarithmic averages. For example, the arithmetic average of 70, 75 and 80 dB is 75dB, while the logarithmic average is 77dB.

Compared to the existing consent condition, averaging will allow noise impacts on residents above the 75dB(L) Peak Hold limit. There is no limit proposed on the magnitude of this increase and, because the number of shots allowed to be fired from the range on any day is also not specified, there is effectively no limit set on the number of shots above 75dB(L) Peak Hold that might be experienced.

As already noted, the Department's Assessment Report adopts arithmetic averaging with a minimum of 50 shots, but makes no mention of the former EPA's caveat concerning non-representative measurements. This issue is important because the inclusion of

unrepresentatively low values will lower an arithmetic average much more than a logarithmic average. The Department's draft conditions (A9e) also delete the standard requirement for prevailing weather conditions to be included in the assessment. Neither these departures from usual practice are explained in the Assessment Report.

There is no doubt that there is a substantial level of uncertainty about how noise from shooting ranges should be measured and assessed. In the Commission's view part of this arises from the attempt to use a single approach for several different purposes.

There are at least three distinct reasons for measuring and assessing noise from shooting ranges, i.e.

- (i) to set appropriate noise limits at the consent stage;
- (ii) as part of routine environmental auditing to determine whether modifications or mitigation strategies are required to maintain impacts within acceptable limits; and
- (iii) as part of regulatory oversight in response to complaints or routine compliance monitoring (i.e. potential breach investigation).

It is not essential that all aspects of the noise assessment process are identical for all three purposes. Obviously for all three purposes noise from shots must be properly recorded (i.e. measurements are taken by a trained operator using the correct equipment in a manner consistent with the relevant Australian Standard) and the recordings must be taken at locations consistent with the conditions of consent (or licence if one exists). But the mix of firearms, number of shots, analytical approach, etc could be different depending on the purpose of the assessment.

In order to set the appropriate levels for inclusion in a consent (i.e. Purpose (i)) it would be reasonable to attempt to determine the expected impacts from normal operations at the range and from any particular type of operations (e.g. single calibre competitions or prevailing weather conditions (primarily wind)) that may result in a higher level of noise at sensitive receptors. These results could be obtained by measurement of a specified number of shots from a mix of firearms or individual firearms under the appropriate range of weather conditions and then using either arithmetic or logarithmic averaging to produce a noise level for consideration in the impact assessment.

Note that depending on the methodology used the derived level may vary substantially and this fact must be incorporated into any assessment of impact on sensitive receivers. Also, if the ENCM table is to be used in setting the consent conditions (i.e. level of firearm noise against the number of days per week that the range is allowed to operate) then it appears that the derived level will have to be compatible with arithmetic averaging since this is the basis on which the table was compiled.

The methodology used to assess noise impacts for setting the consent conditions could also be used as a standardised method for monitoring as part of the regular environmental audits designed to ensure that the range operations are meeting the consent conditions (Purpose (ii)) and, if not, whether any mitigation options (e.g. such as those outlined in the existing consent at A2 through incorporation of the proponent's statement of commitments) should be imposed.

However, this approach is not suitable for enforcement purposes (Purpose (iii)): it requires active cooperation and action from the entity against which legal action may be taken (e.g. access, number of shots to be fired, specific calibres, etc); it cannot be undertaken unannounced, either in response to complaints or on the regulator's own initiative; and it requires the regulator (Council) to have the equipment and trained personnel to conduct the tests and interpret the results (or employ a noise consultant to do this).

The Commission has considered this issue of enforcement carefully. The Council presented a strong case to the Commission that enforcement could only realistically occur if the

consent contained an absolute limit for firearm noise to be received at residential premises. This position was reinforced by Counsel for the Resident Action Group, who also noted that the current consent was framed as an absolute limit.

The Commission agrees that, of the options considered, an absolute limit provides the only feasible option for enforcement in response to complaints or own-initiative inspections by the regulator. However, the problem with setting this absolute limit at the same level as the level derived from measurement for purposes (i) and (ii) is that the averaging used will mean that some shots must inevitably lie above the average. The absolute limit would have to be set higher to account for this and the relevant condition would have to be expressed in terms of a maximum level from any shot measured at any residential premises (essentially as per current condition A9). This doesn't mean that the absolute limit should be set at the maximum level likely to be emitted from the range without implementation of noise mitigation measures. Protection of residential amenity must be the primary consideration and the range noise limit must be able to achieve this even if it requires implementation of mitigation measures from the outset.

