SUBMISSION TO MANGOOLA MINE EA ON BEHALF OF PROPERTY OWNERS OF RIVERSLEA, WYBONG PARK, WYBONG ESTATE, DOLWENDEE AND HOLLYDENE ESTATE

Prepared for: Upper Hunter Holding Pty Ltd
Upper Hunter Holdings Pty limited-Dolwendee
Upper Hunter Resources Pty Limited-Riverslea and Wybong Park
United Pastoral Pty Limited -Hollydene Estate
Wybong Estate Vineyard Pty Limited - Wybong Estate
Wybong Estate -Wybong Winery

Prepared by: R T Benbow, Principal Consultant
Daniele Albanese, Acoustical & Environmental Engineer
BENBOW ENVIRONMENTAL
North Parramatta NSW

Report No: 131062_Rep_Final
June 2013
(Released: 28 June 2013)

Benbow
ENVIRONMENTAL

Engineering a Sustainable Future for Our Environment

Head office: 13 Daking Street North Parramatta NSW 2151 AUSTRALIA
Tel: 61 2 9890 5099 Fax: 61 2 9890 5399
BE Australia: Wollongong NSW, Taree NSW, Calamvale QLD
BE Asia: Causeway Bay, Hong Kong
Email: admin@benbowenviro.com.au
Visit our website at: www.benbowenviro.com.au

EXECUTIVE SUMMARY

A submission to the proposed extension of the Xstrata Mangoola open coal mine has been prepared by Benbow Environmental for the owners of the following properties:

- Riverslea Trust -Riverslea;
- Upper Hunter Resources Pty Ltd -Wybong Park;
- Wybong Estate Vineyard; Pty Ltd
- Upper Hunter Holdings Pty Ltd -Dolwendee
- United Pastorall -Hollydene Estate.
- Wybong Estate Pty Ltd

The submission focuses on areas of Benbow Environmental's expertise – noise, blasting and air emission impacts.

Reviews of these specialist sub consultant reports being relied upon in the Environmental Assessment have been prepared.

It is recognised that the coal mining industry in NSW and specifically the Hunter Valley is of vital importance for the people of New South Wales both in providing royalties to the State Government and the massive use of infrastructure and employment that secures the financial viability of many of the community in this Region.

However, not withstanding the significance of this industry, the cumulative impacts from numerous open cut coal mines are causing significant concerns to industries and adjoining landholders. The perception amongst these greatly concerned stakeholders is that adverse environmental impacts resulting from the continued expansion of the coal mining industry are occurring which may be understated. In relation to the important neighbouring landuses being viticulture, cropping, commercial beef cattle and the Equine and Vineyards Industries it seems likely that impacts on these specific Industries may have been glossed over or even ignored completely.

An additional concern is the very real impacts the coal industry can have upon surrounding property values. The presence of an open cut mine adjoining the property of one of the clients of the report resulted in the inability of the owner to obtain mortgage financing from their bank. Upper Hunter Holdings Pty Limited has tried to sell Lot 3 DP 113745 on a number of occasions only to have each purchaser pull out due to the Banks refusing to finance the purchase due to its proximity to Mangoola Mine. This concern is not considered by the proponent in any of the reports we have been able to examine.

The property owners who have commissioned our report are rightly concerned about a number of inconsistencies between their real life experiences with the impacts of the current operations of the Mangoola Mine and the monitoring report undertaken on behalf of Mine Management. There is considerable alarm at the proposed expansion of this mine from 10,500,000 tpa to 13,500,000 tpa ROM coal and some consternation at the veracity of the specialist reports that support what is a significant 33% increase in production.

Benbow Environmental has prepared an objective review of the documentation provided by the mine and their experts and has found a number of environmental issues that would seem to support the concerns of the adjoining property owners. Whilst these lie principally with noise, blasting, dust and the transport noise impact assessment, our findings raise serious questions as to the overall rigour of the proponent's application.

In summary the following are the main areas of concern:

- Recently approved land subdivisions and new building sites have not been considered in the lists of receiver locations.
  This may have significant impact on the economic viability of the wineries, a tourism activity where additional cabins for long and short term accommodation is in place or have been approved particularly at Dolwendee, Hollydene and Wybong Estates.

- As these additional receivers have not been included in the noise, blasting and air emissions assessment, reliance may be placed on the contour plots of noise and dust rather than on the discrete receptors being included in the modelling.

  For noise specifically there usually is an important difference of 2-4dB(A) between a noise contour plot and the modelling at discrete receptors.

- One of the property owners reported that he was advised during the consultation programme that the operational noise levels were expected to increase as a result of the expansion in the intensification of the coal mining activities. However the findings of the noise assessment report show a significant reduction in operational noise levels. This inconsistency has caused the property owners to question the accuracy of the noise modelling.

It is of concern to us that in the limited timeframe available to us in which to prepare our submission we have nonetheless been able to identify 25 inconsistencies that could lead to over optimistic noise predictions. A detailed discussion of the findings of the review is included in the body of this report.

These issues all require clarification but unnecessarily complicating an objective assessment are the use of a different noise model to that model used in the earlier assessments. Compounding this is a failing to calibrate the noise model being used. Given that the mine is actually in operation this is somewhat surprising.

We further note that earlier versions of the model gave overly optimistic noise reductions due to topography; this led to corrections being made to the model with the direct result that the version used in the assessment is now outdated.

