

UNDER the Fast Track Approvals Act 2024

IN THE MATTER of a substantive application for marine consents that would otherwise be applied for under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012

BY Trans-Tasman Resources Limited

**EVIDENCE OF DR SIMON JOHN CHILDERHOUSE (MARINE MAMMALS)
ON BEHALF OF TRANS-TASMAN RESOURCES LIMITED IN RESPONSE TO
COMMENTS RECEIVED**

13 OCTOBER 2025



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EXECUTIVE SUMMARY

1. I have been asked by TTRL to provide a response to marine mammal issues, including potential impacts, raised by parties invited to comment on the application by the Panel on the Fast Track Approval Act 2024 (**FTAA**) application. This Evidence reaffirms the opinions expressed in my reports and advice presented as part of previous applications and hearings regarding marine mammals and potential impacts on them from the proposed TTRL project.
2. While a wide range of comments were received from parties, there were few new issues that had not already been addressed in previous material. I have provided responses in this Evidence to the few new issues raised. Overall, there is nothing sufficiently new or updated for me to change any of my previous views. A summary of the key comments raised by parties is provided including my responses drawing on my previous conclusions where appropriate.
3. *Insufficient data on marine mammals and potential impacts to undertake a robust assessment* - There is a large amount of detailed information available (including new material) to characterise and provide an understanding of marine mammals within the STB region. This includes information about marine mammals within the proposed mining area. There is also sufficient data to robustly assess potential impacts from the proposed activity on marine mammals.
4. *Best available information* - A common comment was that if you do not understand everything completely and fully, then you cannot assess potential effects due to uncertainty. This expectation of perfect knowledge of all aspects of the consent is simply not realistic nor practical. Where the best available information may include gaps or uncertainty, it is still possible to proceed in making sensible judgements while accounting for uncertainty and including a precautionary approach if required.

5. *Uncertainty and data gaps* - While I agree that there is some uncertainty with some aspects of the available data, I believe that there is sufficient data upon which to make robust and accurate assessments with respect to marine mammals. I believe that where there is uncertainty in the available data, it could be and was addressed through a comprehensive and appropriately precautionary set of proposed consent Conditions related to marine mammals ensuring that, if the consent did proceed, there would be no material harm on marine mammals.
6. *Importance of the proposed mining area to marine mammals* – Based on the best available data, I conclude that while the wider STB region represents an important area for marine mammals, the proposed mining area is highly unlikely to be an area of any special biological significance to marine mammals.
7. *Underwater noise levels* – TTRL have proffered Conditions 11 to 18 which, among other things, set maximum noise levels for the operations and define specific procedures for monitoring underwater noise. These maximum noise levels have been selected to reduce or eliminate noise impacts on marine mammals. In particular, I note that if TTRL are unable to meet the requirements of Condition 11 during *the activity*, then operations should cease (until such time that the noise limits can be met after mitigation). Empirical data on actual underwater operational noise is not required for this assessment (while noting that these data will be collected during pre-commencement monitoring), as the maximum noise level of the activity has already been defined and has been used to evaluate potential effects.
8. *Underwater noise impacts* - New underwater noise modelling was undertaken using updated international marine mammal noise thresholds. Based on these new data, the risk of Auditory Injury (previously known as permanent threshold shift – **PTS**)

from the operation is zero and the risk of temporary threshold shift (**TTS**) impacts from the operation are likely to be very low to negligible and, if they do occur, will only occur within the immediate vicinity (i.e., < 500 m for baleen whales and < 100 m for other whales and dolphins) of the operation and only for individuals that spend significant amounts of time with that area. Given the highly mobile nature of marine mammals, I believe that this latter event is highly unlikely. A behavioural threshold for marine mammals of a root mean square (**RMS**) sound pressure level of 120 dB re 1 μ Pa (unweighted) was applied to assess potential behavioural impacts. The modelling confirms that the behavioural threshold is reached at approximately 3.6 km from the Integrated Mining Vessel (**IMV**) noise source. This means that any marine mammals within this range of the operation have the potential for behavioural disturbance. This suggests that the potential behavioural effects from this operation will be significantly less than we would expect to see from a large vessel transiting the area with the possible caveat that this operation is very slow moving compared with faster moving a large vessel. Overall, the new underwater noise modelling using the new thresholds has confirmed a lower risk of impact from the operation than previously estimated.

9. I believe that the Conditions as described are comprehensive and will avoid material harm from the activity on the local marine mammal populations. I also believe that the Conditions favour caution and environmental protection.

INTRODUCTION

Qualifications and experience

10. My full name is Dr Simon John Childerhouse. I am presently employed as a Principal Scientist specialising in marine mammal issues at the Blue Planet Marine. I am providing this evidence as an independent consultant on behalf of Trans-Tasman Resources Limited (**TTRL**).
11. I have a PhD in Marine Science (2009; Thesis – Conservation Biology of New Zealand sea lions) and a Graduate Diploma in Wildlife Management (1993; Thesis – Individual photographic identification and population size estimates for sperm whales at Kaikoura, New Zealand) from the University of Otago, and a BSc in Zoology (1991) from the University of Auckland.
12. I have worked as a marine mammal scientist for more than 25 years in New Zealand, Australia, Antarctica, the USA, Canada and the South Pacific. My work has included: pure and applied marine research; leading and managing large-scale, international research projects; publication across a broad range of marine research topics; lecturing and teaching at various universities; representation of both Australian and New Zealand Governments at international meetings; development of national and international policy and strategic documents; and delivering applied and practical solutions to challenging marine conservation and resource utilisation issues. I have considerable experience in the ecology and behaviour of marine mammals and the identification and mitigation of impacts of anthropogenic activities on marine mammals.
13. Previously I worked as a:
 - (a) Senior Researcher at the Environmental Law Initiative for 2 years;

- (b) Senior Marine Scientist at the Cawthron Institute for 3.5 years;
 - (c) Senior Marine Scientist at Blue Planet Marine, an environmental consultancy company, for 7 years;
 - (d) Research Partnership Coordinator for 3.5 years at the Australian Government's Marine Mammal Centre; and
 - (e) Senior Marine Mammal Scientist for 11 years at the Department of Conservation (**DOC**).
14. I was a member of the Scientific Committee of the International Whaling Commission for more than 15 years, during which time I have held the positions of Head of the New Zealand delegation for eight years, Chair of the Southern Ocean Whales sub-committee for three years and a member of the Australian delegation for three years.
15. I am also a member of the Convention on Migratory Species (**CMS**) Scientific Council's Aquatic Mammals Working Group, a member of DOC's New Zealand Threat Classification System team for marine mammals and am the New Zealand Coordinator for the International Union for the Conservation of Nature (**IUCN**) Marine Mammals Protected Area Task Force. I previously held a Ministerial appointment as a Fiordland Marine Guardian and was An Executive Officer of the South Pacific Whale Research Consortium.
16. I have three book chapters and over 60 peer-reviewed research papers published in the international scientific literature. These include papers on ten different New Zealand marine mammal species including: Weddell seals, New Zealand sea lions; whales (sperm, humpback, southern right and blue); and dolphins (Hector's, Māui, dusky and bottlenose). I have also authored more than 90 unpublished research reports.

17. I have provided expert evidence on marine mammal ecology and / or the potential impacts on marine mammals for a wide range of resource consent applications under the Resource Management Act 1991 and the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (**EEZ Act**). I have provided technical advice on behalf of applicants, submitters, the Crown and Regulators.

Code of Conduct

18. I have been provided with a copy of the Code of Conduct for Expert Witnesses contained in the Environment Court's Practice Note dated 1 January 2023. I have read and agree to comply with that Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Involvement in project

19. I have been involved in TTRL's previous applications for this project including in 2014, 2017 and 2023 under the EEZ Act.
20. I previously gave evidence for TTRL before a Decision-making Committee (**DMC**) in 2017. My evidence before the 2017 Committee comprised:
- (a) A primary statement of evidence dated 15 December 2016;
 - (b) A rebuttal statement of evidence dated 9 February 2017;
 - (c) Supplementary statements of evidence dated 2 March 2017, 9 March 2017, 1 May 2017 and 23 May 2017
 - (d) A summary presentation of evidence dated 21 February 2016;

- (e) Written responses to questions approved in DMC Minute 21;
 - (f) A joint statement of experts in the field of effects on marine mammals dated 3 March 2017;
 - (g) Oral evidence on 21 February 2017 (Transcript pages 486-51;
 - (h) Oral evidence on 3 March 2017 (Transcript pages 1058-1083); and
 - (i) Oral evidence on 22 May 2017 (Transcript pages 3110-3135).
21. I also previously gave evidence for TTRL before a DMC in 2024. My evidence before the 2024 DMC comprised:
- (a) A primary statement of evidence dated 19 May 2023¹;
 - (b) A rebuttal statement of evidence dated 23 January 2024²; and
 - (c) Co-author of the Joint Statement of Experts in the field of Effects on Marine Mammals dated 19 February 2024³.
22. For the present application, I reviewed and updated relevant parts of the application documents as they relate to the project's impacts on marine mammals including:

¹ Supplementary Technical Report 4c - Evidence Dr Simon Childerhouse - effects on marine mammals - May 2023

² Supplementary Technical Report 4b - Rebuttal evidence Dr Simon Childerhouse - marine mammals - January 2024

³ EPA (2024) A joint statement of experts in the field of effects on marine mammals. 19 February 2024.

- (a) Undertaking a technical review and updating of the marine mammal sections of relevant parts of sections 5.8 of the application document
- (b) updating the draft Marine Mammal Management Plan (Appendix 5.9 to the application).