The Commission's conclusion is that the cumulative impact of changes proposed in the modification application to increase noise limits, adopt averaging of results, alter monitoring locations, and delete the requirement to consider prevailing weather conditions would result in a potentially significant increase above the permissible noise impact established in the March 2010 project approval. The proposed modification does not include any assessment of these potential changes to noise impacts on residents. The Commission considers it would not be appropriate to accept these changes without such an assessment.

C Whether the 800m Range is Compliant

As noted above, Counsel for the Resident Action Group and the proponent appear to agree that the current limit of 75 dB(L) Peak Hold is an absolute limit. The current consent contains no mention of averaging to either derive this limit or to measure compliance with it.

The proponent's noise expert advised the Commission that current use of the 800m range could not comply with the 75 dB(L) Peak Hold limit at all times. This would appear to be borne out by the data included in the Assessment Report at p.8 and in the report from the Resident Action Group's noise expert Dr Tonin (attachment to the Assessment Report dated 15 July 2011). While the vast majority of measurements appear to fall below 75 dB(L) Peak Hold, there are a significant number between 75 and 80. The one particular group of measurements above 80 is noted as being wind-affected (see p.8 of the Report by Dr Tonin).

D Can the 800m range be treated separately to the complex as a whole

The proponent seeks to have the 800m range classed as an 'existing range' and to have a separate and higher noise limit applied to it than to the rest of the complex. The 'existing range' classification was dealt with under A above. Neither the Commission nor the Department consider the 800m range to be an 'existing range' for the purpose of noise assessment.

Counsel for the Resident Action Group advised the Commission that the complex should be treated as one site and that separate (and different) limits should not be allowed. This view was supported by the Resident Action Group's noise expert. The Council also made the point that regulatory limits should apply to the site as a whole and that enforcement of noise limits at receivers would be impractical if two ranges with different limits were operating at the same time (this will almost certainly be the case given the overlapping days for use of the proposed ranges in the complex).

The planning consultants for the Residents' Action Group also made the following points in their submission to the Commission dated 16 April 2012:

'The proposal involves the extension of the 800 metre range into a regional shooting complex. The proposal met the definitions of Major Sporting Facilities under clause 15(3) of schedule 1 of State Environmental Planning Policy (Major Projects) 2005, as it was at the time namely:

'Development for the purpose of a regional shooting complex where two or more shooting clubs or ranges within a defined region are consolidated into a single site.'
(at p.3)

At pp.4-5 the consultants state:

' the 800m range is clearly part of the Southern Highlands Shooting Complex. Its use is permitted by the project approval. Furthermore it is:

- located on the same lot as the other ranges and is on the same State Significant Site as identified in SEPP (Major Development) 2005;*
- It is to be subject to the same Operational and Environmental Management Plan for the whole Complex;*
- The range is run by the SHRSCI and is controlled by the RMC of the Complex.*
- If it was not part of the complex it would still operate under the Council consent and wouldn't have been included in the project application.'*

The proponent has provided an example of a shooting complex where individual ranges have different hours of operation as evidence that shooting complexes can have different conditions applied to the ranges within them. The Commission accepts that an indoor range may have hours of operation that extend beyond those allowed for an external range in the same complex. However, this is based on noise levels from the indoor range not causing unacceptable residential impact. From a regulatory perspective this is quite different to allowing multiple levels of a similar type of impact-causing noise to emanate from within a single site at the same time.

The Commission is of the view that the site is correctly described as a shooting complex and a single site for regulatory purposes. The difficulty in effectively enforcing multiple noise limits is sufficient on its own to make the proposition for multiple noise limits untenable.

Other issues

Deletion of the Acoustic Shelter

The proponent seeks to delete condition D4 of the approval which requires an acoustic shelter to be installed at the 800m firing position on the 800m range. The proponent argues that this shelter would have little effect on mitigating noise impacts since it is located at only one of 8 firing positions on the range, that it is not the most commonly used position, and it is also not the position responsible for the greatest impact.

The Department's Assessment Report notes that the IHAP recommended that the proponent provide acoustically treated shelters at all external ranges, including the 800m range. However, condition D4 limits the requirement to provide shelters on the 800m range to one firing point only. The reasons for this are not stated in either the 2010 or current Assessment Reports. However, the Commission noted at its site inspection that the current configuration of the 800m range would make installation of permanent acoustic shelters at the intermediate firing points challenging. The possibility of temporary mobile noise mitigation structures for these intermediate firing points was raised by the Resident Action Group's noise expert at the public meeting.

It is clear that measurement of noise impacts from the 800m range will need to be refined and standardised. Once this is done a proper assessment can be undertaken of the mitigation measured that may be necessary to bring each firing point on the 800m range into

compliance. Until that is done the Commission considers that the requirement to install an acoustic shelter at the 800m firing range point should remain.

