

## Appendix K: Low Frequency Noise

### Introduction

This Appendix has been prepared to specifically address QLD Health's concerns in relation to low frequency noise emissions from the proposed Caval Ridge Project.

Below is a copy of QLD Health's submission on the issue of low frequency noise.

*Relevant Project EIS Section: Section 12*

*Queensland Health disagrees with the approach to not undertake any mitigation measures against low frequency noise and recommends that the proponent mitigates against the potential adverse health impacts from low frequency noise.*

### Response to QLD Health Low Frequency Noise Submission

The exceedences of the low frequency noise guidelines in the EIS are attributable to the mobile mechanical plant in and around the pits, not the stationary processing plant proposed for this mine. Based on feedback from DERM, the low frequency noise guideline is intended to apply to all plant, though the major emphasis is on stationary plant. The three following paragraphs add further evidence that inherent low frequency noise problems arise from either stationary structures (e.g. wind over chimneys), stationary processing plant (e.g. large fans) or defective equipment (e.g. mobile mechanical plant with defective mufflers), and not to well maintained mobile mechanical equipment where the noise emission is dominated by an internal combustion engine.

Based on both the extensive community consultation that has been conducted by BMA in relation to the Bowen Basin Growth Projects (including very recent extensive consultation for this project) and Heggies wider experience in the acoustic industry, there is no evidence to suggest that people complain of "low frequency" noise issues around mines (or quarries) where the noise emission is dominated by mobile mechanical plant. Whilst noise complaints are received around such facilities, they are not of an inherent "low frequency" nature (based on Heggies experiences).

Furthermore, Heggies has undertaken analysis of internal road traffic noise at a significant number of units adjacent a major roadway in South East Queensland where the road traffic noise levels were of a similar level to those predicted for the Caval Ridge project. Interestingly, there was a considerable portion of properties where the two (2) "test" noise levels stated in the Low Frequency Noise Guideline were exceeded as well as the daytime and night time criteria. Again, to Heggies knowledge (having worked on this particular project as the acoustic consultant) there have not been any specific "low frequency" noise complaints. It is therefore reasonable to assume that exceeding the criteria in the Low Frequency Noise Guideline does not always mean there will be a specific "low frequency" noise problem.

Lastly, the spectrum balance within the low frequency range is considered a factor in noise annoyance and this factor is not taken into account in the guideline. Mobile mechanical mining plant is expected to exhibit a relatively balanced low frequency spectrum (as opposed to other sources that may exhibit tonal characteristics) hence it is unlikely to be a source of low frequency annoyance.

Further analysis of the low frequency noise assessment (from that conducted in the EIS) shows that:



BHP Billiton Mitsubishi Alliance

- Three (3) of the 4 locations – Locations 8, 10 and 11 - that are predicted to have only marginal exceedences of the Planning for Noise Control criteria (see ID 3.74) have substantial (up to 12 dB) exceedences of the low frequency noise criteria
- An additional eight (8) locations (not identified in ID 3.74) exceed the low frequency noise criteria – Locations 12, 14, 15, 16, 17, 18, 19 and 20 – by up to 9 dB

As the low frequency noise criteria are all internal criteria, building façade upgrades (where required) in combination with air conditioning of homes (as windows will need to be shut to achieve the noise criteria) represents the most reasonable and feasible forms of mitigation.

Preliminary calculations have been undertaken in order to determine what form of building façade upgrades might be required to achieve up to 17 dB (5 dB already assumed in the modelling for 'open windows' plus the additional up to 12 dB to achieve compliance) noise reduction. These calculations show that for an average sized room, with walls made from timber or masonry, windows of (up to) 10.38mm laminated glass may be required.

Given that;

- (a) low frequency noise complaints are not anticipated to be an issue (based on previous experience),
- (b) detailed site inspections of each home would be required in order to finalise the required mitigation measures and
- (c) installation of replacement glass and air-conditioning can be undertaken in a short period of time,

it is recommended that further action in relation to low frequency noise only be undertaken following internal "validation" noise measurements.

Despite the fact that low frequency noise is not expected to be an issue for this proposed mine, BMA is committed to internal "validation" noise monitoring at the commencement of operations. This commitment is now contained in the noise section (see Section 3.5) of the revised EMP.