Scope of evidence

- 23. I have been asked by TTRL to provide a response to marine mammal issues, including potential impacts, raised by parties invited to comment on the application by the Panel on the Fast Track Approval Act 2024 (**FTAA**) application.
- 24. I provide some specific responses in this statement to some of the marine mammal issues raised in comments provided on this application including:
 - (a) Taranaki Regional Council, including their Attachment 2, a Technical Report by PDP;
 - (b) Horizons Regional Council, including their Appendix 1, a Technical Report by PDP;
 - (c) Forest and Bird, including a Statement of Evidence by Dr Deanna Clement and Scientific Peer Review by JASCO Applied Sciences;
 - (d) KASM, including a Statement of Evidence by Dr Leigh Torres.
- 25. While not contained in this evidence statement, I have also provided further comments in the response tables provided as part of TTRL's wider response package to the FTAA Panel. I confirm that comments in response to the impacts on marine mammals have been provided by myself and are within my scope of expertise.

26. I also draw on some Statements of Evidence from other TTRL experts, including Dr MacDiarmid⁴ and Mr Humpheson⁵, to respond to issues that are relevant to marine mammals but outside my specific area of expertise.

RESPONSE TO SUBMITTER COMMENTS – TRC

27. The Taranaki Regional Council (**TRC**) provided a submission⁶ on the application which included a Technical Assessment Report⁷ undertaken by PDP. Both documents provide some comments on marine mammals and where relevant, these have been set out below.

PDP Technical Report for TRC

28. PDP Comment:

The panel may wish to consider whether the existing baseline data on marine mammal populations and behaviours are sufficient to evaluate the potential impacts of the proposed mining activity (Section 5.2.1, p. 28).

29. There is considerable baseline data available on marine mammals within the South Taranaki Bight (**STB**) region as noted in my original Statement of Evidence of 19 May 2023⁸ and, specifically, paragraphs 8 and 9 of my Rebuttal Evidence of

⁴ MacDiarmid, A. (2025) Evidence of Dr Alison MacDiarmid (Marine Ecology) on behalf of Trans-Tasman Resources Limited in Response to Comments Received. 13 October 2025. 27 p.

⁵ Humpheson, D. (2025) Evidence of Darran Humpheson (Acoustics) on behalf of Trans-Tasman Resources Limited in Response to Comments Received. 13 October 2025. 26 p.

⁶ Taranaki Regional Council (2025) Taranaki VTM Project: Written Comment. TRCID-1492626864. 40 p.

⁷ PDP (2025a) Technical assessment of Fast Track Application (FTAA-2504-1048 Taranaki VTM Project). Prepared for Taranaki Regional Council. August 2025. 51 p. Attachment 2 to TRC submission.

⁸ Childerhouse, S (2023) Expert Evidence of Dr Simon John Childerhouse on behalf of Trans-Tasman Resources Limited. 19 May 2023. 98 p.

23 January 2024⁹. These data sources have been used extensively in assessing which marine mammals are found within the STB, including the proposed mining area, how they may be using these areas and any potential impacts upon them.

30. I reiterate my earlier statement that while I acknowledge that there were some information gaps and uncertainties in the information provided, I believe that most of these gaps would be impossible to fill given their complexity and the significant difficulties in actually collecting the required data (e.g., robust abundance estimates and distribution maps for all marine mammals in the region).
31. In addition, I believe that where there was uncertainty in the available data, it could be and was addressed through a comprehensive and appropriately precautionary set of proposed consent Conditions related to marine mammals ensuring that, if the consent did proceed, there would be no material harm on marine mammals¹⁰.
32. PDP Comment:

The panel may wish to take into account that the described uncertainty could influence the ability to fully assess the magnitude and significance of potential noise-related impacts on marine mammals both directly and during foraging (Section 5.2.1, p. 28).
33. As I noted in my earlier Evidence¹¹, while I agree that there is some uncertainty with some aspects of the available data, I believe that there is sufficient data upon which to make robust and accurate assessments with respect to impacts on marine mammals. Where the best available information includes

⁹ Childerhouse, S (2024) Expert Rebuttal Evidence of Dr Simon John Childerhouse on behalf of Trans-Tasman Resources Limited. 23 January 2024. 33 p.

¹⁰ Childerhouse, S (2023) Paragraph 114, p. 45.

¹¹ Childerhouse, S (2024) Paragraph 10-11, p. 5

gaps or uncertainty, it is still possible to proceed in making sensible judgements while accounting for uncertainty and implementing a precautionary approach if required.

34. I believe that uncertainty in the available data, could be and has been addressed through a comprehensive and appropriately precautionary set of consent Conditions ensuring that if the consent did proceed, there would be no material harm on marine mammals.

35. PDP Comment:

The updated information still does not provide useful information about the marine mammals that occur within the mining area and how they use it (Childerhouse, 2023) (Section 5.2, p. 26).

36. I am assuming that this statement, which appears to be attributed to me (i.e., citing Childerhouse 2023), is an error by PDP as that statement does not reflect my view. As noted in my paragraphs 29 to 31 above, there are sources of data on marine mammals within the mining area including, dedicated aerial surveys for marine mammals (Cawthorn 2015¹²) and individual species level distribution modelling that includes the mining area and wider STB region (Stephenson et al. 2020¹³).

37. PDP Comment:

The assessment of noise effects primarily relies on modelling rather than any in situ measurements (Section 5.2, p. 27).

38. While this statement is accurate, it is misleading. The best available data has been used in the assessment of noise and, given that there is no comparable operation presently working, it is not possible to collect any *in situ* measurements

¹² Cawthorn, M. (2015) Cetacean Monitoring Report. Report prepared for TTL. November 2015. 35 p.

¹³ Stephenson F et al. (2020) Modelling the Spatial Distribution of Cetaceans in New Zealand Waters. Diversity & Distributions 26(4): 495–516, <https://doi.org/10.1111/ddi.13035>.

from the operation. Estimates of background, ambient underwater noise levels are available from the STB region including in Barlow et al. (2023¹⁴), Warren et al. (2021a,b¹⁵) and JASCO (2017, 2019). The consideration of ambient noise by TTRL has been specifically addressed by Mr Humpheson in paragraphs 45 to 51 of his 2025 Evidence¹⁶ including consideration of ambient levels provided in JASCO reports (2017, 2019). His primary conclusion was that the range of noise levels generated by TTRL's activities would not be dissimilar to existing ambient noise levels, although he noted that noise would be generated in a new area of the STB.

39. PDP Comment:

The proposed maximum operational noise threshold of 135 dB is used as a compliance benchmark, but there is limited empirical data reflects the actual Conditions of the STB.

40. I believe PDP have misinterpreted this proffered Condition by TTRL. Condition 11 in Attachment 1 – Proposed Marine Consent Conditions, is not simply a compliance benchmark but is a very active and forceful control on the amount of noise that can be generated by the activity. Condition 11(b) and 11(c) clearly define the overall combined noise level at 500 m from the IMV (Integrated Mining Vessel) in two different ways: (i) 130 dB re 1µPa RMS linear of the individually specified

¹⁴ Barlow DR et al. (2023) Temporal Occurrence of Three Blue Whale Populations in New Zealand Waters from Passive Acoustic Monitoring. Journal of Mammalogy 104(1): 29–38. <https://doi.org/10.1093/jmammal/gyac106>.

¹⁵ Warren VE et al. (2021a) Marine Soundscape Variation Reveals Insights into Baleen Whales and Their Environment: a Case Study in Central New Zealand. Royal Society Open Science 8(3): 201503– 201503, <https://doi.org/10.1098/rsos.201503>.; Warren VE et al. (2021b) Passive Acoustic Monitoring Reveals Spatio-Temporal Distributions of Antarctic and Pygmy Blue Whales Around Central New Zealand. Frontiers in Marine Science 7: <https://doi.org/10.3389/fmars.2020.575257>.

¹⁶ Humpheson, D. (2025) Statement of Evidence of Darren Humpheson (Acoustics) on behalf of Trans-Tasman Resources Limited in Response to Comments Received. October 13, 2025, 47-51 p.

frequency bands, and (ii) 135 dB re 1µPa RMS linear across all frequencies.

41. As background, the 130 dB re 1µPa RMS linear level was originally proposed by Professor Bernd Würsig¹⁷, and also supported by Mr Andrew Baxter¹⁸, both of whom were appearing on behalf of DOC. Both the 130 and 135 dB re 1µPa RMS linear levels were agreed to by many of the working group at that time¹⁹ and were seen as a critical control on the mining operation. It was carefully and deliberately set at a level that would minimise or eliminate biologically meaningful impacts on marine mammals from noise based on the empirical data provided by Professor Würsig²⁰.
42. Following on from this and based on underwater noise modelling by Mr Humpheson²¹, it was estimated that an underwater noise level of 130 (spectrum specific) and 135 (broadband) dB re 1µPa RMS linear at 500 m from the IMV (as specified in Condition 11) was equivalent to a total combined noise source level (measured in water) of not more than 177 dB re 1µPa RMS linear at one metre from the IMV. Therefore, Condition 11 was used to specify Condition 12. Combined, these two Conditions set maximum noise levels for the operation.

¹⁷ Würsig, B.G. (2014) Statement of Evidence of Bernd Gerhad Würsig for the Director General of Conservation. 24 February 2014. 25 p.

¹⁸ Baxter, A. (2014) Summary Statement of Andrew Stephen Baxter for the Director General of Conservation. 1 April 2014. 11 p. Paragraph 22.

¹⁹ Humpheson et al. (2014) Noise Conditions, 11 April 2014. 3 p.; Joint Witness Statement (2014) Joint Statement of Experts in the field of Effects on Marine Mammals Including Noise. Report prepared for the Environmental Protection Agency. 26 March 2014. 50 p.

²⁰ Würsig, B. (2014)

²¹ Humpheson, D. (2017) Trans-Tasman Resources – Acoustic Modelling. 2 May 2017. 10 p. Report appears as Appendix 3 in Childerhouse, S. (2017) Second Expert Supplementary Statement of Evidence of Simon John Childerhouse on behalf of Trans-Tasman Resources Limited. 1 May 2017. 46 p.