Publication of Noise Monitoring Reports

The proponent's request to increase the time limit for reporting of compliance monitoring results from 7 days to 14 days is supported by the Department and not opposed by the Resident Action Group. The Commission has no objection to this part of the proposal, but is of the view that it ought not be severed from the total package of changes sought by the proponent in this modification.

COMMISSION'S DETERMINATION

The Commission has carefully considered the views expressed at the public meeting and in meetings with the proponent, the Department's Assessment Report, and agency and public submissions.

The Commission notes the technical difficulties that this modification proposal presented and the Department's efforts to find an equitable solution to the issues raised. However, for the reasons set out in this report the Commission has come to the view that the case for the modification proposal has not been adequately justified and that it would not be in the public interest to approve it as recommended.

The Commission has made detailed comment in this report on each aspect of the proposed modification. Apart from simply setting out its reasons for decision the Commission has sought to identify some of the complex technical factors that would need to be addressed in any subsequent proposals concerning this or other shooting ranges.

The Commission's conclusion is that the modification application should be refused.



Dr Neil Shepherd AM
Commission Member



Joe Woodward PSM
Commission Member

Appendix 1

NSW Office of Communities – Submission to the Planning Assessment Commission (3 May 2012)



Office of
Communities

Obj: DG12/0347
Ref: B15992

Mr Anthony Witherden
Panel Secretariat
Planning Assessment Commission
Level 13, 301 George Street,
SYDNEY NSW 2001

Dear Chairperson

RE: Submission on modification of major project approval: Southern Highlands Regional Shooting Centre MP 06-0232 MOD 4

The following submission is made in relation to the modification to the Major Project approval at the Southern Highlands Regional Shooting Complex (SHRSC), in particular the modification to *Condition A6 Use of the existing 800m range* which decreases use of the existing 800m range from four (4) to three (3) days per week.

Comments are also provided in relation to correspondence from BBC Consulting Planners dated 21 March 2012 forwarding advice from Renzo Tonin and Associates.

Existing 800m Range at Hilltop

On 26 September 1986, Wingecarribee Shire Council approved Development Application 6100-4-407/86 for an 800m rifle range at Hill Top.

It has been confirmed as part of the PAR (Planning Assessment Report) for MP 06-0232 Mod 4, that the 800m rifle range was first used in October 1988.

Accordingly, the subject range is classified as an existing range.

Intended Interpretation of Environmental Noise Control Manual (ENCM)

As outlined in advice from The Acoustic Group (TAG) Steven Cooper indicates his familiarity with the ENCM guidelines as it was himself who developed the original version of the guidelines in his capacity as a member of the State Shooters' Liaison Committee, which was chaired by the State Pollution Control Committee (original publisher of the ENCM).

Steven Cooper also specifically advises that based on previous EPA assessment/approvals for existing rifle range complexes that have been expanded by the provision of additional ranges/disciplines, he considers the existing operations as an existing category under the ENCM guidelines with the additional ranges/disciplines considered as a future range classification. Relevant examples of precedents have been provided to the PAC via email on 1 April 2012.

Accordingly, for the subject application, the existing 800m range should be considered as an existing category under the ENCM guidelines, in particular when referring to Table 1 below.

Section 6.2 *Firearm Noise Levels* of the PAR states:

'The Department does not support the use of "existing range" criteria for a number of reasons. Use of the criteria would translate into use of the range for up to 7 days per week under the ENCM guidelines.'

However Steven Cooper notes that the intended procedure has not been adopted in the case of the subject development, with the approach being to reduce the entire complex to future range criteria.

Accordingly, it is considered that given the intended interpretation of the ENCM by its developer, it is appropriate to permit the existing 800m range to be used up to four (4) days per week as originally outlined in the determination document for MP 06-0232, particularly as the intended interpretation of the ENCM guidelines would permit up to seven (7) days per week usage of the existing 800m range.

