**BEFORE THE ENVIRONMENTAL PROTECTION AUTHORITY**

**AT WELLINGTON**

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| **IN THE MATTER** | of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (**EEZ Act**) |
| **AND** | |
| **IN THE MATTER** | 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**<br><br>Applicant |
| **AND** | **Environmental Protection Authority**<br><br>EPA |
| **AND** | **Fisheries Inshore New Zealand Limited, New Zealand Federation of Commercial Fishermen Inc, Talley's Group Limited, Southern Inshore Fisheries Management Company Limited and Cloudy Bay Clams Limited**<br><br>Fisheries Submitters |

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# SUPPLEMENTARY STATEMENT OF EVIDENCE OF HELEN MARGARET ANDERSON FOR FISHERIES SUBMITTERS

**Dated: 22nd May 2017**

In response to DMC Minute 43

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Counsel Acting

ROBERT MAKGILL

BARRISTER

Instructing Solicitor

PETER DAWSON

DAWSON & ASSOCIATES

P 03 544 1967 F 03 544 1968 E peter@maritimelaw.co.nz

PO Box 3830, Richmond 7050, New Zealand

## INTRODUCTION

1. My name is Helen Margaret Anderson and I am a Principal Planner with Jacobs New Zealand Limited (**Jacobs**).

2. I completed my primary statement of evidence for the Fisheries Submitters on 23rd January 2017. My qualifications and experience are set out at paragraphs [3] to [7] of my primary evidence.

3. I participated in the expert conferencing session on Conditions and Planning on 2nd March 2017[1].

4. I prepared rebuttal evidence to the expert evidence of Dr Donald Robertson, dated 2nd March 2017[2], rebuttal evidence to the expert evidence of Alison Undorf-Lay, dated 16 March 2017[3]. This is fourth statement of evidence that I have prepared during this hearing.

## CODE OF CONDUCT

5. I have read the Environment Court Code of Conduct for expert witnesses and agree to comply with it.

6. 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.

## PURPOSE AND SCOPE OF EVIDENCE

7. I have been retained by the Fisheries Submitters to prepare evidence for the assessment of Trans-Tasman Resources Limited's (**TTR**) proposed mining activities on fisheries and the supportive ecosystem in the South Taranaki Bight (**STB**).

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1 Joint Statement of Experts in the field of Conditions and Planning, dated 2nd March 2017.

2 Evidence in reply of Helen Anderson to the expert evidence of Dr Donald Robertson, dated 2 March 2017

3 Statement of evidence of Helen Anderson in reply to Alison Undorf-Lay, regarding Review of conditions sought by Sanford in 2014 and those agreed to by Sanford in 2016/17, dated 16 March 2017

8. This supplementary statement of evidence is prepared in response to:

   (a) Dr Mitchell's Supplementary Evidence in Response to Questions from the Decision Making Committee (**DMC**), 2 May 2017, pertaining to the revised marine consent conditions;[4]

   (b) the provision by the EPA Analysis of Conditions Report on 19 May 2017.[5]

**REVISED MARINE CONSENT CONDITIONS**

9. In making the following comments on the proposed consent conditions I am in no way endorsing that the marine consents and marine discharge consents sought by TTR should be granted. I make comments on the proposed conditions in order to assist the DMC in their decision making.

10. The Supplementary Statement of Evidence of Dr Philip Mitchell, dated 2 May 2017,[6] provides a high-level overview of the latest version of the proposed marine consent conditions (**the Revised Conditions**). Key aspects of the Revised Conditions are:

   *(a) Approach taken to define "discharge limits";*

   *(b) Inclusion of a "benthic recovery standard";*

   *(c) Inclusion of an "ecological standard' to be applied to the environment beyond the mining area; and*

   *(d) Structure of the Revised Conditions.*

11. The Environmental Protection Authority (**EPA**) Analysis of Conditions Report, prepared by Dr Rob Lieffering provides a detailed analysis of TTRL's latest set of proposed conditions attached to Dr Mitchell's Expert Supplementary Evidence dated 2 May 2017.