43. Given the careful selection of this maximum noise level, and its inherent constraint on the activity, there will be no noise greater than the levels specified in from the operation. Therefore, there is no need to know the actual Conditions of the STB, as we know what the maximum noise level from the activity can be and can thereby use that maximum level to assess possible effects, which is what has been done.

44. PDP Comment:

There is some uncertainty about the potential effects of noise on marine mammals... (Section 5.2, p. 27).

45. It is not clear what specific uncertainty PDP are referring to but I acknowledge that there is some uncertainty. As one simple example, some of the marine mammal species possibly found in the STB are only known from a handful of beach cast and stranded specimens and, therefore, it is impossible to completely reduce uncertainty in this assessment.

46. Furthermore, I note a comment made by Dr Deanna Clement, a marine mammal expert providing technical advice to Forest and Bird, that:

It is my opinion that the level of information considered necessary by some experts is not available for most marine mammal species around New Zealand, nor is it reasonably obtainable. There will always be gaps in our understanding of most marine mammal species and how they interact with their environment (Paragraph 24, p. 6)²².

47. Given these statements in the paragraphs immediately above, what has been done in the risk assessment in the Application is to take a precautionary approach which:

²² Clement, D. (2025) Statement of Evidence of Deanna Marie Clement for the Royal Forest and Bird Protection Society of New Zealand Incorporated (Marine Mammals). 6 October 2025. 22 p.

- (a) assumes that any of the listed marine mammal species could occur within the activity area (also proposed by Dr Clement in paragraph 27 of her Evidence²³);
 - (b) assumes that the maximum noise and spectral components from the operation will be below both 130 (spectrum specific) and 135 (broadband) dB re 1µPa RMS linear (as reflected in Condition 11); and
 - (c) models the potential noise impacts of this maximum noise level for all marine mammals using specific marine mammal groups and, for each group, applying specific weighting thresholds based on empirical hearing sensitivities that meet international best practice guidelines (i.e., NMFS 2024²⁴).
48. This approach represents international best practice for assessing impacts on marine mammals, uses the best available data, and provides the best assessment with the lowest possible uncertainty of potential noise impacts.
49. PDP Comment:
- Several agreements were also made about the uncertainty of the underpinning datasets for the marine mammal modelling (Section 5.2, p. 27).*
50. I refer to some of my earlier comments about the robustness of the spatial modelling approaches. Models for rarely sighted species showed reasonable fits to available sightings and showed high predictive power for commonly sighted species (Stephenson et al. (2020a,b, 2021). There is nothing to suggest

²³ Clement, D. (2025)

²⁴ [NMFS] National Marine Fisheries Service (US) (2024) 2024 Update to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0): Underwater and In-Air Criteria for Onset of Auditory Injury and Temporary Threshold Shifts. Report by the US Department of Commerce and NOAA. NOAA Technical Memorandum NMFS-OPR-71. 182 p.

that these data are inadequate, unreliable or are underestimating marine mammal use of the proposed mining area and almost all the new research cited has been published in international, peer reviewed scientific journals²⁵.

51. In general, I agree with PDP relating to the potential limitations of these data. However, notwithstanding these limitations, these data can and do provide useful new data on marine mammal distribution in the STB region and, when interpreted correctly, can provide a useful insight into marine mammal presence and have been taken into account during TTRL assessments²⁶.

TRC Report

52. TRC Comment:

That the uncertainties relating to marine mammals remain highly relevant (Paragraph 2, p. 3)

53. I have provided some responses to this issue in my paragraphs 32, 44, and 49 above.

54. TRC Comment:

Give close consideration to the knowledge gaps with regards to seabirds and marine mammals, as well as the uncertainty associated with the models that have been employed to fill these knowledge gaps, and how the Expert Panel will take into account the need to favour caution and environmental protection regarding potential effects on these animals.

55. I have provided some responses to this issue in my paragraphs 283249 above.

56. TRC Comment:

²⁵ Childerhouse (2024) Paragraph 24, p. 10

²⁶ Childerhouse (2024) Paragraph 25, p. 10.

Note that the need to favour caution and environmental protection in the above matters will be particularly important for sensitive or endangered species such as pygmy blue whales, Hector's and Māui dolphins (Paragraph 35(n), p. 13).

57. I agree with this sensible and practical statement, and in my view favouring caution and environmental protection is what the proposed Conditions will achieve. The project risk assessment contained in the Application confirmed there will be no significant biological impact on marine mammals from the proposed activity if the marine mammal focused Conditions within Attachment 1 – Proposed Marine Consent Conditions are implemented.

Response to submitter comments – HRC

58. The Horizons Regional Council (**HRC**) provided a submission²⁷ on the application which included a Technical Assessment Report²⁸ undertaken by PDP. Both documents provide some comments on marine mammals.

PDP Technical Report for HRC

59. I note that this Technical Report by PDP is very similar to the PDP Report prepared for TRC and discussed in detail above.
60. PDP Comment:
- In situ noise measurements were not used and compliance benchmarks suggested have limited empirical data to inform their appropriateness (Section 4.7, p. 17)*
61. I refer to my previous comments on this issue in my paragraph 38 and 40.

²⁷ Horizons Regional Council (2025) Taranaki VTM Project – FTAA-2504-104: WRITTEN COMMENT – HORIZONS REGIONAL COUNCIL. APP-2025205407.00. 25 p.

²⁸ PDP (2025b) Technical assessment of Fast Track Application FTAA-2504-1048 (Taranaki VTM Project). Prepared for Horizon Regional Council. August 2025. 51 p. Attachment 2 to TRC submission.

62. PDP Comment:

Given the limited data, there is some uncertainty about the potential effects of the mining operation on marine mammals, particularly for sensitive or endangered species (Section 4.7, p. 17).

63. I refer to my previous comments on this issue in my paragraph 29, 33, 36, 45, and 50.

64. PDP Comment:

The limited data on marine mammals, particular given their threat classification, are sufficient to evaluate the potential impacts of the proposed activity (Section 4.8.7, p. 19).

65. I refer to my previous comments on this issue in my paragraph 29, 33, 36, 45, 50 and note a similar comment by Dr Clement as reflected in my paragraph 140.

66. PDP Comment:

Potential noise related impacts on marine mammals from mining are uncertain and there is a lack of empirical data to fully assess the magnitude and significance of effects (Section 4.8.7, p. 19).

67. I refer to my previous comments on this issue in my paragraph 38 and 40.

HRC Report

68. HRC Comment:

Given limited data, there is some uncertainty about the potential effects on marine mammals.

69. I refer to my previous comments on this issue in my paragraph 29, 33, 36, 45, and 50.

70. HRC Comment:

The limited data on marine mammals, particular given their threat classification, are sufficient to evaluate the potential impacts of the proposed activity (Paragraph 36l).

71. I refer to my previous comments on this issue in my paragraph 29, 33, 36, 45, and 50.

72. HRC Comment:

Potential noise related impacts on marine mammals from mining are uncertain and there is a lack of empirical data to fully assess the magnitude and significance of effects (Paragraph 36m).

73. I refer to my previous comments on this issue in my paragraph 38 and 40.

RESPONSE TO SUBMITTER COMMENTS – FOREST AND BIRD

74. The Royal Forest and Bird Protection Society of New Zealand Incorporated (**F&B**) provided comments²⁹ on the application which included several supporting documents including a *Scientific Peer Review in Relation to Underwater Noise and Marine Mammals undertaken by JASCO Applied Sciences (JASCO)*³⁰, a Statement of Evidence of Dr. Deanna Clement³¹ and a Statement of Evidence of Natasha Sitarz³². All four of these documents provide some comments on marine mammals.

JASCO Scientific Peer Review

75. JASCO's Scientific Peer Review was commissioned by DOC but appears in F&B's submission. The JASCO report provides

²⁹ Royal Forest and Bird Protection Society of New Zealand Incorporated (2025) Memorandum of Legal Comments of Counsel for the Royal Forest and Bird Protection Society of New Zealand Incorporated. 6 October 2025. FTAA-2503-1035. 45 p.

³⁰ JASCO Applied Sciences (Australia) Pty Ltd (2025) Trans-Tasman Resources Limited Fast Track Application - Taranaki VTM, 2025. Scientific Peer Review in Relation to Underwater Noise and Marine Mammals. 29 August 2025. Prepared for the Department of Conservation. 35 p.

³¹ Clement, D.M. (2025) Statement of Evidence of Deanna Marie Clement for the Royal Forest and Bird Protection Society of New Zealand Incorporated (Marine Mammals). 6 October 2025. 22 p.

³² Sitarz, N. (2025) Statement of Evidence of Natasha Sitarz on behalf of the Royal Forest and Bird Protection Society of New Zealand Incorporated (Marine Mammals). 6 October 2025. 133 p.

some specific comments about marine mammals and underwater noise. I provide some responses below and also note that the evidence of Mr Humpheson³³ on behalf of TTRL also responds to some of the issues. I draw on Mr Humpheson's work where appropriate.

76. JASCO Comment:

We are not aware of any additional substantial sources of information that would add further detail to the baseline data assessment (Section 2.2, p. 4).

77. I agree.

78. JASCO Comment:

there remain some vital gaps in understanding for these populations such as basic information (Section 2.2, p. 4).

79. I refer to my previous comments on this issue in my paragraph 29, 33, 36, 45, and 50.

80. Further, I reference my earlier Evidence³⁴ whereby both scientific process and risk assessments move forward by assessing the level and extent of uncertainty inherent in an issue and then make expert judgements about the potential impacts of that uncertainty. Decision makers are not required to have perfect knowledge of all issues under consideration before they can reach decisions. In my opinion, the best available information presently before the FTAA Panel is sufficient to form a reasonable conclusion about the likely impact of this project particularly when considered alongside the mammal focused Conditions proposed³⁵.

