Maules Creek Community Council

Maules Creek Coal Mine
Peer Review EIS Air Quality

Report No. 70Q-11-0312-TRP-511520-0-draft
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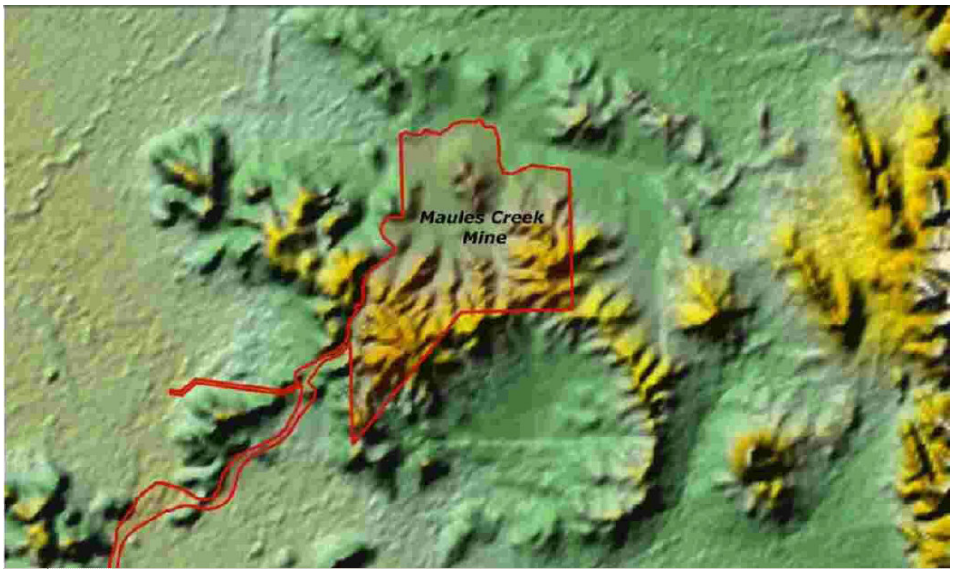
1. INTRODUCTION

The Maules Creek Community Council requested VIPAC Engineers & Scientists conduct a Peer Review of the Maules Creek Mine EIS Air Quality Assessment performed by PAE Holmes in 2011.

While the assessment implies that air quality impacts will be minimal, the confidence on the assessment is questionable for a number of reasons. These shortcomings are outlined in the following sections.

2. MODEL SELECTION

The use of a steady state Gaussian model in adverse terrain such as this is inappropriate. A Gaussian model does not properly account for flow steering. An assessment of the surrounding terrain has differential heights in immediate area of up to 100-150 m and further afield greater than 1000 m. Shown below is the terrain representation from the PAE Holmes report.

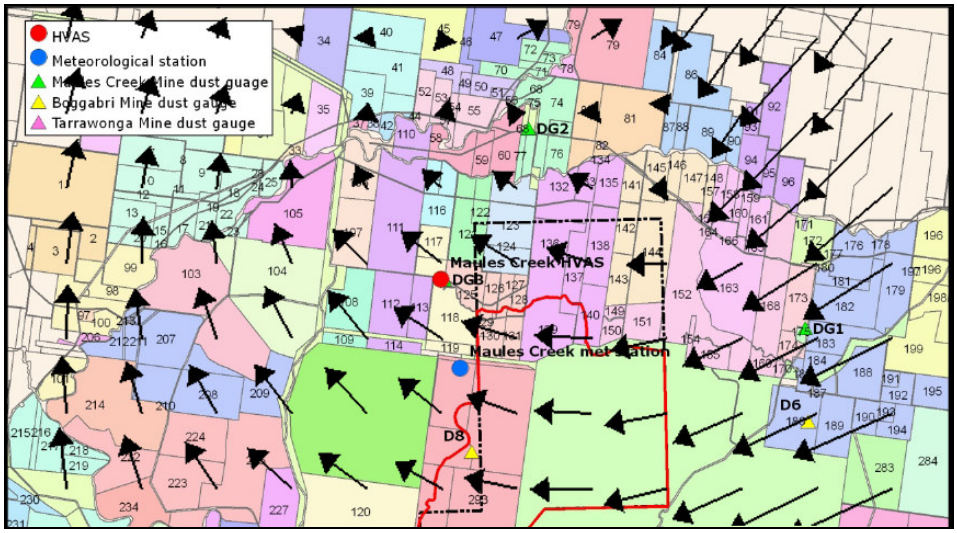


Adding to the complexity for the assessment that this brings is to the east of the site is a distinct feature that can be best described as "catchers mitt". See attached image that shows this feature. While it is acknowledged that ISCMOD is regularly used for the modelling of coal mines due to the in-pit modules are useful. However with the complexity of the surrounding terrain it is not suitable in this context alone.