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4 Supplementary Evidence of Dr Philip Mitchell on behalf of TTRL in response to Questions from the Decision Making Committee, dated 2 May 2017.

5 EPA Analysis of Conditions Report, Trans-Tasman Resources Limited offshore iron sand extraction and processing project, dated May 2017

6 Supplementary Evidence of Dr Philip Mitchell on behalf of TTRL in response to Questions from the Decision Making Committee, dated 2 May 2017.

12. Dr Lieffering makes some general comments with respect to the proposed consent conditions in paragraphs [9] to [17] of the EPA Analysis of Conditions Report. I concur with the following comments made, being:

    (a) At paragraph [10], that a *'significant'* change needs to be clearly specified in conditions 6.c, 8 and 9 so that the EPA, as the consent authority, can enforce the conditions and check compliance with them.

    (b) At paragraph [11], that monitoring locations, frequency and duration of monitoring, and what is to be monitored (i.e. where, what, and when) should be 'hard coded' in the conditions, not embedded in the management plans, and any changes to these parameters should be by way of a formal application to change conditions provided for by section 87 of the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012 (**EEZ Act** or **Act**).

    (c) At paragraph [12] that the EPA be required to 'certify' management plans, not 'approve(d)'. Additionally, I agree that plans prepared under other Marine Management Regimes (MMRs) or that are prepared in consultation with other parties or agencies do not need to be certified by the EPA, but should require independent review prior to submission to the EPA.

    (d) With respect to the volunteered or *Augier* conditions, as discussed by Dr Lieffering at paragraph [15], I have no particular view as to whether these should be dealt with by way of side agreements rather than being imposed as consent conditions. In my opinion, if TTR wish to volunteer conditions, then I consider they should be retained as conditions, provided they are effective and enforceable by the EPA.

    (e) At paragraph [16], I agree that there should be the consistent use of terminology throughout the conditions.

13. Dr Lieffering at paragraph [13] of his report supports the approach of the latest set of conditions of including both 'end of pipe' discharge limits (proposed condition 5) and receiving environment Suspended Sediment Concentration (**SSC**) limits (proposed condition 6), but considers that the DMC will need to

be satisfied that compliance with these will result in acceptable environmental effects.

14. I also support the approach now proposed in the latest set of consent conditions, to include both discharge limits and receiving environment limits. In combination, these conditions are intended to address the significant uncertainty concerning TTR's predictive plume modelling and reduce the risks associated with SSC impacts resulting from the proposed mining activity.

15. However, the Fisheries Submitters' experts have some significant concerns, around the level of confidence that should be placed on the 'end of pipe limits', and 'receiving environment SSC limits'. This is because TTR has not provided any evidence on whether it can technically and operationally implement either proposed condition 5 or 6. These concerns are discussed in paragraphs [19] to [30] of this statement.

16. With respect to proposed condition 9: Benthic Recovery, I agree with Dr Lieffering[7] that, as currently worded, this condition does not specify what actions TTRL is required to take if recovery has not occurred or is not 'on track' to be achieved. I see this as a significant oversight which needs to be addressed.

17. Dr Lieffering in Table 1 – Analysis of TTRL Conditions, makes a number of minor edits and supporting comments, none of which I disagree with. If these changes are adopted by the DMC, they will in my opinion, make the conditions more robust, certain and enforceable.

18. Nevertheless, I continue to hold the opinion, as discussed in paragraph [98] of my primary evidence[8], that TTR has not provided adequate information to support approving the present application on the basis of the revised conditions alone. Continuing information gaps, as discussed under the following headings, include:

    (a) Sampling methodologies to be used for 'end of pipe' monitoring;

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7 EPA Analysis of Conditions Report, Trans-Tasman Resources Limited offshore iron sand extraction and processing project, dated May 2017, Table 1. Analysis of TTRL Conditions, page 14.