The Annual Environmental Management Plan for the period 1 January 2012 to 31 December 2012 in relation to noise in Section 3.11.1 states that attended noise monitoring is not undertaken at 71 receivers but only at those receivers agreed to with OEH (now NSW EPA) and can be '*inferred*' using a calibrated noise compliance model. In our view it is not acceptable to make an '*inference*' in these circumstances but that the results claimed should be demonstrated.

It is somewhat incongruous that the published noise monitoring data shows no exceedances, yet there were 386 complaints formally registered relating to noise. Given that noise prediction model for the mine extension was not calibrated this is a significant deficiency in the report. It is not surprising that the adjoining affected property owners disbelieve the assumptions and conclusions of the noise assessment.

Also missing is any comment on compliance with road and rail noise impacts resulting from the proposed 33% increased production.

Based on the large number of inconsistencies found and the significant failure to ensure objectivity by calibrating the noise model regardless of its origin and choice as being the "best" model to use, uncertainty has been created. This unfortunately needs to be resolved and reinforces the community's opinion that their concerns are not weighted equally due to the significance of the coal mining industry to the economy of NSW.

The blast prediction assessment also raises uncertainty due to the arguments presented to remove the condition that limits the MIC.

The assessment makes the statement that the findings "*suggest*" that this condition can be deleted. This is an inopportune expression as consents on such a major issue would need conclusive evidence rather than one with an underlying risk that it may be wrong. The facts to support the recommendation need to be based on strong findings supported by monitoring data, not merely that the findings "*suggest*" such an outcome.

One of the concerns of the property owners relating to blasting is the lack of consideration for the existence of a very old winery on one of their properties. We would have expected that at least the lower ground vibration criteria applicable to historic dwellings and structures would have been applied, yet this has been missed in the document. The property Wybong has a winery and tourist facilities present which dates back to 1965.

The winery building was an original convict sandstone gaol of mid 1800's and has been further developed in 1965 with large historic woolshed timbers for colonial Sydney and from Huon pine brought to the estate by Dr. Smith who was granted special permission to mill the Huon pine by the then head of the Legislative Council of Tasmania. This facility is being refurbished for overseas and VIP guests of the wine estate. Similarly at Hollydene Estate with origins back to the 1960s along with Wybong two of the oldest winery vineyards in the Upper Hunter.

The blast impact assessment needs to address historical buildings.

The Director General Requirements specifically requires various matters to be addressed by the proponent. Yet from the specialist reports provided we note that the following issues have been omitted.

- Assessment of transport noise relating to rail. Presumably as a result of increased production a greater number of rail movements will be required. The potential impact along the rail route especially the cumulative impact due to the intensification from the planned expansion of other coal mines in the area would have been expected as a fairly basic observation needing at least to be addressed in the report and assessed objectively to further the commitment being made to the community by this industry.

  The DGR relating to blasting stated that the impacts on <u>livestock and property</u> also needed to be considered besides the effects on people.

  Whereas the air impact assessment has given consideration to blast fumes upon <u>people</u> it has not considered the impact of oxides of nitrogen within the plume from the blast fume and health implications to the important <u>Equine and Vineyards Industry for which the Hunter Region is notable</u>.

The air emissions assessment needs to address the impacts at the subdivisions on the land holder's properties. These have not been considered and this is a flaw in an otherwise satisfactory assessment.

The land holders advise that the water tanks on three of their properties are desludged by the coal mine and sludge is removed. This practice is not mentioned in the air impact assessment report and would have been of relevance.

The levels of dust deposition may therefore be higher at these landholdings then was modelled.

Calibration of the predicted levels with measured results has not occurred and the sensitivity of the assumptions in the modelled predictions is unable to be tested.

The environmental reporting does not attempt to establish the contribution of the dust that occurs from the coal mining activities. Analyses of the dust deposited on the roofs and in the gutters of homes on the land owners properties would be able to be used to establish the proportion that is due to coal mining.

The levels of the dust deposition measured at the gauges and predicted in the model would not be expected to require desludging of these tanks used for drinking water.

The sensitivity of the predicted levels to error has not been addressed in the report.

Given the importance of dust to the community especially those engaged in sensitive agricultural activities, a sensitivity analysis would be considered essential.

We note that other air impact assessments undertaken for other coal mining intensification projects also fail in this regard.

Assessments of coal mining need to establish a higher level of transparency given the potential adverse impacts and the significance of these.

R T Benbow
Principal Consultant

CONTENTS PAGE

FIGURES PAGE

ATTACHMENTS

Attachment 1: Site Plan Lot 1
Attachment 2: Site Plan Lot 2
Attachment 3: Approved Plans Lot 1
Attachment 4: Approved Plan Lot 2
Attachment 5: Plan of Subdivision
Attachment 6: Masterplan 'Riverslea' Denman Road, Muswellbrook
Attachment 7: Riverslea Subdivision of Lot 511 DP 854289
Attachment 8: Sub Plan 4620_001
Attachment 9: Atmospheric Environment (NO_x Emission from Blasting Operations in Open Cut Coal Mining)
Attachment 10: Dangers of Toxic Fumes from Blasting
Attachment 11: Safety Alert (Prevention and Management of Blast Fumes)

1. INTRODUCTION

This submission was prepared on behalf of adjoining property owners who believe their amenity will be adversely affected by the planned intensification of Mangoola Mine.

