

## Memorandum

To	Vicki Morrison-Shaw	Page	1
CC			
Subject	TTRL - Reponses to Questions Directed to Dr Childerhouse		
From	Darran Humpheson		
File/Ref No.	60540430	Date	24-May-2017

This memo address questions raised by Karen Pratt which were directed to Dr Childerhouse and were subsequently deferred to myself as they were outside his expertise.

I have maintained the numbering format of Dr Childerhouse's memo dated 23 May 2017.

**6(a) Do you agree that industry manufacturers of equipment would be able to provide noise profile information for the scale of beneficiation processes and de-salination plant that will be in operation and that this would be providing the DMC with 'the best available information at little cost?'**

Response: Noise level data is widely available for a range of industrial processes, including desalination and water beneficiation processes. However, such data is only relevant if the scale of the plant is similar and also the environment it operates in.

For the TTR operations the approach taken was to determine the overall source level for the IMV and crawler in order to achieve a receiver level of 135 dB at 500 metres. A combined source level of 171 dB was then determined based on the know transmission loss characteristics of the study area. The project's source level then becomes the 'noise budget' for the project (along with an enengineering 'headroom' allowance). Each item of noise generating plant will have a share of this noise budget. The individual contributions to this noise budget will only be known once a contractor has been commissioned and detailed engineering design undertaken. I have high confidence that the source level of 171 dB re 1 $\mu$ Pa at 1m is attainable.

**6(b) Do you agree that AECOM statement (3.1 of report) below regarding 172 dB excludes the suction head (see Hegley page 13) and so it is NOT the full noise for the crawler? "Based upon information provided by De Beers it was agreed by the acoustic experts at the 2014 hearing that a likely source level for the crawler would be 172 dB re 1 $\mu$ Pa at 1m." and "Technological improvements in pump design and acoustic control will, in my opinion, result in marginally lower source levels to those assumed in this assessment. It is likely that source levels would be 1-2 dB lower than the assumed 172 dB re 1 $\mu$ Pa at 1m"**

Response : The project's source level would be 171 dB re 1 $\mu$ Pa at 1m in order to achieve a receiver level of 135 dB at 500 metres. This source level includes the contribution from all noise sources, including use of the water jets on the crawler, the electric pumps, noise generated by the movement of water and sediment, etc. The assessment therefore includes the full noise for the crawler (and the IMV).

**6(c) Do you agree that the vessels used in the DeBeers Study were of 77m in length and 138m in length, and so are unsuitable for providing the estimation of noise of the IMV of 345m length?**

Response: Regardless of the length of the IMV, it will be required to comply with the project's noise limit. Therefore comparing the length of the proposed IMV to those used in the De Beers assessments is not a valid comparison as to the potential for noise generation.

**6(d) At the Hearing (pg 37 of the PowerPoint) I presented a table of noise from SINO iron in Australia which processes iron-ore – and the table included de-salination plant and grinding machinery – which are both are processes not included in either of the DeBeers Reports, or in Hegley's reports. Do you agree that no DeBeers empirical data has been presented during the Hearing to support the statement by AECOM "It is considered that extraction and processing activities will generate a worst case sound pressure level similar to that of the crawler, i.e. ~170 dB re 1µPa. Again this source data is supported by the De Beers empirical data". Do you agree that the importance of this source of noise requires the De Beers data referred to, to be presented?**

Response: The project's source level would be 171 dB re 1µPa at 1m in order to achieve a receiver level of 135 dB at 500 metres. This source level includes the contribution from all noise sources including the crawler and IMV operating. The contribution from the IMV will include all noise sources and detailed engineering design will quantify the noise level contribution from all on-board plant. The assessment therefore includes the totality of noise for the crawler and IMV.

I have high confidence that the source level of 171 dB re 1µPa at 1m is attainable even with an allowance for some engineering headroom.