8 Primary Expert Evidence of Helen Anderson on Environmental Planning for Fisheries Submitters, dated 23 January 2017.

(b) How the 'end of pipe' discharge limits are going to be monitored or controlled. Lack of an Environmental Management Plan (**EMP**) that details how samples will be collected and monitoring managed;

(c) Operational risk;

(d) Sediment Plume Modelling and uncertainty;

(e) Baseline information and Monitoring.

**PROPOSED CONDITION 5 - DISCHARGE LIMITS AND CONDITION 6 – ENVIRONMENTAL LIMITS**

19. The intent of proposed condition 5, specifically conditions 5.c and 5.d, is to limit the sediment discharge rate being discharged into the sea by setting the rate (in $m^3$/hr) of discharge of the de-ored sediment of a certain size (being <38 microns) over certain time periods. By controlling the rate of the discharge and size of the de-ored sediment, TTR considers that it can control the release of fine sediments to a level that will manage environmental effects of the mining activity at an acceptable level.

20. The intent of proposed condition 6 is to provide controls on the maximum suspended sediment concentrations allowed to be present within the receiving environment during operations, by ensuring that SSC limits at any of the seven monitoring sites, when compared to baseline SSC are not exceeded.

21. Fisheries experts' have reviewed conditions 5 and 6. Assuming TTR is able to implement proposed conditions 5 and 6, Dr Barbara[9] and Mr Jorrisen[10] consider that the risks of impacts from the mining operation due to release of fine sediments are less likely to occur and are likely to limit the SSC impacts to those predicted in the sediment plume modelling reports.

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9 Supplementary Statement of Evidence of Dr Greg Barbara in response to DMC Minute 41, dated 19 May 2017, paragraph [26]

10 Supplementary Statement of Evidence of Mr Joris Jorissen in response to DMC Minute 41, dated 19 May 2017, paragraph [13]

22. However, the Fisheries Submitters experts have concerns regarding TTR's proposed conditions 5 and 6 regarding:

    (a) proposed values and sampling methodologies; and

    (b) more fundamentally, whether the proposed conditions can be technically and operationally given effect.

**TTR's proposed values and sampling methodologies**

23. Mr Jorrisen[11], Dr Barbara[12] and Mr Clarke[13] consider that the limits in condition 5.c, which are currently defined in a volumetric rate of (solid) fine sediments (i.e. $m^3$/hr), should instead be a mass-based discharge rate (tonnes/hr), as used in plume modelling investigations and because this rate can be determined more directly and compared to the target limits set for extraction and processing under proposed condition 5, which is expressed in tonnes/hr.

24. Dr Barbara[14] and Mr Clarke[15] also have concerns regarding the lack of information on the sampling methodologies to be used for Condition 5. No information on how the composite sample will be collected is provided, and that one (composite) sample per day, to determine an averaged discharge limit, is not statistically robust. Without specifying how samples should be collected, there is a distinct risk of introducing bias into the sample collection. The condition needs to be reworded to provide more certainty on how the composite sample is formed. I agree with this conclusion.

25. Dr Barbara also makes a recommendation to reword condition 5.d[16], relating to particle size distribution (**PSD**) sampling. The current wording proposes 'representative samples'. This potentially means subsamples of extracted

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11 Supplementary Statement of Evidence of Mr Joris Jorissen in response to DMC Minute 41, dated 19 May 2017, paragraph [12]

12 Supplementary Statement of Evidence of Dr Greg Barbara in response to DMC Minute 41, dated 19 May 2017, paragraph [30]

13 Supplementary Statement of Evidence of Mr Bruce Clarke in response to DMC Minute 41, dated 19 May 2017, paragraphs [28] & [29]

14 Supplementary Statement of Evidence of Dr Greg Barbara in response to DMC Minute 41, dated 19 May 2017, paragraph [32]

15 Supplementary Statement of Evidence of Mr Bruce Clarke in response to DMC Minute 41, dated 19 May 2017, paragraph [30]

16 Supplementary Statement of Evidence of Dr Greg Barbara in response to DMC Minute 41, dated 19 May 2017, paragraph [33]

seabed material are tested for PSD, which may not include the whole sediment profile. The samples need to be representative of the seabed material extracted, and therefore whole samples representative of the extracted seabed material should be completed.