Planning Assessment Report - MP 06-0232 Mod 4

Section 5.2 *Environmental Noise Control Manual* of the subject Planning Assessment Report (PAR) acknowledges that the ENCM guidelines do not provide a maximum noise level for shooting ranges, rather, it specifies usage rates of ranges be limited according to the measured noise level at residential boundaries, as shown in the table below:

Table 1: ENCM guidelines for target shooting ranges

Residential Level dB(Lin) Peak Hold											
	60	65	70	75	80	85	90	95	100	105	>105
Maximum Usage – Days/Nights per week											
Existing range daytime use	7	7	7	7	7	7	5	4	3	2	1
Existing range night time use	3	3	2	2	2	1	-	-	-	-	
Future range daytime use	7	5	5	4	3	2	1	-	-	-	
Future range night time use	3	2	1	-	-	-	-	-	-	-	

Source: NSW Government Planning & Infrastructure Planning Assessment Report – MP 06-0232 Mod 4

Section 6.1 *Averaging of Noise Levels* of the PAR states it is *"recommended that arithmetic averaging be used to measure noise from the existing and new ranges."*

Section 6.2 *Firearm Noise Levels* of the PAR states that:

"The Department has reviewed the noise monitoring reports for the 800m range and identified the highest average noise level recorded to be 77.28dB (Lin) peak hold, on 19 June 2010, recorded at the northern end of Rocky Waterholes Creek Road and fired from the 800m position."

It is acknowledged that Sport and Recreation is seeking to adjust the noise level for the 800m range to 80dB (Lin) peak hold as an average. However, it is noted that even when using Table 1 in the way it was not originally intended by its developer (i.e. as

has been done by the Department of Planning & Infrastructure in the PAR), the highest average noise level recorded was 77.28dB (Lin) peak hold, therefore placing the range closer to the four (4) days per week maximum usage level, rather than a three (3) day per week usage level when using the average 'Residential Level dB (Lin) Peak Hold' scale in Table 1.

Environmental Noise Control Manual (ENCM)

It is acknowledged that the ENCM guidelines are being utilised for the subject development as no replacement controls have been adopted, and as such the ENCM remains the most relevant document for firearm noise in NSW.

Given that the ENCM is a guideline document only, it is considered further assessment on the merit of the subject development is needed, particularly in regard to the significant impact reduced usage of the existing 800m range will have on the planned operations of the SHRSC.

Issues raised in correspondence from BBC Consulting Planners dated 21 March 2012 forwarding advice from Renzo Tonin and Associates

1. Shooting noise limit

The purpose of condition A9 is to give clarity to the operation of the existing 800m range which has been in operation for over 20 years, and proposed new range/ranges on the same 1036 hectares.

Each range has been specifically designed and built to accommodate particular types of shooting. There is no specific reason why different noise limits cannot be applied to each individual range. The factors that will determine these limits will depend on the type of firearms used, the way in which the range is constructed and the distance from residents.

A precedent exists at the SISC (Sydney International Shooting Centre) which sits adjacent to residential areas. The pistol ranges are baffled and partly indoors and are only licensed for .22 rifles and pistols of a calibre up to .38. The shotgun ranges are outdoors. The ranges are within 100m of each other but each has different conditions. The rifle and pistol ranges can operate 7 days a week from 8am to 10pm. The shotgun range can only operate from 10am to 5pm and two nights of the week.

Accordingly it is recommended that condition A9 remain as proposed by Sport and Recreation.

2. Where the noise limits apply

Under the consent for the project, Sport and Recreation are charged with the responsibility for monitoring noise levels. That obligation needs to be able to be met without the need to gain the further approval.

Sport and Recreation invited the residents to view any testing and had an independent firearms expert at the testing. Difficulties were experienced in coordinating times that were suitable to the residents which would be compounded if approval to enter private land were required.

It is recommended that condition A9 remain as proposed by Sport and Recreation with noise monitoring indicators at set locators in accessible positions as close as possible to the effected residents.

3. Arithmetic average

Renzo Tonin are in effect recommending changes to the guidelines of the EPA. These guidelines have been in place and used by acoustic experts since 1993.

Chapter 164 Noise Control Guideline and its Supplementary EPA 1993 memo interpreting aspects of the Guideline, and consent requirements, as currently approved by the Department of Planning is:

- a. Use of an arithmetic average
- b. Compliance with Point 3 of the 1993 EPA Guideline memo i.e.
 - i. the number of noise measurements will be sufficient to determine a noise level that is representative of the type of firearm being used,
 - ii. Will be based on up to 50 shots,
 - iii. In determining the final noise level, measured levels that are clearly not representative should be excluded.

Renzo Tonin are requesting 150 shots be measured with the loudest 50 to be averaged.

This is again against the guidelines and extremely onerous on a small Club facility. Centre fire ammunition is very expensive and to expect the Club to supply 150 rounds of each calibre for each receiver testing is considered unreasonable and contrary to the current guidelines.