81. I also note that there are very few places in the world where the level of data that JASCO have identified (and suggested

³³ Humpheson, D. (2025)

³⁴ Childerhouse, S. (2024) Paragraph 11

³⁵ Childerhouse, S (2024) Paragraph 11, p. 10

is required to undertake an assessment) is available and certainly no place where all the data they identified as “foundational” is available.

82. JASCO Comment:

Humpback whales not considered in the application (Section 2.2, p. 4).

83. This is incorrect. In my earlier Statement of Evidence³⁶, there is important consideration of humpbacks in the STB region. There are sighting and stranding data considered³⁷, specific consideration of Temporary- **(TTS)** and Permanent- **(PTS)** Threshold Shifts for whales including for humpbacks³⁸, and spatial distribution modelling of humpbacks³⁹.

84. JASCO Comment:

Blue whale, Māui dolphin, orca, common dolphin and minke whale have been recorded to occur within, or adjacent to, the modelled 120 dB SPL contour (Section 2.2, p. 5).

85. This statement includes new data provided by the Department of Conservation after the current application was filed. It is also important to note that out of the nearly 3,500 marine mammal records from STB in the DOC database that were used in this assessment, there is only 1 record within the proposed activity area⁴⁰. Furthermore, there is only one blue whale, one Hector's dolphin (a new record), one killer whale and one minke whale within the 120 dB re 1µPa RMS SPL

³⁶ Childerhouse, S (2023)

³⁷ Childerhouse, S (2023) Paragraph 30(c), p. 12; Table A2-1, p. 56

³⁸ Childerhouse, S. (2023) Table 3, p. 31

³⁹ Childerhouse, S (2023) Humpback whale figure, p. 92

⁴⁰ Childerhouse, S. (2023) Table A2-2, p. 58

contour which is approximately equivalent to an area 3.6 km in radius⁴¹ around the proposed activity.

86. The new figures of marine mammal sightings provided by JASCO are also almost identical to the figures provided in the FTTA Application with only an apparently small number of new sightings not previously reported⁴².

87. JASCO comment:

Of the above impact pathways, not all have been evaluated within the referral documentation (Section 2.3, p. 8).

88. JASCO are incorrect. All five of the impact pathways they identify are covered in the Application, Statement of Evidence, or both. With respect to the discharge of potential brine/hypersaline water, I refer to the Evidence of Mr Shaun Thompson⁴³ and his paragraphs 25 to 30. Based on his expert advice, I do not anticipate any impacts on marine mammals from this activity. In addition, there is also assessment of potential changes in the water column through extensive plume and other modelling which are reported in the Evidence of Dr MacDiarmid⁴⁴, paragraphs 23 to 25.

89. JASCO Comment:

A key point is that the underwater noise impact evaluation does not consider all noise sources, both emitted by the vessels themselves, and from all project vessels (Section 2.3, p. 8).

⁴¹ Humpheson, D. (2025) Attachment 1

⁴² Childerhouse, S. (2023) Figures A2-1 to A2-3, p. 59-80.

⁴³ Thompson, S. (2025) Evidence of Shaun Thompson (Technical and Operational) on behalf of Trans-Tasman Resources Limited in Response to Comments Received. 13 October 2025. 21 p.

⁴⁴ MacDiarmid, A. (2025). Evidence of Dr Alison Macdiarmid (Marine Ecology) on behalf of Trans-Tasman Resources Limited in Response to Comments Received, 13 October 2025, 23-25 p.

90. I note that Mr Humpheson responds directly to this issue in his Evidence⁴⁵ paragraphs 52 to 56.

91. JASCO Comment:

Based on the information presented regarding the single vessel and crawler, the project has the potential to result in disturbance to marine mammals as a result of underwater noise emissions and vessel activity out to 1500 m. However, in reality, these behavioural disturbance ranges are likely to extend well beyond the range predicted in the referral documentation and will not be limited to the dredge operations (Section 2.3, p. 9).

92. I note that Mr Humpheson responds directly to this issue in Attachment 1 of his Evidence⁴⁶. Overall, this new modelling provides strong evidence that potential behavioural disturbance may occur out to a maximum of 2,000 m around the operation for Low frequency whales (e.g., blue, southern right, humpback) but will be less than 500 m for all dolphin species (including Hector's) and toothed whales (including killer whales). The 120 dB re 1µPa RMS SPL behavioural threshold is usefully applied as a level at which moderate disturbance may occur and, while disturbance is possible outside of the ranges modelled, they are not likely to be of any significant biological impact.

93. JASCO Comment:

Noting that the STB, inclusive of the project area, is likely to support a diversity of marine mammals including blue whales and hectors dolphins, and that the behavioural effects ranges are likely in the order of 10s of kilometres, there exists a credible risk of behavioural disturbance to breeding and foraging blue whales and Hector's dolphins (Section 2.3, p. 9).

⁴⁵ Humpheson, D. (2025). Evidence of Darran Humpheson (Acoustics) on behalf of Trans-Tasman Resources Limited in Response to Comments Received, 13 October 2025, 52-56 p.

⁴⁶ Humpheson, D. (2025) Attachment 1. Consultant's Advice Note. Trans-Tasman Resources – Acoustic Modelling – 2025. 14 p.

94. JASCO cite a “credible risk” which is contradicted by the underwater acoustic modelling provided by Mr Humpheson where any possible biologically meaningful behavioural disturbance will be restricted to an area immediately around the operation. This area of potential impact is defined as the area within the 120 dB re 1µPa RMS SPL zone around the operation as described above in paragraph 92 and reflected in Conditions 17, 18 and Schedule 7 of the proposed Consent Conditions. While minor behavioural disturbance may be possible at ranges greater than these, any such changes are unlikely to be biologically meaningful and therefore represent a very low risk of impact.
95. JASCO Comment:
- JASCO recommend the application of the new thresholds and guidelines they identified (Section 2.3.1, p. 10).*
96. Mr Humpheson⁴⁷ has undertaken some new analysis utilising these new thresholds and guidelines as recommended by JASCO. Full details of this updated work are available in Attachment 1 of Mr Humpheson's Evidence. In essence, the same data inputs and modelling have been undertaken but utilising new and updated international marine mammal noise thresholds. A summary of the key results from this new modelling includes:
- (a) Updated onset distances for Auditory Injury (PTS) and TTS have been estimated as shown in Table 3.1 of Attachment 1. These results confirm that there that there is no risk of PTS for any marine mammal species from the operation as all the of PTS threshold values are higher than the maximum noise level specified in Condition 11 and 12 even an individual marine mammal spends 24 hours in the area. There is a low

⁴⁷ Humpheson, D. (2025) Attachment 1

risk of TTS for marine mammals. However, it is only possible at distances within 100 m from the IMV for all species with the exception of Low Frequency whales (i.e., blue, humpback, southern right), for which the distance is 475 m. The area over which TTS is possible is considerably smaller than was estimated from the previous results using the old thresholds indicating an even lower risk of impact on marine mammals. The distances of these thresholds from the IMV can be seen in Figures 1 to 3 of Appendix A of the Attachment.

- (b) Based on these new data, the risk of PTS from the operation is zero and the risk of TTS impacts from the operation are likely to be very low to negligible and, if they do occur, will only occur within the immediate vicinity (i.e., < 500 m for baleen whales and < m for other whales and dolphins) of the operation and only for individuals that spend significant amounts of time with that area. Given the highly mobile nature of marine mammals, I believe that this latter event is highly unlikely.
- (c) As recommended by JASCO⁴⁸, the behavioural threshold for marine mammals of 120 dB re 1µPa RMS SPL (unweighted) was applied to assess potential behavioural impacts. The modelling confirms that the behavioural threshold is reached at approximately 3.6 km from the IMV noise source. This means that any marine mammals within this range of the operation have the potential for behavioural disturbance. The distance of this threshold from the IMV can be seen in Figure 4 of Appendix A of the Attachment.

⁴⁸ JASCO (2025) Section 2.3.1, p. 10

- (d) I note that the combined noise level estimated to be generated by the crawler unit and IMV combined is 177 dB re 1µPa⁴⁹ and that this level is significantly lower (i.e., 90% quieter) than the average noise level of 187 dB re 1µPa for large vessels (i.e., 100-300 m in length) measured in New Zealand and overseas (Pine et al. 2016⁵⁰). This suggests that the potential behavioural effects from this operation will be significantly less than we would expect to see from a large vessel with the possible caveat that this operation is very slow moving compared with faster moving a large vessel.
- (e) Overall, the new underwater noise modelling using the new thresholds has confirmed a lower risk of impact from the operation than previously estimated.

97. JASCO Comment:

However, in a New Zealand context, there is a lack of information about the ecology, movements, abundance and habitat preferences of these species, which means that it is not possible to confidently predict the effects of any novel anthropogenic activity (Section 2.4, p. 11).

98. JASCO identify some potential and sophisticated ecological impact assessment methods but then note, as stated above, that such methods are not possible to be applied to New Zealand as there is a lack of data to do so. I agree with this statement and note further that to collect the kind of information that would be required for these models for even a single marine mammal species is likely to run into the millions of dollars. The noise assessment approach taken by TTRL

⁴⁹ Humpheson, D. (2025) Paragraph 41

⁵⁰ Pine MK et al. (2016) The Potential for Vessel Noise to Mask Biologically Important Sounds Within Ecologically Significant Embayments. Ocean & Coastal Management 127: 63–73, <https://doi.org/10.1016/j.ocecoaman.2016.04.007>.

represents a practical and robust method for assessing impact and allows for genuine confidence in assessing risk.