Benbow Environmental were engaged to provide an objective review of the noise, blasting, dust and blast fume impacts from the proposed intensification.

The experience of the land owners is that adverse impacts are already occurring and these are not being evaluated to a sufficient extent to remove doubts. Certain of these doubts are reflected in clearly audible night time operations and coal and airborne dust including drinking water tanks continually being contaminated.

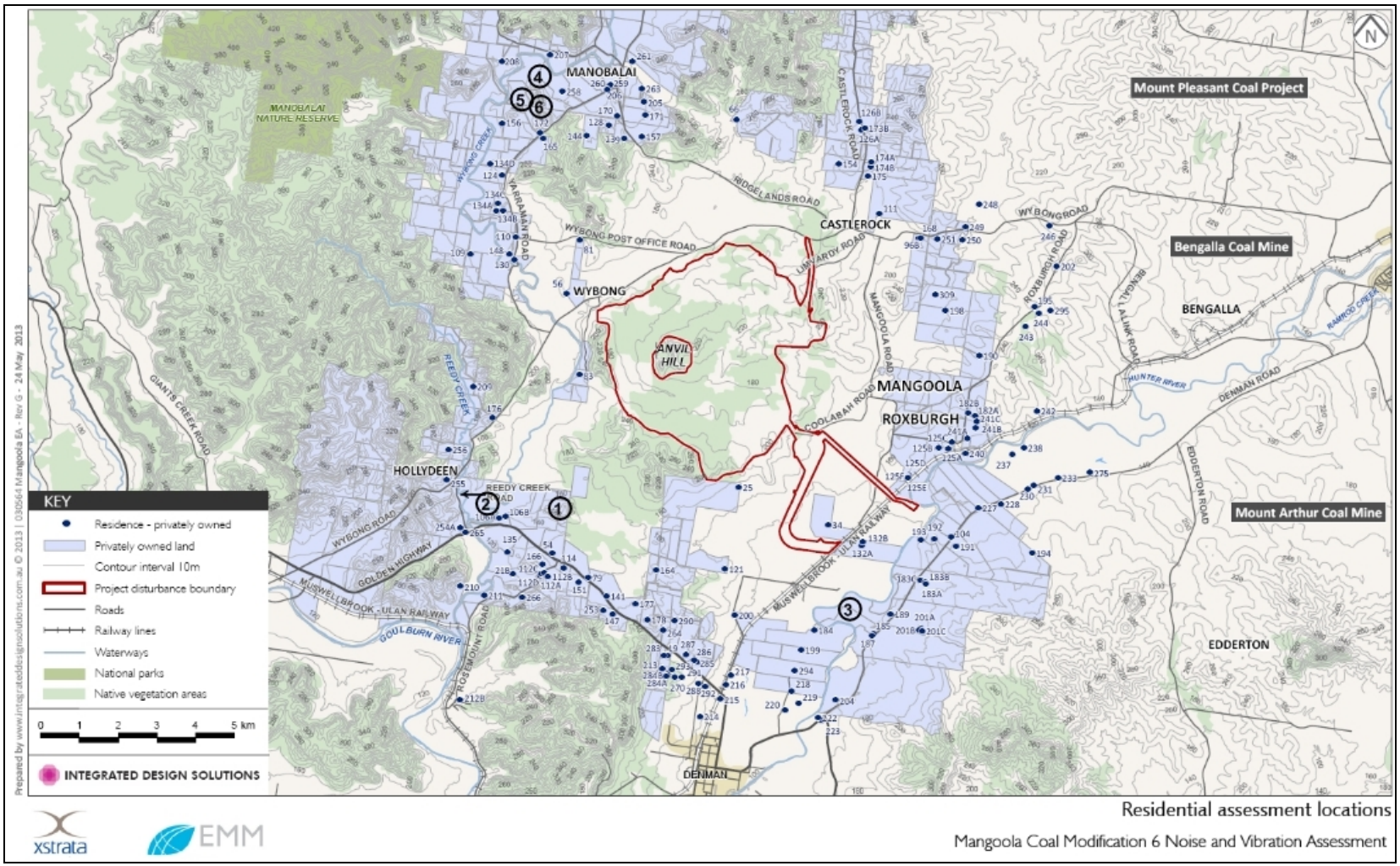
The absence of recently approved land subdivisions on the site layouts in the EA reinforce their doubts.

Refusal by a major lending authority for a first mortgage on one of their properties developed specifically for tourism reinforced their experiences that intensification of the mine would further impact on their lifestyle and value of their properties.

These many issues raised are discussed within this report.

The additional receiver locations are shown on Figure 1-1.

Figure 1-1: Location of additional Receiver



Note:

1- Upper Hunter Holdings P/L – 'Dolwendee' Lots 1,2, 3, 4
2- United Pastoral P/L – 'Hollydene Estate' Lots 5,6,7,8
3- Upper Hunter Holding Resources P/L – 'Riverslea'
4- Upper Hunter Holding Resources P/L – Wybong Park Lot 102
5- Wybong Estate (Vineyard) P/L – Wybong Estate Lot 103
6- Wybong Estate P/L – Lot 13

2. REVIEW OF THE NOISE IMPACT ASSESSMENT

This section presents the findings of the objective review undertaken of the *Mangoola Coal Project – Modification 6 Noise and Vibration Assessment* released on 22nd May 2013.