Testing on 29 April 2012 was conducted during a normal calendared event and was representative of the types of firearms being used, as per b:1 above. Sport and Recreation officers ensured that the known nosiest firearm was used during this testing, and can confirm that the majority of the firearms used were the known nosiest calibre. A match for a typical event is 12 rounds per person. At the April testing it was difficult to have enough shooters present to receive 50 shots fired in two sessions. Measurements were undertaken at two locators simultaneously and then another two locations, 100 shots in total.

4. Audit measurement procedure.

Renzo Tonin's suggestions here are contrary to the practice of Sport and Recreation adopted at the request of residents. Sport and Recreation have conducted testing on a day that the known nosiest firearms are being used and the HTRAG have been very insistent of this. The Group have wanted to know what firearms are being used and at what distance.

Sport and Recreation tried to coordinate a test without notification to the users by using the published web based calendar of events as a guide, however this has not proved feasible. The monitoring was locked in with both the acoustic tester and the residents, then it became known that the Club had changed the program due to another competition being held and was only going to shoot .22 calibre rifles. The test results would not have reflected the known nosiest firearms.

There is no procedure under the chapter 164 guideline to consider any particular type of firearms. There is no requirement by any government authority for a shooting club

to record the calibre of every firearm used at the range for any type of compliance let alone be on a public record.

5. Measuring in windy conditions.

In regard to Renzo Tonin's request to change Condition A9, subclause e), the condition imposed is to ensure that the noise can be heard over the wind. Sport and Recreation have worked with their acoustic expert and have monitored the predicted weather conditions during the days leading up to the testing and will continue to do this. The proposal by Renzo Tonin is not considered appropriate.

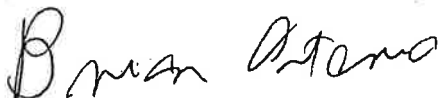
Conclusion

Given the following factors, it is considered unreasonable and incorrect to decrease the usage of the existing 800m range to three (3) days per week as per the modified Condition A6, Use of the existing 800m range:

- the classification of the 800m range as an 'existing range',
- the intended interpretation of the ENCM guidelines as outlined by its developer Steven Cooper,
- the inaccurate categorisation of the existing range under Table 1 of the PAR and,
- the considerable impact the reduced level of usage on the 800m range will have to operations.

It is therefore requested, that the wording of Condition A6 be reinstated to permit usage of the existing 800m range for up to four (4) days per week.

Yours sincerely



Brian Osterio
Director
Asset Management and Procurement

Appendix 2

List of Speakers

Planning Assessment Commission Meeting

Date: Wednesday 21 March 2012

Venue: Hilltop Community Hall

- Mr Ian Dune
- Mr David Shoebridge
- Mr Maurie O'Sullivan
- Ms Kathrine Bolliger
- Ms Julia Watkins
- Mr Seamus and Anne Byrne
- Mr David Wareham
- Mr Tim Robertson
- Mr Charles Watkins
- Ms Julie Cook
- Mr Desmond Kennard

Appendix 3

BBC Consulting Planners submission to PAC - Renzo Tonin and Associates advice
(21 March 2012)



21 March 2012

Our ref: DB/08025

Mr Anthony Witherden
Panel Secretariat
Planning Assessment Commission
Level 13, 301 George Street
SYDNEY NSW 2000

Dear Anthony,

re: Proposed Southern Highlands Regional Shooting Facility (MP 06_0232) – Modification 4 (PAC Ref D119/12) – Public Meeting

We write on behalf of the Hill Top Residents Action Group Inc (HTRAG) in relation to the application to modify the approval to the above major project which has been referred to the PAC for determination.

We are aware that the PAC is holding a public meeting on 21 March 2012.

Consideration has been given to the proposed amendments to conditions of the project approval as contained in Schedule 2 of the modifying instrument recommended to the PAC by the Director General of the Department of Infrastructure and Planning.

HTRAG and its acoustic consultant, Renzo Tonin & Associates, have reviewed the conditions as modified and suggest further modifications to the conditions. These further modifications seek to correctly apply the adopted noise standard, separate requirements for compliance and monitoring and provide conditions that are unambiguous and capable of implementation and enforcement.

The attached advice supports our presentation to the PAC at the public meeting and the PAC is requested to take this into consideration in its determination of the S75W application.

Yours faithfully
BBC Consulting Planners

A handwritten signature in black ink, appearing to read 'Dan Brindle', is written over a light blue horizontal line.