99. JASCO Comment:

The project is likely to result in behavioural disturbance to individual animals that may be undertaking critical behaviours within the proximity of the project area (Section 2.3, p. 11).

100. As noted above in my paragraphs 92 and 94, the area over which significant behavioural disturbance is likely to be restricted to the area immediately around the operation. Based on all the available data, there is nothing to suggest that the operational mining area is of any significance to either blue whale or Hector's dolphins for foraging and, in fact, only one sighting of each species has occurred within 20 km of the operational area.

101. Again, as noted above, by applying the 120 dB re 1µPa behavioural threshold (as provided for through the proposed Conditions) you can estimate the zone over which significant disturbance is likely and while disturbance may occur outside the zone, it is unlikely to be biologically significant.

102. JASCO Comment:

Taken at face value, the project as presented is unlikely to result in population level impacts to blue whales. As the water depths within the project area and predicted ensonified areas mean it is unlikely to be used by blue whales for foraging (Section 2.4, p. 11).

103. I agree with this statement.

104. JASCO Comment:

noting the status of the Hector's dolphin population (and Southern right whales), any potential disturbance to critical behaviours, should be viewed as having the potential to impact the population (Section 2.4, p. 11).

105. I agree with this statement with respect to Māui dolphins (a sub species of Hector's dolphin) but with the caveat that the area over which significant behavioural disturbance is likely is less than 500 m around the operation and therefore the risk of any Māui dolphins being exposed to this is very low given their strong preference for inshore habitat. The zone of disturbance for other species like southern right whales is also relatively small (approx. 2 km) in comparison to their home range (approx. 10,000 kms) so any adverse impacts are highly unlikely.

106. JASCO Comment:

Feasible options that do not appear to have been considered include pre-activity clearance surveys and there does not appear to have been consideration for mitigation approaches to reduce potential impacts from support or export vessels (Section 2.5, p. 14).

107. Proffered Condition 66 details the requirement to develop a final Marine Mammal Management Plan (a draft of which is provided as Appendix 5.9 to the FTAA Application) which will set out the formal mitigation to be undertaken as part of the project. It includes the implementation of Condition 10 which provides details of some specific mitigation measures, including one dedicated Marine Mammal Observer (**MMO**) will be onboard each of the operational vessels. There is also the provision of cameras to supplement MMOs. Soft starts, including pre-start observations by MMOs and ensuring the mitigation zone is clear before starting, are mandated in Conditions 35 and 36. These and other mitigations are proposed by TTRL and will reduce or eliminate risk to marine mammals beyond just those related to noise impacts.

108. JASCO Comments:

JASCO provide some recommendations for alternative modelling approaches (Section 2.6, p. 15).

109. I refer to Mr Humpheson's Evidence⁵¹ in responding to these issues.
110. JASCO Comment:
- Effects of sound and vibration on species other than marine mammals has not been considered within the application, including for fish and seabirds (Section 2.6, p. 16).*
111. Effects of underwater noise on fish have been considered by Dr Alison MacDiarmid in her Statement of Evidence⁵².
112. JASCO Comment:
- The marine mammal management plan as described does not follow what is considered to be international best practice (Section 2.7, p. 16).*
113. Overall, I believe that there is reasonable consistency between what is proposed for the activity and international best practice contrary to what JASCO have stated.
114. I agree with JASCO in that it would be useful to have two MMOs present on the IMV rather than one as the vessel is large (i.e., 300 m in length) and represents the single largest noise source for the operation. It seems unlikely that a single MMO could robustly visually monitor the entire 360° around the vessel and that perhaps a MMO positioned at each end of the vessel would significantly improve sighting probabilities. I do not believe that two MMOs would be necessary on any of the other vessels as they have significantly lower risk profiles with lower noise sources and are generally slow moving when in the operational area.
115. The proposed 300 m exclusion zone for blue whales is consistent with the New Zealand Marine Mammals Protection Act Regulations and, given the slow-moving nature of most of

⁵¹ Humpheson, D. (2025) Paragraphs 52-57

⁵² MacDiarmid, A. (2025) Paragraphs XX-XX

the vessels in the operation, is appropriate to the level of risk posed by the operation.

116. Most vessels in the operation will be moving slowly when in the vicinity of the IMV, so a speed limit is not necessary.

117. JASCO Comment:

The Conditions appear to be focused on the use of 130 dB SPL within specified frequency bands, (or unweighted 135 dB SPL) as the level which cannot be exceeded at 500 m with 500 m being the range to be monitored by marine fauna observers. It is unclear why 130 dB has been selected noting the industry standard threshold for behavioural response is 120 dB (note: this represents the median level at which marine mammals are expected to respond to continuous noise) (Section 2.8, p. 20).

118. I refer to my earlier comments about this issue in my paragraphs 33 and 36.

119. The 130 and 135 dB re 1µPa RMS linear thresholds and 500 m distance was developed based on extensive discussions of the original *Expert Working Group on the Effects on Marine Mammals including Noise* based on proposals and research from Professor Würsig⁵³.

120. Professor Würsig recommended establishing a noise threshold for disturbance below a point where disturbance was likely to be biological meaningful. He considered this to be the equivalent of 'Level 5' of Table 4 of Southall et al. (2007). Professor Würsig then reviewed all the disturbance data available for all species of marine mammals at that time and concluded that the equivalent of 'Level 4' disturbance (below his threshold for being biologically meaningful) across all groups considered was 130 dB re 1µPa RMS linear to be implemented across a range of different frequency bands,

⁵³ Joint Witness Statement (2014) Joint Statement of Experts in the field of Effects on Marine Mammals Including Noise. Report prepared for the Environmental Protection Agency. 26 March 2014. 50 p.; Würsig, B.G. (2014) Statement of Evidence of Bernd Gerhad Würsig for the Director General of Conservation. 24 February 2014. 25 p.

and hence proposed that value with different spectral characteristics⁵⁴.

121. The Expert Working Group refined the concept into a formal Condition which has been adopted by TTRL.
122. So, in conclusion, the 130 dB re 1µPa RMS linear (spectrum specific) threshold, which was split into several individual frequency bands, was later expanded to also include a single 135 dB re 1µPa RMS linear (broadband) threshold. These values were implemented with the aim of preventing biologically meaningful impacts from noise from the proposed activity and is not set on the basis of the 120 dB re 1µPa threshold for behavioural disturbance. Condition 11 is the first of its kind in New Zealand that I am aware of for constraining underwater noise from an activity to a level so as to avoid significant impacts on marine mammals.

Dr Clement Statement of Evidence

123. Dr Clement's Statement of Evidence on behalf of Forest and Bird provides some specific comments about marine mammals. Where required, I provide responses below.
124. Dr Clement's Comment:

TTRL's assumption underpinning its Proposal application appears to be that all the necessary information to ensure adequate protection of these species against any adverse effects could be gathered once the required approvals are granted. This is a fundamental error in my opinion (Paragraph 20, p. 4).
125. I refer to my previous comments on this issue in my paragraph 29, 33, 36, 45, and 50.
126. Overall, TTRL have undertaken a review of the available data on marine mammals for the project area including funding some specific data collection of their own including

⁵⁴ Würsig, B. (2014) Paragraph 35, p. 22

undertaking extensive and details modelling of the potential impacts of underwater noise on marine mammals.

127. It is correct to state that there is a significant amount of monitoring work proposed in the event that the application is approved and that this work will build on, and complement, the existing available data. As I have noted above, there is sufficient data presently available to assess potential impacts on the project on marine mammals. The collection of additional data will further strengthen the existing data set.

128. Dr Clement's Comment:

The most obvious area in which TTRL's application is deficient is the lack of information on the likely underwater noise generated by mining activities and adequate baseline data on the existing ambient underwater soundscape within and around the Proposal (Paragraph 21, p. 4).

129. I refer to my previous comments on this issue in my paragraph 40, 45 and 38. I also refer to paragraphs 52 to 57 (covering underwater noise levels from the operation) and paragraphs 45 to 51 (covering ambient underwater noise) of Mr Humpheson's Evidence⁵⁵ which also addresses these issues.

130. Several submitters have commented that given the estimated noise from the operation can't be accurately characterised (e.g. as there is no identical operation anywhere in the world from which to measure it), any assessment would contain a high level of uncertainty which would therefore preclude undertaking a robust assessment of any impacts.

131. It is my opinion that it is not essential to be able to predict the underwater noise levels of the operation for the simple reason that TTRL have proffered Condition 11 that sets the maximum allowable level of underwater noise from the operation. If this Condition is implemented, then the operation will be limited

⁵⁵ Humpheson, D. (2025) Paragraph 47-51

in the amount of noise it is allowed to make and therefore the maximum noise levels possible from the operation are known and can be assessed robustly through quantitative modelling as has been done and is reported by Mr Humpheson using the best available data⁵⁶.

132. Following the logical conclusion of Dr Clement's statement, it would mean that no new activity for which data did not already exist could ever be approved. Most fundamentally, given Condition 11, it is not necessary to know what the noise level and spectra will be as Condition 11 specifies what it must comply with and, as I understand it, if TTRL are unable to meet the requirements of Condition 11, then operations should cease. This means we know what the noise profile will be and therefore, assess it appropriately.

133. Dr Clement's Comment:

After considering the relevant proposed conditions and management plans, it is my opinion that TTRL has failed to sufficiently address the adverse underwater noise effects of the Proposal and protect marine mammals against underwater noise in two ways: TTRL has not sufficiently demonstrated that it will have the ability to manage or mitigate underwater noise levels in case of exceedances of the Condition 11 limits (Paragraphs 22 and 22.1, p. 4-5).