It is noted that in the report wind roses are shown for the winds generated by TAPM for Maules Creek site looks appropriate with a predominance of southerly winds not apparent from other AWS data shown in the report.

However visualisation of the wind fields show considerable spatial variability that would not be accounted for with a Gaussian model. An example hour of the windfields generated by VIPAC for the area are shown for a given hour area in the Figure below.

This data clearly shows how variable the winds are spatially. As shown in this example hour higher wind speeds would tend to carry dust off the mine site, however in other areas the wind speeds are low. In this situation dust would be carried off site and later encounter low winds speeds resulting in significant dustfall, which a Gaussian model cannot simulate.



The major limitation of the assessment is the use of a gaussian model in this context is totally unsuitable. Validation against a three-dimensional non steady state model such as CALPUFF is required.

3. MODEL PARAMETERS

3.1 PIT SIZE PARAMETERS

No data is provided regarding the parameters for the various pit geometries used in the modelling. These are important considerations as the model used has a pit retention module, which significantly reduces emissions based on this geometry.

Further information is required to confirm appropriate parameters are required.

4. MET DATA

4.1 DATA AVAILABILITY

There is a large amount of meteorological data contained within the Air Quality Impact Assessment; in Table 5.1 of the assessment the meteorological data availability was summarised for the surrounding four weather stations:

- Maules Creek;
- Boggabri Coal Mine;
- Tarrawonga Coal Mine; and

- Narrabri Airport.

Table 5.1 stated that there was 12 months of data available in 2010 however wind speed and wind direction data was discontinuous with 29.9% of the data missing. This is inconsistent with Table 2 of the Existing Environment Chapter of the EIS, where it states that only September 2009-December 2009 were available with the exclusion of the month of October 2009.

Clarification and justification of the use of meteorological data is a significant issue in an assessment of this nature.

Full justification of the quality of this data is required.

4.2 HANDLING ADVERSE TERRAIN

A review of the input parameters as detailed ion Appendix B identified that there are seven cell heights, which are defined in order to calculate the flow of wind and the dispersion of pollutants in the model. The heights of these cells were not provided in Appendix B. It is noted that while the TAPM data was calculated at 1 km intervals and CALMET was calculated at 300 m intervals.

The local terrain features are such that greater resolution is required to best reflect the local meteorological effects from significant terrain features.

4.3 DATA USED FOR MODELLING – CLOUD COVER

After reviewing the wind speed and direction of the four weather stations, the meteorological data was generated using CALMET, which uses input data from weather stations, upper air and cloud data in combination with land use and terrain to predict meteorology for the local area.

In Appendix B of the Air Quality Impact Assessment, it is stated that cloud amount and cloud heights were sourced from observations at Tamworth Airport (BoM site located 90 km from Maules Creek), however the BoM weather station at Barraba is located only 45 km from Maules Creek and has a much more complete cloud dataset than Tamworth Airport for the modelling period. Further justification is required for the use of Tamworth Airport AWS in the model.

Additionally, BoM only record the cloud cover in fractions of eighths at 9 am and 3 pm, there is no nighttime cloud cover data. It can therefore be concluded that using observational data from BoM as the sole source of cloud cover data is inappropriate.

Justification of the cloud cover data used is required.

5. ASSESSMENT YEARS

The impact assessment considered four separate years during the life-time of the mine, the years selected were Year 5, Year 10, Year 15 and Year 21. Whilst these years were chosen to represent the impact in five-yearly intervals, only Year 21 assesses the maximum output of 13 Mtpa, as shown in Table 3.1 of the Air Quality Report. As a result all of the modelling scenarios do not reflect peak activity.

Discussion on the implications of differing activity is required.

6. CONCLUSION

While overall the assessment was thorough, significant uncertainties in elements of the assessment have been raised in this review that need addressing before any confidence can be had in the conclusion that there will be no health or amenity issues with the mine.