Dan Brindle
Director

Doc Ref: TF700-01F04 (rev 0) Submission to PAC

Date: 21 March 2012

To: BBC Consulting Planners

Attn: Dan Brindle Email: dhb@bbcplanners.com.au

From: Renzo Tonin

**RE: SOUTHERN HIGHLANDS REGIONAL SHOOTING COMPLEX –
APPLICATION FOR MODIFICATION, CONDITIONS A9, A6 & D4 -
SUBMISSION TO PAC - ACOUSTICS**

I refer to the Director General's Planning Assessment Report dated 13th February 2012 ("**Director General's Report**") and the Recommended Modifying Instrument to the Planning Assessment Commission ("**PAC**") in relation to an application by the Department of Education and Communities – Sport and Recreation ("**Proponent**") to modify conditions A9, A6 and D4 of the Minister's approval dated 1st March 2011 for the Southern Highlands Regional Shooting Complex at Hill Top ("**SHRSC**").

The proposed amendments to conditions confuse compliance limits with auditing, and make it impossible for noise limits to be enforced. They misapply the adopted noise standard, and are ambiguous.

1 Shooting Noise Limit

The proposed amendment to condition A9 in subclauses a) and b) reads as follows:

a) The noise from firearms used on the 800m range shall not exceed 80dB(Lin) peak hold, as an arithmetic average.

b) The noise from firearms used on all other outdoor ranges (ie. all ranges except the 800m range and indoor air range) shall not exceed 75dB(Lin) peak hold, as an arithmetic average.

There are two issues which I believe are pertinent in these clauses.

In my opinion, the Director General's Report has misinterpreted the application of Chapter 164 of the ENCM guideline which is annexed hereto in "A". The Director General's Report seeks to apply two differing acoustic limits to the SHRSC, one for the 800m range and one for the other outdoor ranges. I do not interpret Chapter 164 in this way. I interpret the limits therein to apply to the whole site and not parts of it.

I understand the intention of applying the limits shown in the table in Chapter 164 is to trade higher noise levels for a longer period of respite. For example, a noise limit of 75dB is restricted to 4 days daytime shooting for a "Future Range". This gives 3 days respite. Similarly, a limit of 80dB is restricted to 3 days daytime shooting giving 4 days respite.

It is not consistent with Chapter 164, in my opinion, to cherry pick the table in a manner that causes the trade-off in respite to become inoperative.

Therefore, if three days of respite is proposed, the noise limit should be 75dB for all firing at the SHRSC and not just parts of it.

If the proponent wants to have an 80dB noise limit then, according to the table in Annexure A, the corresponding period of respite should be four days.

I therefore recommend Condition A9 be drafted in two parts, the first part of which should read as follows:

A Noise Limit

- a) *The noise from firearms used on the site shall not exceed 75dB(Lin) peak hold, as an arithmetic average.*
- b) *The noise limit shall apply at any location specified in subclause B a).*

Subclause B is further discussed in the next section.

2 Where the Noise Limits Apply

In the proposed amendment to conditions A9, subclause c) specifies the location at which noise measurements should be undertaken.

These locations are on public land and appear to preclude the possibility of a noise assessment being made in accordance with the conditions on residential properties, including on those properties experiencing annoyance.

The purpose of a noise limit (like any other pollution control) is to protect sensitive receivers (in this case, the Hill Top residential community) from adverse impact. Whereas it is appropriate for measurements of noise to be made from fixed locations for the purpose of noise assessment or project auditing (to ensure that results can be compared and replicated), and to set noise limits by reference to the impact at the closest or most affected receivers, any exceedence of the noise limit at any sensitive receiver is a breach, which must be capable of detection and objective proof by measurement, and enforcement, if necessary by the complainant as well as the regulator.

A noise assessment, which is usually performed before the project commences, is only a predictive tool, which does not necessarily reflect actual conditions. Once a noise limit is assigned to the project, it protects the community under all conditions, and it must be capable of measurement at the complainant's location.

The proposed condition confuses compliance measurement (to validate or dismiss the complaint) with project auditing.

In accordance with current Office of Environment and Heritage ("OEH") policy, the appropriate location for assessing compliance with noise limits is at the most affected location on the boundary of a residential property or, where that is more than 30 metres from a dwelling, at the most affected location within 30 metres of the dwelling. This of course applies whether the measurement is undertaken to investigate a breach or for auditing purposes.

I therefore recommend that subclause c) should be deleted and replaced by:

B Measurement

- a) *The monitoring location shall be at the most affected location on the boundary of any existing private property with a residential dwelling or, where this is more than 30 metres from a dwelling, at the most affected location within 30 metres of the dwelling. The measurement microphone shall be placed at a height of 1.5m above the ground and not less than 3.5m from any acoustic reflecting surface other than the ground.*

The additional text regarding the microphone height and separation from reflecting surfaces ensures the measurement location complies with Australian Standard AS1055.