The following are the major deficiencies in the report with regard to noise:

1- Page1: No details of the proposed increase in equipment numbers are provided. On page 19 (last paragraph of section 3.1) it is stated that *"minor differences of plant and equipment quantities"* would occur.
Given that the increased production target is 33% it is an inadequate statement to justify how the increase in the annual tonnage will be achieved without a commensurate increase in plant and equipment.

2- Page 3 bullet point n.2. States that up to 150 additional employees and 90 contractors are considered in this assessment. In section 4.8 it is stated that an additional 139 peak employee movements would result from the proposed modification. It is not clear how this number has been obtained. Moreover, it is not clear why in table 4.8 only an additional 122 light vehicles in addition to the current 152 vehicles have been considered. The increased number of employees, contractors and vehicles are in contradiction with one another.

3- Page 8, last paragraph states that no cumulative operational noise was considered in the assessment as existing industrial noise sources near Mangoola Coal with potential to contribute to cumulative noise are '*limited*'. Noise measurement should be undertaken from these other existing industrial sources in order to assess the cumulative noise impacts.

4- Page 9, first paragraph "*Schedule 3, Condition 7 of PA 06_0014 provides criteria for road traffic noise, which remains relevant to the proposed modification".*
Condition 7 of PA 06_0014 is based on the superseded EPA 'Environmental Criteria for Road Traffic Noise". *The new guideline to be considered is the NSW EPA Road Noise Policy released in March 2011.*

Table 2.2 is assumed to contain a typographical error and, in accordance with the ECRTN and RNP this would be corrected by considering the following noise descriptors.
$L_{Aeq(15hours)}$ and $L_{Aeq(9\ hours)}$ for Denman Road for daytime and night-time respectively.
$L_{Aeq(1hour)}$ for Wybong Road and Bengalla Link Road as per NSW EPA Road Noise Policy.

5- The low frequency criteria obtained from the NSW EPA INP should apply. However, if the proposed criteria apply (Norm Broner "A simple outdoor criterion for assessment of low frequency noise") this should consider the frequency range from 10Hz. As data are presented in 1 octave band centre frequency starting from 63Hz, thus the low frequency noise assessment results presented in this report could be inaccurate.

In addition, if instantaneous dB(C) Sound Pressure Level is fluctuating by at least ±5dB then a penalty of 5dB applies. This situation has not been described in the report.

6- Page 13. No explanation of the rationale for the selection of the two exceedances intervals for "management zone" and "affectation zone" is provided.

7- Page 15, second paragraph. "*Similarly, the World Health Organisation (WHO, 1999) suggest that levels below 45 dB(A) inside homes are unlikely to wake sleeping occupants".*
This is inaccurate as WHO states that levels up to 45dB(A) are acceptable but only if the number of events per night is less than 10-15. The anticipated number of such night-time events is not canvassed so there is no way of knowing what is the expectation.

8- Page 19, section 3.2, first paragraph. "*It is prudent to gain an understanding of this variation rather than relying on a single predicted noise level for one set of weather conditions as prescribed in the INP".*
We find this statement to be incorrect as the NSW EPA INP does not prescribe one set of weather conditions, but it considers two options: simple approach and detailed approach which would consider default weather conditions and site specific weather condition respectively. This is presented in Section 5 of the INP. Usually the default weather conditions provide a more conservative approach. For example when considering wind direction from source to receiver instead of specifying a wind direction.
No details of the considered weather conditions have been included in the report.

9- Page 20, second paragraph: "*This analysis results in a noise probability distribution for each receptor, which was used to establish an upper 10% noise level from the mine. This approach is consistent with the most recent previous assessment undertaken for the Modification 4 process approved in June 2012 (refer to Section 5 of Appendix C7 of the Modification 4 EA, Wilkinson Murray 2010). However for the current assessment, EMM adopted three years of hourly weather data between 2010 and 2012 as recorded by the site's northern meteorological station.*
Often a reasonable indicator of noise impact is associated with an industrial noise level present for at least 10% of the time. This is consistent with the intent of the INP".

The noise impact assessment should present results for the worst $L_{Aeq(15\ minute)}$. It is understood that the report shows the 10^{th} percentile of the $L_{Aeq(15\ minute)}$ for different weather conditions.

This anomaly could be the underlying reason for the adjoining residents' complaints about noise as there is no verification from the weather information available.

10- Page 21, section 3.3 last paragraph. "*Other noise mitigation measures were considered and ruled out due to analysis of their reasonable and feasibleness. This included bunding on dumps and haul roads, additional restriction of operations at night time under adverse weather and trolley assist systems".*

Although '*other mitigation measures were considered and ruled out...*" there are no details provided on how the night time restriction of operations under adverse weather conditions is actually implemented.

11- Page 21, *"Sound power level data for most plant and equipment was derived from a recent noise measurement campaign at Mangoola, including data captured in 2012".* 11 out of 24 noise source data have not been obtained from the recent measurement campaign at Mangoola. These 11 noise sources data were lifted from the previous report (Modification 4 Noise Impact Assessment (Wilkinson Murray 2010) and EMM's extensive sound power level database. No precise reference to noise data is made, there are no details on methodology and the results of the recent measurement campaign have not been provided.

12. The sound power level of Coal Rail Load Out is 10dB less than the one considered in the previous noise assessment (Wilkinson Murray 2010). There has been no detail or explanation in regards to this major difference provided.

