

BEFORE THE EXPERT HEARING PANEL

IN THE MATTER	of an application under the Fast-track Approvals Act 2024 for marine consent and marine discharge consent by Trans-Tasman Resources Limited to undertake iron ore mining and processing operations offshore in the South Taranaki Bight
BETWEEN	Trans-Tasman Resources Limited Applicant

COMMENTS BY TALLEY’S GROUP LTD
Dated: 3 OCTOBER 2025

Counsel:
[Redacted]
Harbour Chambers / Stout Street Chambers
[Redacted]
[Redacted]

MAY IT PLEASE THE PANEL

1. Talley's Group Ltd (**Talley's**) is a fisheries company that holds fisheries quota for stocks in the South Taranaki Bight. It is grateful for the invitation by the panel to provide comments on the application by Trans-Tasman Resources Ltd (**TTR**) for approval under the Fast-track Approvals Act 2024 (FTAA).
2. The South Taranaki Bight supports economically valuable commercial fisheries. The average annual commercial catch value of FMA 8 fisheries has been estimated at \$40 million in the period 2016–2020, with catch value increasing over that period. The economic contribution to GDP of harvesting is \$44 million over the same period.¹ Talley's holds quota in the affected areas of FMA7 and FMA8 with a total capital value of approximately \$21 million.

Background to Talley's involvement in this matter

3. Talley's has long been opposed to TTR's seabed mining proposal since the first application was lodged in 2013. The simple reason for this is that the environmental impact of TTR's application is not well understood. TTR has failed to demonstrate that its proposal will not adversely impact fish or commercial fisheries, which makes a significant economic contribution to GDP. TTR has failed to provide any assurance that adverse impacts on quota holders such as Talley's will be avoided (or indeed are capable of being remedied or mitigated) or made any concessions to protect the fishing industry.
4. Talley's has made combined submissions with other seafood/fisheries interest groups on TTR's previous 2013 and 2017 application, appealed the 2017 application, and participated in the 2024 reconsideration. Significant effort by the fisheries parties has been invested into engaging with this application.

Expert evidence

5. This includes expert evidence submitted to the EPA decision making committee as part of the 2024 reconsideration of TTR's application. Copies of these expert statements from Dr Greg Barbara (marine environmental impact), Dr Joris Jorissen (suspended sediment modeling), Dr Jeremy Helson

¹ BERL (2022). The economic contribution of commercial fishing. Fisheries Inshore New Zealand (FINZ) report. March 2022.

(fishing industry – ex Chief Executive of Seafood New Zealand), and Captain Andrew Smith (fishing industry) are attached to these comments.

Legal submissions and ongoing relevance of Supreme Court decision

6. Also attached are the opening legal submissions that were filed with for the 2024 reconsideration. These apply the Supreme Court judgment² to TTR's 2017 application. Talley's invites the panel to consider this material. These submissions deal with the same technical material submitted by TTR to the fast-track panel and traverse key legal issues that in Talley's view remain pertinent to the current application. In particular:
 - (a) The 2017 DMC made findings, which the Supreme Court relied upon and endorsed, that the sediment plume would result in pollution or material harm to the marine environment (submissions at paragraphs 10–27). These are relevant to the bottom line in s 10(1)(b) of the EEZ Act,³ which is a matter the panel must take into account under sch 10, cl 6(1)(b) of the FTAA. The findings of material harm also mean the proposal has adverse impacts that are sufficiently significant to engage the 'decline' ground in s 85(3) of the FTAA.
 - (b) The application lacks sufficient information about the environmental baseline, such that it is not based on the best available information, and the panel does not have adequate information to determine the application (submissions at paragraphs 28–50). These points are relevant to the information principles in s 61(1)(b) and (2), of the EEZ Act which the panel must take into account under sch 10, cl 6(1)(d) of the FTAA.
 - (c) The application is inconsistent with bottom lines in the Resource Management Act 1991 and the Fisheries Act 1996 (or may be inconsistent but there is insufficient information and uncertainty) (legal submissions at paragraphs 51–62). These points are relevant to the nature and effect of other marine management regimes, which the panel must take into account under s 59(1)(h) of the EEZ Act and sch

² *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board* [2021] NZSC 127.

³ Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (EEZ Act).

10, cl 6(1)(d) of the FTAA.

7. TTR has been on notice about the deficits in its application since 2013. It could have used that time meaningfully to collect environmental baseline data and survey data to remedy information deficits in what is an untested and novel application; instead, it has failed to address these in any meaningful way.

Seafood New Zealand submission

8. Talley's has reviewed in draft the comments provided by Seafood New Zealand on TTR's current application and supports those comments.
9. Talley's agrees that the level of information provided by TTR remains deficient. Dr Barbara's and Dr Jorrisen's evidence for the 2024 reconsideration reviewed the information provided and concluded that the information gaps that were identified by the Supreme Court remained and that no new evidence had been submitted.⁴ This remains the case. Almost all of TTR's application remains based on the same information that it lodged in 2016 and many of those reports recycle out-of-date data from 2013.

Lack of information about commercial fisheries

10. A particular concern for Talley's is an inadequate level of information for it to properly evaluate the impacts on its existing interest as a commercial fishing operator and quota holder. TTR's application conflates the impacts of its project on fish with the impacts on fisheries. They are different things. The expert evidence of Dr Jeremy Helson, submitted for the 2024 reconsideration, outlined what level of information is required to address this information deficit. Dr Helson said:⁵

In order for there to be adequate information to assess impacts on fisheries and meet the criticisms by the Supreme Court about the pre-commencement monitoring and management plan regime, I consider that the applicant would need to obtain and analyse up-to-date fisheries catch data, spatial distributions of that catch data, which commercial entities are undertaking fisheries activities, and the extent to which each commercial entity is reliant on fishing in the affected area as a proportion of their total catch. This analysis could

⁴ Evidence of Dr Greg Barbara dated 29 September 2023 at paragraphs 32, 37, 46, 53, 60, 69, 74; Evidence of Dr Joris Jorrisen dated 2 October 2023 at paragraphs 17 and 28.

⁵ Evidence of Dr Jeremy Helson dated 6 October 2023 at paragraph 33.

then enable an overall economic and social impact assessment of the effects on fisheries, as well as more granular assessment of the effects on particular commercial entities and the regions in which they are based. ...

11. TTR lodged a report that attempted to provide this information during the 2024 reconsideration but then withdrew its application before the fisheries' submitters were able to respond to it.⁶ Talley's considers that the 2024 report still fails to provide sufficient information to address the information gap about the impacts on commercial fisheries because:
 - (a) It only shows successful catch information, so is not a catch per unit effort assessment nor a thorough review of recreational or customary fishing. It does not reflect the effort fishers go to, to access areas and how long they spend in an area.
 - (b) There is no socioeconomic assessment of the catch and potential impacts of having to travel further to fish if fishers are excluded from the project and buffer area. There is no basis for the assumption that fishers can easily relocate without an impact on the feasibility of their business.
 - (c) There has been no impact of the cumulative assessment on fisheries of other restrictions that have been imposed on the industry in recent years. TTR says the "cumulative effects may potentially leave some set net fishers with limited flexibility to respond to even small additional exclusions in the future", but no research, evidence or analysis is provided in support of that proposition or that would allow fisheries to interrogate it.⁷
 - (d) There is no information on the age class or size of fish caught, which means the impacts on cyclic fish stock numbers are not understood. Many fish species live for around two decades, so the time snapshot of the NIWA report makes it difficult to assess any patterns over time.
 - (e) There are a number of recently identified reefs in the Pātea Shoals

⁶ NIWA (2024) South Taranaki Bight Fishing 1 October 2007 - 30 September 2023. Prepared for Trans-Tasman Resources Ltd. March 2024.

⁷ TTR Taranaki VTM Project Fast-track Act application (15 April 2025) at page 241.

area, near the proposed mining area.⁸ These subtidal reefs are common on Pātea Bank and there are likely to be many more that are awaiting discovery.⁹ They operate as nursery or breeding grounds for fish and are habitats of particular significance to fisheries management and require protection under the Fisheries Act 1993.¹⁰ The impacts of the proposed mining activity on these reefs, and the consequential impact on fisheries management, has not been assessed. The likely presence of rare and vulnerable ecosystems such as subtidal reefs is a ‘known unknown’ that TTR has failed to engage with.¹¹

Sediment plume model is not worst-case scenario

12. A key assumption of TTR’s application is that its sediment plume model represents the worst-case scenario.
13. But Dr Barbara explains that there is considerable uncertainty about the percentage of muds and fines in the sediments that TTR proposes to mine, and notes that experts have previously agreed there is insufficient information to validate assumptions about particle size distributions.¹² Dr Jorrisen says that there is insufficient conservatism in the model for it to represent the worst-case scenario.¹³ Understanding the nature and extent of the sediment plume is vital to allow the panel to quantify the adverse effects of the proposal on the environment.
14. This also means that the entire application fails to meet the statutory requirement under the EEZ Act to favour caution and environmental protection when available information is uncertain.¹⁴ The impacts of the sediment plume are still not well understood, despite TTR having had many years to improve the informational position.

⁸ Evidence of Dr Greg Barbara dated 29 September 2023 at paragraph at [71].

⁹ Morrison et al “Offshore subtidal rocky reef habitats on Pātea Bank, South Taranaki” (September 2022) at 2022

¹⁰ Evidence of Dr Jeremy Helson dated 6 October 2023 at paragraph 52; Evidence of Captain Andrew Smith dated 6 October 2023 at paragraph 41.

¹¹ EPA “Response to request for section 51 report for Taranaki VTM Project” (22 September 2025) at page 121.

¹² Evidence of Dr Greg Barbara dated 29 September 2023 at paragraph at [47].

¹³ Evidence of Dr Joris Jorrisen dated 2 October 2023 at paragraph 20.

¹⁴ Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012, s 61(2).

Legal framework under the FTAA

15. When considering the application, the panel must take into account the various matters listed in sch 10 cl 6. These are:
 - (a) the purpose of the Fast-track Approvals Act; and
 - (b) sections 10 and 11 of the EEZ Act; and
 - (c) any relevant policy statements issued under the EEZ Act; and
 - (d) sections 59, 60, 61(1)(b) and (c) and (2) to (5), 62(1A) and (2), 63, and 64 to 67 of the EEZ Act.
16. The panel is directed to give the greatest weight to the first of these criteria, the purpose of the FTAA.
17. But this does not mean that the purpose of facilitating the delivery of development projects with significant regional or national benefits is a trump card. The panel cannot turn a blind eye to the other matters — it must assess all of the matters listed in sch 10 cl 6, uninfluenced by the purpose of the FTAA, before standing back and conducting an overall balancing.¹⁵ The panel cannot use the purpose of the FTAA to neutralise the other matters.¹⁶ Effects on the environment, which are required to be taken into account under ss 10(1)(b) and 59 of the EEZ Act, do not become any less material because of the purpose of the FTAA.¹⁷ TTR's approach suggests that the weighted purpose of the FTAA means that adverse effects can remain unmitigated and simply be ignored by the Panel; that is clearly incorrect.
18. Once the panel has identified and understood the adverse impacts of the project, it must apply the proportionality assessment required by s 85(3) of the FTAA. This requires the panel to consider whether the adverse impacts are sufficiently significant to be out of proportion to the project's regional or national benefits, taking into account conditions that may be set in relation to the adverse impacts. It is implicit in this proportionality assessment that the panel will have sufficient information to understand whether the proposed conditions will avoid, remedy, mitigate, offset or compensate for the adverse

¹⁵ *Enterprise Miramar Peninsula Inc v Wellington City Council* [2018] NZCA 541, [2019] 2 NZLR 501 at [52].

¹⁶ *Enterprise Miramar Peninsula Inc v Wellington City Council* [2018] NZCA 541, [2019] 2 NZLR 501 [53].

¹⁷ *Enterprise Miramar Peninsula Inc v Wellington City Council* [2018] NZCA 541, [2019] 2 NZLR 501 at [55].

impacts.

19. One issue that is likely to be live for the panel is what to do if you conclude that you do not have adequate information to undertake the s 85(3) proportionality assessment. As outlined already, there are significant information gaps in the application, identified by the Supreme Court in 2021, which have not been filled. These gaps mean it is impossible to know what the environmental baseline is and how the conditions will address the adverse impacts of the project.
20. Section 62(2) of the EEZ Act allows a marine consent authority to refuse an application for a consent if it considers that it does not have adequate information to determine the application. This provision is something that the panel is directed to “take into account” under the Fast-track Approvals Act (sch 10, cl 6(d)).
21. TTR’s report notes that: ¹⁸

it is hard to see what purpose the cross-reference to section 62(2) serves if it merely enables an FTA Panel to consider whether it has adequate information but does not enable the Panel to decline approval if it determines that the information is inadequate. The approach that seems to accord the most with the intention of the provisions as a whole is that the cross-reference to section 62(2) should be read as adding to the list in s 85 one additional ground for an FTA Panel to potentially decline an approval, namely inadequate information.

22. We agree with the statement that inadequate information under section 62(2) provides an additional ground for declining an approval under the FTAA. There is nothing in the FTAA that says the grounds for a decline decision in s 85 are exhaustive. And if a panel could not decline an approval because the applicant had not supplied adequate information then:
 - (a) that would cut across the Act’s prescriptive requirements for the information that must accompany an application,¹⁹ and the ability for the panel to request further information;²⁰ and
 - (b) it would give applicants an incentive to game the process by not

¹⁸ TTR Taranaki VTM Project Fast-track Act application (15 April 2025) at page 322.

¹⁹ Section 43

²⁰ Section 67.

supplying the panel with information that may weaken an application;
and

- (c) the panel would not be able to make the proportionality assessment required by s 85(4) as to whether the adverse impacts of the approval are sufficiently significant to be out of proportion to the project's regional or national benefits.

- 23. Talley's submits that the information supplied by TTR has failed to address the information gaps that were identified by the Supreme Court's 2021 decision.
- 24. TTR has failed to undertake the necessary work needed to better understand the environmental baseline of the area it seeks consent to operate in.
- 25. It has also failed by a considerable margin to provide the panel and parties in this process with sufficient up to date information so that they can understand the environmental effects that the application will have on the marine environment, including, but not limited to, how that will impact the fishery and commercial fishing.
- 26. In Talley's submission without that information, it is impossible to have any confidence that the adverse effects of the proposal on the commercial fishery, (and in turn the impact on quota holders – who have rights as existing users to fish the affected area) will be appropriately managed. TTR has failed to quantify these effects or show how they can be adequately avoided, remedied or mitigated to an acceptable level.
- 27. Based on the information provided by TTR and the evidence received from its independent experts to date, Talley's consider there is the potential for significant environmental impacts. If granted, there is a serious risk to the sustainability of both the commercial fishery in FMA7 and FMA8 and economic interests of the quota holders in this area. These fisheries have a significant commercial catch value and contribution to GDP.
- 28. For these reasons, it is respectfully requested that the Panel decline the

application.

Dated 3 October 2025

[REDACTED]

[REDACTED]

Counsel for Talley's Group Ltd

**BEFORE THE ENVIRONMENTAL PROTECTION AUTHORITY
AT WELLINGTON**

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

AND

IN THE MATTER The reconsideration of an application for marine consent under section 38 of the EEZ Act by Trans-Tasman Resources Limited to undertake iron ore and processing operations offshore in the South Taranaki Bight

BETWEEN **Trans-Tasman Resources Limited**
Applicant

AND **Environmental Protection Authority**
EPA

AND **Seafood New Zealand Limited, New Zealand Federation of Commercial Fishermen, Talley's Limited, The Southern Inshore Fisheries Management Company Limited and Cloudy Bay Clams Limited**
Fisheries Submitters

**EXPERT EVIDENCE OF DR GREGORY MATTHEW BARBARA ON
MARINE ECOLOGY FOR FISHERIES SUBMITTERS ON TTR'S
RECONSIDERATION**

DATED: 29 SEPTEMBER 2023

Dawson & Associates

[REDACTED]
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INTRODUCTION

Qualifications and Experience

1. My name is Dr Gregory Matthew Barbara.
2. I am a Principal at JBS&G Australia Pty Limited in Adelaide Australia, an independent environmental consultancy, focusing on due diligence, contaminated land management, groundwater remediation, environmental assessments and approvals.
3. I hold the qualifications of a Bachelor of Science from Flinders University awarded in 1995, Honours in Marine Microbiology Bachelor of Science from Flinders University awarded in 1996 and a PhD in Marine Ecology from Flinders University awarded in 2002. My PhD was on pelagic marine bacterial interactions with discrete increases in nutrients or stimulates, my thesis drew links between bacterial productivity and the carbon sink in the world's oceans.
4. I have over 25 years of professional experience including research experience in marine ecology, environmental assessment, aquaculture and consulting. My specialist area is marine ecosystems, particularly foodweb interactions and human impacts on the marine environment. I have a wide range of multi-disciplinary skills specialising in coastal, benthic and pelagic systems with broad experience in marine biodiversity, marine ecosystems, and the state of the marine environment and human impacts on marine ecosystems.
5. I was employed by Flinders University from 1996 to 2002 as lecturer and marine ecology researcher in the School of Biological Sciences focusing on marine microbial foodweb and interactions between fisheries and aquaculture. In 2002 I relocated to the then Ocean Research Institute at the University of Tokyo to take up my two-year Post-doctoral Research Fellowship sponsored by the Japanese Society for the Promotion of Science, working on bacterial mutualism with fish. My post-doctoral role in Japan was followed in 2005 by a two-year Marie Curie Research Fellowship in Scotland through St Andrews University but based on the west coast of Scotland out of the Scottish Association for Marine Science researching marine invertebrate cell culturing and food toxins.
6. From 2007 to 2010 I was employed by Scottish Seafarms as the Chief Fish Health Biologist with responsibility for managing the impacts of all the company's farms and environmental health as well as the health of the farmed

salmon and production. In mid-2010 I returned to Adelaide and took up a role as a senior marine scientist with the professional services and consulting firm Sinclair Knight Merz (SKM) which serviced clients across Australia, New Zealand and the South Pacific. In late 2010 I was promoted to Team Leader and Marine Technical Lead for the marine practice. I worked on a range of marine focused projects, including environmental impact statements (EIS) and approvals for offshore oil and gas exploration, major port developments including dredging monitoring projects and discharge fisheries impact monitoring for power stations and desalination plants.

7. In 2013 SKM was acquired by Jacobs a global engineering and professional services firm, my role in Jacobs increased to marine practice leader for the Asia Pacific region, working predominantly with the company's Australian and New Zealand client base.
8. While at Jacobs (SKM) I led many marine investigations for clients across Australia and authored over 60 consultancy reports including matters related to water quality, discharge impacts, fish monitoring, invasive marine species surveys, benthic habitat mapping and health, dredging impacts and approvals, port EIS/EIA, biogeochemical modelling and threatened species assessments. I have also assisted on over 50 other projects as the marine lead or reviewer including independent reviews of environmental and social impact assessments for the New Zealand Environmental Protection Authority.
9. I participated in the review of the first (2013) Trans-Tasman Resources (TTR) seabed mining application for South Taranaki Bight for the New Zealand EPA and for the marine consent application by Chatham Rock Phosphate Ltd to undertake activities in the Chatham Rise. I also appeared as an expert witness in the hearing for the second (2016 TTR) application and participated in the expert witness sessions and joint witness statements noted below in paragraph 15 and Schedule 1.
10. In 2018 I was offered the opportunity to work for the Secretariat of the Pacific Regional Environmental Programme (SPREP) in Samoa as the environmental assessment and policy officer, working with all of the Pacific island countries and territories to build capacity in environmental impact assessments and strategic environmental assessment. During my time at SPREP I developed

several Pacific guidelines^{1,2,3} for good practice in environmental assessment in English and French, endorsed by the SPREP member countries, including New Zealand. These guidelines are also recognized as good practice for environmental assessment by the World Bank, United Nations Environment Programme and other donor agencies. I was also environmental assessment lead for the Pacific Small Island Developing States as part of the technical assistance to the Pacific Islands Forum Secretariat in the negotiations for the development of the new internationally legally binding agreement for the Biodiversity Beyond National Jurisdiction.

11. I relocated back to Australia in 2022 and accepted my current role with JBS&G as their national marine lead and a role as Principal in environmental assessment and approvals. Based on the guidelines I developed for SPREP I was engaged by the Pacific Regional Infrastructure Facility to produce a harmonization matrix for donor safeguards operating in the Pacific using the SPREP guidelines as a stop-gap for aligning country and donor environmental assessment processes. I am currently engaged in developing the marine scopes of work for a number of major desalination plants and green hydrogen production in Australia.

Code of Conduct

12. I have read the Environment Court's 2023 Code of Conduct for expert witnesses and agree to comply with it.
13. I confirm that the topics and opinions addressed in this statement are within my area of expertise except where I state that I have relied on the evidence of other persons. I have not omitted to consider materials or facts known to me that might alter or detract from the opinions I have expressed.

