

**BEFORE THE ENVIRONMENTAL PROTECTION AUTHORITY
AT WELLINGTON**

IN THE MATTER of the Exclusive Economic Zone and
Continental Shelf (Environmental Effects)
Act 2012

AND

IN THE MATTER of a decision-making committee
appointed to hear a marine consent
application by Trans Tasman Resources
to undertake iron ore extraction and
processing operations offshore in the
South Taranaki Bight

**EXPERT REBUTTAL EVIDENCE OF SIMON JOHN CHILDERHOUSE ON
BEHALF OF TRANS TASMAN RESOURCES LIMITED**

9 FEBRUARY 2017



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INTRODUCTION

1. My name is Simon John Childerhouse.
2. I prepared Expert Evidence dated 15 December 2016 (First Statement) with respect to these proceedings on behalf of Trans Tasman Resources Limited.
3. My qualifications and experience as a marine mammal scientist are set out in paragraphs 1-7 of my First Statement.
4. I repeat the confirmation given at paragraph 8 of my First Statement that I have read the Code of Conduct for Expert Witnesses and agree to comply with it.
5. The purpose of this Rebuttal Evidence is to respond to matters raised in submitter evidence. It addresses the following matters:
 - (a) General issues about marine mammal ecology; and
 - (b) Potential impacts of noise on marine mammals.
6. In preparing this evidence I have reviewed the following statements of evidence:
 - (a) Anton Leo Van Helden on behalf of Royal Forest and Bird Protection Society;
 - (b) Dr Leigh Torres on behalf of Kiwis Against Seabed Mining Incorporated;
 - (c) Professor Elisabeth Slooten on behalf of Kiwis Against Seabed Mining;
 - (d) Non-Expert Evidence by submitter Karen Pratt
 - (e) Helen Margaret Anderson on environmental planning for fisheries submitters;
 - (f) Natasha Sitarz on behalf of Royal Forest and Bird Protection Society of New Zealand Incorporated; and
 - (g) Gregory Matthew Barbara on Marine Ecology for Fisheries Submitters.

MARINE MAMMAL STRANDING RECORD

7. Several witnesses commented that the TTR reports and expert evidence did not include reference to the marine mammal stranding record.
8. This was deliberate as it was unclear how these records could be used to define cetacean occurrence at the scale

of the mining area or the plume. In his evidence, van Heldon cites Pyenson (2011)¹ as indicating the reliability of stranding records but examination of this paper indicates that the stranding record is most suited for reflecting patterns of richness and relative abundance in living communities for coastlines greater than 2,000 km in length and latitudinal gradients greater than 4°. This scale is much larger than considered here. The crux of the problem is that sick or dead whales may drift considerable distances before stranding onshore in the region, particularly given the exposure of the South Taranaki coastline to the prevailing south-westerly winds and the D'Urville Current, i.e. specimens may originate from populations nearshore, in the STB region, or from a broad area of the Tasman Sea. For defining the occurrence of these species in a much smaller area the stranding record is potentially misleading.

9. I have no problem in accepting, however, that the whale and dolphin fauna of the STB is greater than suggested by the sightings data alone. In the future, passive acoustic monitoring (PAM) equipment, as presently deployed in the STB by Dr Leigh Torres and by NIWA, will provide another key data source for identifying cetacean occurrence in the region. The proposed installation of PAM equipment by TTR and suitable analysis of the recordings will provide additional data on cetacean occurrence in the vicinity of the mining operation.

APPLICATION OF DATA FROM THE ENTIRE STB TO THE MINING AREA

10. Several witnesses provided detailed comments on the wide diversity of marine mammals that have been reported from the STB region and what this might mean for the mining area.
11. While it is appropriate to review what is known about marine mammals from the entire STB/Cook Strait region (which covers an area in excess of ~30,000 km²), it is not appropriate to assume that the ~66 km² area of the mining area (which comprises less than 1% of this entire area) is therefore important for all the species that occur in the region.
12. Several witnesses routinely referred to the "area" as being important to marine mammals but there was often confusion about exactly what area was being referred to. I agree that the STB is an important area for marine mammals but I don't agree that the mining area itself is important for marine mammals. My conclusion is based on an assessment of systematic aerial surveys undertaken of the area, habitat modelling and a review of marine mammal records.