13. The Sound Power Level for the lighting plant is 98 dB(A). This was 107 dB(A) in the previous report (Wilkinson Murray 2010). No details in regard to this difference are provided.

14. Sound power level data provided in appendix B are presented in 1 octave band centre frequency from 63 Hz to 8000 Hz. It is more appropriate to consider spectrum data in 1/3 octave band centre frequency from 20Hz to 20,000Hz. This can impact on the accuracy of the noise contours especially where the topography has high vertical rests.

15. Analysis for determining the presence of tonal components has not been presented. 1 octave band spectrum data would not be suitable for this type of analysis.

16. In table B.1 (Appendix B) the Total dB(A) values do not match with the 'A' Weighted frequency spectrum data provided. Overall values are expected to be up to 1.8dB higher than the ones presented based on the data provided.

17. Conveyor drives' noise data would result in an overall around 80dB(A). The table shows a Total dB(A) of 76 (per metre) (partially enclosed). This should be clarified and any partial enclosure effect should be reflected in the entire spectrum for each centre frequency band individually rather than on the overall only.

18. Some noise sources (i.e. Shovel gate banging) have been considered only when assessing the sleep disturbance and it is not clear if they are present in the modelled operational scenarios. Those noise sources are likely to contribute to increasing the overall operational noise emission from the site particularly at night.

19. Page 22, *"Table 3.1 Typical equipment sound pressure levels"* shows instead "Representative $L_{eq,15minute}$ sound power level, dB(A)". Moreover a 15 minute interval is not considered to be appropriate when describing moving vehicles (i.e. haul trucks). The glossary presented in page 4 relates the L_{eq} to a sound pressure level. Clarification on the noise descriptor is needed.

20. Page 23, table 3.2. 152 receptors are listed as privately owned, in addition, 80 receptors are listed as Mangoola owned in appendix D. This would result in a total number of receptors of 232 which would be inconsistent with the statement in page 19 which states the following: "*The effect of a representative set of meteorological conditions on the level of noise received at receptors is presented in this study. A total of 266 receptor locations (privately owned and mine owned) were used".*

Some receptors have not been included in the study. For example the two land subdivisions present to the south west of the site identified as Lot 1 and lot 2 DP 1160936 have not been considered in this assessment. Note that a development application for two residential dwellings on the aforementioned lots has been approved in 2011.

21. Page 29, end of third paragraph states: "*To that end, those privately owned lots (vacant or otherwise) considered marginally impacted were modelled in detail by adopting additional assessment points within these lots to improve the accuracy of the presented noise contours"*.

It is not clear whether the noise contours have been obtained by reducing the grid space utilised for the calculation or adjusted by adopting additional assessment points and using an interpolation method to re-define the noise contours. The two methods could provide different results which could be in accurate.

22. Table 4.1 page 30. This table present a typographic error (dB(A)=333).
This table should display results for both neutral and adverse weather conditions. The table does not specify under which adverse weather condition a certain noise level has been calculated.

23. Table 4.1 page 33 Note n.2: *" The evening (4 – hr) period noise levels are not shown as this period is not as statistically relevant as the day (11 – hr) or night (9 – hr) periods. However noise levels can conservatively be assumed to be the same as the night time period".*

Noise levels have not been shown for evening time. It is a specific requirement of the NSW EPA INP to assess the noise levels for day time, evening time and night time separately.

Moreover, considering the night time predicted noise levels to be the same as evening time it is not always conservative. In fact, as per table 4.1, for some receptors daytime noise levels are expected to be higher than the night time noise levels.

24. Page 37, first bullet point: "*all the sources (individually) pass the at-source dB(C) minus dB(A) 15 dB test, with the exception of the CHPP (based on the spectrums listed in Appendix B)".*

Based on the data provided in Appendix B the CHPP would pass the dB(c) minus dB(A) 15 dB test.

25. Page 37, last bullet point: *"EMM can also confirm that total noise levels from the mine satisfies the lowest recommended (night time) 60 dB(C) Broner criterion at all nominated locations".*

No results have been provided. Considering that levels up to 42-46 dB(A) could potentially result in noise level expressed in dB(C) having value greater than 60, this presents a major concern.

In addition the absence of fluctuation of SPL dB(C) of ±5dB should be demonstrated. This would potentially result in applying a 5dB penalty to the predicted noise levels.

26. *"Table 4.5 shows the implications on the total mine noise level with application of a 5 dB penalty to the CHPP at the receiver (as per the INP)."*

    It is not clear if the 5dB penalty has been applied to the overall predicted noise levels or to the CHPP noise contribution at the receivers only.

27. Page 38. "*sound power levels adopted in the current study reflect actual measured emissions captured from plant at site through regular on site surveys. These vary from the assumed emission values adopted in the assessment for Modification 4 (Wilkinson Murray, 2011), completed prior to site – specific data being available. This is expected to be the main reason for differences between the two studies".*

    Reference to Modification 4 Wilkinson Murray 2011 is incorrect. It is understood that the aforementioned study is dated 2010.
    11 out of 24 noise source data were obtained from measurement of similar equipment at different sites; therefore the statement is not precise.

28. Page 39, first and second paragraph: "*Maximum noise levels at each residence were calculated under "prevailing meteorology" and reported herein".*

    "Table 4.7 summarises the highest predicted L_{max} noise levels from trucks under worst case meteorology conditions at adopted assessment locations based on typical equipment positions used for mining operations".