¹ SPREP 2022 Good Practice Guidelines in Environmental Impact Assessment for Coastal Engineering in the Pacific. Apia Samoa ISBN: 978-982-04-1146-3 (ecopy)

² SPREP 2020 Strategic Environmental Assessment (SEA): guidelines for Pacific island countries and territories. Apia, Samoa ISBN: 978-982-04-0849-4 (recopy)

³ SPREP 2018 Environmental impact assessment : guidelines for coastal tourism development in Pacific island countries and territories. Apia, Samoa ISBN 978-982-04-0885-2 (ecopy)

Scope of this evidence

14. I have been retained by the Fisheries Submitters (Seafood New Zealand Limited, New Zealand Federation of Commercial Fishermen, Talley's Limited, The Southern Inshore Fisheries Management Company Limited and Cloudy Bay Clams Limited) to prepare a statement of evidence for the Decision-making Committee's reconsideration of the application by Trans-Tasman Resources Ltd for a marine consent and marine discharge consents.
15. I provided expert evidence before the original DMC on behalf of Fisheries submitters. The details of this are set out in Schedule 1 to this brief.
16. In summary my earlier evidence provided an assessment of the overall ecological effects and the significance of, and context for, the effects of the proposed TTR activities on fisheries and the supportive ecosystem in the STB. This included an assessment of the effects on:
 - (a) Marine Mammals as indicators for over health of the region as a fishery;
 - (b) Underwater noise impacts on marine organisms;
 - (c) Particle Size Distribution of sediments and suspended sediments;
 - (d) Sediment redeposition and physico-chemical effects on benthic species;
 - (e) Effects on pelagic primary productivity and the foodweb;
 - (f) Non-indigenous species or invasive marine species; and
 - (g) Interactions with fisheries.
17. I rely on that earlier evidence as the background to this statement.
18. The first purpose of this statement to respond to the new evidence filed by Trans-Tasman Resource Ltd in relation to the reconsideration of its application. This is the 2023 evidence from Dr Alison MacDiarmid, Dr Simon

Childerhouse, Dr Helen MacDonald, Dr David Thompson and Dr Phil Mitchell, which I have reviewed.

19. I understand that:
 - (a) TTR has provided this further evidence in response to what were identified by the Supreme Court as information deficits or gaps in the evidence that was before the Decision-making committee when it made the earlier decision;
 - (b) The information deficits or gaps were: effects on seabirds, effects on marine mammals, and effects caused by the sediment plume and suspended sediment levels.
20. My evidence in response to TTR's new evidence will address whether in my professional opinion TTR's evidence has addressed the Supreme Court's identified information deficits or gaps relating to effects on marine mammals and effects caused by the sediment plume and suspended sediment levels⁴. To do so I will:
 - (a) Summarise my earlier concerns where they are relevant to the information deficits or gaps identified by the Supreme Court;
 - (b) Explain the extent to which TTR's new evidence has addressed that information deficit or gap identified by the Supreme Court; and
 - (c) If new evidence has been provided, I explain whether I agree or disagree with that new evidence.
21. I also provide a response to discrete points noted by Dr MacDiarmid and Dr Childerhouse in their evidence. This response is at paragraph 54–6945–56.
22. The second purpose of this statement is to update my earlier evidence to the extent that it needs to be updated. My updates to my earlier evidence are below at paragraphs 70–74.

⁴ I do not comment on the effects on seabirds as that topic is outside my areas of expertise.

Material reviewed

23. In preparing this evidence I have read the following documents (additional to those referred to in my earlier evidence):
- (a) NIWA (2022) Offshore subtidal rocky reef habitats on Pātea Bank, South Taranaki. Prepared for the Taranaki Regional Council. Project ELF202202 Report No: 2022229AK
 - (b) Simon-Lledó, E., Bett, B.J., Huvenne, V.A.I. *et al.* Biological effects 26 years after simulated deep-sea mining. *Sci Rep* **9**, 8040 (2019). <https://doi.org/10.1038/s41598-019-44492-w>; and
 - (c) Ahnert, A. and C. Borowski (2000): Environmental risk assessment of anthropogenic activity in the deep sea. *Journal of Aquatic Ecosystems, Stress and Recovery* **7**, 299 – 315.

RESPONSE TO TTR'S NEW EVIDENCE

24. As noted above, I have reviewed the new evidence filed by TTR on its reconsideration application in light of the information gaps or deficits identified by the Supreme Court and the concerns that I held at the end of the 2017 DMC hearing. I comment in this section on whether the information gaps or deficits have been identified by reference to the concerns I identified in my earlier evidence.

Topic 1: acoustic monitoring for nationally threatened marine mammals

25. In my statement of evidence dated 23 January 2017 at paragraph 86(a) I concluded that TTR's then current Baseline Environmental Monitoring Plans (BEMP) and Environmental Monitoring and Management Plan (EMMP) should be updated to include acoustic monitoring for all nationally threatened marine mammals along with blue whales, and that seals should also be included in the BEMP and EMMP as key indicators of habitat health.

26. I assume that this concern forms part of the information gap as to effects on marine mammals identified by the Supreme Court.
27. There has been no new evidence provided by TTR regarding the abundance or distribution of marine mammals including of seals in TTR's proposed mining area. There does not appear to be inclusion for monitoring of all threatened marine mammals in their proposed BEMP and EMMP.
28. Dr Childerhouse's 2023 evidence at paragraphs 42 and 48 cites acoustic monitoring studies carried out by others within the STB, which confirmed the prevalence of pygmy and Antarctic blue whales, and that the STB is of significance for marine mammals. However, there is no new evidence or studies for TTR's proposed mining area, with all other studies conducted outside of the area and a distance too far to determine if any cetacean vocalizations occur within the proposed area. In paragraph 111 of his 2023 evidence Dr Childerhouse states

The previous marine mammal survey data (from the TTR application) is now very dated and therefore it is essential that new baseline data is collected. I would recommend that both aerial surveys and acoustic monitoring are probably the most cost effective and robust monitoring methods for marine mammals in the area.

29. He also states at paragraph 4 that data from wider studies of the STB

confirms the STB as an important hotspot for marine mammal diversity within New Zealand, including as a feeding and breeding location.

30. I agree that the data used in TTR application is now very dated and there have been no new surveys that encompass the proposed TTR mining area. Therefore, the acoustic monitoring of the proposed mining area remains an information gap. Given the importance of the STB as a hotspot for marine mammals, and that the presence of blue whales and other cetaceans has now been confirmed to be year-round in the STB, it is imperative that TTR provide data from their proposed mining area assessing whether the area is utilized infrequently and develop a suitable BEMP and EMMP based on the

understanding of the how marine mammals use the area.

31. During the 2017 DMC expert conferencing it was agreed that acoustic monitoring of the proposed mining area was needed.⁵ It has now been over 6 years and there has been no progression of data collection by TTR.
32. If this information is not available to the DMC, then in my view the information about nationally threatened marine mammals is uncertain and inadequate for the purposes of assessing the effects on marine mammals.

Topic 2: inadequate benthic surveys

33. In my statement of evidence dated 23 January 2017 at paragraph 71 I concluded that the benthic surveys referenced in TTR's reports were inadequate because they would have overlooked organisms smaller than 4mm and did not include benthic diatoms.
34. I assume that this concern forms part of the information gap as to effects of the sediment plume and suspended sediment levels identified by the Supreme Court.
35. There was no new evidence submitted by TTR, nor any new studies conducted within the proposed mining area in regard to macroinfauna or meiofauna species less than 4mm nor any benthic diatom (microalgae studies).
36. As the density and biodiversity of species in this size class of organisms is not known, it is not possible to determine the degree of impact of the proposed mining activity on the macroinfauna or meiofauna species less than 4mm nor any benthic diatom. As these organisms provide food to higher organisms and removal of them would impede the recovery rate of other trophic levels in the area during and after the mining process.
37. My concerns from my previous evidence about the inadequacy of the benthic surveys still stand. If information about macroinfauna and meiofauna species less than 4mm and benthic diatoms is not available, then in my view the

⁵ Joint statement of experts in the field of effects on marine mammals dated 3 March 2017, at page 12, Question SC21, Areas of agreement and disagreement, first bullet point.

information available to the DMC is uncertain and inadequate for the purposes of assessing the effects on those species and other species that rely on them for food.

Topic 3: Sediment redeposition and physico-chemical effects on benthic fauna

38. In my statement of evidence dated 23 January 2017 at paragraph 51 and 75 I raised concerns about the impacts of the mining process on the removal of benthic organisms and changes to the sediment chemistry impacting the demersal fisheries.
39. I assume that this concern forms part of the information gap as to effects of the sediment plume and suspended sediment levels identified by the Supreme Court.
40. There has been no new evidence submitted by TTR in regard to benthic surveys conducted within the proposed mining area. Nor have they provided any evidence to understand how the worm fields and other benthic areas identified in their 2015 baseline surveys would be affected by mining sediments to depths of 11m below the seabed.
41. Studies undertaken into the only seabed mining experiment (known as DISCOL) has demonstrated that decades after the mining trial there is still significantly lower benthic invertebrate heterogeneity of the area (Simon-Lledó et al. 2019). While the DISCOL area is in a different environment, being the deep sea, it is nonetheless the only seabed mining trial data for assessing long-term impacts of mining activity. It only used a racking furrow method of the seabed to determine effects of disturbing the sediments.
42. TTR's proposal to mine will generate furrows several times the depth of the DISCOL experiment, and will also involve extraction, crushing, recombination and redistribution of deeper sediments with surface sediments. Apart from the physical changes to the sediment the mining process will also alter the sediment chemistry. Subsurface marine sediments are usually anoxic, with the depth at which marine sediments become anoxic varying with the porosity of the sediment, amount of organic matter, availability of electron receptors and supply of oxygen. Generally, anoxia is more common in muddy finer

sediments where there is a high amount of organic matter. In these anoxic sediments oxygen is depleted rapidly by bacterial respiration until other bacteria use different chemotrophic processes such as nitrate, sulfate, manganese or iron to break down organic matter. The most common anoxic pathway is sulfate reduction, which produces sulfide. High concentrations of sulfide can inhibit the growth of oxygen dependent organisms, i.e. reducing the abundance and diversity of invertebrates.

43. As the TTR mining process will extract the coarser material and mechanically refine the metal sands of the proposed mining area, the returned sediments will be finer than the ambient sediments. This physical change along with mixing anoxic sediments with the surface sediments will have long lasting and potentially permanent effects on the physicochemical properties of the sediments in the proposed mining area.
44. I also refer to my primary evidence from 2017 (paras 50–51) where I reviewed the TTR laboratory reports (Vopel et al. 2013) that indicated copper levels in elutriates from unprocessed ore would be elevated. Copper is a known inhibitor of settlement and growth of marine organisms and therefore elevated concentrations of copper within the de-ored sand would impede the recolonization of the area by benthic organisms.
45. Elevated copper elutriate could also travel beyond the redeposition, as the elutriate is soluble it can travel with and potentially further than the sediment plume. The existing model indicated some risk of impact to Pātea Banks (Graham Bank). Based on recent findings of more reef areas and likelihood of other reefs nearby that provide fish nursery areas (Morrison et al. 2022), impacts to demersal fish species and the fisheries in the area are also likely.
46. In my view the information about the effects of sediment redeposition is uncertain and inadequate for the purposes of assessing the physico-chemical effects on benthic fauna and consequential effects to fish species and fisheries in the area.

Topic 4: Sediment Plume Modelling dependency on Particle size distribution of sediments

47. In my statement of evidence dated 23 January 2017 at paragraphs 33-42 I

explained that there is considerable uncertainty about the percentage of muds and fines in the sediments that TTR proposes to mine. In the joint statement of experts on sediment plume modelling dated 13 February 2017 at paragraph 9, the experts agreed there is insufficient information to validate assumptions regarding the average particle size distribution of tailings or degree of variability in distribution throughout the proposed mining area.

48. I assume that this concern forms part of the information gap as to effects of the sediment plume and suspended sediment levels identified by the Supreme Court.
49. There has been no update to the sediment plume model to include the ultra-fines discussed in the expert conferences. The uncertainty regarding the particle size distribution percentages of fines expected to be produced by the mining operation has still not been resolved.
50. The model relies on assumptions that an upper limit of 2.25% ultra-fines that could be mined. However, the experts were shown borehole log data during the conferencing session that indicated conservative percentages greater than 60% for some samples (HRW 2014; Vopel et al. 2013). This is nearly 30x greater than the assumptions the model relied upon.
51. Given the recent findings of additional reef and mud banks in the STB, with many more likely to be discovered (Morrison et al 2022), and the results TTR studies (HRW 2014; Vopel et al. 2013) that there will be pockets of muds and clays across the proposed mining area, the model prediction of only 4% fines or 2.25% ultra-fines is unrealistic.
52. As stated in my primary evidence, the sediment plume is a fundamental component of the proposal. The majority of TTR's impact assessment is based on the assumption that the suspended sediment content will be low. This assumption is based on predictions from the TTR suspended sediment concentration modelling, which assumed that less than 4% of the sediments redeposited within the proposed mining area will be fines (muds, silts or clays). These assumptions to date have not been backed by any independently verified data or written information on the TTR mining processes. If the plume modelling parameters do not capture the worst-case scenarios, then the ramifications to TTR's impact assessment are wide reaching in terms of

significant potential adverse effects.

53. In my view the information about the particle size distribution of sediments is uncertain and inadequate for the purposes of assessing the effects of the sediment plume.

RESPONSE TO MACDIARMID AND CHILDHOUSE EVIDENCE ON MARINE MAMMALS

54. Dr MacDiarmid presents no new data for TTR. She instead relies on her previous evidence, the Morrison et al. (NIWA 2022) and the cetacean modelling studies referred to in Dr Childerhouse statement. Both Dr Macdiarmid and Dr Childerhouse concur that the STB is a hotspot for cetaceans, with Dr Macdiarmid stating in paragraph 15:

The inshore areas in the STB were identified as being among the top 5% for cetacean conservation value in the New Zealand region inside the EEZ boundary and the STB as a whole in the top 15% of areas.

55. The studies Dr MacDiarmid and Dr Childerhouse refer to all indicate the STB is utilised year-round by cetaceans. As I have noted above at paragraph 28 of this statement, the recent marine mammals surveys in the STB were not conducted within the proposed mining area. However, those studies conducted close by to the mining area all detected blue whale vocalisations (Childerhouse 2023 at para 43). Therefore, it is likely that the entire STB is utilised by cetaceans at different times of the year and detecting them is simply a matter of acoustic survey effort.
56. The cetacean predictive modelling both Dr MacDiarmid and Dr Childerhouse refer to relies on historical records and observations. As pointed out by Dr Childerhouse (paragraph 34 -39).

it is important to be completely clear what the model outcomes represent... models [predict] probability of occurrence measures which estimate the probability that an individual may occur in a specific location. However, this measure doesn't prove that an individual is in an area only that it might be found there with some degree of probability...Similarly,

areas with a low probability of occurrence doesn't necessarily mean that individuals aren't there.

Spatial models can be useful tools when outcomes are interpreted correctly but can also be misleading if outputs maps are simply taken at face value as representing actual presence or absence.

57. Dr Childerhouse confirms (para 2) there has been no new studies of the proposed mining area and the survey data he has used is based on spatial modelling predictions, incidental sighting records and surveys from other parts of the STB but there is very limited new material available related to species abundance.
58. Dr Childerhouse (para 31) also states that the new sighting records do not necessarily reflect the most abundant or commonly found species in the STB region but rather other factors such as how much their distribution may overlap with people, active research and/or monitoring programmes (e.g., DOC encourage the public to report all sightings of Hector's and Māui dolphins within the region and have an active reporting programme), and the interest of the public. Therefore, the data used in the spatial modelling to predict the probability of a species occurring in an area using historical data would be skewed toward areas in which there has been higher study effort.
59. Given the spatial modelling predictions rely on marine mammal sighting records and understanding of historical distributions of species, the models are likely to underestimate species' use of the TTR proposed mining area due to the lack of data for the area. I therefore disagree with Dr Childerhouse's conclusion at para 2 that marine mammals would have a low frequency of use of the proposed mining area and that there is nothing to suggest that the mining area is of any significance to marine mammal species.
60. In my view the reliance on inadequate spatial modelling for marine mammal distributions means the information is uncertain and inadequate for the purposes of assessing the effects on marine mammals.

RESPONSE TO MACDIARMID EVIDENCE ON MODELLING

61. Dr McDiarmid relies on her previous evidence and refers to the new reef study conducted outside of the proposed mining area by Morrison et al. (NIWA 2022).

62. I disagree with Dr MacDiarmid's claim at para 19(d) of her evidence that the modelling for TTR was for a worst-case scenario, for the reasons given above at paragraphs 47 - 53
63. I refer to the Morrison 2022 study which identified new areas of rocky reef. The discovery of these important biological areas for biodiversity and fish nurseries within the predicted plume extent highlights the need for additional modelling to predict sedimentation rates across the area, using the worst-case ultrafine concentrations presented in the experts conferencing session in 2017.
64. Dr MacDiarmid (para 18) agrees that the rocky habitats are islands of biological diversity. The Morrison et al. (NIWA 2022) report states

The unusual distance of these reef systems from shore, occurring on a wide shallow continental shelf, makes them relatively unique in the New Zealand context, and may have protected them (in part) from land-based impacts seen elsewhere around New Zealand. They are worthy of careful management by the [Taranaki Regional Council], and other governance entities.

65. The majority of Dr MacDiarmid's reconsideration evidence at paragraphs 20–38 relies on the TTR sediment model prediction. Again, the reliance on this model as worst-case is flawed, and therefore predictions of extents of impacts on benthic organisms and comparisons to episodic natural disturbances such as storms are fundamentally flawed. The mining operation would not be episodic it would be generating a plume 24 hours a day 7 days a week for at least 35 years. This is fundamentally different in nature to an intermittent storm event that impact different areas and does not scour sediments down to 11m below the seabed (as would the mining operation).
66. Given the proximity of additional newly identified sensitive reef habitats to the proposed mining area, and the limitations of the existing TTR sediment plume model, I disagree with Dr MacDiarmid's conclusion at paragraph 21 of her evidence that the impacts of the sediment plume and mining operations would be "immaterial".
67. I note that the 2017 DMC made findings about the level of effects on various

ecologically sensitive rocky reef areas as follows:

- (a) Pātea Shoals — moderate effects on primary production,⁶ and the local scale effects on benthic primary productivity may be significant;⁷
 - (b) The Crack — significant effects on primary production,⁸ effects of concern on rich and diverse benthic fauna,⁹ temporary or permanent displacement of species,¹⁰ and major effects on visibility for diving;¹¹
 - (c) Project Reef — significant effects on primary production,¹² and major effects on visibility for diving;¹³
 - (d) Graham Bank — significant adverse effects on fish and primary production,¹⁴ and effects including temporary or permanent displacement of species.¹⁵
68. There is no information provided by TTR to suggest that the level of impact at the further areas of rocky reef recently identified by Morrison et al (2022) will be any lower than for the areas assessed by the DMC in the 2017 decision. Due to the uncertainty around the model predictions for sedimentation and quantities of fine sediments generated by the proposed mining operation it is not possible to predict the extent of impact on the new identified reef habitats. In my view, the level of impact to ecologically sensitive rocky reef areas within the coastal marine area inshore of the proposed mining area, particularly any within the area of the reefs assessed during the 2017 DMC is likely to be material.
69. At the very least, the level of information available to the DMC is uncertain and inadequate to be able to conclude that the level of harm will be immaterial.

UPDATES TO MY EARLIER EVIDENCE

⁶ 2017 DMC decision at para 350 and 970.

⁷ 2017 DMC decision at paragraph 968.

⁸ 2017 DMC decision at para 350 and 970.

⁹ 2017 DMC decision at paragraph 406.

¹⁰ 2017 DMC decision at paragraphs 437 and 980.

¹¹ 2017 DMC decision at paragraph 952.

¹² 2017 DMC decision at para 350 and 970.

¹³ 2017 DMC decision at paragraph 952.

¹⁴ 2017 DMC decision at paragraph 350, 940 and 970.

¹⁵ 2017 DMC decision at paragraphs 437 and 980.

70. Further to the points I have made above, I reiterate my statement from my 2017 supplementary evidence (dated 10 April 2017) that the sediment plume modelling is not a worst-case model. Nor was there a consensus at the expert conferencing that the model represented a worst case. TTR modelers instead used indicative values in place of worst case for ultra-fines concentrations and other parameters that could not be determined due to a lack of baseline data. Without the inclusion of the percentage of ultra-fines in mine sediments the model is underestimating the extent or duration that sediments would remain in suspension. For the reasons I have described above the model is not a worst-case model and therefore impacts to areas such as the recently identified rocky reefs in Pātea Bank cannot be determined.