134. TTRL have confirmed that they can meet both Conditions 11 and 12. Conditions 11 and 13 also include direction to undertake specific monitoring to demonstrate compliance with Conditions 11 and 12. If TTRL are found to be in exceedance of either Condition, then presumably they can either stop operating or modify their operational noise profile so as to become compliant. This seems no different to the implementation of any approval or consent Condition whereby the Regulator monitors compliance with Conditions

⁵⁶ Humpheson, D. (2025) Paragraphs 47-57

and provides instruction to the operator in the event on any non-compliance.

135. With respect to Dr Clement's paragraph 22.1(a), I refer to paragraph 66 of Mr Humpheson's Evidence which covers this point.
136. Dr Clement's paragraph 22.1(b) is discussed in detail in my paragraph 90 and in Mr Humpheson's Evidence in his paragraphs 47 to 51⁵⁷.
137. Dr Clement's Comment:

TTRL has failed to acknowledge that the noise generated by the Proposal will significantly increase the existing average ambient soundscape (i.e. cumulative noise) within the mining area and nearby regions (Paragraph 22.2, p. 5).

138. It is implicit that the proposed operation will increase ambient noise levels. I refer to paragraphs 45 to 51 of Mr Humpheson's Evidence⁵⁸ which addresses this issue. In my 2023 Evidence⁵⁹, I noted that the combined noise level estimated to be generated by the crawler unit and IMV combined is 177 dB re 1µPa and that this level is significantly lower (i.e., 90% quieter) than the average noise level of 187 dB re 1µPa for large vessels (i.e., 100-300 m in length) measured in New Zealand and overseas (Pine et al. 2016⁶⁰). This suggests that the potential behavioural and other impacts from this operation will be significantly less than we would expect to see from any large vessel transiting the STB with the notable caveat that this

⁵⁷ Humpheson, D. (2025) Paragraph 47-51

⁵⁸ Humpheson, D. (2025) Paragraph 47-51

⁵⁹ Childerhouse, S. (2023) Paragraph 95

⁶⁰ Pine MK et al. (2016) The Potential for Vessel Noise to Mask Biologically Important Sounds Within Ecologically Significant Embayments. *Ocean & Coastal Management* 127: 63–73, <https://doi.org/10.1016/j.ocecoaman.2016.04.007>.

operation is very slow moving compared with faster moving large vessels.

139. Furthermore, TTRL have committed to an underwater noise Condition which limits their operational noise to a specific level that was set on the basis of eliminating any biologically meaningful impacts to marine mammals (See my previous paragraphs 40 and 118 for additional notes). To the best of my knowledge, no other marine user in New Zealand has offered or been required to comply with such a Condition. TTRL is doing so voluntarily.

140. Dr Clement's Comment:

It is my opinion that the level of information considered necessary by some experts is not available for most marine mammal species around New Zealand, nor is it reasonably obtainable. There will always be gaps in our understanding of most marine mammal species and how they interact with their environment (Paragraph 24, p. 6).

141. Noted and agreed.

142. Dr Clement's Comment:

In such cases when the effects of a novel development are unknown, I consider an appropriately conservative approach would be to assume that any of the marine mammal species that have been found or observed in the STB (past or present) could be present near the Proposal area at any point in the mining operations (Paragraph 27, p. 7).

143. Agreed. In my paragraph 45, I make a very similar observation and can confirm that this is approach that I have taken during my assessment of potential impacts.

144. Dr Clement's Comment:

Missing information on ambient soundscapes (Paragraphs 29-34, p. 7-9).

145. I refer to paragraphs 47 to 51 of Mr Humpheson's Evidence⁶¹ in responding to these issues.

146. Dr Clement's Comment:

It is my opinion, based on previous consent experiences and the evidence and Conditions in this case, that the Proposal presents a relatively low risk to marine mammals in relation to vessel collision or gear entanglement, vessel or gear spills, and sediment plume impacts. I consider the Conditions proposed by TTRL will adequately manage those risks (Paragraph 36, p. 9).

147. Noted and agreed.

148. Dr Clement's Comment:

TTRL has not sufficiently demonstrated that it has the ability to manage or mitigate underwater noise levels that have the potential to cause behavioural disturbance, physical stress (TTS) or injury the hearing (PTS) of nearby marine mammals if they exceed Condition 11 limits (Paragraph 42, p. 10).

149. Refer to my paragraph 134. Again, by TTRL proposing Condition 11 and 12, they are setting a precautionary and maximum level of noise that can be generated by the operation. These Conditions when combined with Conditions 13 to 18 (which specify detailed monitoring requirements) means that the operation is highly managed and monitored with clear thresholds to reduce or eliminate any potential impacts.

150. Dr Clement's Comment:

Based on the Proposal operations, as described in TTRL application and for reasons outlined below, it is highly likely that once operations have commenced and the in situ noise levels of active mining by the IMV and crawler are measured, they will be louder than TTRL's predicted levels (Paragraph 43 and 44, p. 10).

151. I am not sure on what basis Dr Clement believes that the operation, once it starts, will be louder than TTRL's predicted

⁶¹ Humpheson, D. (2025) Paragraph 47-51

levels. TTRL have stated that they believe they can meet the acoustic thresholds set in Conditions 11 and 12. Underwater acoustic monitoring is specified in Conditions 13 to 18 and so there will be clear and robust data available to assess compliance against the thresholds. There is little benefit to TTRL failing to meet these thresholds as it is possible that by doing so, they will be non-compliant with their consent, and the Regulator is likely to take action which may impact on their operation.

152. Dr Clement's Comment:

it is critical for TTRL to have collected baseline data on the STB's average ambient soundscape in the Proposal area and affected regions (paragraph 55, p. 12).

153. TTRL have a detailed proposal for monitoring operational noise and the soundscape once the application is approved. These data can be compared with ambient data sets already available from the STB including research published by including in Barlow et al. (2023), Warren et al. (2021a,b) and JASCO (2017, 2019). I also refer to paragraphs 47 to 51 of Mr Humpheson's Evidence⁶² which also addresses this issue.

154. Dr Clement's Comment:

The Conditions and draft management plans do not address what will happen when the proposed noise threshold limits are exceeded nor give any details as to how they might reduce them (Paragraph 58, p. 13).

155. It is not necessary for TTRL to set what actions are required if there is an exceedance of limits set in Conditions. It is TTRL's responsibility to remain within the limits set by the Conditions, and TTRL are confident that they can meet and abide by the proffered underwater noise Conditions. I also refer to the

⁶² Humpheson, D. (2025) Paragraph 47-51

Planning Statement of Evidence⁶³ which comments on Conditions more broadly.

156. Dr Clement's Comment:

There is also no Condition requiring TTRL to demonstrate that the Proposal will not increase overall average ambient noise levels in the Proposal area (Paragraph 65, p. 13).

157. While it may be potentially desirable to ensure that the proposed activity does not increase the ambient noise level, there is no requirement for them to do so. As Dr Clement notes in her paragraph 66, there are no New Zealand or International Regulations or noise standards for underwater ambient noise that TTRL must comply with. TTRL have committed to a set of precautionary underwater noise Conditions which limits their operational noise to a specific level that was set on the basis of eliminating any biologically meaningful impacts to marine mammals (See my previous paragraphs 40 and 118 for additional notes). To the best of my knowledge, no other marine user in New Zealand has offered or been required to comply with such a Condition. TTRL is doing so voluntarily.

158. Dr Clement's Comment:

As the proposed monitoring and management plan stand, these measures will do little to properly assess or help mitigate the potentially significant risk of underwater noise effects on local endangered and threatened species, and there will be little to no options to reduce these adverse effects once operations begin (Paragraph 76, p. 15).

159. It is important to remember that TTRL have committed to an extensive pre-commencement monitoring programme. This programme, as defined in Conditions 47 to 51, includes marine mammal monitoring for 3 years prior to the operation

⁶³ Michell, P and Faithful, L. (2025) Evidence of Phil Mitchell and Luke Faithfull (Planning and Conditions) on behalf of Trans-Tasman Resources limited in response to comments received. 13 October 2025.

starting. There will also be ongoing monitoring as specified in Condition 54-55 following the Environmental Management and Monitoring Plan which also includes marine mammal components. Following the completion of the pre-commencement monitoring, the Marine Mammal Management Plan (**MMMP**, specified as Condition 66), will be finalised, provided to the Technical Review Group for review and feedback before being provided to the EPA for certification. If the pre-commencement monitoring identifies some new information which was not anticipated or covered in the original Application, then amendments can be made to the MMMP to reflect the updated findings. This process provides a robust method for changes to be made to the operation if pre-commencement monitoring identifies any issues.

Natasha Sitarz Statement of Evidence

160. Ms Sitarz' Comment:

There are a number of small but potentially important changes to Conditions relating to marine mammals, which may be in response TTR's consultation with the Department of Conservation however these changes are not explained in the application. This includes removing marine mammal species classified as "Endangered" or "Vulnerable" in the International Union for the Conservation of Nature "Red List" from Condition 10.a. (Paragraph 311(d)(i), p. 80).

161. My understanding of this change was that it was implemented to simplify the Condition and to specifically apply the New Zealand Threat Classification system rather than the overseas, international IUCN system. In practice there is little difference between the two as most species would be included under either of the two different systems. There are only two notable differences between the two classifications: (i) Killer whales – they would be included under the New Zealand system (Nationally Critical) but would not be under the IUCN system (Data Deficient); and (ii) Humpback whale – they would be

included under the IUCN system (Endangered) but not under the New Zealand system (Migrant). So, if you used the IUCN system, Humpbacks would be in and Killer whales would be out whereas if you used the New Zealand system, then Killer whales would be in and Humpback whales out. I would recommend applying the New Zealand system as it makes more sense as the threat status classifications are based on New Zealand specific marine mammal data rather than global data.

Forest and Bird

162. F&B's Comment:

The noise of the operation will have significant adverse impacts on marine mammals (Paragraph 4, p. 1).