**Inadequacy of information concerning TTR's technical and operational ability to comply with proposed conditions**

26. Irrespective of the above matters identified with respect to condition 5, Fisheries experts consider that insufficient information has been provided on the measures and procedures that TTR proposes to implement to demonstrate compliance with conditions 5 and 6 during operations.[17]

27. I concur with the Supplementary Evidence of Dr Barbara, Mr Jorissen and Mr Clarke. In my opinion, TTR have not provided any information as to how the 'end of pipe' discharge limits are going to be monitored or controlled. It is not clear from the information provided if the mining operation will stop in order to remain within the limits and thresholds proposed, or what other methods TTR will use to achieve compliance.

28. TTR should have provided a robust sampling plan for their 'end-of-pipe' monitoring, and to comply with environmental monitoring targets proposed in Condition 6. To date TTR have not provided a robust EMP that details how samples will be collected and monitoring managed.

29. This lack of operational information results in significant uncertainty concerning how proposed conditions 5 and 6 will be implemented to achieve a robust and achievable monitoring and management for reducing fines extraction and generation and whether the environmental impacts of the mining activity can be adequately managed.

30. The lack of operational information in respect of proposed condition 6 is compounded due to the lack of baseline information provided by TTR concerning the existing receiving environment. For example, TTR's reliance

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17 Supplementary Statement of Evidence of Mr Joris Jorissen in response to DMC Minute 41, dated 19 May 2017, paragraph [14], and Supplementary Statement of Evidence of Dr Greg Barbara in response to DMC Minute 41, dated 19 May 2017, paragraph [26], Supplementary Statement of Evidence of Mr Bruce Clarke in response to DMC Minute 41, dated 19 May 2017, paragraph [23]

on limited sampling means that proposed condition 6 effectively means that that there is no allowable change in SSC statistics. This point is also picked up Dr Lieffering at page 11 of the Conditions Report.

**OPERATIONAL RISK**

31. Mr Bruce Clarke has also reviewed the Operational Risk Review prepared by Transfield Worley, 2013, and Risk Assessment TTRL Mining Vessel, prepared by Vuyk Engineering Rotterdam BV, Rev B, 2014[18].

32. In summary, Mr Clarke advises that he would have expected a more detailed risk assessment to have been undertaken given that there have been changes to the proposed activity since with the Operational Risk Review was completed in 2013.

33. Mr Clarke has identified numerous inconsistencies within the Operational Risk Review report, which bring into question the validity of the report's risk assessment outputs.[19]

34. With respect to the Risk Assessment TTRL Mining Vessel, prepared by Vuyk Engineering, Mr Clarke[20] notes that the risk assessment described in the report, is high-level and for the specific purpose of mitigating vessel design risk. It does not contain detailed analysis of the operational risk posed by the vessels within the STB during the mining operation. It does not adequately address all risks of grounding (e.g. on mounds created by the mining or on shallow reefs). It also does not adequately address the potential for the hull to come into contact/collision with the crawler during heavy weather events.

35. Mr Clarke is of the opinion that information provided to date and the high-level nature of the risk assessment provides little assurance that the vessels, equipment and safety measures are fit for purpose.

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18 Supplementary Statement of Evidence of Mr Bruce Clarke in response to DMC Minute 41, dated 19 May 2017.

19 Supplementary Statement of Evidence of Mr Bruce Clarke in response to DMC Minute 41, dated 19 May 2017, paragraphs [9] to [16]

20 Supplementary Statement of Evidence of Mr Bruce Clarke in response to DMC Minute 41, dated 19 May 2017, paragraphs [17] to [20]

36. In my opinion, this information should have been provided by TTR as part of the Impact Assessment. This information gap again highlights the uncertainty and risks around whether the environmental impacts of the proposed activity can be adequately managed.