71. Morrison et al. (NIWA, 2022)'s, recent survey of the Pātea Bank has been undertaken to identify previously unknown reefs. The report states that:

These (reef complexes) have not been seen elsewhere. Sponge-rich habitat clusters were present on the boundaries of some reefs, as patches in association with rock tells (limited rock just at or before sediment surface) and as a relatively large patchy sponge garden at the deepest site surveyed (30–33 metres). This deeper site also held high densities of juvenile blue cod, consistent with it providing important nursery habitat for this species... Other abundant fish species were scarlet wrasse, butterfly perch, leatherjacket, and tarakihi.

72. Morrison et al. (NIWA 2022) goes on to state

This report demonstrates that subtidal reefs are in fact common on Pātea Bank, with many more awaiting discovery by multibeam sonar mapping.

73. Of the reef sites surveyed by Morrison et al. (NIWA 2022), one was located on the south-east side of Graham Bank. This is an area already identified at paras 350, 940 and 970 of the 2017 DMC decision as being likely to be significantly impacted by the sediment plume. The discovery of the additional reef areas and likelihood of many more reef areas in Pātea Bank highlights

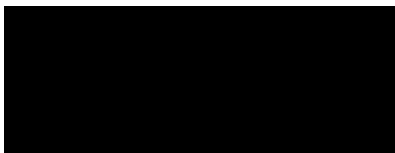
that even more reef habitat would be impacted by the sediment plume than predicted by the TTR submission. This is further likely given that the existing sediment plume model is underestimating the extent of the plume because it does not include the correct percentage of ultra-fines which would remain in suspension longer and therefore travel further.

74. The results of a proper worst-case plume modelling will require re-examination and peer review by independent ecologists to determine the likely extents of impacts. Until a proper worst case modelling has been prepared and assessed by independent ecologists, in my view the information about the sediment plume remains uncertain and inadequate for the purposes of assessing the effects of the sediment plume.

CONCLUSION

75. In summary, I conclude that an approach which favours caution should be applied in regard to the continuing gaps in scientific understanding of the potential impacts from the proposed TTR mining operations. TTR's experts have not provided any new evidence to demonstrate that the level of impacts will not be material, and they rely on the sediment plume model which was not a worst-case scenario. As the mining activities have the potential to cause material harm to the fisheries industry and the environment, and in the absence of a scientific consensus otherwise, the lack of scientific certainty about the materiality of the impacts of the proposed mining operation is not justification for assuming no significant impacts or no material harm.

Dated this 29th day of September 2023

A black rectangular box redacting the signature of Gregory Matthew Barbara.

Gregory Matthew Barbara

Schedule 1 – Greg Barbara’s evidence presented to the DMC in 2017

- (a) Primary brief of evidence dated 23 January 2017
- (b) Reply brief to Dr Donald Robertson dated 3 March 2017
- (c) Supplementary brief of evidence dated 10 April 2017
- (d) Supplementary brief of evidence dated 19 May 2017
- (e) Participation in expert conferencing on the following topics
 - Joint Statement of Experts in the Field of Sediment Plume Modelling, dated 13th February 2017
 - Joint Statement of Experts in the Field of Effects of Sediment Plume on Primary Production, dated 14th February 2017
 - Joint Statement of Experts in the Field of (Commercial, Recreational and Customary) Fishing, dated 15th February 2017
 - Joint Statement of Experts in the Field of Benthic Ecology, dated 20th February 2017
 - Joint Statement of Experts in the Field of Fish Ecology, dated 17th February 2017
 - Joint Statement of Experts in the Field of Effects on Marine Mammals, dated 3rd March 2017
 - Joint Statement of Experts in the Field of Sediment Plume Modelling – Setting Worst Case Parameters, dated 23rd February 2017
- (f) Attendance at the hearing to present my evidence on 21 February 2017

**BEFORE THE ENVIRONMENTAL PROTECTION
AUTHORITY AT WELLINGTON**

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

AND

IN THE MATTER of a reconsideration of an application for marine consent under section 38 of the EEZ Act by Trans-Tasman Resources Limited to undertake iron ore mining and processing operations offshore in the South Taranaki Bight

BETWEEN **Trans-Tasman Resources Limited**
Applicant

AND **Environmental Protection Authority**
EPA

AND **Seafood New Zealand Limited, New Zealand Federation of Commercial Fishermen Inc., Talley's Limited, Southern Inshore Fisheries Management Company Limited and Cloudy Bay Clams Limited**
Fisheries Submitters

**EXPERT EVIDENCE OF JORIS GERARD LEONARD
JORISSEN ON SEDIMENT PLUME MODELLING FOR
FISHERIES SUBMITTERS ON TTR RECONSIDERATION**

2 October 2023

Instructing Solicitor:

[Redacted]

Counsel:

[Redacted]

INTRODUCTION

Qualifications and experience

1. My name is Joris Gerard Leonard Jorissen. I am a principal coastal engineer at WGA Pty Limited in Brisbane, Australia since October 2022. I hold the degree of Master of Science (Civil Engineering, specialisation coastal engineering) from Delft University of Technology in the Netherlands awarded in 2002.
2. I have over 20 years of professional experience in coastal engineering. My specialist area is the assessment of coastal processes, particularly the numerical modelling of waves, hydrodynamics and sediment transport processes. I have led a number of studies into the sediment plume effects of dredging projects in the marine environment, including the numerical modelling of sediment plumes and the assessment of sediment source terms from different types of dredging and disposal activities¹.
3. Prior to joining WGA, I worked as a coastal engineer at Jacobs from September 2015 to October 2022 and at BMT from September 2006 to September 2015. Before this, I worked for Delft University of Technology and Rijkswaterstaat in the Netherlands and then Capita Symonds and AECOM (formerly Scott Wilson) in the UK. From 2008 to 2010, I was also a lecturer in coastal engineering at Queensland University of Technology.

Code of conduct

4. I have read the Environment Court Code of Conduct for expert witnesses and agree to comply with it.
5. I confirm that the topics and opinions addressed in this statement are within my area of expertise except where I state that I have relied on the evidence of other persons. I have not omitted to consider materials or facts known to me that might alter or detract from the opinions I have expressed.

¹ Yarra River Dredge Plume Modelling Study, Garden Island Marine Impact Study, Eden Breakwater Wharf Extension – Dredge Impact Study, Mud Island Dredge Material Placement Investigation, Berri Oil Field Expansion – Drilling Islands Feasibility Study and EIA, Teraiku Land Development Feasibility Investigations

Background to Evidence Preparation

6. I have been retained by the Fisheries Submitters (Seafood New Zealand Limited, New Zealand Federation of Commercial Fishermen, Talley's Limited, The Southern Inshore Fisheries Management Company Limited and Cloudy Bay Clams Limited) to prepare a statement of evidence for the Decision-making Committee's reconsideration of the application by Trans-Tasman Resources Ltd for a marine consent and marine discharge consents. My evidence reviews the approaches and methods used by Trans Tasman Resources Ltd (**TTR**) to predict the potential suspended sediment plume resulting by the mining activities proposed by TTR.
7. I confirm that I prepared the following evidence for the original proceedings before the DMC:
 - (a) Primary expert evidence of Joris Gerard Leonard Jorissen on laboratory testing and plume modelling (dated: 23 January 2017);
 - (b) Supplementary statement of evidence on the "materiality" of the additional sediment plume modelling undertaken by Trans-Tasman Resources Limited (dated: 7 April 2017);
 - (c) Supplementary statement of evidence of Mr. Joris Gerard Leonard Jorissen for Fisheries Submitters (dated: 18 May 2017)
8. I also participated in JWS of modelling experts and appeared to give my evidence before the DMC on 24 February 2017.
9. My earlier evidence provided a review of the sediment plume modelling undertaken by TTR to predict the effects of the sediment plume. In summary that evidence concluded:
 - (a) The overall strategy and adopted modelling approach is appropriate for its intended use, but the accuracy of the model predictions rely on the accuracy of the model inputs.
 - (b) Insufficient evidence has been provided by TTR to determine with sufficient accuracy a number of important aspects of the potential

release of fine sediments resulting from the proposed mining activity, and as a result, there is uncertainty whether or not the sediment plume modelling undertaken by TTR can be relied upon to accurately assess the associated environmental impacts of the proposal.

- (c) In particular, insufficient evidence has been provided to assess the particle size distribution of the seabed material and the run of mine (ROM) proposed to be discharged into the sea, and the degree of variability in this distribution throughout the proposed mining period.
- 10. I rely upon that earlier evidence as the background to my comments in this statement.
 - 11. The other purpose of this statement is to respond to the new evidence filed by TTR, I have been requested by the Fisheries Submitters to review and comment on the updated evidence provided by TTR since 18 May 2017 and relating to sediment plume modelling.
 - 12. In preparing this evidence, I confirm that I have reviewed the following new documents:
 - (a) Expert evidence of Helen Skye MacDonald on behalf of Trans-Tasman Resources Limited, dated 19 May 2023; and
 - (b) The Marine Consent Conditions in Appendix 2 to the Decision-Making Committee's decision dated 3 August 2017.
 - 13. I understand that:
 - (a) TTR has provided this further evidence in response to what were identified by the Supreme Court as information deficits or gaps in the evidence that was before the Decision-making Committee when it made the earlier decision; and
 - (b) One of the information deficits or gaps identified by the Court related to issues around sediment plume modelling and associated prediction of suspended sediment levels.
 - 14. My evidence in response to TTR's reconsideration evidence will address

whether in my professional opinion TTR's evidence has addressed the areas where the Supreme Court identified that there were information deficits/ gaps – including a concern that the information about effects caused by the sediment plume and suspended sediment levels was uncertain/incomplete. My evidence focuses on the modelling of the sediment plume, which is in my area of expertise. The effects of the sediment plume are addressed by Dr Gregory Barbara and others.

NO NEW INFORMATION PROVIDED RELATING TO MODELLING

15. Ms. MacDonald, in her reconsideration evidence at paragraph [7], confirms that no new sediment plume modelling has been completed since the 2017 evidence. She indicates that there have been updates to the modelling software used for the sediment plume modelling (ROMS) since 2017, but that these updates will not substantially alter the results presented in the evidence submitted.
16. No new information has been provided by TTR with regards to the characteristics of the seabed material proposed to be extracted by TTR and the effects of processing on board the Integrated Mining Vessel (IMV) on the sediment composition.
17. Therefore, I remain of the opinion that there remains insufficient evidence to predict sufficiently accurately the nature and rate of the fine sediment potentially being released by the mining operations at timescales relevant to the behavior of the sediment plume.

RESPONSE TO COMMENTS MADE ON “WORST CASE SCENARIO”

18. Ms MacDonald throughout her reconsideration evidence¹, including at paragraph [25] refers to the “worst-case scenario” plume modelling that was completed in 2017 and states that parameters for this modelling were selected by the sediment plume expert conferencing group.
19. As stated in the Joint Statement of 23 February 2017², agreement was **not**

¹ Expert Evidence of Helen MacDonald on behalf of Trans Tasman Resources dated 19 May 2023 at [3]

² Joint Statement of Experts in the Field of Sediment Plume Modelling - Setting worst case parameters, 23 February 2017

reached by the group on important aspects of the worst-case scenario definition, which means that the scenario modelled is not the “worst case” scenario. The matters that were still in dispute at the completion of expert conferencing session and have not been resolved (or addressed by TTR in later evidence) are:

- (a) The adequacy of the sediment sampling and its reporting. Paragraph 8 of that JWS statement records that the independent experts have not been provided with complete reports of a full analysis of the sediment samples and cannot verify the validity of the sediment fractions that have been used in modelling. The experts have had to make assumptions on the particle size distribution (PSD) and processing rate on board the IMV based on the verbal accounts from Dr Dearnaley, who has been informed by TTR without being able to review how the values have been derived.
- (b) Information regarding the mining process and the inter-relation with the ROM that has been revealed through conferencing sessions and was not appropriately collated for this application making it difficult to fully assess the schematisation of the mining process in the models.
- (c) None of the independent experts had the opportunity to view the source data of the ultra-fines content estimates provided by TTR. The independent experts, myself included, felt unable to sign off on that without having reviewed the source data.
- (d) The independent experts did not have the opportunity to review the process so are unable to assess the validity of the table showing the discharge from the IMV. They have not reviewed the source data on PSD analysis, sediment core logs or complete laboratory reports in the PSD. Based on the lack of evidence it is not possible to accurately define the worst-case parameters for fines discharge.
- (e) The threshold for suspension was derived from the three samples analysed by HR Wallingford. The experts considered that the erosion threshold for the fines released by the mining activity will vary throughout the mining area, but in the absence of measured data a worst-case scenario parameter for this cannot be established. There is some uncertainty around the erosion rate in the model, but as with

the erosion threshold, a worst-case scenario cannot be established based on only three samples. I note that Dougal Greer's updated evidence for the DMC's 2023 reconsideration, which I have reviewed in draft, also notes a concern with only using three samples.

- (f) The retention rate of fine sediments discharged in the mining pit as adopted in the far field modelling, including the nearfield modelling scenario that was used to estimate the amount of material leaving the mining area as a passive plume. The near field modelling only considers wave periods between 7 and 11 seconds with the results from the 7 seconds scenario being used to inform the sediment plume inputs into the far field modelling. The project area frequently experiences waves with a wave period that is substantially greater than 7 seconds, and using an overly low wave period to estimate the amount of material that settles in the mining pit will lead to underestimation of the amount of sediments released in a passive plume. Therefore, the modelling, even the worst-case scenario, may have significantly underestimated the amount of sediments leaving the mining area in the passive plume.

- 20. In my opinion, insufficient conservatism has been included in the adopted worst-case scenario, particularly with respect to the rate and nature of the fine sediments that will be released into the marine environment at time scales of significance for sediment plume dispersion (hours to days).

PARTICLE SIZE DISTRIBUTION & COMPOSITION

- 21. TTR has previously³ provided a table with the results of the Particle Size Distribution (PSD) tests that they have conducted to assess the particle size characteristics of the seabed material throughout the mining site. For clarity a copy of this table is provided in **Appendix A**.
- 22. The table indicates that in total 70 samples have been tested from 10 borehole locations within the project area (refer to Appendix A for borehole locations). This is considered a small number of tests in the context of the amount of seabed material proposed to be extracted.

³ Table 1 of Joint Statement of Experts in the Field of Sediment Plume Modelling, 13 February 2017.

23. The table demonstrates that there will be significant variability of the fine sediment content in the seabed material proposed to be disturbed by TTR. One sample (Sth012RC at 7m) has an ultra-fine (<8 µm) sediment of 18.0%, which is a value that is more than 22 times greater than the claimed averaged ultra-fines content of the seabed material and approximately 10 times greater than proportion adopted as the maximum content in the worst-case scenario sediment plume modelling conducted by TTR.
24. TTR has previously indicated that the highest ultra-fines content that they could operate at for a period of weeks to one month is 2.25% and that they would not mine material with an ultra-fines content of 10%. However, no details have been provided on how this would be monitored and reacted to during operations.
25. If the mined material contains a higher proportion of fine sediments, the sediment plume will increase in size.

PARAMETERS IN THE CONDITIONS

26. The 2017 DMC majority decision imposed a set of conditions aimed at reducing the risks associated with suspended sediment concentration impacts resulting from the proposed mining activity. I understand that TTR is seeking to rely on this condition set, with some amendments, as part of the reconsideration process. Condition 4.d provides limits for the maximum concentration of ultra-fine sediments that can be discharged into the sea — the extraction of seabed material having a size of smaller than 8µm shall not exceed 1.8% of the total seabed material extracted, averaged over any one week period. The condition proposes to determine the weekly averaged percentage of ultra-fine sediments in the seabed material by analysing a minimum of 20 representative samples of the mined seabed material per week.
27. This condition is retrospective and can result in situations whereby non-compliances will only be established after a significant period of time (potentially up to a week), unless TTR proposes to retain the de-ored seabed material on the IMV until compliance with the condition has been demonstrated. It is my understanding that TTR does not propose to hold this material on the IMV to ascertain whether the limit is met, prior to discharging

the sediment.

28. In my opinion, insufficient information has been provided on the measures and procedures that TTR proposes to ensure that the DMC can be confident that TTR can comply with condition 4.d during operations if consent is granted. At present:

- (a) No source data on the seabed sediment sampling has been provided by TTR to allow independent experts to assess/ verify the validity of sediment composition assumptions made in the plume modelling and it is unclear how the information provided by TTR has been derived.
- (b) The seabed sediment sampling data that has been provided confirms that there are parts of the mining area where the fine sediment content is substantially greater than the limit.
- (c) The locations within of the project area where the fine sediment content is greater than the limit cannot be ascertained because there has been insufficient sampling data.
- (d) The proposed operations and conditions appear to be set up in a way that means that there is no way of knowing whether or not the discharge exceeds the limit allowed for in the condition until after the discharge has been released.

29. This means that there is potential that from time to time the rate of fine sediments release from the mining activity will be significantly greater than of the proposed conditions would allow and the sediment plume may be substantially greater than predicted by the sediment plume modelling.

OPERATIONAL SEDIMENT PLUME MODEL

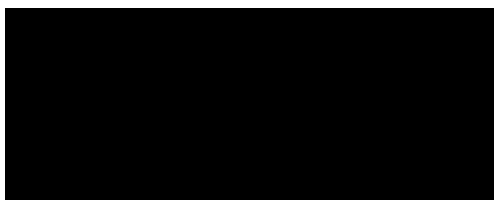
30. Ms. Macdonald in her reconsideration evidence at paragraphs [26], [27] and [28] comments on the requirements of the proposed operational sediment plume model (OSPM) to ensure it will provide accurate forecasts of the sediment plume behaviour. She highlights the need to appropriately validate the model before it can be relied upon for operational decision making. I concur with this requirement.

31. It is important to note that the accuracy of the OSPM will be significantly influenced by the accuracy of the model inputs. The accuracy of the OSPM will rely on the accuracy of the inputted fine sediments content of the ROM during the forecast period. As TTR will not examine the characteristics of the seabed material prior to it being mined, the fines content in the ROM cannot be predicted accurately until the seabed material has been excavated. Therefore, unless TTR proposes to retain the de-ored material on the IMV until the characteristics of the ROM during the entire forecast period have been determined, the OSPM cannot make an accurate prediction of the sediment plume caused by the mining operation.

CONCLUSION

32. As stated in my previous evidence, the sediment plume modelling system adopted by TTR is a useful tool for assessing the potential sediment plume effects of the proposed mining activity, but the accuracy of the modelled predictions relies on the accuracy of the model inputs.
33. Insufficient data has been provided by TTR to predict with sufficient accuracy the nature and rate of the fine sediment potentially being released by the mining activity at timescales relevant to the behavior of the sediment plume.
34. Proposed condition 4.d is retrospective and can result in situations whereby non-compliances will only be established after a significant period of time, (potentially up to a week). This means that the sediment plume generated by the mining activity could be substantially greater than predicted by the sediment plume modelling undertaken by TTR. As such, in my opinion, the proposed condition is not an effective measure to limit the amount of sediment being released into the sea by the proposed mining activity.