163. I refer to several key responses which refute this statement including my paragraphs 38, 40, 45, 118, and 134.

164. F&B's Comment:

Without adequate baseline acoustic data or a cumulative effects framework, the application fails to meet best practice standards and poses a material risk to marine mammals. She concludes that the proposed Conditions are insufficient to protect these species from behavioural disturbance, auditory stress, or injury.

165. While the style of this paragraph is that it appears to reflect the opinion of Dr Clement, I note that nowhere in her Evidence does she refer to the term "material risk". It appears that the author of the F&B Statement may be misrepresenting Dr Clements position. Furthermore, I refer to my previous paragraphs to rebut the statement that the proffered Conditions are insufficient to protect these marine mammals including my paragraphs 155 to 159.

166. F&B's Comment:

The STB is home to a diverse range of marine mammals, including blue whales, humpback whales, southern right

whales, and common dolphins, many of which use the area for feeding, migration, and calving. Of particular concern was the presence of pygmy blue whales, with the STB described as an important feeding area. Since then, the pygmy blue whale population has been confirmed as a genetically distinct population that relies on the STB as its only known feeding and nursing habitat in New Zealand (Paragraph 18, p. 4).

167. While the STB region is an important area for marine mammals, not all of the region is equally important as can be seen from the spatial modelling results (Stephenson et al. 2020; Roberts et al. (2019)).
168. For example, spatial distribution data and habitat suitability modelling confirms that the offshore part of the STB is an important area for blue whales. These models also confirm that the north-eastern and inshore waters of the STB, including the project area, have a very low probability of presence of blue whales. These models also confirm that the proposed consent location is highly unlikely to be an area of any special biological significance to blue whales.
169. Furthermore, while the offshore STB is a well-documented and important feeding area for blue whales, it is only one such feeding area that blue whales utilise around New Zealand. This is based on satellite tracking data and also on resighting of individual blue whales from the STB in other places such as the Hauraki Gulf, Kaikoura, Westport, and Greymouth highlighting the large areas over which these whales' range.
170. Given that only a very small fraction of blue whale feeding habitat will be potentially affected, MacDiarmid et al.⁶⁴ concludes that any displacement or impacts on blue whale feeding would be negligible.

⁶⁴ MacDiarmid A (2024) Expert rebuttal evidence of Dr Alison MacDiarmid on behalf of Trans-Tasman Resources Limited. 23 January 2024.

171. F&B's Comment:

Forest & Bird has provided evidence from Dr Clement, who raises serious concerns about the potential acoustic impacts of TTRL's proposed mining operations on vulnerable marine mammal species (Paragraph 153-155, p. 32).

172. I have provided a detailed critique of Dr Clement's Evidence in my paragraphs 125 to 159. While Dr Clement and I agree on a range of issues, there are several key ones which we differ. Refer to the earlier relevant sections of my Evidence for a full discussion.

173. F&B's Comment:

Dr Clement's evidence raises serious concerns about TTR's ability to manage underwater noise effects from its proposed mining operations. The absence of baseline ambient noise data and reliance on a single numeric limit (Condition 11) means frequent exceedances are likely, exposing marine mammals to behavioural disturbance, auditory stress, or injury. The proposed Conditions do not adequately address these risks, particularly given the continuous nature of the mining activity and the lack of mitigation detail.

174. Refer to my paragraphs 129, 134, and 149. In particular, TTRL have proffered Conditions 11 and 12 which set strict and explicit limits on underwater noise generated by the operation. This is the primary mechanism for the protection of marine mammals from noise and are based on recommendations provided by DOC's marine mammal experts and were designed to specifically protect marine mammals from biologically meaningful impacts (as discussed in paragraph 118.

175. F&B's Comment:

Dr Clement concludes that TTR's proposed Conditions relating to underwater noise and marine mammals are inadequate. In Dr Clement's view, Condition 11 is unlikely to be achievable under the current proposal (Paragraph 191, p. 38).

176. This is discussed in detail in my paragraph 155. Dr Clement also states that Condition 11 is unlikely to be achievable yet doesn't propose any amendments that may improve it. Mr Humpheson has proposed some refinements to the original Condition 11 in paragraphs 58 to 61 of his Evidence⁶⁵ to update it consistent with more recent guidelines (as recommended by JASCO) and it may be that the updated version of Condition 11 will address Dr Clement's concerns.

RESPONSE TO SUBMITTER COMMENTS – KASM & GREENPEACE

177. Kiwis Against Sand Mining (**KASM**) and Greenpeace Aotearoa Inc (**Greenpeace**) provided a joint submission⁶⁶ on the application which included several supporting documents including a Statement of Evidence of Dr Leigh Gabriela Torres⁶⁷. Both documents provide some comments on marine mammals.

Dr Torres Statement of Evidence

178. Dr Torres Comment:

South Taranaki Bight (STB) is a critical year-round habitat for pygmy blue whales (Paragraph 12, p. 5).

179. I agree that areas within the STB represent important parts of the home range of blue whales. Dr Torres has not established how she has defined the STB as 'critical year-round habitat' – there are a range of possible definitions. As I noted earlier in paragraph 118, pygmy blue whales range widely around New Zealand and move large distances over short periods of time. Dr Torres' own blue whale field project has confirmed that out

⁶⁵ Humpheson, D. (2025) Paragraphs 58-61

⁶⁶ Kiwis Against Sand Mining (KASM) and Greenpeace Aotearoa Inc (Greenpeace) (2025) Legal Submissions and Comment of KASM and Greenpeace. 6 October 2025. 48 p.

⁶⁷ Torres L.G. (2025) Statement of Evidence of Dr Leigh Gabriela Torres (Marine Mammals). 6 October 2025. 109 p.

of her five years of boat-based research, two of those years (i.e., 2016, 2024) had either no or very few blue whales found within the STB⁶⁸. This work confirms the importance of parts of the STB to blue whales but also highlights that at least during a significant proportion of the time, they are living outside the region and therefore, at these times, any activity within the STB will be unlikely to impact them in any way.

180. Dr Torres Comment:

Impacts from sediment plume to be produced by mining on the quality, quantity and distribution of krill prey that blue whales rely on in the STB. The plume may disrupt krill populations, which are the whales' sole food source. Krill are filter feeders and sediment from the plume could interfere with krill filtration, reducing their abundance and nutritional value. This would diminish food availability and compromise the health of the blue whale population that relies on krill prey. There is insufficient information to determine the degree of impact (a) of the mining operations on the turbidity in the water column that may impact krill and whale foraging efficiency, and (b) sediment plume extent under various oceanographic Conditions (Paragraphs 13 to 15, p. 5)

181. Dr Torres does not produce any data to support these assertions. By contrast, TTRL have undertaken extensive sediment plume and water column modelling to understand that nature extent and content of the plume derived from a possible mining operation (e.g., Sections 5.3 to 5.5 of the TTRL application). Additional work by Dr Helen Macdonald⁶⁹ and Dr Alison MacDiarmid⁷⁰ concluded that: (i) Based on the plume modelling, impacts will be highly localised (e.g. 1-2 km) around the activity; (ii) As noted previously, it is highly unlikely that there will be any blue whales within the proposed mining

⁶⁸ Torres, L (2025); Barlow DR, Klinck H, Ponirakis D, Branch TA, Torres LG (2023) Environmental conditions and marine heatwaves influence blue whale foraging and reproductive effort. *Ecology and Evolution* 13:e9770

⁶⁹ MacDonald, H. (2023) Expert Evidence of Helen Skye MacDonald on behalf of Trans-Tasman Resources Limited. 19 May 2023. 14 p.

⁷⁰ MacDiarmid, A. (2023) Expert Evidence of Alison MacDiarmid on behalf of Trans-Tasman Resources Limited. 19 May 2023. 20 p.

area; and (iii) Given the extremely large home ranges of these whales, any impacts from the proposed operation will only affect a very small proportion of their total home range. In addition, Dr Clements states this project presents a relatively low risk to marine mammals in relation to sediment plume impacts and she considers that the Conditions proposed by TTRL will adequately manage those risks⁷¹.

182. Dr Torres Comment:

The introduction of sustained noise into their habitat could interfere with these signals, leading to adverse effects such as displacement from preferred foraging areas and reduced feeding efficiency. Chronic noise exposure may trigger physiological stress responses, including elevated cortisol levels. The whales' documented year-round presence near the proposed mining site and their sensitivity to acoustic disturbance means the cumulative noise impacts may adversely affect the health and viability of the population. The sediment and noise from mining operations may cause chronic physiological stress and behavioural disturbance, potentially displacing whales from critical habitat and impairing reproduction. These risks are not adequately addressed. The proposed Conditions of consent fail to demonstrate sufficient environmental protection or precaution (Paragraphs 16 to 18, p. 5 to 6).

183. Dr Torres provides many examples of possible impacts from the proposed activity on blue whales yet doesn't provide any data to support or quantify these risks. By contrast, TTRL have provided detailed modelling (e.g., Humpheson 2025, 2024⁷²) to demonstrate that underwater noise from the activity will be no worse than noise from a large vessel transiting the area, and have ensured that this will be the case by proffering precautionary noise Conditions and also estimated the relatively small area over which potential hearing injuries and biologically meaningful impacts may occur. Also, as noted in

⁷¹ Clement, D. (2025) Paragraph 36

⁷² Humpheson, D. (2025); Humpheson, D. (2024) Consultant's Advice Note. TTRL – Weighted underwater sounds exposure levels. 23 January 2024. 4 p. Appears as Appendix 1 in Childerhouse, S. (2024) Expert Rebuttal Evidence of Dr Simon John Childerhouse on behalf of Trans-Tasman Resources Limited. 23 January 2024. 33 p.

the paragraph above, TTRL have also undertaken extensive plume and sediment modelling and confirmed that there will be little impact outside of 2 km around the operation.