    It's not clear if prediction has been undertaken under prevailing meteorology or worst case meteorology conditions.

29. Page 39, end of second paragraph: reference to OEH is made. Earlier in the report this was referenced as EPA. The landowners believe minor errors such as these suggest the document was prepared in a risk.

30. Current road traffic noise levels were obtained from a previous assessment (Wilkinson Murray 2010). This is based on calculations and not on actual measurements. Current road traffic noise levels should have been measured at several residential locations and utilized in this assessment. This approach could result in a grossly inaccurate assessment of the road traffic noise generated.

31. Table 4.9. Only six receptors have been considered in the assessment. No results for private properties on Bengalla Link Road are provided. These were included in the previous assessment (Wilkinson Murray 2010).

32. Noise Model:

    We note that the March 2013 version of the Bruel & Kjaer Predictor noise model corrected an overestimation of barrier effects in ISO 9613.1/2, ISO 9613.1/2 (1/3 octave), ISO9613.1/2 Road or DAL32 models.

    If the prediction model version utilised did not include the aforementioned update and the ISO 9613.1/2 modules were adopted, then it is likely that the noise levels predicted at the residences are underestimated.

The Predicator model has seen accepted by regulatory authorities in NSW but from our understanding only after it has been calibrated for the site.

Calibration of acoustic models using observed noise levels has been practiced by Benbow Environmental over the past 15 years and provides surety to the community about the accuracy of the noise predictions.
Calibration is undertaken within 100-200m of the combined activities of the site and then at reference locations where the site activities are still clearly well above background levels and not acoustically shielded.

For such a large activity as an open cut coal mine and where topography is an important noise reducing feature, further calibration reference points are chosen on the coal mine site.

The calibration of the noise model is then able to be used in undertaking a sensitivity analysis of the assumptions that are made in the model. The noise predictions are of vital importance to all parties. The absence of quantitative data to support the assumptions, makes it difficult to rely on the conclusions presented in this assessment.

The list of noise amelioration factors that are presented in the report appear impressive but have no dB(A) noise reduction levels presented. This is one of many major flaws in the assessment.

33. Section 4.9 Blasting

    No clear reference is made to any relevant document that was used to predict the overpressure and vibration associated with blasting operations as the reference quoted deals only with overpressure.

    No results are provided showing the predicted vibration and overpressure levels at the residences.

    There is a no confirmation that the prediction graphs have been calibrated. No contours are provided showing the residences potentially affected by the blasting operations.

    A sensitivity analysis of the variations in predicted overpressure and ground vibration is needed due to the significance of this issue and the land owner's heritage winery building that may potentially be affected.

The minimum offset required to achieve blast criteria would vary depending on face orientation and other factors which are not considered in this assessment.

A number of residences are expected to be affected by the blasting operations throughout the years of operation of this mine; this should be appropriately assessed taking into account also the residential locations that were not considered in the assessment.

3. AERIAL PHOTOGRAPHS

The following are the Aerial photographs of the properties involved.

Figure 3-1: Aerial Photos of Riverslea

Figure 3-2: Wybong Park Lot 102 and Wybong Estate Lot 13 and Wybong Estate (Vineyard) Lot 103