Dated: 2 October 2023

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JORIS JORISSEN

APPENDIX A: Particle Size Distribution Test Results

Table 1: Particle Size Distribution Test results used by TTR to define PSD of ROM

Inside Mining Area	Cumulative percent Sth015RC Average 0m - 8m Analysis	Cumulative percent Sth015RC Average 0m - 9m Analysis (Mud Layer)	Cumulative samples Sth016RC Average 0m - 5m Analysis	Cumulative samples Sth019RC Average 0m to 11m	Cumulative samples Sth019RC Average 0m to 15m	Cumulative samples Sth010RC 0-11m Muddy layer at 11m	Cumulative percent Sth010RC 0-10m	Cumulative samples Sth012RC 0-6m	Cumulative samples Sth012RC 0-7m Muddy layer at 7m	Vibrocore drillholes					TOTAL Averaged
Size fraction microns	Ave	Ave	Ave	Ave	Ave	Ave	Ave	Ave	Ave	VC_C1	VC_C2	VC_C3	VC_D2	VC_D3	Ave
10000	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
2000	99.56	99.56	98.80	99.65	99.65	98.94	98.94	99.43	99.43	98.10	96.90	99.40	100.00	98.70	99.08
1000	95.98	96.20	96.26	95.84	96.19	96.37	96.23	98.01	98.21	98.01	95.50	99.40	100.00	98.66	97.20
710	90.38	91.12	93.87	88.30	88.36	92.74	92.57	95.12	95.71	96.88	92.21	99.40	100.00	98.39	93.93
500	79.00	80.82	90.65	73.11	71.85	85.65	85.65	88.18	89.48	90.81	84.63	98.28	97.64	96.03	86.56
355	55.21	58.64	81.55	50.75	47.69	74.84	74.80	68.15	71.72	72.11	68.52	86.35	82.96	84.43	69.84
250	24.79	28.58	48.41	25.20	22.31	49.06	47.54	33.52	40.40	40.55	42.29	54.70	51.85	57.15	40.45
212	14.61	17.91	29.59	15.61	13.70	34.68	32.21	20.38	28.21	26.27	29.31	37.12	35.66	41.31	26.90
150	4.56	6.72	6.78	5.01	4.80	14.32	10.51	7.00	15.55	7.39	9.00	10.47	10.31	13.54	9.00
125	2.84	4.67	3.51	3.25	3.36	9.87	5.81	4.64	13.22	3.73	3.62	4.46	3.68	5.28	5.14
106	2.11	3.79	2.50	2.57	2.80	8.20	4.11	3.56	12.09	2.58	1.40	2.43	0.97	1.54	3.62
90	1.70	3.27	1.95	2.18	2.47	7.47	3.43	2.91	11.31	2.29	0.67	2.02	0.08	0.21	3.00
63	1.22	2.60	1.28	1.70	2.04	6.52	2.75	2.05	9.97	2.27	0.59	2.01	0.00	0.05	2.50
45	0.99	2.21	1.04	1.46	1.80	5.73	2.38	1.59	8.75	2.16	0.58	1.96	0.00	0.05	2.19
38	0.91	2.05	0.95	1.37	1.70	5.34	2.25	1.44	8.15	1.94	0.52	1.73	0.00	0.05	2.03
31	0.83	1.87	0.85	1.26	1.58	4.87	2.08	1.28	7.42	1.59	0.37	1.34	0.00	0.05	1.81
16	0.63	1.33	0.63	0.95	1.18	3.42	1.62	0.90	5.07	0.96	0.12	0.62	0.00	0.04	1.25
8	0.42	0.85	0.37	0.64	0.75	2.11	1.04	0.59	3.07	0.77	0.10	0.45	0.00	0.05	0.80
4	0.22	0.46	0.18	0.34	0.35	1.07	0.50	0.32	1.58	0.36	0.02	0.17	0.00	0.00	0.40
2	0.10	0.19	0.08	0.14	0.14	0.41	0.18	0.14	0.57	0.07	0.00	0.00	0.00	0.00	0.14
P80	518	495	350	595	604	424	424	441	423	416	458	334	345	338	443
P50	337	325	255	350	369	254	259	300	282	281	281	240	246	233	284
No of Samples	8	9	5	11	15	11	10	6	7	5	6	3	3	6	105
<2mm%	99.56%	99.56%	98.77%	99.65%	99.65%	99.65%	98.94%	98.94%	99.43%	98.10%	96.90%	99.40%	100.00%	98.70%	99.09%

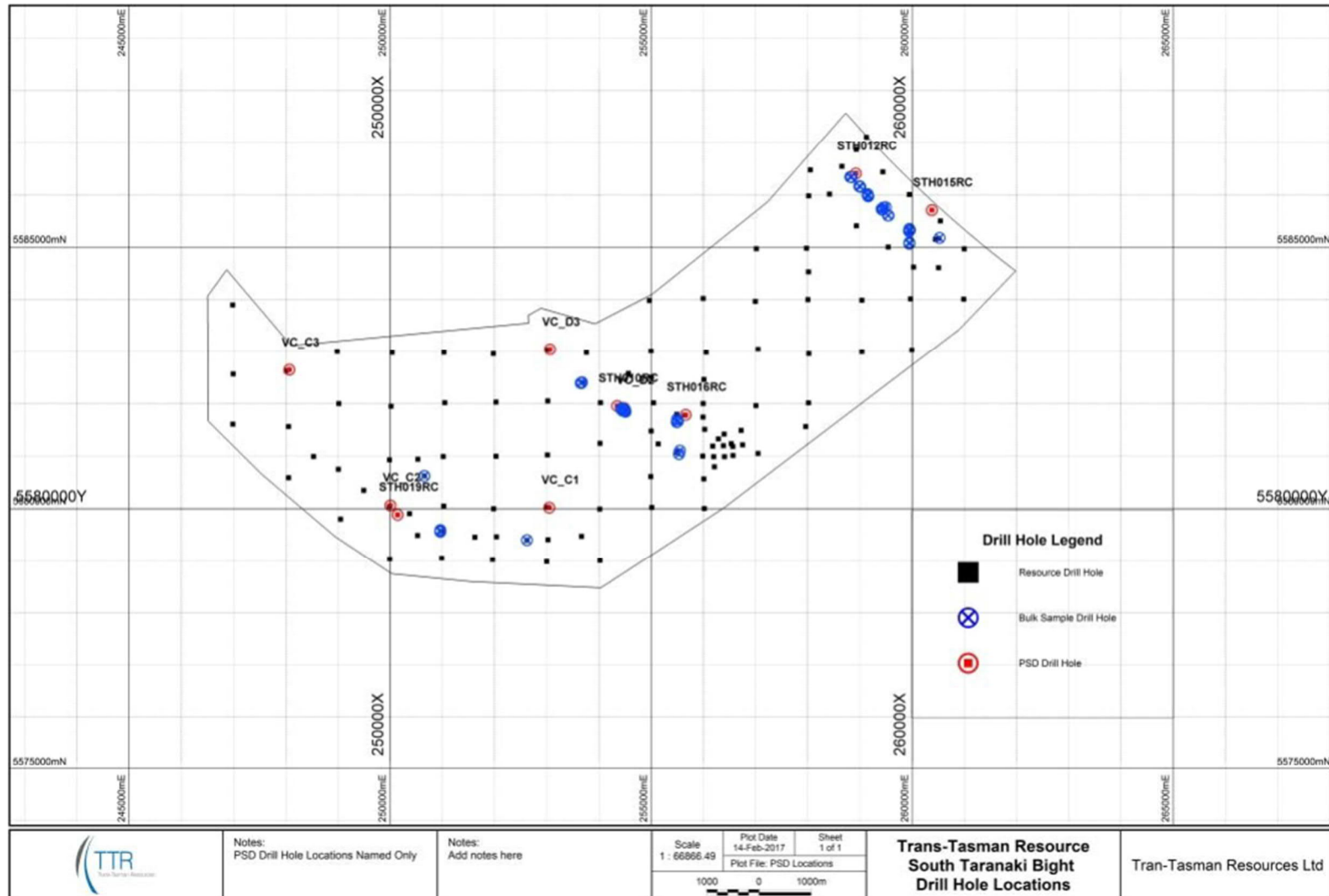


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INTRODUCTION

Qualifications and Experience

1. My name is Dr Jeremy Graham Helson. I am the Chief Executive of Seafood New Zealand Limited (Seafood NZ) which, following the amalgamation of Seafood NZ, Deepwater Group Ltd and Fisheries Inshore New Zealand Ltd on 1 February 2023, is a successor in the reconsideration proceedings to Fisheries Inshore New Zealand Limited (a submitter to the 2016 application). I previously held the role of Chief Executive of Fisheries Inshore New Zealand Ltd prior to the restructure and change to Seafood NZ.
2. Seafood NZ is a commercial fisheries organisation that works for the collective interests of commercial fishers and those that own quota for deepwater, inshore and pelagic species.
3. I hold a Bachelor of Science with Honours (First Class), a Doctor of Philosophy in Marine Biology and a Bachelor of Laws. After gaining my PhD, I was a Japan Society for the Promotion of Science postdoctoral fellow at Tokyo University of Marine Science and Technology in 2002–2003.
4. Prior to working for Seafood NZ and before that Fisheries Inshore New Zealand, I spent 10 years in fisheries management at the Ministry for Primary Industries (and its predecessor organisations), most recently as the Manager of Deepwater Fisheries.
5. I have also worked as a lecturer in marine ecology at Victoria University of Wellington and as consultant marine biologist.

Code of Conduct

6. I have read the Environment Court Code of Conduct for expert witnesses and agree to comply with it.
7. I confirm that the topics and opinions addressed in this statement are within my area of expertise except where I state that I have relied on the evidence of other persons. I have not omitted to consider materials or facts known to me that might alter or detract from the opinions I have expressed.
8. I acknowledge that I have an interest in these proceedings given my position as Chief Executive of Seafood NZ. Nevertheless, I have endeavoured to prepare my evidence with the level objectivity required of me under the Code of Conduct for expert witnesses. I understand in this respect that the weight

placed on my evidence depends on my ability to exercise objectivity in any views that I offer.

Background to Evidence Preparation

9. I am familiar with the general characteristics of the TTR application site and surrounding environment of the South Taranaki Bight. I am also familiar with the fisheries that exist in the vicinity of the application area.
10. As part of the original DMC process in 2017 I provided the following evidence:
 - (a) Primary Evidence dated 23 January 2017
 - (b) Evidence in reply to Dr Donaldson dated 2 March 2017
 - (c) I appeared before the DMC to present my evidence on 22 February 2017, and gave a summary slide presentation of my evidence.
11. I also participated in witness conferencing in respect of the effects on fishing (commercial, recreational and customary) on 14 February 2017, and signed a joint statement dated 15 February 2017.
12. The documents I have read in preparing this evidence are those listed in my earlier evidence. In addition, I have read:
 - (a) The decision of the Supreme Court in *Trans-Tasman Resources Ltd v Taranaki Whanganui Conservation Board & Ors* [2021] NZSC 127.
 - (b) The briefs of evidence filed by TTR in support of its reconsideration request, from Alison Macdiarmid, David Thompson, Phillip Mitchell, Helen Macdonald, and Simon Childerhouse.
 - (c) The Reconsideration Panels Minutes and Directions 1–5.
 - (d) TTR's memorandum of response of counsel for Trans-Tasman Resources Limited in response to Minute 3, Addressing other Marine Management Regimes.
 - (e) The briefs of evidence prepared by Captain Andy Smith (6 October 2023), Dr Joris Jorisson (2 October 2023) and Dr Gregory Barbara (29 September 2023) on behalf of the Fisheries Submitters

Ongoing Involvement in TTR application

13. Fisheries Inshore New Zealand (as it then was) has been involved in TTR's present application since it was lodged in 2016. FINZ was a submitter in the initial proceedings before the DMC. Fisheries Inshore New Zealand Limited, New Zealand Federation of Commercial Fisherman Inc, Talley Group Limited (now Talley's Ltd), Southern Inshore Fisheries Limited and Cloudy Bay Claims Limited (collectively referred to as the Fisheries parties or Fishers) jointly appealed the decision to the High Court. They were a Respondent party jointly presenting a case with the iwi parties in the subsequent Court of Appeal and Supreme Court proceedings and participated in the directions hearing in the High Court in 2022.
14. Like many other parties, the Fisheries parties were also submitters in TTR's earlier 2013 application for consents necessary for iron sand mining in the South Taranaki Bight. That application was refused due to uncertainty and the applicant providing insufficient information.
15. TTR has now been advancing this proposal for over a decade. FINZ and now Seafood NZ has spent thousands of hours and incurred significant expense procuring experts and counsel to respond to the application and participate in the appeals. It has been a challenging and frustrating process. While I understand the reasons for the Supreme Court allowing the opportunity for TTR to have the application considered by a new DMC, it is clear from reading the material recently filed that TTR has not sought to address the major deficiencies in its application identified by the Supreme Court.

Purpose of Evidence

16. The purpose of this evidence is to:
 - (a) Provide relevant updates to my 2017 evidence.
 - (b) Comment on areas within my expertise, relevant to the reconsideration arising out of the findings of the Supreme Court, including the reconsideration evidence lodged by TTR.
 - (c) Comment on matters contained in the memorandum of counsel addressing other management regimes; and
 - (d) Provide a summary, stating my key conclusions on the application

considering the matters outlined above at (a)-(c).

RELEVANT UPDATES TO MY 2017 EVIDENCE

The New Zealand Seafood Industry

17. Since the initial DMC hearing in 2017, there have been several relevant changes, which I discuss by way of updates to my evidence, with reference to the paragraphs in my Primary Evidence dated 23 January 2017.

Update regarding changes to the New Zealand Seafood industry

18. Paragraphs 12–15 of my Primary Evidence provided a description of the New Zealand seafood industry. By way of update:
- (a) The fisheries sector as at 2022 employed approximately 16,530 full time equivalents directly in fishing, seafood processing and related industries that provide infrastructure and services.¹ It remains the case that many of these jobs are in small coastal centres where fisheries are an important component of the social fabric.
 - (b) The seafood industry provided export earnings to New Zealand of \$1.9 billion in 2022 (including aquaculture, wild capture and seafood).²
 - (c) The New Zealand seafood industry excluding aquaculture had a total economic output of \$5.2 billion in 2022 and a GDP contribution of \$2.9 billion in the same period.³ Of this contribution, the inshore finfish sector made up 25 per cent of the total fishing value, followed by rock lobster with 12 per cent and shellfish with nine percent. The top value species within the finfish industry were snapper, followed by jack mackerel and tarakihi. Snapper accounts for seven per cent of inshore finfish and 18 per cent of total fishing value.⁴
 - (d) New Zealand's Quota Management System remains in place and is a highly effective fisheries management system.

¹ BERL "The economic contribution of commercial fishing" (March 2022) at page i.

² Ministry of Primary Industries "Situation and Outlook for Primary Industries" (June 2023) at page 110.

³ BERL "The economic contribution of commercial fishing" (March 2022) at page i.

⁴ At page iii.

19. To update paragraph 17–20 of my Primary Evidence, there are now four national industry representative bodies, representing rock lobster, paua, aquaculture and other fisheries.
20. The change from five to four industry bodies results from the amalgamation of the Deepwater Group, Fisheries Inshore New Zealand with the former Seafood NZ to form the current version of Seafood New Zealand (of which I am Chief Executive). This amalgamation occurred in February 2023.
21. Seafood New Zealand is a professional organisation delivering services for the wider benefit of the seafood industry; primarily fisheries for deepwater, coastal, and highly migratory species. Seafood New Zealand plays a leading role in developing and presenting the seafood industry's response on regulatory proposals and generic issues affecting the industry; these include research, monitoring, food safety, market access, labour supply, and strategic and operation matters relating to managing New Zealand's commercial fisheries.

Overview of the Quota Management System

22. At paragraph 35 – 40 of my Primary Evidence I described the Quota Management System. This description remains accurate, however by way of update I note that:
 - (a) The government currently contracts approximately \$20-25 million in research annually, about \$12 million of which is recovered from quota owners.
 - (b) In the next fishing year, the seafood industry will contribute approximately \$41.4 million through cost recovery levies to pay for research, observers, enforcement and other services in support of managing New Zealand's fisheries.
 - (c) There are now 642 fish stocks under the QMS, which are each split into Individual Transferrable Quota (ITQ).

Update to evidence in Reply to Dr Donald Donaldson

23. I note my evidence in reply to Dr Donaldson commented on the Fathom

report.⁵ I agreed with him that the Fathom report was a useful analysis of fisheries in the STB. I reiterate however my caveats on the usefulness of that report:

- (a) Firstly, the analysis primarily deals with effects on exclusion from the mining site itself, not the wider area of sediment plume and displacement effects that may result; and
- (b) Secondly, I noted the age of the data relied upon in the Fathom report. The review was conducted in July 2013 but as noted in my earlier evidence, the initial review and NIWA report it was based on use data from the period 2004/2005 to 2009/2010. Back in 2017 I commented that using catch effort and data up to September 2010 to analyse fishing activity is inappropriate. It is even more inappropriate to use data from 2010 (and earlier) in 2023. The data is now over 13 years old and does not take into account recent developments. For example, climate change is impacting on fish distributions and availability of stock. It would have been relatively straightforward for the applicant and its consultants to request updated data since 2010 from MPI in order to update the figures and conclusions expressed in the Fathom report, but it has failed to do so.

Update on level of uncertainty as to effects on fisheries

- 24. At the close of the original DMC Hearing, Fisheries submitters continued to hold the view that the impact on the fishing industry was not properly understood and there had been insufficient information provided to properly understand the likely effects of the sediment plume on the fishing industry. Because the effects of the sediment plume are not well understood it is not possible to adequately quantify or assess the impact that that plume could have on fish and fishing with any certainty.
- 25. TTR's focus has been on the biological effects *on fish*. However, as the experts agreed in the joint statement of the effects on fishing, a fishery is a combination of a biological resource to exploit, economic investment, fishing technology and knowledge and rules and regulations to administer the fishery. My view remains that to consider the effects on fisheries, one must start with the effects on fish, but go further to assess how those effects

⁵ Fathom (2015) Report 25 South Taranaki Bight iron sand mining proposal Assessment of potential impacts on commercial fishing. 5 July 2013 and reconsidered 18 November 2015.

would manifest in the fisheries in question. TTR has not in my view conducted that analysis.

26. To put this point in another way, a veterinarian can assess whether the animal stock on a farm are healthy, but that assessment does not tell you whether the farm as a business is economically healthy or viable.
27. Before the previous DMC, the Fisheries' Planning expert (Helen Anderson) expressed the view that there was insufficient baseline information to assess the effects of the proposal on fishing.⁶ In response to that concern, the DMC Majority, imposed condition 48, which relates to pre-commencement monitoring:

‘Prior to the commencement of any seabed material extraction activities authorised by these consents, the Consent Holder shall ensure that a minimum of two (2) years of environmental monitoring has been undertaken and shall, as a minimum, include monitoring of:

- [...]
- Seafood resources;
- Underwater noise;
- Commercial fishing.’

28. This condition requires collecting of (2) years of pre-commencement baseline monitoring data for Seafood resources, underwater noise and commercial fishing.
29. This is the same condition “set up” to that which was criticised by the Supreme Court in respect of sea birds and mammals in terms of gathering baseline information *after* the grant of consent.⁷ The condition “set up” also seems to engage the Supreme Court’s concern that the high level of uncertainty as to the effects caused by the sediment plume necessitated the need to favour caution and environmental protection.⁸ I note that one of the Supreme Court Judges was particularly concerned that the conditions “went well beyond monitoring or identifying adverse effects and were for the purpose of gathering totally absent baseline information”.⁹
30. In my opinion similar information deficits exist for seafood resources and commercial fishing. If TTR is only going to gather this information by pre-commencement monitoring, then I am concerned that Seafood NZ and the

⁶ Footnote her evidence on this

⁷ TTR (SC) at [277]–[278] per Glazebrook J, at [295] per Williams J and at [329] per Winkelmann CJ.

⁸ TTR (SC) at [131] per Ellen France and William Young JJ, at [274] per Glazebrook J, at [294] per Williams J, and at [327] per Winkelmann CJ.

⁹ TTR (SC) at [276] per Glazebrook J.

other fishing industry organisations will not have any opportunity for input into how that information should inform the consent authority's decision.

31. The deficit in information about seafood resources, underwater noise and commercial fishing has not been resolved in the materials TTR has provided with its reconsideration application. The only references to fisheries impacts in TTR's reconsideration evidence are:
 - (a) Mr Childerhouse at [36] refers to a 2022 paper by MacKenzie that provides an updated spatially explicit fisheries risk assessment for marine mammals. However, this does not say anything about the impacts of TTR's proposed activity on fisheries; and
 - (b) Mr Childerhouse at [60] refers to a 2022 paper by FNZ as providing a useful summary of Hector's and Māui dolphin biology, ecology and fisheries impacts — but again this does not say anything about the impacts of TTR's proposed activity on fisheries.
32. Notably, there is no analysis in TTR's evidence of the difference between the effects on fish, and the effects on fisheries. These are distinctly different.
33. In order for there to be adequate information to assess impacts on fisheries and meet the criticisms by the Supreme Court about the pre-commencement monitoring and management plan regime, I consider that the applicant would need to obtain and analyse up-to-date fisheries catch data, spatial distributions of that catch data, which commercial entities are undertaking fisheries activities, and the extent to which each commercial entity is reliant on fishing in the affected area as a proportion of their total catch. This analysis could then enable an overall economic and social impact assessment of the effects on fisheries, as well as more granular assessment of the effects on particular commercial entities and the regions in which they are based. This analysis has not been done.
34. A further concern with the conditions framework and level of information arises from the post-commencement monitoring conditions, which are conditions 54 and 55. These require the consent holder to undertake monitoring of various matters listed in condition 54, and to ensure that this monitoring is appropriate to ensure that the activities authorised by the consents do not result in any adverse effects that were not anticipated at the time of granting the consents. The matters listed in condition 54 include seafood resources, underwater noise, and *recreational* fishing. But there is no reference to *commercial*

fishing, despite that being in the list of pre-commencement monitoring matters in condition 48. My concern is this means there will be no monitoring of, or management response, to adverse effects on commercial fishing.

Changes in regulation of the fisheries industry

35. Since the 2017 DMC Hearing there has been several new regulatory responses relevant to the STB.
36. The Department of Conservation has introduced further measures including exclusion areas to protect Hector's and Maui dolphins via the Hector's and Maui Dolphin Threat Management Plan 2020. Set net and trawling measures, implemented under the Fisheries Act 1996, are in place around the North and South Islands to reduce the threat of fishing-related mortality to these dolphins. These measures are summarised in the following diagram prepared by MPI, which indicates that in the orange areas that a set net prohibition has come into force from October 2020:



Figure 1: Commercial and recreational set net prohibition areas off the west coast of the North Island ¹⁰

¹⁰ Department of Conservation, Fisheries New Zealand “Hector’s and Māui Dolphin Threat Management Plan 2020 (December 2021) at page 12 <<https://www.doc.govt.nz/globalassets/documents/conservation/native-animals/marine-mammals/maui-tmp/hectors-and-maui-dolphin-threat-management-plan-2020.pdf>>.