¹ Pyenson ND (2011). The high fidelity of the cetacean stranding record: insights into measuring diversity by integrating taphonomy and macroecology. *Proceedings of the Royal Society B* 278(1724): 3608–3616

CONSIDERATION OF POTENTIAL IMPACTS FROM NOISE

13. Several submissions stated that TTR have not considered noise effects or have not considered them adequately.
14. These statements are incorrect as TTR have undertaken assessments of potential noise impacts as reported in the report of Hegley (2016)² and my First Statement³. I undertook a simple but effective assessment of noise impacts (summary in Table 2 of my First Statement) using the most conservative noise values (i.e. loudest) and disturbance thresholds (i.e. lowest) reported in the international literature. From this work, I concluded that while there exists the potential for behavioural modification (e.g. exclusion from the area), given that this area is likely to be relatively small (e.g. an area potentially a maximum of several km around the source) the effect on individuals, let alone species in the STB, is likely to be extremely limited.
15. Witnesses stated that as operational and ambient noise have not been directly measured, impacts therefore cannot be assessed. This is also incorrect as, noted above, I have used conservative values from the literature to assess impact.
16. Furthermore, TTR has voluntarily proposed a limit on the amount of noise the operation is able to produce through Condition 12. This stipulates a maximum broadband sound level of no more than 135dB re 1µPa RMS linear at 500m from the source which will ensure that noise from the operation will not exceed this level and, in fact, may well be less. This provides a high degree of protection to any marine mammals in the area and means that it is not necessary to know operational and ambient noise levels as operations can be no louder than this conservative threshold.
17. Many witnesses cited examples of recorded impacts on marine mammals from noise from other operations (e.g. military sonar, seismic surveys) as evidence that the TTR mining operation will create these same impacts. It is inappropriate to use most of these examples as these operations are completely different to the mining operation in both frequency range and/or intensity. As an example, seismic surveys are between 1,000 and 100,000 times louder than the maximum noise that is likely to be produced by the mining operation and so any impacts attributed to seismic surveys cannot be expected to be the same for the mining operation.

² Hegley N (2015) Offshore Iron Sand Extraction and Processing Assessment of Noise Effects [Report 28].

³ Childerhouse S (2016) Expert Evidence of Dr Simon John Childerhouse on behalf of Trans Tasman Resources Limited. 15 December 2016.

AERIAL SURVEYS OF THE MINING AREA

18. Several witnesses criticised the methodology and/or results from the aerial surveys undertaken by Cawthorn⁴ of the proposed mining area and inshore waters on behalf of TTR.
19. Cawthorn undertook dedicated aerial surveys for marine mammals inside and outside the mining area every 2-3 months for over two years covering over 8,400 km of transects. There was only one sighting of common dolphins and four sightings of fur seals.
20. The survey was undertaken using reasonable and acceptable methodology following international standards using experienced personnel. The survey was designed to estimate the distribution and presence of marine mammals in the area rather than abundance and therefore many of the pieces of data that were identified by witnesses as being absent from the report, were not required for analysis and so were not collected.

UNCERTAINTY

21. Several witnesses stated that there is insufficient information available to reliably assess the effects of the proposal on marine mammals. They therefore concluded that given the high level of uncertainty, it is not possible to make a reliable assessment and that the only way to address this would be to collect additional data. I do not agree with this assessment with respect to marine mammals. In my opinion, there is sufficient information available in the application and supporting documents to reliably assess potential impacts on marine mammals.



Simon John Childerhouse

9 February 2017

⁴ Cawthorn M (2015) Cetacean Monitoring Report. Report prepared for TTR. 35p.