3 Arithmetic Average

3.1 Arithmetic Average Not Defined

In the proposed amendment to conditions A9 in subclauses a) and b) cited above, a reference is made to the "arithmetic average" without a clear definition of what the term means.

In the The Acoustic Group ("TAG") reports submitted by the Proponent, shots that are inaudible and/or not measurable are included in the average. It is logically impossible to include in an average something that cannot be measured, and the EPA Noise Control Guideline in Annexure A clearly states that "measured levels that are clearly not representative should be excluded". In my view this would include a) shots that cannot be measured and b) shots that are so different to other shots that they are not representative.

Whilst in subclause d) of the proposed amendment, it refers to testing being "undertaken using the loudest firearms used at the range", this does not in itself resolve the issue for there is a possibility that some shots for whatever reason may be much quieter than other shots and not "representative".

Moreover, as a result of the confusion between compliance and auditing in the amendments, one interpretation is that a breach can never be established (even if the noise limit is exceeded at all residences) unless the loudest weapons are being fired. What matters to complainants is the noise they receive and its annoying characteristics, and not the description of the weapon

used to produce that noise. How would a complainant (or an independent noise monitor) know what weaponry was used on the ranges (and what range was in use) at the time?

On the other hand, there is nothing inherently wrong with testing firearms in the course of auditing the facility, and in using worst case analysis to do so. I am not an expert in firearms and cannot add anything to the debate about whether particular firearms should be used in auditing the ranges. It would clearly be sensible for the proponent to do so, as otherwise it may unknowingly breach the noise limit.

It is my view that some sensible method of not including in the average shots that are "not representative" should be incorporated into the amendment.

3.2 Recommended Definition of Arithmetic Average

It is therefore my recommendation that at least 150 shots should be recorded and the loudest 50 shots should be averaged.

This makes practical sense in that a) the non-representative shots would be excluded and b) the loudest shots represent what the residential community responds to in terms of noise impact.

I therefore recommend a new sub-clause in the B Measurement clause in the following form:

b) A minimum of 150 contiguous shots shall be measured on the day of the monitoring at any location specified in subclause B a). The shots shall be ranked in dB order highest to lowest and the arithmetic average reported shall be of the highest ranked 50 shots measured.

In my opinion, it would not be an onerous task to measure 150 contiguous shots instead of 50, a number which has been accomplished by TAG.

4 Audit Measurement Procedure

I have deleted the requirement to test the loudest firearms in what would be a staged event. Instead, for the reasons stated below, I recommend that testing in the course of the audit should be done without informing the Proponent on a day and time that the SHRSC is likely to use the loudest firearms. Of course this will not be possible in respect of the first three attended noise monitoring events.

I further recommend that records of shooting programs for each day should be kept by the SHRSC administration and retained on site and accessible to the public. A copy of the shooting program for the day of testing could then be appended to the noise compliance test report. The additional clause I recommend to be added to condition D2(b) is as follows:

The monitoring must be done without informing any person associated with or using the rifle range and must be done on a day and time that the rifle range is likely to use the loudest firearms. A copy of the shooting program for the day shall be appended to the noise monitoring report.

5 Measuring in Windy Conditions

In the proposed amendment to conditions A9, subclause e) reads as follows:

e) Noise monitoring is to occur under still wind or light wind conditions to avoid the sound level meters recording wind rather than noise from the ranges.

As the central issue relates to the measurement of shot noise rather than wind noise on the microphone, in my opinion a better result can be obtained by specifying the level the shot noise should be above the wind noise as follows:

The dB(Lin) peak hold noise level attributable to each shot shall exceed the dB(Lin) peak ambient noise level recorded 1 second before and 1 second after the shot by at least 5dB.

In other words, the peak noise trace from the shot must be clearly prominent above any wind noise which may occur at the time.

This proposal is simple to implement on modern sound level meters and would enable shots to be measured during mild wind conditions.

6 Conclusion

In conclusion, I therefore recommend the following consolidated changes to the conditions submitted by the Minister to the PAC:

Condition A9 Firearm Noise Limits

A Noise Limit

- a) *The noise from firearms used on the site shall not exceed 75dB(Lin) peak hold, as an arithmetic average.*
- b) *The noise limit shall apply at any location specified in subclause B a).*