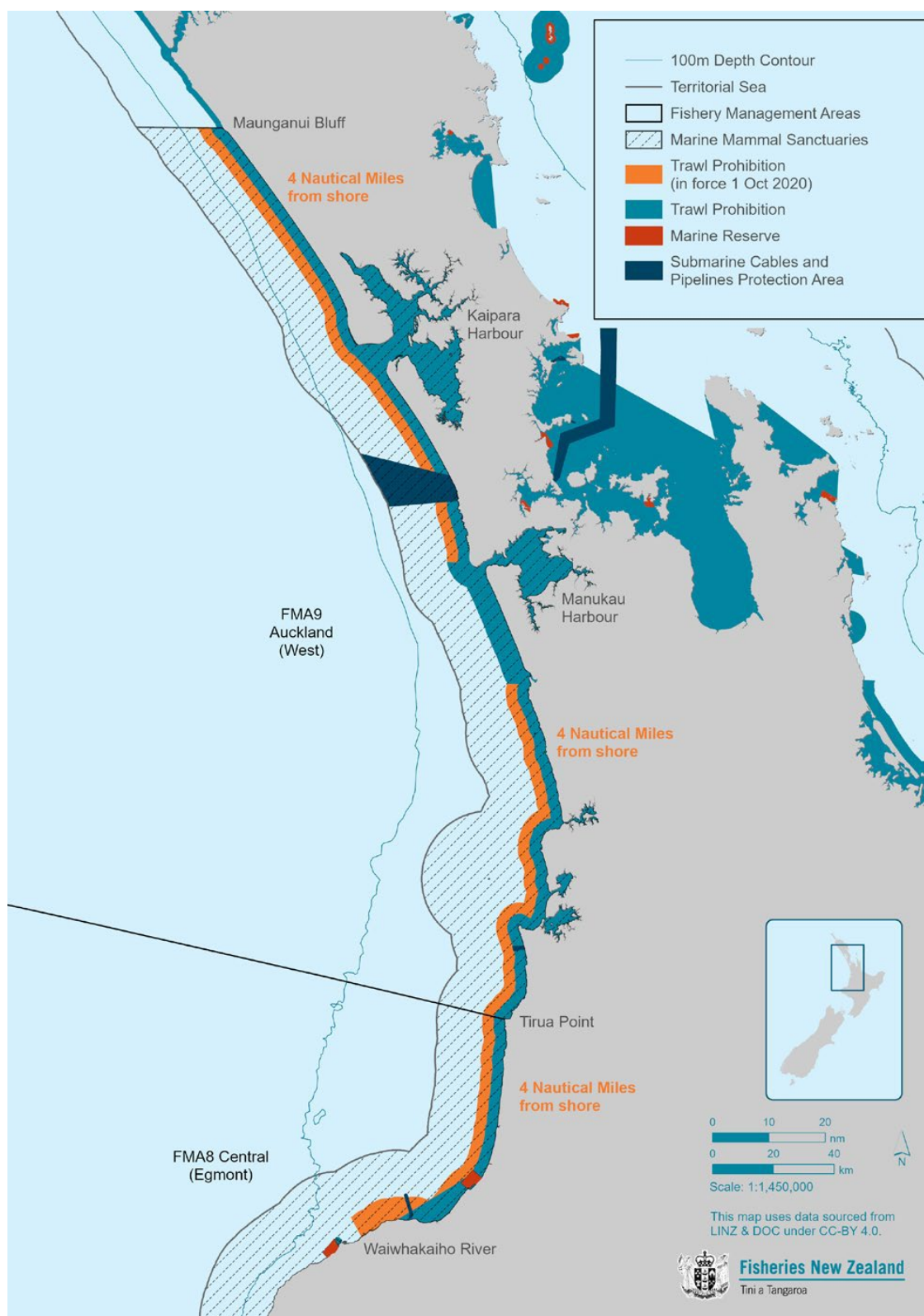


Figure 2: Commercial trawl prohibition areas off the west coast of the North Island¹¹

37. The effect of the set net and trawling measures is that more vessels have been displaced from fishing within the 4 nautical mile limit (nm) and further offshore and towards the STB. This means that vessels with annual catch entitlement in Fisheries Management Areas 7 and 8 will be more likely (compared with pre-2020) to be fishing closer to TTR's proposed project area, contributing to a

¹¹ At page 13

relative increase in the commercial value of fishery further offshore. Thus the commercial impacts of TTR's proposal on the fisheries existing interests in the area will be relatively higher since the 2017 DMC decision given the lesser area available for fishing.

Comment on matters contained in the memorandum of counsel addressing other management regimes.

38. The DMC's Minute 3 asked:

(i) What are the key features, nature and effect of each of the MMR's identified as relevant. Specifically:

- a. What are the objectives of the MMR?
- b. What are the outcomes which the MMR seeks to achieve?
- c. Does the MMR provide for an "environmental bottom line"?

39. The Fisheries Act is identified as a relevant Marine Management Regime, in section 7(2)(f) of the EEZ Act. The Supreme Court has confirmed what is required by the direction in s59(2)(h) to take into account the 'nature and effect' of other management regimes and how that assessment should be undertaken.

40. Fisheries interests are also an "existing interest" under section 59(2)(a) and (b) of the EEZ Act, which means that effects on fisheries must be taken into account in the DMC's decision making.

41. I discussed the Fisheries Act as a relevant Marine Management Regime in my Primary Brief at paragraphs 23–28 and explained why in my view that legislation is illustrative of a cautious and adaptive approach to the management of fisheries and effects on fisheries. I went on to explain why the analysis that supports TTR's application is uncertain as to the possible downstream environmental and economic consequences for fisheries, and that it does not represent a cautious or adaptive approach.

42. My concerns about the uncertain impacts on fisheries are much the same as they were when I prepared my Primary Brief.

Updated comments on the Fisheries Act as a marine management regime

43. There have however been some significant developments since 2017 in the understanding and approach being taken to the environmental principle in section 9(c) of the Fisheries Act. That principle is that all persons exercising or performing functions, duties, or powers under this Act in relation to the utilisation of fisheries resources or ensuring sustainability, shall take into account the following environmental principles (c) *“habitat of particular significance for fisheries management should be protected”*.
44. The Prime Minister’s Chief Science Advisor noted in a February 2021 report that this environmental principle had not explicitly been used to protect habitats, and there are no habitats of particular significance for fisheries management formally identified.¹² The Chief Science Advisor noted however that:¹³
- (a) Most habitat is significant to at least one species.
 - (b) There is a substantial body of research on areas of importance, such as juvenile nurseries; but
 - (c) Without definition or quantification, we do not know what level or type of protection is provided to potential habitats of particular significance for fisheries management, nor do we know what additional level of protection might be valuable.
45. The Chief Science Advisor recommended that a framework should be created for the prioritisation and protection of habitats of particular significance for fisheries management. This would include guidance documentation for defining and identifying such areas.¹⁴ This approach is within the broader theme of taking an ecosystem approach to fisheries management under the Fisheries Act.
46. More recently, in November 2022 Fisheries New Zealand embarked upon consultation to develop:
- (a) guidance for identifying habitats of particular significance for fisheries management, including a register of such habitats; and

¹² Office of the Prime Minister’s Chief Science Advisor “The Future of Commercial Fishing in Aotearoa New Zealand (February 2021) at page 93.

¹³ At page 120–121.

¹⁴ At page 25.

- (b) operational proposals for how Fisheries New Zealand will take into account the need to protect habitat of particular significance for fisheries management when developing its fisheries management advice.
47. The Chief Science Advisor's report, and the Fisheries New Zealand consultation, are part of a process towards taking an ecosystem-based approach to the management of fisheries. This is an approach that integrates the management of competing uses and values of marine resources while maintaining the ecosystems that support them.
 48. I make a few comments on the movement towards an ecosystem approach and recognising and protecting habitats of particular significance for fisheries management, and how this is relevant to the TTR proposals.
 49. First, if habitats of particular significance for fisheries management are to be identified and recognised then it should be necessary for the DMC to have sufficient information about those habitats. Such information is needed for the DMC to be able to take into account the nature and effect of the environmental principle of protecting such habitats (s 9(c) of the Fisheries Act).
 50. In my opinion, the impacts of non-fisheries industry activity such as seabed mining on habitats of particular significance for fisheries management are likely to be more significant than the impacts caused by the fisheries industry. For example, sedimentation could have significance adverse activities on a habitat of particular significance for fisheries management. By contrast, fisheries industry participants will, by their nature, be incentivised to carry on their activities with more care and caution to protect habitats of particular significance for fisheries management from impacts of their activities to protect future livelihood, income and sustainability. Fishers do not wish to fish in a manner that detrimentally impacts the future productivity of the fisheries. That natural aspiration is supported by the strong current interest in exercising greater selectivity in fishing activity.
 51. In my view there is a deficit of information and assessment by TTR about the potential presence of habitat of particular significance for fisheries management in and near the TTR project area. This makes it difficult for the Fisheries Submitters to comment on whether the proposal is consistent with the environmental principle of protecting habitats of particular significance for fisheries management.

52. Secondly, while no habitats of particular significance for fisheries management have been formally identified at present, I note that at paragraphs 63–64 of Dr Gregory Barbara’s evidence he refers to recent studies that identified new areas of rocky reef in the STB, and states that these are “important biological areas for biodiversity and fish nurseries within the predicted plume extent”, and that TTR’s consultant Dr MacDiarmid agrees these rocky habitats are islands of biological diversity and support an abundant and diverse benthic biota. This evidence indicates to me that while further information may be required to confirm the position, there are likely to be habitats of particular significance for fisheries management near the proposed mining area.
53. Finally, I note that in respect of the application by Chatham Rock Phosphate Ltd for marine consents, the DMC in that case held that the proposed seafloor mining activity would be inconsistent, and effectively negate, the existence of a benthic protection area that overlapped with the mining area.¹⁵ This was a significant factor in the decision to refuse consent for that application.¹⁶
54. In my view, the existence of possible habitats of particular significance for fisheries management in and around the TTR proposed mining area raises a similar inconsistency with the Fisheries Act marine management regime, TTR’s proposal will result in significant and in some cases irreversible effects on habitats that may be of a particular significance for fisheries management. There is a duty to take into account the protection of these areas under the Fisheries legislation.
55. The effects of the sediment plume will be felt in the coastal marine area, the West Coast North Island marine mammal sanctuary (which was expanded in 2020 to include the South Taranaki Bight) and the areas with set net and trawling prohibitions discussed above at paragraphs 36 and 37. TTR’s argument that it is recognising the protection afforded to those areas by not mining in those locations is nonsensical. The discharge of sediment into those marine environments, and the impact of TTR’s activities in that area cannot be said to equate with protection.

Other responses to TTR’s memorandum on marine management regimes

¹⁵ Environmental Protection Authority “Decision on Marine Consent Application — Chatham Rock Phosphate Limited — To mine phosphorite nodules on the Chatham Rise” (EEZ000006) at paragraph 736.

¹⁶ At paragraph 906.

56. TTR's memorandum on marine management regimes dated 25 August 2023 includes a number of other points on the Fisheries Act that I wish to respond to.
57. TTR's memorandum refers to the 2017 DMC's findings on the effects on fisheries, and notes that "these were not matters that were appealed or the subject of any findings on appeal". The memorandum then says that on that basis the granting of consents cannot be inconsistent with the nature and effect of the Fisheries Act.
58. I note that the basis for the Fisheries Submitters appeal to the High Court was that there was insufficient baseline information to support the application, and that the DMC's way of addressing this uncertainty was incorrect. This position was, as I understand it, upheld by the Supreme Court. The Fisheries Submitters do not consider that the 2017 DMC's findings on the effects on fisheries should be considered correct or robust when they were based on insufficient information and an incorrect approach to addressing informational uncertainty.
59. TTR's memorandum also asserts that any effect of the TTR project on fisheries is "sufficiently small to be consistent with the Fisheries Act objective of ensuring sustainability. I do not agree with that conclusion. However, it is in any event an incomplete statement about the relevant marine management aspects of the Fisheries Act regime. Other important features of the Fisheries Act, which TTR ignores, include the environmental principles in section 9 and the information principles in section 10. I have explained the significance of those principles in my Primary Evidence and in this updating statement.
60. I note that one of the information principles in section 10(c) of the Fisheries Act is that decision makers should be cautious when information is uncertain, unreliable or inadequate. Decisions around quota management are made based on this approach. There are examples of cautious or precautionary reductions in setting catch limits for species such as hoki, orange roughy, tarakihi, paua and rock lobster.
61. For example, quota owners of rock lobster in CRA2 became concerned that the science available was not reflecting the stock decline observed by operators. For the 2016/17 and 2017/18 fishing years, CRA2 operators shelved 25% of their Annual Catch Entitlement (50 tonnes in each year) to

reduce fishing pressure on the stock. This was at a cost to operators of at least \$8 million dollars in landed value.

62. Another example is east coast tarakihi where quota owners considered that to achieve a faster rebuild of the stock they needed to reduce catch by approximately 10%. Industry proactively and voluntarily shelved that Annual Catch Entitlement and then supported a decision a year later by the Minister to formally reduce the total allowable commercial catch limit under the Fisheries Act. These sorts of changes have been accepted by the industry and in my experience this cautious approach forms part of the nature and effect of the Fisheries Act management regime.

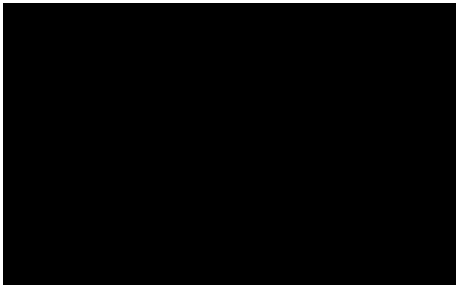
Summary of my concerns

63. My previous evidence outlined concerns that the Fisheries Submitters held, which included that:
- (a) TTR's analysis of the impact of the proposal on commercial fishing are simplistic and inadequate. The reports and evidence provided conflate the biological effects on fish species with the economic, social and regulatory effects on fisheries. While biological impacts are part of any analysis of the effects on fisheries, the analysis fails to appreciate that fisheries are an economic activity that is conducted subject to a complex regime.
 - (b) TTR has not adequately understood or analysed the effects on fisheries that may result from the proposed mining operation.
 - (c) TTR has not conducted an economic impact analysis on the commercial fishing sector.
 - (d) TTR has not provided details on the local-scale effects of the mining operation with regard to the reduction of light levels or primary production. Both factors may have direct and indirect impacts on fisheries that are not adequately considered.
64. I consider the Application constitutes a risk to fisheries, not just in FMA 8 and adjacent areas, but also to New Zealand's reputation as a world-class manager of fisheries and producer of seafood.
65. These concerns are not addressed by the updating material that TTR has

provided in support of the reconsideration application.

66. My concerns have increased in light of the following developments since 2017 (a) the limited data on fisheries that TTR relies on is even more out of date than it was in 2017; (b) larger areas of exclusion to protect Hector's and Māui Dolphin; and (c) movement towards an ecosystem approach to the management of fisheries and habitats of particular significance for fisheries management.

Dated 6 October 2023



Jeremy Helson

**BEFORE THE ENVIRONMENTAL PROTECTION
AUTHORITY AT WELLINGTON**

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

AND

IN THE MATTER of a reconsideration of an application for Marine Consent under section 38 of the EEZ Act by Trans-Tasman Resources Limited to undertake iron ore mining and processing operations offshore in the South Taranaki Bight

BETWEEN **Trans-Tasman Resources Limited**
Applicant

AND **Environmental Protection Authority**
EPA

AND **Seafood New Zealand Limited, New Zealand Federation of Commercial Fishermen Inc, Talley's Limited, Southern Inshore Fisheries Management Company Limited and Cloudy Bay Clams Limited**
Fisheries Submitters

**EXPERT EVIDENCE OF CAPTAIN ANDREW PETER
SMITH ON FISHERIES MANAGEMENT FOR FISHERIES
SUBMITTERS AS PART OF THE RECONSIDERATION**

Dated 6 October 2023



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INTRODUCTION

Qualifications and Experience

1. My full name is Andrew Peter Smith.
2. I am a qualified deep-sea fishing skipper with 47 years' experience in the fishing industry.
3. When I left high school, I went to sea as a deckhand on a small fishing vessel working out of Nelson, the 36 foot "Entruder" owned by Alan MacManaway. After a number of years at sea, I began working for Sealord Products Limited on their larger fishing vessels. I completed my first coastal skipper's certificate when I was 19 and, at the age of 25, I obtained my deep-sea skipper's ticket.
4. Fishing skippers or vessel captains are responsible for the overall running of a fishing boat. Responsibilities include navigating the vessel, organising crew, and catching and processing fish. I have skippered both inshore and deep-water fishing vessels, including trawlers, purse seiners and long-liners in New Zealand and elsewhere including Chile, Namibia, South Africa, and Ireland. I have also captained vessels travelling from Norway to New Zealand, and from Spain to Chile via Panama.
5. I have owned and operated my own vessels, in both the inshore and deep-water sectors. Over my years as a skipper, I regularly fished both the East and West coast of New Zealand, including Cook Strait. I am familiar with the area known as the "Rolling Grounds" (an area of high seabed ridges and dunes in the South Taranaki Bight) having fished that zone. As a fisherman, I am personally acquainted with the migration patterns of fish species, and the effect of tides, currents, water conditions and weather on the aggregation and abundance of fish.
6. In addition to owning and operating my own vessels, I have been a contracted Captain/Fishing Master and an international fisheries consultant in Namibia, South America, Antarctic and other jurisdictions. Through this work, I have gained a wide knowledge of the regimes that govern the management of fisheries, both internationally and domestically.

7. To keep up with developments in commercial fishing and fisheries management, I regularly attend international regional fisheries management meetings and other stakeholder forums that seek to regulate the activities of fishing vessels on the high seas and within exclusive economic zones.
8. I was contracted for 12 years to Talley's Ltd to oversee the operations of their deep-water fleet. I am currently self-employed as an international fisheries consultant acting for domestic and international fishing companies providing a range of advice on vessel operations and access to international fisheries.

Code of Conduct

9. I have read the Environment Court Code of Conduct for expert witnesses and agree to comply with it.
10. I confirm that the topics and opinions addressed in this statement are within my area of expertise except where I state that I have relied on the evidence of other persons. I have not omitted to consider materials or facts known to me that might alter or detract from the opinions I have expressed.
11. I acknowledge that I have an interest in these proceedings given my position as a fisheries consultant, with a particular focus on the smaller fleet in the fishing industry. Nevertheless, I have endeavored to prepare my evidence with the level of objectivity required of me under the Code of Conduct for expert witnesses. I understand in this respect that the weight placed on my evidence depends on my ability to exercise objectivity in any views that I offer.

Background to Evidence Preparation

12. I am familiar with the general site of TTR's application and surrounding environment of the South Taranaki Bight (STB) as I have personally fished in the area on a regular basis since the 1980's. I provided evidence to the 2017 DMC to which I will cross refer:
 - (a) Primary Expert Evidence of Andrew Peter Smith on Fisheries Management for Fisheries Submitters dated 23 January 2017 (my

Primary Evidence); and

- (b) I appeared before the original DMC on Thursday 2 March 2017 and provided a summary of my evidence; and
 - (c) A further brief, titled Supplementary Expert Evidence of Captain Andrew Smith regarding Charts dated 10 March 2017 was filed responding to questions asked by the original DMC during my appearance at the hearing.
13. The documents that I have read in preparing this evidence are listed in my earlier evidence statements. In addition, I have reviewed the 2023 evidence lodged by TTR from Alison MacDiarmid, Simon Childerhouse, Helen MacDonald, David Thompson and Phillip Mitchell. I have also reviewed the draft briefs of Jeremy Helson, Gregory Barbara and Joris Jorrisen, which are being lodged on behalf of the Fisheries Submitters.
14. The purpose of this evidence is to:
- (a) Provide relevant updates to my 2017 evidence.
 - (b) Comment on the reconsideration evidence filed on behalf of TTR in response to matters within my area of expertise.
 - (c) Provide a summary, re-stating my key conclusions on the application considering the matters outlined above at (a) – (b).

RELEVANT UPDATES TO MY 2017 EVIDENCE

15. Since the original hearing of the DMC of this matter in 2017, several matters have occurred which are relevant. I provide updates of those below. To avoid repetition, I have done so with reference to the paragraph number in my original evidence.

Changes in the fisheries industry and regulatory environment

16. There have been considerable changes in the fisheries industry since 2017. There are now fewer vessels with more regulatory oversight over

the activities of vessels through on-board cameras and electronic management. Many smaller vessels have left the industry and have been replaced with larger vessels run by a reduced number of operators.