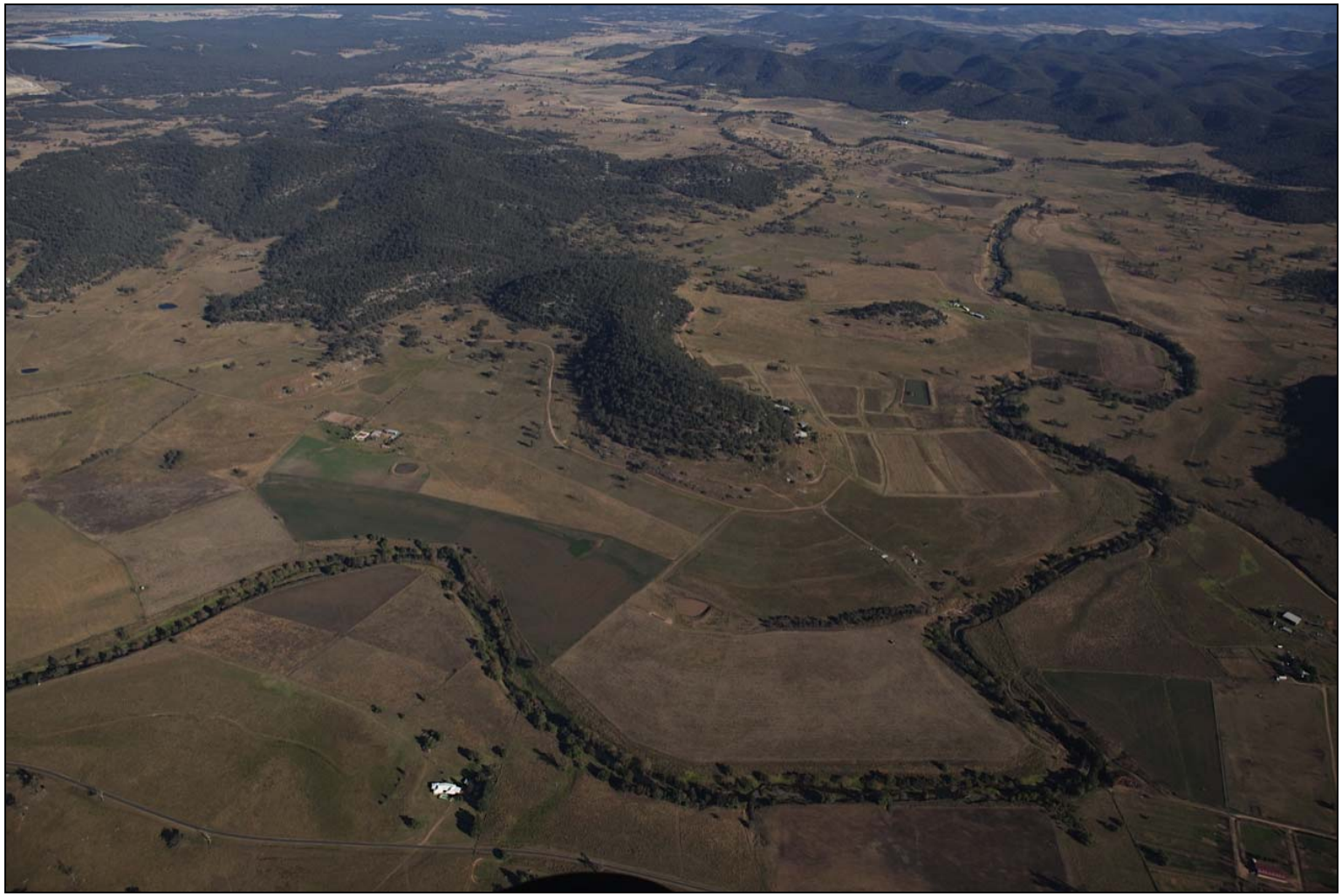


Figure 3-3: Dolwendee Lots 1 to 4

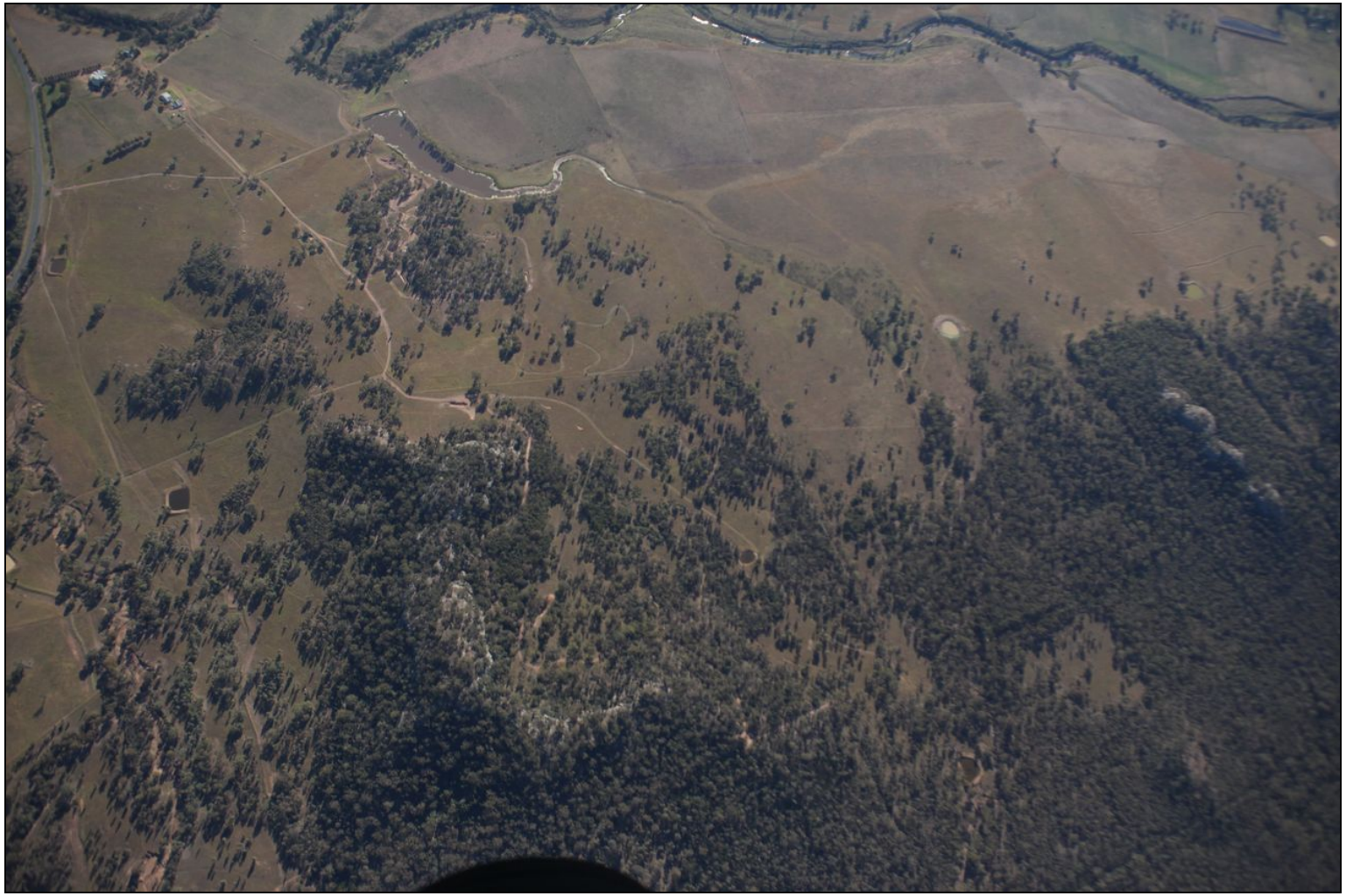


Figure 3-4: United Pastoral – Hollydene Estate

4. DUST AND BLAST FUME

The findings from the modelling of oxides nitrogen are in doubt and a further assessment is warranted.