B Measurement

- a) *The monitoring location shall be at the most affected location on the boundary of any existing private property with a residential dwelling or, where this is more than 30 metres from a dwelling, at the most affected location within 30 metres of the dwelling. The measurement microphone shall be placed at a height of 1.5m above the ground and not less than 3.5m from any acoustic reflecting surface other than the ground.*
- b) *A minimum of 150 contiguous shots shall be measured on the day of the monitoring at any location specified in subclause B a). The shots shall be ranked in dB order highest to lowest and the arithmetic average reported shall be of the highest ranked 50 shots measured.*
- c) *The dB(Lin) peak hold noise level attributable to each shot shall exceed the dB(Lin) peak ambient noise level recorded 1 second before and 1 second after the shot by at least 5dB.*

Condition A6 Use of the Existing 800m Range

Modify condition A6(c) as follows:

(c) Attended Noise Monitoring:

- i) Attended noise monitoring to be undertaken by an appropriately qualified acoustic consultant on the first 3 occasions of use of the 800m range from the date of this approval, thereafter, quarterly in the first 12 months of operations (aligned with each season) and annually thereafter to confirm noise levels from use of the 800m range comply with Condition A9.*
- ii) The monitoring must be done without informing any person associated with or using the rifle range and must be done on a day and time that the rifle range is likely to use the loudest firearms. A copy of the shooting program for the day shall be appended to the noise monitoring report.*
- iii) There shall be at least four monitoring sites, which shall be at the most affected location on the boundary of any existing private property with a residential dwelling or, where this is more than 30 metres from a dwelling, at the most affected location within 30 metres of the dwelling. The measurement microphone shall be placed at a height of 1.5m above the ground and not less than 3.5m from any acoustic reflecting surface other than the ground. If approval cannot be obtained from the resident to measure within the property boundary (where this is required) then the closest representative location shall be used.*
- iv) Testing for each location may be conducted either separately or simultaneously.*

Condition D2 Operational and Environmental Management Plan

Modify condition D2(b) as follows:

(b) Attended Noise Monitoring:

- i) Attended noise monitoring to be undertaken by an appropriately qualified acoustic consultant on the first 3 occasions of use of each range/facility, thereafter, quarterly for the first 12 months of operations (aligned with each season) and annually thereafter to confirm noise levels from use of the site comply with Condition A9.*
- ii) The monitoring must be done without informing any person associated with or using the rifle range and must be done on a day and time that the rifle range is likely to use the loudest firearms. A copy of the shooting program for the day shall be appended to the noise monitoring report.*
- iii) There shall be at least four monitoring sites which shall be at the most affected location on the boundary of any existing private property with a residential dwelling or, where this is more than 30 metres from a dwelling, at the most affected location within 30 metres of the dwelling. The measurement microphone shall be placed at a height of 1.5m above the ground and not less than 3.5m from any acoustic reflecting surface other than the ground.*

If approval cannot be obtained from the resident to measure within the property boundary (where this is required) then the closest representative location shall be used.

iv) *Testing for each location may be conducted either separately or simultaneously.*

New Condition

A record of the shooting program (including gun type, manufacturer, calibre of firearms fired, shooting position and time of each activity) shall be kept by the rifle range administration and a copy retained on site for a period of 6 years. The shooting program records shall be provided for viewing to any person who requests it.

Signed:



Dr Renzo Tonin

**Annexure A – Chapter 164 EPA Environmental Noise Control Manual (ENCM)
and EPA Noise Control Guideline on Shooting Noise**

CHAPTER 164
NOISE CONTROL GUIDELINE
TARGET SHOOTING RANGES

Air rifle and air pistol competitions are not scheduled since the projectile is not propelled by an explosion.

Such competitions are usually held indoors and seldom present a noise problem. They are lawful sporting activities and the EPA is the responsible authority for any noise investigation.

This guideline specifies criteria for assessing the effect on nearby residences of pistol, rifle or gun club shooting ranges when the propellant is explosive. Criteria may be used for guideline and less stringent figures could be used if site details and topography are very favourable.

Measurement should be made at the worst affected location and consideration should be given to any neighbouring vacant land zoned as residential.

Note that any premises used for competitive shooting where the propellant is explosive are scheduled premises under the Act.

Times of Day Restrictions

Daytime operation is considered as being from 10 a.m. to 5 p.m. Night operation normally extends from 5 p.m. to 10 p.m. To cater for special events such as state or national championships or charity shoots, the EPA may consider an extension of the times on both nights in one weekend provided such events occur no more than two or three times a year.

Restricted Number of Days

Peak Hold (Linear) readings are taken at the most affected residential boundary. The number of days and **nights usage** of the range should be limited to correspond with the measured level as shown in the table on page 164-2.

A concession has been made in the case of existing ranges and is included in the table. This may be subject to future review by the EPA.

Alterations to existing ranges should incorporate a movement towards the "Future Range" figures whenever possible.