17. The Geographical areas of Fisheries Management Areas 7 and 8 (FMA 7 & FMA 8), discussed at paragraph 38 of my Primary Evidence, remain the same.
18. There is significantly heightened regulation of fishing activities now, compared to in 2017 when the application was originally before the DMC. These include:
 - (a) Introduction of ecosystem-based management (which is explained in Dr Jeremy Helson's 2023 evidence).
 - (b) The Government has introduced a requirement for cameras to be installed on all fishing boats fishing the West Coast North Island Area. Priority Group 1 vessels went live with on-board cameras from 1 August 2023 – with a rapid national rollout of cameras on a further 200 plus vessels which will cover around 85% of the catch volume of New Zealand's inshore fisheries.¹
 - (c) An amendment of the Fisheries Act in 2022 has changed the way the industry manages discards. The recently introduced section 72 of the Fisheries Act 1996 prohibits commercial fishers from returning or abandoning to the sea or other waters any fish or other animal that is aquatic life that is subject to the quota management system, unless the Minister has made an instrument permitting otherwise.² The Ministry also requires that all catch must be reported whether they are Quota Management System (QMS) species or not, with electronic reporting compulsory from 2019. This provides far greater scrutiny over catch and creates a better data set for the fishery.
 - (d) The Department of Conservation has introduced further measures including exclusion areas to protect Hector's and Maui dolphins via

¹ <https://www.mpi.govt.nz/fishing-aquaculture/commercial-fishing/fisheries-change-programme/on-board-cameras-for-commercial-fishing-vessels/>

² <https://www.mpi.govt.nz/dmsdocument/53740-Fisheries-Landing-and-Discard-Exceptions-Notice-2022-with-corresponding-New-Zealand-Gazette-Notice>

the Hector's and Maui Dolphin Threat Management Plan 2020. These are discussed in the 2023 updating brief of evidence of Jeremy Helson.

19. These increased regulatory requirements impose significant costs on the fisheries industry.
20. In addition, the industry is exposed to rising fuel prices and the impact of the Covid-19 pandemic which include disruption to operations and labour shortages.
21. Dealing with the effects of seabed mining within STB for industry participants who own quota there would be a further blow to an industry that is already struggling. I note that many fisheries operators are already contemplating exiting the industry or have already left. In 2012 there were 1378 registered fishing vessels, and we are now down to 948 in 2023.

Update to Fish Stock assessments/quota allocation

22. At paragraphs 15–16 and Annexures A–B of my Primary Evidence, I set out an aerial plan of the proposed mining area and what I consider to be the potential impact area from a fisheries management perspective. This showed key areas that may be affected by the mining operation and accompanying sediment plume. That remains the same.
23. My Primary Evidence at paragraph 28 noted that the TTR project area is an important fishery, including for horse mackerel. The area continues to be important as a horse mackerel fishery. Most of the quota for blue mackerel and jack mackerel within FMA 8 continues to be caught in and around the project area.
24. As a consequence of the changes in the fishing industry discussed above at paragraphs 16–18, fisheries abundance has increased in Fishing Management Area (FMA) 7.

Windfarm applications

25. Since 2017 there has been renewed interest in the development of

Taranaki's relatively shallow offshore shelf³ for offshore wind farms in West Taranaki. Some of these projects are in the vicinity of the proposed mining area:

- (a) Wind Quarry Ltd recently applied for resource consent to Taranaki Regional Council for an 810MW (54 turbine) offshore windfarm on the South Taranaki Bight; and
 - (b) The South Taranaki Offshore Wind Project is being developed by Blue Float Energy and Elemental Group. This is a 900MW offshore windfarm consisting of 60 turbines off and a proposed 230 km² beyond the nautical mile zone and outside of the Patea Shoals and West Coast North Marine Mammal Reserve.⁴ This proposal is currently in the feasibility stage of development.
26. These proposals demonstrate that there are many competing “would be” users of the proposed project area in the South Taranaki Bight. The effects on other users will need to be carefully managed to avoid interactions with fisheries and (if TTR's application is granted) seabed mining activities.

SAFETY CONCERNS

27. The time since 2017 has provided new knowledge in respect of New Zealand's limited capabilities to respond to a maritime disaster, and the potential for subsequent environmental catastrophe.
28. Large vessels will break down at sea from time to time.
29. A dramatic example was the grounding of the *MV Rena* and corresponding oil spill, which occurred at Astrolabe Reef, Bay of Plenty, in 2011. The effects of this disaster on Astrolabe reef and the surrounding fishing area are not fully understood.
30. There have been further examples of vessel breakdowns more recently, which have demonstrated the vulnerability of New Zealand to a marine disaster.

³ <https://www.venture.org.nz/assets/Offshore-Wind-Discussion-Paper.pdf>

⁴ <https://southtaranakioffshorewindproject.com>

31. On 30 January 2023 the Interislander ferry *Kaitaki* broke down and drifted to within less than a nautical mile of Wellington's coastline, narrowly avoiding running aground on rocks in windy conditions. At the time of the incident there were no vessels in the area with the salvage capacity required to assist had the vessel need towing.
32. The *MV Shiling*, a cargo ship, broke down in Wellington Harbour on 15 April 2023 and drifted dangerously close to a shallow shoal. It was detained by Maritime New Zealand for a period, before being released to return to Singapore for repairs. However, it then became stranded off Farewell Spit because of a power and steering failure and drifted without power, issuing a mayday signal, in May 2023. It was able to be assisted and towed to safety by the *Skandi Emerald*, an ocean-going harbour tug that happened to be in New Zealand at the time supporting rigs working off New Plymouth.
33. These recent examples have illustrated that incidents of this nature are not uncommon occurrences, and that New Zealand does not have reliable ability to properly respond to an emergency involving a vessel of this size. There are no ocean-going emergency vessels in New Zealand capable of towing or salvaging a ship of a similar size or larger if it gets into trouble in New Zealand waters. It was simply good fortune that the *Skandi Emerald* happened to be nearby and able to respond to the *MV Shiling's* mayday.
34. TTR's proposed mining operation involves vessels larger than those I have referred to above. Should a breakdown or other incident occur to the mining vessel or any support vessels, a significant maritime disaster could unfold with dramatic consequences to all marine life in the STB, and FMA 7 and FMA 8.
35. Some areas of TTR's proposed mining area are quite shallow, in the order of 10–20 m depth.⁵ If the mining vessel breaks down in these shallow waters, it could quickly run aground or hit the crawler tractor.⁶
36. At times, the TTR's mining vessel will need to enter Admiralty Bay (near

⁵ 2017 DMC decision at paragraphs 186–187.

⁶ The crawler tractor is 8 metres high, and the IMV has depth below sea level of 12 metres. See the 2017 DMC decision at paragraphs 162–165.

Durville Island) at the northwestern point of Marlborough Sounds, for the purposes of seeking shelter in adverse weather or because of safety requirements. A breakdown of the mining vessel or any support vessels in or near these confined areas, with the kind of weather experienced regularly there, would see a vessel of that size aground on rocks in hours.

37. A maritime disaster at the top of the Sounds would decimate fish stocks, including the paua, crayfish and the mussel farming industry. It would also affect other species including Tuatara that live on Stephen's Island, and have potential to ruin one of New Zealand's most pristine coastlines.
38. I remain concerned that TTR's proposal relies upon the use of vessels of this size, with from what I can see absolutely no real safety measures in place to safeguard or prevent this happening despite this posing a significant risk to the marine area. I do not consider that general maritime safety rules are fit for purpose for an operation of this scale.

RECONSIDERATION OF EVIDENCE FILED BY TTR

39. I have reviewed the expert evidence filed by TTR in support of its reconsideration request. I have the following comments.

Evidence of Dr Alison McDiarmid

40. In my Primary Evidence I explained that if the mining activity displaces fish species from one fish management area (e.g. FMA7) into another fish management area (e.g. FMA8), then that has a commercial and financial impact on quota holders who can only lawfully fish in the area in which they hold quota.⁷ I therefore disagree with Dr MacDiarmid's evidence at paragraph 29 that the effects of fish being displaced away from the affected area to avoid any noise or sediment plume effects are not material, because she has not taken into account the impacts of displacement on quota holders.
41. While FMA 8 is relatively large, there are some areas within that FMA where species are more abundant and can be caught economically. These

⁷ Primary Evidence at paragraphs 40–41.

are areas relatively close to shore, which can be accessed without significant steaming time. The effects of the TTR mining operation, including the direct closure of the mining area and the effects of the sediment plume and noise on surrounding areas, will displace fish within FMA8 and potentially FMA7, and such fish may move out of FMA8 and cross into FMA9 and FMA7. This will result in the need for fisheries operators to head further afield, resulting in greater catch effort and/or cost to catch, as well as potentially losing the ability to catch fish if they are displaced into another management area.

42. At paragraphs 17–18 Dr MacDiarmid provides updated information on the occurrence of rocky reef in the STB, by reference to the NIWA Morrison et al (2022) paper.
43. Rocky reefs are significant to fisheries, because they act as a nursery and breeding ground. The rough seafloor of the rocky reef attracts fish and many juvenile fish species tend to live in and around rough ground. There is typically good fishing in the vicinity of these areas. Sponges, crustaceans, molluscs, corals and similar species are a part of the rocky reef ecosystem. Snapper, terakihi, blue cod and gurnard are abundant in these areas. These rocky reef areas not themselves commercially fished, but they play an important role in maintaining the fishery as they are areas where fish source their food.
44. I consider that the Morrison 2022 paper should be a cautionary tale, as it identifies that there is a larger extent of rocky reef habitat than was previously understood, and that further areas of rocky reef are awaiting discovery. The absence of information about the extent of these rocky reefs, which are important for fisheries, as well as the effects on them caused by seabed mining, indicates to me that TTR has not adequately assessed the impacts of its proposed operations.
45. At paragraph 24 Dr MacDiarmid reiterates Dr Cahoon’s conclusion “*that the impacts on primary production and ecosystems dependent upon it will be temporally limited, spatially limited occurring in an environment where physical disturbance on much greater scale is a normal feature*”. I disagree with that conclusion and note that there has been no further evidence filed by TTR on the impacts on primary production or the fishing

industry as part of the reconsideration process.

46. In my view the greater geographical extent of the rocky reef within and near to the project area, which has been identified since 2017, demonstrates that the impact on the fisheries industry would be greater.
47. At paragraph 26(a), Dr MacDiarmid suggests that filter feeding bivalves can compensate and feed within a range of suspended sediment concentrations. I agree that the STB is an area of currents and tides that create sediment at levels which filter feeding bivalves can compensate for shortened periods. However, my view is that additional sediment concentrations produced by TTR's mining operation, which is cumulative on natural variations, will tip the balance and potentially cause material harm to organisms in the area. There are examples of this happening. For example, in 2009 there was huge runoff from floods into Golden Bay and the scallop fishery was decimated. There had been many periodic flood events in the area beforehand, however it was the additional load or extra sediment that this event caused that harmed the scallop fishery which to this day has not recovered. In short: just because a species can tolerate some increases in sediment concentrations as part of natural processes, that does not mean it can tolerate those increased levels for sustained periods.
48. Dr MacDiarmid explains at paragraphs 30–31 that the benthic community in the TTR project area is dominated by short-lived, opportunistic and early successional or colonization stages, and is well adapted to the sorts of disturbance that will be generated by the mining activities. In response, I note that the effects of returning 45 million tons per year of sand and sediment into the water is cumulative on the sediment that enters the water as a result of natural coastal process. The suggestion that the marine ecosystem in this area is well adapted to disturbance and will recover in time once the disturbance has ceased (after 35 years) is of concern to me. Over the 35-year duration of the mining consent, there will be 1.57 billion tonnes (that is, 45 million tonnes per year over 35 years) of sand and associated sediment discharged into this area. This is over and above what would have been there naturally.

49. I expect it will take significant time for the benthic communities to recover from the cumulative impacts of this additional sediment load. I agree with Dr MacDiarmid that the time for recovery cannot be stated with precision. However, I would add that in my view we cannot assume the prospect of any recovery at all on the information TTR has provided. I consider it is quite likely that the level of harm to the benthic ecosystems will be irreparable.

Evidence of Dr Childerhouse

50. Dr Childerhouse says at paragraph 2 that there is new information on marine mammals, specifically whales. He says, “*there is a low likelihood of mammals being present in the TTR consent area*”. He then goes on to say that the wider area is “unlikely” to be suitable habitat for Māui dolphins, and if present they are “likely” to be in very low numbers.
51. There were 406 records of sightings of Hector’s and Māui dolphins in the project area. While I appreciate that there may be multiple sightings of the same animal, these are hardly “low numbers,” especially for Maui dolphin where there is a total population of around 54.⁸
52. The key point here is that there is compelling evidence that Maui and Hector’s dolphins frequent this area.
53. The evidence of Māui and Hector’s dolphins in this area has been more than sufficient for the Department of Conservation and Fisheries New Zealand, and the Minister of Fisheries to take urgent action to put very restrictive measures in place to protect them. It would be counterintuitive to allow a proposal in this environment that undermined those efforts that discharged large amounts of suspended sediment and noise into that habitat.
54. It is in my opinion counterproductive for the Fishing Industry to have accepted such restrictive measures to protect nationally critical and nationally threatened species, but for TTR to then undertake mining

⁸ <https://www.doc.govt.nz/nature/native-animals/marine-mammals/dolphins/maui-dolphin/facts/> .
See also Childerhouse (2023) at para 59.

operations that pollute the known habitat for these species. It is not clear to me whether TTR would even find out if a Māui dolphin fatality had been caused by its mining operations, because the mining activity occurs under water.

55. At paragraph 72, Dr Childerhouse lists several resource consents granted in the STB since 2016, including marine consents and marine discharge consents for the Kupe Development Drilling Program. He concedes that these are not directly relevant to the assessment of potential impacts from seabed mining. I note these applications, and their potential effects, are vastly different from TTR's seabed mining application. The effects of the Kupe drilling are very isolated, apply to a small area, and have a short duration. By contrast TTR's application is for a 66 km² area and subsists for a period of 35 years. Compared with oil drilling activities, TTR's application is novel and untested, and will result in significant and prolonged adverse effects over a far greater area. It is not surprising that a more detailed effects assessment and greater level of information is required.

CONCLUSION

56. Upon reading the TTR application, including the reconsideration evidence now available, I have no confidence that there will not be significant adverse effects on and material harm to the marine environment, including the ecosystems and associated fish, mammals, benthos, and other micro-organisms.
57. I am concerned about the flow on effects for the fisheries industry, which as I have explained is already facing difficult times due to changes in the regulatory and economic climate since 2017.
58. My concerns about the adverse effects of TTR's proposal have only increased since I gave evidence to the DMC in 2017. This is because of the changes in regulatory environment, the identification of further areas of rocky reef in the STB area, and the increase in knowledge about maritime safety risks in New Zealand waters.
59. TTR has had considerable opportunity to address the uncertainties and

gaps in the package of information it has provided to the DMC. It has, however, presented very limited new information and I consider it has failed to address the gaps and uncertainties.

60. Much of what I have read in TTR's initial application is based on inadequate information about the receiving environment and the nature of existing fisheries interests, and modelling of that imperfect information. I do not consider it is appropriate to rely on models that in turn rely on inadequate inputs to determine potential impacts of the proposal on fisheries. This is because the uncertainty of potential impacts is only multiplied when there is a lack of information concerning the receiving environment and existing interests.

Dated this 6th day of October 2023

A large black rectangular box redacting the signature of Captain Andrew Peter Smith.

Captain Andrew Peter Smith

**BEFORE THE ENVIRONMENTAL PROTECTION AUTHORITY
AT WELLINGTON**

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

AND

IN THE MATTER of a reconsideration of an application for marine consent and marine discharge consent under section 38 of the EEZ Act by Trans-Tasman Resources Limited to undertake iron ore mining and processing operations offshore in the South Taranaki Bight

BETWEEN **Trans-Tasman Resources Limited**
Applicant

AND **Environmental Protection Authority**
EPA

OPENING LEGAL SUBMISSIONS OF FISHERIES SUBMITTERS

Dated: 4 March 2024

Instructing Solicitor:

[REDACTED]

[REDACTED]

OPENING LEGAL SUBMISSIONS OF FISHERIES SUBMITTERS

1. Trans-Tasman Resources Ltd (**TTR**) has applied for consent under the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (**EEZ Act**) to mine the seabed in a 66 km² area within the South Taranaki Bight (**STB**). It would extract 50 million tonnes of seabed material per year over a 35-year period. The activity is vast in scale and if approved would be novel for Aotearoa New Zealand.
2. TTR first lodged a consent application in 2013. The Fisheries Submitters¹ have been opposed since that time. They have committed significant resource into protecting their existing interests in the fisheries resources of the STB. But despite the passage of over ten years, there is still a lack of information presented by TTR to enable the Fisheries Submitters to properly understand the likely effects of the sediment plume on the fishing industry. There is a serious concern that the marine environment will be materially harmed if the proposed mining and discharge activities are given consent, with flow on effects for the fishing industry. It is not possible, on the information available, to set appropriate conditions to avoid, remedy or mitigate effects on fisheries.
3. These submissions explain the Fisheries Submitters' position. In summary:
 - (a) The reconsideration that this DMC is tasked with is wide reaching and directed at correcting fundamental errors of law in the 2017 DMC decision. Fisheries Submitters' evidence is within that broad scope.
 - (b) The marine discharge consent application cannot be granted unless the DMC is satisfied that there will be no "material harm" caused by the discharge of sediment. That is an environmental bottom line. The 2017 DMC made factual findings that are tantamount to findings of material harm. You can properly place weight on those. There is no new evidence that changes that position. If you apply the bottom line test, then you should conclude that there will be material harm and decline the consents.
 - (c) The information principles in s 61 of the EEZ Act also require that consent be declined.² There is too much uncertainty, and TTR has not

¹ Seafood New Zealand Limited, New Zealand Federation of Commercial Fishermen Inc, Talley's Limited, Southern Inshore Fisheries Management Company Limited and Cloudy Bay Clams Limited.

² EEZ Act, s 61(2) EEZ Act.

provided the best available information despite ample opportunity to address information deficits. TTR's proposed pre-commencement monitoring regime is unlawful.

(d) The TTR proposal is also inconsistent with the nature and effect of the Resource Management Act 1991 (**RMA**) and subsidiary planning instruments, and with the protection of habitats of particular significance for fisheries management, which is part of the nature and effect of the Fisheries Act 1996.

(e) Each of the above points means the application must be declined.

4. These opening submissions now expand on these points.

Errors of law and scope of reconsideration

5. The Supreme Court held that there were several errors of law in the 2017 DMC majority decision. These errors were fundamental and broad in scope. The Court found that the DMC:

(a) Applied an incorrect approach to s 10(1)(b) of the EEZ Act in failing to recognize it as containing an environmental bottom line;³

(b) Failed to favour caution and environmental protection where the information available was uncertain and inadequate — with examples being the effects on seabirds, marine mammals, and the effects of the sediment plume;⁴

(c) Failed to properly apply the statutory direction to have regard to the “nature and effect” of the other marine management regimes (MMRs), including the RMA and NZ Coastal Policy Statement (NZCPS);⁵

(d) Failed to properly engage with tikanga as an existing interest and applicable law;⁶ and

(e) Failed to give reasons for not requiring a bond.⁷

³ *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board* [2021] 1 NZLR 801 (SC): Glazebrook J at [266], Williams J at [292] and Winkelmann CJ at [303].

⁴ Ellen France J at [129]–[131]; Glazebrook J at [274], Williams J at [294]–[295] and Winkelmann CJ at [331].

⁵ Ellen France J at [175]–[187], Glazebrook J at [280], Williams J at [298] and [331] per Winkelmann CJ.

⁶ Ellen France J at [154]–[155], Glazebrook J at [159] and [237], Williams J at [296]–[297] and Winkelmann CJ at [332].

⁷ Ellen France J at [221], Glazebrook J at [285]–[286], Williams J at [299], and Winkelmann CJ at [332].

6. These errors undermined the 2017 DMC majority's decision in a material way. The entire decision was quashed.⁸ Accordingly, there is broad scope for the topics that may need to be addressed on this reconsideration.⁹
7. It would be wrong to narrowly focus on three specific areas of "information deficit", as TTR does.¹⁰ The three specific "deficit" topics identified by the Supreme Court were only *symptoms* of the overarching errors of law in the 2017 DMC's approach.¹¹ One deficit — a lack of information about the effects of the sediment plume — effectively jeopardises the entire marine discharge consent application. The three specific deficit topics are not exhaustive of the findings that are impacted by the DMC's incorrect approach to the statutory purpose, information principles, and other MMRs. The 2017 decision was quashed in its entirety, and in deciding whether you can place reliance on it (or adopt its conclusions or factual assessments), you will need to consider the extent to which its findings were impacted by the errors of law.
8. In our submission, the issues that require reconsideration include (among other things):
 - (a) Effects on fisheries. The 2017 DMC's findings on the effects on fisheries were based on the DMC's assessment of the sediment plume.¹² As there was an error in the DMC's approach to the uncertain effects of the sediment plume,¹³ it follows the DMC's assessment of the 'downstream' effects on fisheries is impacted by that error and must be reconsidered.¹⁴ The Fisheries Submitters' experts have provided updating evidence on the fishing industry, which shows that the level of harm to that industry from the sediment discharge is greater than the position was in 2017. This evidence should rightly be considered in your assessment of whether the bottom line of avoiding material harm has been satisfied in terms of the existing interests of the Fisheries Submitters.