The isopleths shown for the two conditions blasting with permissions and blasting without permissions do not show significant differences and this outcome is not explained or analysed to provide surety to the reader of the report.

The community reads these reports and these need to convey explanations as to why the findings can be relied upon.

For these two conditions i.e. blasting with permissions and blasting without permissions there is no detail provided on the weather conditions that were applied in the model.

The size of the blast fume was not indicated. The findings that the levels of NO_x would be within the site differs from the expectation if one reads the reference used in the air impact assessment report.

The reference is presented in the attachments.

The study referred to is the CSIRO study of NO_x emission from blasting operations in open cut mining. This study was undertaken in the Hunter Valley and established that '*…Numerical modelling indicated that NO_x concentrations resulting from the blast would be indistinguishable from background levels at distance greater than about 5km from the source...'*

In between the blast centre and the 5km, what happens is therefore subject to interpretation based on a number of factors and principally amongst these is the model that is used, the assumptions relating to the blast plume and meteorological conditions.

CALPUFF was not used in the CSIRO study. AFTOX was used as this was developed by the United States Air Force to assess real time toxic chemical released.

Figure 2 in the CSIRO study shows a photograph of the plume with dimensions of width 90m, depth 90m and height 150m.

The sensitivity of the findings of the model to other dimensions of the plume given that the length of the blast face may be greater than 90m and may extend over hundreds of metres need to be assessed using AFTOX or after calibration of a model such a CALPUFF with real time NO_x measurements such is the importance of this issue for all parties.

There are differences in the literature we were able to access that indicated that the average emission flux of NO_x may exceed the 0.9 kg/tonne of explosive mentioned in the CSIRO study.

Also provided in the Attachments is a study titled "*Dangers of Toxic Fumes from Blasting*" by Mainiero, Harris and Rowland III.

Figure 2 in this study shows a higher quantity of NO_x being produced when detonating ANFO. The CSIRO study also refers to the explosive as ANFO.

A further document that establishes that exposure to blast fume can cause significant health impacts is provided to hopefully achieve a balanced view point that the issue is real. This is a Safety Alert published by the Queensland Government and refers to incidents that have occurred.

At the open cut mines in Australia a direct comparison may not be possible with this data from the USA paper, but rather than ignore this lack of our current scientific knowledge a sensitivity analyses is needed to establish the range of ground level concentrations of NO_x that could occur for the following factors:

- Range of NO_x emissions rates;
- Plume size;
- Range of wind speeds and stability classes;
- Assume flat topography;
- Apply actual topography;
- Worst case ground level concentrations presented at property boundaries as well as residential receptors.

The CSIRO study indicated that a 1 ppm concentration of NO_2 would be exceeded at 3,000 m from the blast centre for Pasquil Stability Classes C-F.

The current ground level concentration limit is 0.12 ppm for one hour averaging period. Such an increase above the limit indicates why it is such a sensitive issue and one that has been personally experienced by our Principal Consultant. The outcome of exposure to concentrations above a safe level are a significant health risk as NO_2 (i.e. NO_x) exposure is toxic.

A further study has been commissioned in Queensland with the study being undertaken by SIMTARS. Until more comprehensive assessments are undertaken a separate independent assessment of the sensitivity of this issue is needed before the expansion could be approved.

Significant health risks are the concern of the community and the inadequate level of quantitative analyses just supports these concerns.

The framework of an independent assessment using sensitivity analysis is needed. It is noted that the air impact assessment presented for an intensification of Drayton South did not include blast fume.
The coal mining industry is ill advised in the way this issue is being assessed.

5. CONCLUDING COMMENTS

The findings of our review are that there are a number of technical deficiencies in the proponent's consultant's reports that require clarification, and other matters that require re-evaluation of specific impacts. Various assumptions have been made that are not based upon available data but on supposition; this invariably leads to conclusions that may be proven in time to be erroneous.

Reports which include the number and type of deficiencies identified in our review demonstrate to the various affected stakeholders that they lack the rigour necessary for Authorities to make a considered merit assessment of the application.

Importantly they also indicate that, rightly or wrongly, proposals with significant economic potential will typically take precedence over the legitimate environmental concerns of the community. This may be erroneous; it is not within our brief to make judgement as to the intent of the proponent only to identify and highlight omissions in the technical reports relied upon to seek such approvals. Regretfully a flawed report serves merely to undermine the veracity of the entire application which is to no-one's benefit.

One way forward would be for the Consent Authorities to require the proponent to enter into a consultative process with the land owners to achieve a mutually agreed and satisfactory outcome. A formal report of the consultation would be provided to the Department of Planning and Infrastructure.

If further assistance is required please advise.

Daniele Albanese
Acoustical & Environmental Engineer

R T Benbow
Principal Consultant