184. Dr Torres Comment:

Given the uncertainty associated with the lack of accurate noise estimates for this specific mining operation, the resulting insufficient estimation of the acoustic footprint of the TTRL site, and the lack of data available on potential behavioural and physiological response of cetaceans to increased noise, I do not think there is sufficient evidence to conclude that there will be no material harm or no adverse effects caused by the proposed TTRL mining operation and there is a significant risk that the proposal will result in the significant adverse impacts including the relocation of these mammals from the region altogether Paragraph 22, p. 7).

185. I refer to my previous Evidence on this issue including paragraphs 33, 45, 50, and 79.

186. Dr Torres Comment:

As far as I can tell, there is no new evidence (since 2016) relating to marine mammals as part of TTR's 2025 Fast-track application (Paragraph 32, p. 9).

187. I do not concur with this statement. My 2023 and 2024 Evidence provides a summary of the extensive new data and reports (including many excellent reports by Dr Torres and her team) that were included and considered in the 2024 and 2025 applications and significantly updated the 2016 process. Specifically:

- (a) more than 50 new published scientific papers covering marine mammals within the region (refer to Appendix 1 of my 2023 Statement);
- (b) new abundance estimates for both blue whales (Barlow et al. 2018) and Hector's and Māui dolphins (Roberts et al. 2019);

- (c) Acoustic monitoring (e.g. Wright & Tregenza 2019; Nelson & Radford 2019; Warren et al. 2021a,b; Barlow et al. 2023a,b);
- (d) nearly 700 new sightings included in the DOC Marine Mammal Database;
- (e) new information on marine mammal distributions from comprehensive spatial modelling work (Mackenzie et al. 2022, Barlow et al. 2021a,b, 2023, Stephenson et al. 2020a,b, 2021, Roberts et al. 2019, Deville et al. 2016); and
- (f) Extensive and highly detailed underwater acoustic modelling provided by Mr Humpheson that built on and updated the previous modelling approaches. This work has further been updated in this round of information as Humpheson (2025)⁷³.

188. Dr Torres Comment:

Dr. Childerhouse's models are too broad-scale and inappropriate for predicting local marine mammal presence at the TTRL site (Paragraph 38(a), p. 11).

189. The models I refer to in my Evidence are not my models but have been developed by other researchers, including Dr Torres, who is a co-author of Stephenson et al. (2021). They also all published in international, peer reviewed journals.

190. Dr Torres Comment:

A hydrophone (in 2016-2017) placed 18.8 km from the TTRL site recorded blue whale calls almost daily throughout the year, confirming the area's critical habitat (Paragraph 38(b)(ii), p. 11).

191. I agree that the hydrophone close to the proposed mining site detected blue whales calls but, what Dr Torres' statement overlooks, is that it was not possible to estimate the direction

⁷³ Humpheson, D. (2025)

of the detected calls from the hydrophone. Barlow et al. (2023a) estimated the mean daily detection range for acoustic detections at 79.21 ± 19.09 km for New Zealand blue whales, 147.57 ± 20.62 km for Antarctic blue whales and 253.55 ± 116.60 km for Australian blue whales. These data combined mean that the whales detected were likely to be on average between 80 and 250 km away from the recorder and in an unknown direction. This is in no way evidence that the proposed mining site is 'critical habitat' but rather that some unknown parts of the wider STB are likely to be important areas for blue whales. Also given, that these whales are on average such a long way from the hydrophone and the hydrophone is 18.8 km from the activity area, then it is likely that many of these are well outside any possible impact from the proposed activity noting that behavioural disturbance is only likely out to approximately 22 km from the site.

192. Dr Torres Comment:

Persistent, elevated noise exposure is correlated with increased cortisol stress levels in whales, which can cause negative long-term health and reproductive consequences.

193. Dr Torres has not provided a citation for this statement, but I believe it to be true. However, it is likely that the whales showing these increased stress levels were exposed to much higher levels of impact than what would be expected in the STB from the proposed mining operation given the proposed controls and limits on noise levels.

194. Torres Comment:

Sediment plume impact on krill (Paragraph 38(d), p. 13).

195. I refer to my previous paragraphs 181 and 183 that confirms that, if there is any impact on krill, it will be highly localised around the mining operation. It is also important to note that the primary feeding areas of blue whales are considerably further west and south of the proposed mining site.

196. Torres Comment:

Conclusions on the effects of the proposing mining operation (Paragraph 57, p. 20).

197. I note that these statements are from Dr Torres' previous Statement of Evidence. I refer people to my previous Statements on Evidence 2023⁷⁴ and 2024⁷⁵ which provide a response to the issues raised here by Dr Torres.

KASM & GREENPEACE LEGAL SUBMISSIONS & COMMENT

198. *KASM/Greenpeace Comment:* Sufficient baseline data has not been provided, notably there have been no additional marine mammals surveys. Dr Childerhouse on behalf of TTRL, in 2023 acknowledges that "the previous marine mammal survey data is now very dated and therefore is it essential that new baseline data is collected" and recommends acoustic monitoring and aerial surveys (Paragraph 139, p. 39).

(a) *Response:* I note in that same paragraph (111) of my previous Evidence, that I state that "I strongly support the proposed minimum of two years of marine mammal and environmental monitoring prior to the commencement of any seabed extraction"⁷⁶. While it is important to collect that data, I note that it forms part of the TTRL proposed research programme that would be completed prior to the start of any operations. I do not believe that it is essential to collect that data prior to an approval being issued as there is already sufficient data to complete a robust risk assessment of the proposed activity on marine

⁷⁴ Childerhouse, S. (2023)

⁷⁵ Childerhouse, S. (2025)

⁷⁶ Childerhouse, S. (2023)

mammals (see my previous paragraphs 29, 33, and 36).

199. *KASM/Greenpeace Comment: Summary of blue whale data provided by Dr Torres (Paragraph 140, p. 40).*

(a) *Response: I have provided details comments above about Dr Torres Evidence⁷⁷ and would reiterate those comments again including my paragraphs **Error! Reference source not found.**, 181, and 183. In summary, parts of the STB region are important for blue whales at some times of the year and while they can be found there throughout the year, there are also significant periods of the year when they are not there with individuals likely foraging widely around all of New Zealand and potentially further. Also, Dr Torres provides many examples of possible impacts from the proposed activity on blue whales yet doesn't provide any data to support or quantify these risks. Many of her examples are related to deep sea mining operations which are undertaken in a significantly different ecological environment and therefore are not likely to be relevant to this proposed operation.*

200. *KASM/Greenpeace Comment: These risks are not adequately addressed. The proposed Conditions of consent fail to demonstrate sufficient environmental protection or precaution. (Paragraph 141, p. 40).*

(a) *Response: I have previously responded to this statement in my paragraph 183. I would also note that statement from Dr Clement, who provided Evidence on behalf of Forest and Bird, that "It is my opinion, based on previous consent experiences and the evidence and Conditions in this case, that the*

⁷⁷ Torres, L. (2025)

*Proposal presents a relatively low risk to marine mammals in relation to vessel collision or gear entanglement, vessel or gear spills, and sediment plume impacts. I consider the Conditions proposed by TTRL will adequately manage those risks"*⁷⁸. This statement strongly contradicts the statement made by Dr Torres for all potential risks other than underwater noise which I have already addressed separately.

201. *KASM/Greenpeace Comment:* Dr Torres' statement on uncertainty and lack of data (Paragraph 142, p. 40).

(a) *Response:* I have previously responded to this statement from Dr Torres in my previous paragraphs 33, 45, 50, and 79

202. *KASM/Greenpeace Comment:* In the absence of this fundamental information, there can be no certainty about the nature or scale of potential adverse effects, nor any confidence that such effects can be appropriately avoided or mitigated. (Paragraph 143, p. 41).

(a) *Response:* I have previously responded to this issue in my paragraphs 33, 45, and 50. I also will reiterate my previous 2024 statement here that my personal view is that there was sufficient information relating to marine mammals and the potential impacts upon them provided in the 2017 case for the DMC to make an informed decision about the consent. While I acknowledge that there were some information gaps and uncertainties in the information provided, I believe that most of these gaps would be impossible to fill given their complexity and the significant difficulties in actually collecting the required data

⁷⁸ Clement, d. (2025) Paragraph 36

(e.g., robust abundance estimates and distribution maps for all marine mammals in the region). In addition, I believe that where there was uncertainty in the available data, it could be and was addressed through a comprehensive and precautionary set of consent Conditions ensuring that if the consent did proceed, there would be no material harm on marine mammals.

CONCLUSION

203. This Evidence reaffirms the opinions expressed in my reports and advice presented as part of previous applications and hearings regarding marine mammals and potential impacts on them from the proposed TTRL project.
204. While a wide range of comments were received from parties, there were few new issues that had not already been addressed in previous material. I have provided responses in this Evidence to the few new issues raised. Overall, there is nothing sufficiently new or updated for me to change any of my previous views. A summary of the key comments raised by parties is provided including my responses drawing on my previous conclusions where appropriate.
205. The key comments raised by parties includes:
 - (a) *Insufficient data on marine mammals and potential impacts to undertake a robust assessment;*
 - (b) *Best available information;*
 - (c) *Uncertainty and data gaps;*
 - (d) *Importance of the mining area to marine mammals;*
 - (e) *Underwater noise levels; and*
 - (f) *Underwater noise impacts.*

206. I have provided comprehensive responses to these comments and are satisfied that the Application addresses these issues adequately.
207. I believe that the Conditions as described, including some suggested refinements, are comprehensive and will avoid material harm from the activity on the local marine mammal populations.
208. I also believe that the Conditions favour caution and environmental protection.

A handwritten signature in dark ink, appearing to read 'S Childerhouse', with a stylized, flowing script.

SIMON JOHN CHILDERHOUSE

13 October 2025