⁸ *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board* [2022] NZHC 1511 at [36].

⁹ Detailed submissions have already been filed on the scope and approach to reconsideration — see Joint Memorandum of counsel on behalf of Certain Submitters dated 30 November 2023, paragraphs 6- 37(c).

¹⁰ Outline of legal submissions for TTR dated 5 February 2024 at [12].

¹¹ Ellen France J at [131], where Her Honour says that "the conditions relating to seabirds and marine mammals [are] the most obvious illustration of the problems".

¹² Decision on marine consents and marine discharge consents application Trans-Tasman Resources Ltd (August 2017) ["2017 DMC decision"] at [893]–[896].

¹³ Ellen France J at [131]; *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board* [2020] NZCA 86 at [259(b)].

¹⁴ TTR accepts this — see Outline of legal submissions for TTR dated 5 February 2024 at [24].

- (b) Changes in the planning framework. Caselaw indicates that changes in planning policy since the original decision will be important in a reconsideration exercise.¹⁵ Here, the nature and effect of the recently operative Regional Coastal Plan for Taranaki is a significant change in planning policy — affording greater protection for certain areas in the coastal marine area — which requires consideration.¹⁶
 - (c) The nature and effect of the Fisheries Act as a recognised MMR. This MMR was not addressed by the 2017 DMC *at all*, let alone through the correct legal framework now articulated by the Supreme Court.¹⁷ This must be considered as part of your decision.
 - (d) Other updating evidence provided by submitters or TTR as to the baseline against which effects are to be measured. The High Court’s 2022 directions decision anticipated “updating” evidence.¹⁸ The discovery of new ecologically sensitive rocky reefs areas within the close vicinity of the proposed mining site is a good example of this.¹⁹
9. The evidence presented by the Fisheries Submitters addresses the above topics that you will need to reconsider. This also responds to TTR’s misplaced objection that the Fisheries Submitters’ evidence is out of scope.

Material harm — a bottom line

10. The Supreme Court held that s 10(1)(b) of the EEZ Act creates an environmental bottom line in the sense that if the marine environment cannot be protected from “pollution” (i.e. material harm) through regulation (conditions) then a marine discharge activity must be prohibited. The assessment of whether harm is “material” requires qualitative, temporal, quantitative and spatial aspects to be weighed.²⁰ The decision-making criteria in s 59²¹ must be weighed in a manner that achieves sustainable management

¹⁵ *R (Perrett) v Secretary of State for Communities and Local Government* [2009] EWCA Civ 1365, [2010] 2 All ER 578 at [26]; *Hawke’s Bay Eastern Fish and Game Councils v Hawke’s Bay Regional Council* [2014] NZHC 3191, [2015] 2 NZLR 688 at [182]-[184].

¹⁶ Statement of evidence of Natasha Sitarz (6 October 2023) at [146].

¹⁷ 2017 DMC decision at [1003], which records that “other marine management regimes” were “taken into account when considering activities relevant to this application”. However, the 2017 DMC at [881] limited its consideration of the Fisheries Act to the cautionary information principle in 10(c) of the Act and did not consider the nature and effect of any other aspects of the Fisheries Act management regime.

¹⁸ *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board* [2022] NZHC 1511 at [37].

¹⁹ Evidence of Greg Barbara (29 September 2023) at [61]-[75] referring to the NIWA/Morrison (2022) paper.

²⁰ *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board* [2021] 1 NZLR 801 (SC) at [3].

²¹ Section 87D (1) and (3) provides that the information principles contained in s 59(2) except (c) and s 59(3) are relevant to assessment of marine discharge consents.

and avoidance of material harm purposes in s 10.²²

11. The 2017 DMC made factual findings, (which the Supreme Court relied upon and endorsed), as to the effects of the sediment plume on certain ecologically sensitive areas. These findings included that:²³
 - (a) For the Pātea Shoals, there will be moderate effects on primary production,²⁴ and the local scale effects on benthic primary productivity may be significant;²⁵
 - (b) Within the Pātea Shoals, the DMC referred to a higher level of adverse effects at the following specific sites:
 - The Crack — significant effects on primary production,²⁶ effects of concern on rich and diverse benthic fauna,²⁷ temporary or permanent displacement of species,²⁸ and major effects on visibility for diving;²⁹
 - Project Reef — significant effects on primary production,³⁰ and major effects on visibility for diving;³¹
 - Graham Bank — significant adverse effects on fish and primary production,³² and effects including temporary or permanent displacement of species.³³
12. Should you rely upon and adopt these assessments? In our submission, the answer is yes. They are not significantly impacted by the DMC's errors of law in the approach to the "material harm" bottom line. The DMC's error was not appreciating the legal significance of its findings. To the extent that the DMC applied the wrong legal approach in forming its views, a correction of the error would only make the assessed level of harm greater. We now explain this point further by reference to the 2017 DMC decision.

²² *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board* [2021] 1 NZLR 801 (SC) at [5].

²³ Glazebrook J at [268] and Appendix 3. See also *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board* [2020] NZCA 86 at [111].

²⁴ 2017 DMC decision at [350] and [970].

²⁵ 2017 DMC decision at [968].

²⁶ 2017 DMC decision at [350] and [970].

²⁷ 2017 DMC decision at [406].

²⁸ 2017 DMC decision at [437] and [980].

²⁹ 2017 DMC decision at [952].

³⁰ 2017 DMC decision at [350] and [970].

³¹ 2017 DMC decision at [952].

³² 2017 DMC decision at [350], [940] and [970].

³³ 2017 DMC decision at paragraphs [437] and [980].

13. The 2017 DMC helpfully explains what it means by the various descriptors (e.g. major, moderate, etc.) it uses to characterise effects by reference to “Table 5” in its decision.³⁴ Table 5 includes descriptors based on a scale in TTR’s application. Table 5 is set out in the Appendix to these submissions.
14. Table 5 does not define the word “significant”, but “significant” is commonly understood in the RMA context as denoting effects that are “more than minor”.³⁵ The DMC majority appears to use the term “significant” as greater than “3 – Moderate” and synonymous with “4 – Major” or “5 – Severe” as defined in Table 5.³⁶
15. TTR tries to escape these findings of “significant” or “moderate” harm by arguing they are expressed in “different terminology” to the Supreme Court’s prescribed material harm tests.³⁷ It says that this DMC needs to consider whether the findings have accounted for all of the qualitative, quantitative, temporal, and spatial dimensions.
16. In our submission, the 2017 DMC adequately accounted for the relevant qualitative, quantitative, and spatial dimensions in reaching its findings about the harm to the Pātea Shoals. An account of qualitative, quantitative and spatial dimensions is implicit in the DMC’s use of the Table 5 consequence levels. And explicit in, by way of example, the DMC’s findings on oceanic productivity at paragraphs 345–350, which:
 - (a) Note the Pātea Shoals is an important site due to its large area of relatively shallow depths — i.e. a spatial and qualitative dimension;
 - (b) Conclude that at the scale of the SMD (“Sediment Model Domain”, a 13,300 km² area), the effects may be discernible but not significant, but that at the local scale effects on benthic primary productivity may be significant — i.e. a spatial dimension;

³⁴ DMC 2017 Decision under the heading “Effects of the activities” the DMC explains its approach, noting at [135] and Table 5: “We have used the scale established in the table where relevant when considering the ecological consequences of impacts on habitats.”

³⁵ See for example *RJ Davidson Family Trust v Marlborough District Council* [2017] NZHC 52, [2017] NZRMA 227 at [44]. This use of “significant” is carried over in the Classification of Regulations under the EEZ Act. Section 29A(6) of the EEZ Act provides that ‘the regulations must not provide for the discharge of a harmful substance as a permitted activity, if in the Ministers opinion (a) the activity has or is likely to have adverse effects on the environment or an existing interest that are significant in the circumstances;’

³⁶ 2017 DMC decision at [350] indicates that “significant” effects at The Crack and The Project Reef are greater than the “moderate” effects on the Pātea Shoals more generally.

³⁷ Outline of legal submissions for TTR dated 5 February 2024 at [26].

- (c) Note that a “SMD” approach leads to a discounting in the assessment of ecologically sensitive areas or valued ecosystem components, and therefore it is necessary to pay attention to localized impacts — reflecting the DMC’s judgement on the appropriate spatial scale; and
 - (d) Ultimately conclude that “the effect on the primary production of the Patea Shoals is likely to be moderate but will be significant at ecologically sensitive areas such as The Crack and The Project Reef”.
17. There were quantitative inputs into this evaluation in the expert evidence that the DMC had regard to, as well as the use of Table 5. Dr MacDiarmid has confirmed that the information placed before the DMC in 2017 included qualitative, temporal, quantitative and spatial aspects.³⁸
 18. The temporal dimension is arguably absent from the 2017 DMC’s assessment of oceanic productivity, because timescales are not expressly mentioned at paragraphs 345–350 of the decision. Timeframes are however a part of the Table 5 “consequence levels” matrix that the DMC utilised, because it includes assessment of recovery times.
 19. The “recovery time” input into the DMC’s assessment does not reflect the correct legal approach to the “material harm” test.³⁹ The Supreme Court held that the assessment must take into account the total duration of the project harm before remediation occurs.⁴⁰ This is in keeping with the Act’s broad definition of effect.⁴¹ It is an error to focus on the recovery time after mining ceases, which is the approach taken by Dr Cahoon and by extension Dr MacDiarmid (and is the premise of the recovery period in Table 5).⁴²
 20. But correcting that error does not advance TTR’s position. Once you consider the full timeframe over which the harm subsists (i.e. the mining period plus (estimated) recovery period), it seems unlikely that the 2017 DMC’s findings of significant/major/moderate harm can be fairly reframed as “immaterial”. Adding in the harm suffered during the mining period (as opposed to just the recovery period) can only increase the assessed level of impact.
 21. In summary, you can therefore rely upon and adopt the 2017 DMC’s findings

³⁸ Rebuttal evidence of Alison MacDiarmid (23 January 2024) at [30].

³⁹ Glazebrook J at footnote 440.

⁴⁰ Glazebrook J at [257], Williams J at [292] and Winkelmann CJ at [319].

⁴¹ EEZ Act, s 6, definition of effect.

⁴² Evidence of Alison MacDiarmid (19 May 2023) at [24]; Evidence of Lawrence Cahoon (15 December 2016) at [41].

that we have noted above at paragraph 11. Those DMC findings account for the relevant qualitative, quantitative and spatial dimensions. To the extent the DMC erred in considering the temporal dimension, that error results in an understatement of the level of harm. In substance, therefore, the 2017 DMC found that the material harm bottom line test was not met in respect of certain ecologically sensitive areas. That should be given significant weight in circumstances where the Supreme Court endorsed and relied upon those findings in explaining the correct legal framework.

22. Where the 2017 DMC went wrong was in failing to appreciate that its findings of material harm (or similar) were fatal to the application. Now that the correct legal framework has been elucidated, the only option available to you is to decline the application. As Glazebrook J said:⁴³

There is also much force in the iwi parties' submission that the DMC majority could not, had it properly directed itself in terms of the requirements of s 10(1)(b), have rationally come to the conclusion it did in light of a sediment plume that, for a distance of 2–3 km of the mining site, would have "severe effects on seabed life" and significant effects on ecologically sensitive areas (ESAs) substantially further from the site.

23. This is particularly the case where TTR's own experts confirm that no new or further information has been filed for the reconsideration process, for example in relation to key information gaps such as sediment plume modelling,⁴⁴ the effects of the sediment plume,⁴⁵ and effects on seabirds.⁴⁶ The consequence of this must be that the previous 2017 DMC findings should stand.
24. If, however, this DMC decides to revisit the findings that we have referred to, then you will need to exercise judgement as to the appropriate temporal and spatial scale against which material harm is assessed.
25. TTR invite the DMC to adopt a very broad starting point in assessing materiality.⁴⁷ For example, Dr MacDiarmid suggests that the effects of mining will be "negligible" if the area of suspended sediment concentrations are small

⁴³ Glazebrook J at [268].

⁴⁴ Evidence of Helen Macdonald (19 May 2023) at [7].

⁴⁵ Evidence of Alison MacDiarmid (19 May 2023) at [19]–[35], which largely repeats and rephrases evidence presented in 2017 without providing new material.

⁴⁶ Evidence of David Thomson (19 May 2023) at [11].

⁴⁷ Outline of legal submissions for TTR dated 5 February 2024 at [9].

compared to the area used by the populations of these species.⁴⁸ But when considering effects, a key question to ask yourself is “compared to what?” Of course, many harms can be framed as immaterial when compared against an indeterminate area and time period. Following this reasoning, it is possible to describe almost any proposal (regardless of how catastrophic the effects will be) as having minimal effect depending on the time and spatial scale.

26. But that is not a realistic or correct approach to the bottom line.
 - (a) In terms of the spatial dimension, assessing harm over the entire “sediment model domain” is the wrong approach.⁴⁹ The sediment model domain is an area of 13,300 km² of coastal waters.⁵⁰ Using this lens will mean that you discount ecologically sensitive areas or valued ecosystem components that occur on smaller spatial scales. These features are important “constituent parts” of ecosystems that form the natural environment, and it is this environment that must be protected against material harm.⁵¹
 - (b) In terms of the temporal dimension, the Supreme Court has held that you must take into account the entire period over which harm subsists.⁵² The ecological assessment framework used by Dr MacDiarmid and adopted by the 2017 DMC is not the correct tool, because it only accounts for the recovery time period.⁵³
27. Even if you consider that TTR’s experts have shown that the evidence available as at 2017 can be interpreted as supporting a finding that any harm is immaterial, that is not the end of the matter. You must go on to consider the updating information provided by submitter parties, which shows there will be a greater (rather than lesser) level of harm than was the case as at 2017. For example, there is now known to be a greater extent of ecologically sensitive rocky reef environments in the vicinity of the mining area. The experts on benthic ecology agree that if there are large reefs (within 1-2km of the near plume modelling area) to the proposed mining site then there is potential for significant ecological impact, and that additional survey effort is required to

⁴⁸ Rebuttal evidence of Alison MacDiarmid (23 January 2024) at [12].

⁴⁹ 2017 DMC decision at [349].

⁵⁰ 2017 DMC decision at [178].

⁵¹ EEZ Act, s 4, definition of “environment”.

⁵² *Trans-Tasman Resources Ltd v Taranaki-Whanganui Conservation Board* [2021] 1 NZLR 801 (SC) at [5(b)(iii)].

⁵³ 2017 DMC decision table 5 on page 32.

identify these sensitive benthic habitats within 2km of the mining area.⁵⁴ This is new evidence that is relevant to the qualitative and spatial aspects.

Information principles

28. The information principles in the EEZ Act include that you must base your decision on the best available information and take into account any uncertainty or inadequacy in the information available.⁵⁵ If the information is uncertain or inadequate, then you must favour caution and environmental protection.
29. In our submission, the level of uncertainty means the only approach that favours caution and environmental protection is to decline the application. A key area of uncertainty is in “baseline” information about the marine environment as it stands now.
30. The lengthy history of TTR’s proposal is important. To start, there was a great deal of uncertainty in TTR’s initial application filed in 2013. The 2014 DMC decision declined consent, due to uncertainty regarding the potential effects of the sediment plume and changes to the seafloor bathymetry on existing iwi and fishing interests and impacts on marine mammals and habitats of threatened species.⁵⁶ The DMC recorded: “we lack confidence in granting a consent for a 20 year large scale mining project in this environment when we do not have adequate environmental baseline information and where it is left to a process, in respect to which we have no role, to analyse and interpret baseline information, to develop an environmental management and monitoring plan and to set trigger compliance values for critical environmental parameters”.⁵⁷ In short, the baseline information was not adequate.
31. Moving forward to 2017. By this time, there was still a similar level of uncertainty in terms of the environmental baseline. To address that uncertainty, the DMC majority imposed condition 48 requiring two years of pre-commencement monitoring against a substantial list of 16 topics.⁵⁸ The minority, by contrast, said the lack of adequate baseline information means it

⁵⁴ Joint statement of experts in the fields of sediment plume modelling and effects on benthic ecology (23 February 2024) at [51]–[53]. See also Evidence of Greg Barbara (29 September 2023) at [68] and [73].

⁵⁵ EEZ Act, ss 61 and 87E.

⁵⁶ 2014 decision at paragraph [9], [108]–[110], [846].

⁵⁷ Trans-Tasman Resources Ltd Marine Consent Decision (June 2014) at [134].

⁵⁸ 2017 DMC decision at [1065], where the DMC said that the pre-commencement monitoring period was to “provide sufficient information as a precursor to commencing extraction of seabed materials”.

could not adequately describe the potentially affected environment and assess the sensitivity of the receiving environment, and it followed that formulation of robust consent conditions was not possible.⁵⁹ This was confirmed by the Supreme Court.⁶⁰

32. The Supreme Court was critical of the DMC's decision to rectify the information deficits by pre-commencement monitoring. It described these conditions as being a "mechanism for providing baseline information as to effects, which was lacking in TTR's application",⁶¹ and the conditions being "designed to collect the very information that would have been required" to draw conclusions as to the possible effects, harms and impacts of the conditions.⁶² The Court found that this failed to meet the requirement to favour caution and environmental protection.⁶³ Glazebrook J said:⁶⁴

... I think it is strongly arguable that in this case the pre-commencement monitoring conditions (conditions 48 to 51) were ultra vires as they went well beyond monitoring or identifying adverse effects and were for the purpose of gathering totally absent baseline information.

33. There are three reasons why a proper application of the information principles requires you to decline the present application.
34. First, TTR has simply failed to provide the missing baseline information. It has been on notice of that deficiency since the June 2014 DMC decision. The pre-commencement monitoring condition that it proposed in the 2016 application was for the purpose of gathering baseline information over a two-year period.
35. The Supreme Court invited TTR to address the uncertainty and information deficits by remedying those deficits.⁶⁵ It is surprising that TTR elected not to provide further information by way of monitoring, or otherwise sought to remedy the uncertainty. Its expert evidence on the sediment plume modelling/effects, and effects on seabirds, acknowledges that no further

⁵⁹ 2017 DMC decision, minority decision at page 228, [3]. A different DMC reached a similar finding and declined consent for the Chatham Rock Phosphate application for marine consents and marine discharge consents in February 2015 — see Decision on Marine Consent Application Chatham Rock Phosphate Limited (February 2015) at [824].

⁶⁰ Ellen France J at [129].

⁶¹ Ellen France J at [205].

⁶² Glazebrook J at [275].

⁶³ Ellen France J at [205] and Glazebrook J at [275]-[276]. See also the Court's summary at [12].

⁶⁴ Glazebrook J at [276].

⁶⁵ Ellen France J at [229].

information has been produced since December 2016.⁶⁶

36. Dr Jorrisen, an expert in sediment plume modelling, explains the difficulties with the model that TTR relies on. In his view, it does not predict with sufficient accuracy the nature and rate of the fine sediment released by the mining operations,⁶⁷ and does not represent the “worst case scenario” for several reasons.⁶⁸ He considers that the operational sediment plume model will not provide an accurate prediction of the sediment plume.⁶⁹ Dr Barbara notes further areas of uncertainty, including inadequate benthic surveys,⁷⁰ effects of sediment redistribution,⁷¹ and the percentage of fines and ultra-fines in the sediment.⁷² These major uncertainties in the modelling will have flow on impacts for other topics.
37. Secondly, TTR’s only way around the uncertainty is to continue to rely upon the pre-commencement monitoring condition (condition 48) in the form criticised by the Supreme Court. It has not sought to amend this condition,⁷³ despite the Supreme Court noting the “information was in important respects entirely lacking and would only become available once the pre-commencement monitoring had occurred and the opportunity for public input had passed.”⁷⁴
38. In our submission, condition 48 is unlawful. The Act only enables conditions to be set for the purpose of “deal[ing] with adverse effects of the activity ... on the environment or existing interests”.⁷⁵ Examples of the types of conditions that might be lawfully imposed are set out in s 63(2),⁷⁶ including a condition requiring monitoring and reporting on “the exercise of the consent and the effects of the activity it authorises”.
39. Condition 48 falls outside the permitted purpose for which conditions can be imposed. It is for the purpose of gathering absent baseline information about the receiving environment to understand the characteristics of that

⁶⁶ Evidence of David Thompson (19 May 2023) at [11]; Evidence of Helen Macdonald (19 May 2023) at [7]; Evidence of Alison MacDiarmid (19 May 2023) at [19].

⁶⁷ Evidence of Joris Jorrisen (2 October 2023) at [17].

