



Katestone Environmental

ABN. 92 097 270 276

17th March 2005

Attention: Bradley Chenoweth, facilitator
Health and Emissions Working Group
Wagerup 3 Refinery Expansion
PO Box 252
Applecross WA 6153

Dear Bradley,

Re: DESKTOP REVIEW OF THE CSIRO PHASE 2, 3A AND 3B REPORTS FOR ASSESSMENT OF THE ALCOA WAGERUP REFINERY EXPANSION

Katestone Environmental has been commissioned by Alcoa to provide independent expert advice, in the form of a desktop review of project studies related to Alcoa's Wagerup 3 refinery expansion, in order to assist the Emissions and Health Working Group. A detailed analysis of the Wagerup 3 refinery expansion project reports is presented in Katestone Environmental review report entitled "Desktop Review of the CSIRO Phase 2, 3A and 3B Reports for Assessment of the Alcoa Wagerup Refinery Expansion, March 2005".

The desktop review considers the final air dispersion modelling reports for the Wagerup 3 refinery expansion prepared by CSIRO and comments on amendments to the draft reports and additional information prepared by CSIRO in response to issues raised in our initial review (Katestone Environmental 2005). Based on feedback from the community on the initial review, the report aims to present the issues in an easy to understand language and identify the significance of the findings of the previous technical review report.

The revised reports prepared by CSIRO have addressed either directly or indirectly the significant issues identified in our initial review. Some of the additional information requested in our review has not been supplied. The question "is the model predicting the right answer for the right reason" remains unanswered. It would give more confidence in the results if this question was answered but due to the limited monitoring information available for the region it may not be possible.

Generally the modelling undertaken for the Wagerup 3 Refinery expansion adequately assesses the potential impacts on the local atmospheric environment so long as a degree of conservatism is taken into account when applying the uncertainty factors from the modelling results presented by CSIRO in the HRA.

Key issues that are highlighted in the desktop review and that are critical for credible assessment of air quality impacts of the refinery expansion are:

1. The model validation study (Phase 2 Appendix A) has shown that the model can provide reasonable predictions of ground-level concentrations of nitrogen oxides provided that daily average emission rates are used. The validated model setup should be used for subsequent HRA modelling work and has been used in the Phase 3 modelling scenarios as requested in our initial review.
2. The model validation study has shown that coupling the meteorological model with surface meteorological measurements (i.e. called data assimilation in CSIRO reports) provides a more realistic characterisation of wind conditions at Yarloop and consequently a better understanding of the air quality impacts of the refinery. Whilst there may be practical reasons why data assimilation cannot be used explicitly in the HRA modelling work, the impact on predictions of air quality is significant and needs to be accounted for by some alternative means.
3. To reduce uncertainty due to year-to-year variability in wind patterns the modelling results should be presented for the maximum exposed location as well as at the key receptors as listed in Phase 3 reports.
4. The peak emission scenario used to predict the short-term impacts is conservative as all sources are assumed to be operating at peak emissions at the same time and during the worst meteorological conditions. However, individual sources can operate at higher emission rates than those modelled, though there is likely to be a low risk that these short-term peaks will coincide. Therefore it is likely that the actual impacts will be lower than those presented if actual emission rates were used.
5. Whilst there appears to be substantial uncertainty in the predictions of the air quality impacts that are presented in the CSIRO reports, these uncertainties can be minimised through the experience gained in CSIRO's various studies for this project and by accounting for known uncertainties in a reasonable way, as discussed above. It is important to recognise that any modelling or measurement process will have associated errors and uncertainties, particularly where complex processes such as meteorology are at work. For the refinery expansion, the errors and uncertainties inherent in the modelling will be the same for the existing refinery and the expanded refinery and therefore, the relative changes in impacts will be as important as the magnitude of impacts

If you have any questions about the review please contact me directly.

Yours sincerely

Christine Killip