⁶⁸ Evidence of Joris Jorrisen (2 October 2023) at [19]–[20].

⁶⁹ Evidence of Joris Jorrisen (2 October 2023) at [31].

⁷⁰ Evidence of Greg Barbara (29 September 2023) at [33]–[37].

⁷¹ Evidence of Greg Barbara (29 September 2023) at [38]–[46].

⁷² Evidence of Greg Barbara (29 September 2023) at [47]–[53].

⁷³ Evidence of Philip Mitchell (19 May 2023) at [20].

⁷⁴ Glazebrook J at [277], Williams J at [295] and Winkelmann CJ at [329].

⁷⁵ EEZ Act, s 63(1), which links conditions to the purpose of “deal[ing] with adverse effects”.

⁷⁶ But see EEZ Act, s 87F(4) in respect of marine discharge consents.

environment.⁷⁷ The condition is not about monitoring and reporting on the activity and its adverse effects, but rather for setting the baseline against which the effects of the activity will be measured later. As Glazebrook J said:⁷⁸

This information deficit could not legitimately be compensated for by conditions designed to collect the very information that would have been required before any conclusion at all could be drawn as to possible effects, any possible material harm and any effect of any possible conditions. No conclusion was therefore possible on what the bottom line could be met and a consent could not legitimately be granted.”

40. The purpose of the pre-commencement monitoring is clear from the DMC 2017 decision and TTR’s recent evidence.⁷⁹ And Ms Sitarz, Forest & Bird’s planning expert, explains that the pre-commencement monitoring condition goes further than just informing operational model outputs, because it involves monitoring of sediment quality and marine mammals to gather additional information, *which inform the imposition of limits*.⁸⁰
41. From a policy perspective, there are good reasons why the EEZ Act does not permit pre-commencement monitoring regimes of this nature. They delegate the DMC’s condition setting power to an EPA “certification” process, where the monitoring leads to a review and possible adjustment of certain matters (e.g. numerical SSC limits) to reflect *actual rather than modelled* conditions.⁸¹ It is unlawful for conditions of consent to delegate the consent authority’s decision-making power.⁸² Doing so means that submitters are deprived of the right to submit on the effects of the proposal and are excluded from the subsequent process of reviewing limits.⁸³
42. Of particular concern to Fisheries Submitters is TTR’s failure to do any proper analysis on commercial fisheries in the STB to enable the effects of TTR’s

⁷⁷ Glazebrook J at [275]–[276]; Williams J at [295] and Winkelmann CJ at [329].

⁷⁸ Glazebrook J at [275].

⁷⁹ 2017 DMC Decision at [36], [155], [1062], [1064]–[1065]. Dr Childerhouse explains the pre-commencement monitoring is to “allow meaningful comparisons with future and ongoing survey work to assess potential trends or changes” (Evidence of Simon Childerhouse (19 May 2023) at [111]). See also Evidence of Philip Mitchell (19 May 2023) at [20], and Evidence of David Tompson (19 May 2023) at [46].

⁸⁰ Evidence of Natasha Sitarz (6 October 2023) at [68].

⁸¹ 2017 DMC decision at [1064] and condition 51. See also Glazebrook J at [278], where Her Honour says that “some of the suspended sediment concentration limits required to be complied with under condition 5 are only to be set following the pre-commencement monitoring”, with reference to DMC 2017 decision at condition 48 and 51 and sch 2.

⁸² *Royal Forest and Bird Protection Society Inc v Gisborne District Council* [2013] NZRMA 336 (EnvC) at [83]–[85]; *Mount Field Ltd v Queenstown Lakes District Council* [2012] NZEnvC 262 at [77]; *Aubade NZ Ltd v Marlborough District Council* [2015] NZEnvC 154 at [37]; *Turner v Allison* [1971] NZLR 833 (CA) at 856–857.

⁸³ Glazebrook J at [277]; Williams J at [295] and Winkelmann CJ at [329].

proposal to be understood. Fisheries Submitters have not been provided with up-to-date fisheries catch data and other analysis that might enable an overall economic and social impact assessment of the effects on commercial fisheries.⁸⁴ The previous DMC wrongly sought to address this information deficit by including monitoring of commercial fishing as part of condition 48.⁸⁵

43. In light of this, condition 48 must be eliminated from your assessment of TTR's application. This condition forms the crux of how TTR proposes to address uncertainty. In its absence the only way to favour caution and environmental protection is to decline the consent.
44. Our third submission on the information principles is that you have not been presented with the best available information. Best available information means the best information that, in the particular circumstances, is available without unreasonable cost, effort, or time.⁸⁶
45. It can be inferred from the proffering of the pre-commencement condition 48 that a reasonable level of monitoring information could have been obtained within a two-year period and at a reasonable cost. But TTR has not done that work since the Supreme Court decision in 2021.
46. TTR have provided no explanation of why the costs involved with collecting a reasonable level of baseline monitoring data were unreasonable. TTR has spent significant resource on advancing (and litigating) its application. It cannot rationally say that obtaining the baseline information is unreasonable.
47. The information before you is the best information *that TTR is willing to provide*. This falls far short of the "best available information" standard in the Act and is inconsistent with the applicant's obligation to provide basic information about the environment that it wishes to operate in, against which the application can be properly assessed.
48. The recent experts' conference on the effects on fishing confirmed that the analysis presented is not based on the best available information, as the information is out of date and additional available information should have been considered.⁸⁷ The experts also agreed that there would be benefit in

⁸⁴ Evidence of Jeremy Helson (6 October 2023) at [33].

⁸⁵ 2017 DMC decision at [889] and [899], which notes there is a pre-commencement monitoring requirement for the Consent Holder to establish the existing "background conditions" relating to commercial fishing.'

⁸⁶ EEZ Act, s 61(5).

⁸⁷ Joint witness statement – effects on fishing and effects on fish (20 February 2024) at [17].

having a fuller understanding of the location and extent of rocky reefs as habitats for reef fish and nursery areas within the predicted impact zone.⁸⁸

Dr Helson's evidence explains what sort of analysis would be required to understand the effects on commercial fisheries.⁸⁹

49. The DMC may be tempted to request the EPA or submitters to provide further information so that uncertainty is reduced, and information comes closer to the "best available information" standard. However, it is not the role of the DMC or submitter parties to fill gaps. The onus to bring enough information about the proposal is on the applicant.⁹⁰ As the Supreme Court held, inadequacies in the information available disadvantage the applicant not others.⁹¹
50. In light of this, and the multiple opportunities over a long period that TTR has had to fix known informational deficiencies, in our submission you should decline consent on the basis that you do not have "adequate information" to determine the application.⁹² This is a fair outcome in circumstances where submitters have been put to significant cost to respond to inadequate information.

Other marine management regimes (MMRs)

51. The Supreme Court majority held that bottom lines in other MMRs cannot be outweighed by other factors in the s 59 decision making matrix. That is because there must be synergy between the s 10(1)(b) bottom line and other bottom lines (such as those in the NZCPS).⁹³ There is an equivalence between the requirement of the "avoid" policies in the NZCPS and the "material harm" bottom line in the EEZ Act.⁹⁴
52. TTR's planning witness, Dr Mitchell, suggests that other MMRs are not required to be complied with.⁹⁵ This is the wrong approach in light of the Supreme Court's direction that bottom lines in other MMRs cannot be overridden by other factors. The correct approach requires that decisions

⁸⁸ Joint witness statement – effects on fishing and effects on fish (20 February 2024) at [41].

⁸⁹ Evidence of Jeremy Helson (6 October 2023) at [33].

⁹⁰ EEZ Act, ss 39 and 54.

⁹¹ Ellen France J at [137].

⁹² EEZ Act, ss 62(2) and 87F(3).

⁹³ Glazebrook J at [280], Williams J at [298], and Winkelmann CJ at [331].

⁹⁴ *Port Otago Ltd v Environmental Defence Society Inc* [2023] NZSC 112, [2023] 1 NZLR 205 at [65].

⁹⁵ Rebuttal evidence of Philip Mitchell (23 January 2024) at [24]. See also Joint Statement of experts in the field of planning including conditions (27 February 2024) at [17].

under the EEZ Act march “in lockstep” with other MMRs.⁹⁶

Environmental bottom lines in the RMA

53. In *King Salmon* the Supreme Court confirmed that RMA and its subsidiary instruments include relevant bottom lines.⁹⁷ These will be exceeded by TTR’s proposal.
54. First, s 107 of the RMA provides a mandatory direction to decision makers, as to when they “must not” grant discharge consents. They must not grant a discharge consent or coastal permit to do something that would be likely to give rise to a conspicuous change in the colour or visual clarity, or any significant effects on aquatic life in receiving waters after reasonable mixing.
55. TTR did not define a zone of reasonable mixing in the 2017 proceeding.⁹⁸ Its legal submissions suggest the zone of reasonable mixing is “20km from the mining source”.⁹⁹ If that is seriously TTR’s view, then the zone is enormous and TTR has not provided a realistic attempt to define a reasonable mixing zone. This suggests its proposal is not consistent with the nature and effect of the s 107 direction. It should not be permitted to sidestep this bottom line by failing to define a realistic and reasonable mixing zone for its marine discharge. The clear nature and effect of s 107 is to prohibit discharges of this type within the coastal marine area.¹⁰⁰
56. The Fisheries Submitters agree with the evidence from Ms Sitarz that the TTR proposal is inconsistent (or may be inconsistent but there is uncertainty) with bottom lines in the NZCPS,¹⁰¹ Taranaki Regional Policy Statement,¹⁰² Regional Coastal Plan for Taranaki,¹⁰³ and the Horizons One Plan.¹⁰⁴
57. Notably the Regional Coastal Plan has only recently become operative. It will

⁹⁶ Williams J at [298].

⁹⁷ *Environmental Defence Society Inc v The New Zealand King Salmon Co Ltd* [2014] 1 NZLR 593 (SC) at [132].

⁹⁸ 2017 DMC decision, minority at [44].

⁹⁹ Rebuttal evidence of Philip Mitchell (23 January 2024) at [37], referring to TTR’s marine management regime memorandum dated 25 August 2023.

¹⁰⁰ See Evidence of Natasha Sitarz (6 October 2023) at [61] and 2017 DMC decision at [952] (more than 20% reduction in visibility in parts of the CMA) and [970] (“significant impact on the Traps”).

¹⁰¹ Evidence of Natasha Sitarz (6 October 2023) at [109]–[118]. NZCPS avoid Policies 11, 13, 15 and 23 and 22 (“will not result in”) are examples of environmental bottom lines in the NZCPS.

¹⁰² Evidence of Natasha Sitarz (6 October 2023) at [141]–[145]. There is agreement between the planners that RPS CNC Policy 1, CNC Policy 4, BIO Policy 3, NFL Policy 1, HIS Policy 2 are in the nature of bottom lines.

¹⁰³ Evidence of Natasha Sitarz (6 October 2023) [167]–[174]. Policies 9, 15 and 22 and 10 of the Regional Coastal Plan are bottom lines.

¹⁰⁴ Evidence of Natasha Sitarz (6 October 2023) [187]–[190]. Objectives 8-2, Policy 8-6 and policies 5-3, 18-9 and 18-12 of the Horizons One Plan are bottom lines.

require fresh assessment as it was not a feature of the 2017 DMC decision. By way of example, Ms Sitarz's evidence is that the proposal is inconsistent with the bottom line in Policy 9 of the Regional Coastal Plan. That policy is to protect the visual quality and the physical, ecological and cultural integrity of coastal areas of outstanding value identified in schedules. The Project Reef is a scheduled area of outstanding value. Ms Sitarz concludes that the potential for significant and major adverse effects on the Project Reef is inconsistent with this bottom line.¹⁰⁵

Bottom lines in the Fisheries Act 1996

58. The Fisheries Act is a pertinent MMR whose nature and effect was not properly assessed in 2017. The DMC majority made only passing reference to the Fisheries Act.¹⁰⁶ This is a symptom of a broader error of law in the DMC's approach taken to other MMRs.
59. TTR accepts that the Fisheries Act contains an environmental bottom line, because it has an objective of "ensuring sustainability",¹⁰⁷ defined to mean:
 - (a) maintaining the potential of fisheries resources to meet the reasonably foreseeable needs of future generations; and
 - (b) avoiding, remedying, or mitigating any adverse effects of fishing on the aquatic environment.
60. There are further bottom lines in s 9 of the Fisheries Act, which are part of the objective of ensuring sustainability. All persons exercising powers/functions under that Act must take into account the following environmental principles:
 - (a) associated or dependent species should be maintained above a level that ensures their long-term viability:
 - (b) biological diversity of the aquatic environment should be maintained:
 - (c) habitat of particular significance for fisheries management should be protected.
61. The expert called by the Fisheries Submitters on this, Dr Helson, has provided

¹⁰⁵ Evidence of Natasha Sitarz (6 October 2023) at [152]–[154] and [167].

¹⁰⁶ 2017 DMC decision at [881], which notes the DMC has had regard to the Fisheries Act and cross-refers to another part of the decision (part 24.11, at [1001]–[1024]). That part of the decision does not however refer to the Fisheries Act.

¹⁰⁷ TTR's marine management regime memorandum (25 August 2023) at [73].

evidence focused on the third of these principles. His opinion is that there is a deficit of information about the presence of habitats of particular significance for fisheries management in TTR's application, but that important biological areas for biodiversity and fish nurseries within the predicted plume extent have been identified. Dr Barbara says these are "important areas for biodiversity and fish nurseries",¹⁰⁸ although the extent is uncertain because the information required to assess that has not been provided.¹⁰⁹

62. In the absence of proper assessment of the Fisheries Act bottom lines, you cannot be confident that TTR's proposal is consistent with the nature and effect of the Fisheries Act bottom line of ensuring sustainability.

Conditions

63. The Fisheries Submitters disagree with TTR that the conditions will avoid remedy and mitigate the effects of the proposal. They have five major areas of concern with the proposed condition framework which, taken together, mean that consent cannot be granted.
64. First, as explained above,¹¹⁰ the pre-commencement monitoring condition 48 is unlawful and must be removed from your consideration.
65. Secondly, the amendments to the conditions framework that TTR proposes do not address the Supreme Court's concerns. The Court found that the conditions requiring "no adverse effects at a population level" were not sufficiently defined or certain to remedy, mitigate or avoid the effects.¹¹¹
66. TTR's response through Dr Mitchell has been to propose that conditions 9 and 10 just refer to "no adverse effects".¹¹² But this does not answer the criticism. The Supreme Court said that the conditions need to say "something more" about how the adverse effects would be measured.¹¹³ TTR proposes to say less. It does not propose to measure adverse effects against any specified standard.¹¹⁴ This means the conditions are even less appropriate in terms of how the adverse effects on seabirds and marine mammals are measured.

¹⁰⁸ Evidence of Greg Barbara (29 September 2023) at [63].

¹⁰⁹ Evidence of Jeremy Helson (6 October 2023) at [51]–[52].

¹¹⁰ Above at paragraphs 37 to 43.

¹¹¹ Ellen France J at [129]–[130].

¹¹² Evidence of Philip Mitchell (19 May 2023) at [24].

¹¹³ Ellen France J at [130].

¹¹⁴ Ellen France J at [130].

67. Thirdly, there is no condition requiring ongoing monitoring or a management response to adverse effects on commercial fishing, despite this being a matter for pre-commencement monitoring in condition 48. Commercial fisheries are excluded from the lists in conditions 54 and 55, for no apparent reason. Dr Helson expresses concern that this means there will be no monitoring by TTR of the adverse effects on commercial fishing, or management response when such adverse effects arise.¹¹⁵ TTR has not addressed this issue in its rebuttal evidence or elsewhere and instead has suggested this is out of scope.
68. Fourthly, condition 4(d) is problematic. As explained by Mr Jorrisen, the provision in condition 4(d) for a maximum concentration of ultra fine sediments that can be discharged into the sea is based on insufficient source data and is only assessed retrospectively. This means it can result in situations where non-compliances related to the sediment plume will only be established retrospectively after a significant period of time (up to a week). This condition set up, using a rolling average,¹¹⁶ is not an effective measure to limit the amount of sediment being released by the mining activity, and the DMC can have no confidence it will be complied with.¹¹⁷
69. Fifthly, there is an issue of whether TTR should be required to provide a bond. TTR's submissions say that a bond is not required because any unforeseen risks are unplanned events and will be covered by insurance. The Fisheries Submitters disagree because:
- (a) TTR has not provided the terms of the proposed insurance. We do not know what occurrences are covered, and what deductible might impact on the efficacy of the insurance in guarding against unforeseen risks.
 - (b) It is not clear whether insurance would continue if TTR went into liquidation. There is no mechanism to prevent liquidation after TTR has completed the profitable seabed material extraction. If that occurs it would make the benthic recovery condition unenforceable. That was a key concern identified by the Supreme Court.¹¹⁸ It is not answered in TTR's updating evidence.

¹¹⁵ Evidence of Jeremy Helson (6 October 2023) at [34].

¹¹⁶ Rebuttal evidence of Phil Mitchell (23 January 2023) at [103]

¹¹⁷ Evidence of Jorris Jorrisen (2 October 2023) at [26]-[29] and [34].

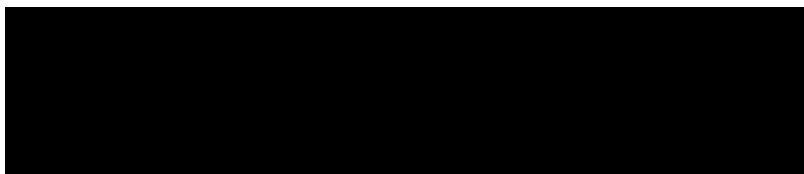
¹¹⁸ Ellen France J at [221].

70. In summary, the conditions proposed by TTR are not sufficiently robust to mitigate the harm caused by the mining operation to an immaterial and acceptable level. You cannot have any confidence in the conditions proposed, and there are problems with the lawfulness and enforceability of the conditions. TTR has not shown that its conditions will protect the environment from pollution.

Conclusion

71. For the reasons given in these submissions, once you correctly apply the legal framework, the only outcome available is to decline the consent application. The proposal will cause material harm to the Pātea Shoals, and specific areas within the Shoals. The conditions proposed have not been shown to be robust or sufficient to mitigate the level of harm to an immaterial level.
72. In addition, the uncertain and inadequate information provided to you means that the requirement to favour caution and environmental protection is engaged. The only way to meet that requirement is to decline the consent. The proposed pre-commencement monitoring conditions are not lawful. The information before you is not sufficient to satisfy you that there will be no material harm or that any material harm will be avoided or mitigated through the conditions.¹¹⁹ Additionally, you do not have the best available information to make a decision on the application. The information principles therefore require that consent be declined.
73. Finally, granting consent would be inconsistent with the nature and effect of various bottom lines in other MMRs — notably the RMA, NZCPS, Taranaki Regional Coastal Plan, and the Fisheries Act. The proper approach when a proposal is inconsistent with bottom lines in other MMRs is to decline consent. Other factors cannot outweigh this.

Dated 4 March 2024

A large black rectangular redaction box covering the signature area.

P D Tancock / D W Ballinger

Counsel for the Fisheries Submitters

¹¹⁹ Glazebrook J at [279].

Appendix – Table 5 in the 2017 DMC decision at [135]

[\(click here to return to submissions\)](#)

Consequence Level	Proportion of Habitat Affected	Population / Community / Habitat Impact	Recovery Period
1 – Negligible	Affecting <1% of area of original habitat area	Interactions may be occurring but unlikely to be ecologically significant (<1% changes in abundance, biomass, or composition) or be detectable at the scale of the population, habitat or community	No recovery time required
2 – Minor	Measurable but localized; affects 1-5% of total habitat area	Possibly detectable with 1-5% change in population size or community composition and no detectable impact on dynamics of specific populations	Rapid recovery would occur if activity stopped – less than 8 weeks
3 – Moderate	Impacts more common; >5-20% of habitat area is affected	Measurable with >5-20% changes to the population, habitat or community components without there being a major change in function	Recovery in >2 months to 1- 2 years if activity stopped
4 – Major	Impacts very widespread; >20-60% of habitat is affected/ removed	Populations, habitats or communities substantially altered (>20-50%) and some function or components are missing/ declining/ increasing well outside historical ranges. Some new species appear in the affected environment	Recovery occurs in 2-10 years if activity stopped
5 – Severe	Impact extensive; >60-90% affected	Likely to cause local extinctions of vulnerable species if impact continues, with a >50-90% change to habitat and community structure and function. Different population dynamics now occur with different species or groups now affected	Recovery period 1-2 decades if activity stopped
6 - Catastrophic	Entire habitat in region is in danger of being affected; >90% affected/ removed	Local extinctions of a variety of species are imminent/immediate. Total collapse of habitat, community or ecosystem processes. The abundance, biomass or diversity of most groups is drastically reduced (by 90% or greater) and most original ecological functional groups (primary producers, grazers etc.) have disappeared	Long-term recovery to former levels will be greater than 1-2 decades or never, even if activity stopped