**SEDIMENT PLUME MODELLING AND UNCERTAINTY**

37. As stated in Dr Barbara's supplementary evidence, dated 10 April 2017[21], several worst-case parameters for the model could not be determined due to lack of baseline data. As such, a number of important parameters for a worst-case scenario, such as percentage of fines in plume, were not agreed upon for developing the model. The assumptions made around SSC modelling have also not been backed by independently verified data or written information on the TTR mining processes. Instead TTR proposed substituted "indicative" values in place of verified worst case values. This has resulted in the creation of an updated model that still does not represent a "worst-case scenario" but rather a "worse" case model. Key components of the sediment plume investigation, particularly the assessments to characterise the sediment properties of the tailings material, do not follow international best practice for assessment of sediment plumes by dredging.

38. Dr Barbara also notes in his latest Supplementary Evidence[22] that a worst-case scenario is meant to include all of the most extreme events that could possibly happen, even the rare events. However, in Dr Barbara's opinion the current model has excluded unlikely events such as particle size distribution (**PSD**) concentrations beyond 2.25% being mined for greater than 21 days (as TTR proposed not to mine under those conditions), peak wave and extreme weather conditions. Therefore, the plume information that the DMC has asked the plume experts to review is not representative of a 'worst-case' scenario.

39. As the model is not a worst-case scenario, it is therefore not possible to determine the extent of the elevated SSC levels. The SSC limits in Schedule 2 of the Revised Conditions are intended to provide environmental protection, however without knowing the full extent of a worst-case scenario plume, I do

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21 Supplementary statement of Dr Gregory Matthew Barbara, dated 10th April 2017, paragraph [10].

22 Supplementary Statement of Evidence of Dr Greg Barbara in response to DMC Minute 41, dated 19 May 2017, paragraphs [10] to [14].

not consider that it is possible to predict what degree of impact may occur, and whether the SSC limits proposed will actually provide environmental protection.

40. The implications of the lack of 'worst-case' scenario modelling is that the extent and adverse effects of the sediment plume may be significantly underestimated.

41. The sediment plume is a fundamental component of the mining proposal, and it is the effects of the plume on the fisheries resource that Fisheries Submitters are particularly concerned about. Based on advice from Fisheries Submitters' experts, it is my opinion that there remains significant uncertainty as to the potential effects of the sediment plume and hence it is difficult to determine what the effects of the mining activity will be on existing fishing interests.

**BASELINE INFORMATION AND ENVIRONMENTAL MONITORING**

42. In my primary evidence at paragraphs [32] to [40][23] I outlined the concerns I have with TTR's proposed two years of baseline environmental monitoring through a Baseline Environmental Monitoring Plan.

43. The Revised Conditions now propose to undertake two years of 'Pre-commencement Environmental Monitoring' (proposed condition 43).

44. In my opinion, the change in name does not change the fundamental issue regarding the lack of baseline information about the receiving environment. Having at least two years of baseline sampling undertaken in order to determine the sensitivity of the receiving environment and to understand the seasonal specific variability and natural variation is essential, and also follows good international practice. TTR propose to complete this after consent is granted, via the 'Pre-commencement Environmental Monitoring Plan'[24]. This baseline sampling should have been undertaken prior to lodgement in order to inform the Impact Assessment (**IA**) and supporting technical assessments,

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23 Primary Expert Evidence of Helen Anderson on Environmental Planning for Fisheries Submitters, dated 23 January 2017

24 Supplementary Evidence of Dr Philip Mitchell on behalf of TTRL in response to Questions from the Decision Making Committee, dated 2 May 2017, Appendix 1, Proposed Conditions – Further Revisions, Conditions 43 to 46.

and establish consent conditions that ensure protection of the receiving environment once the proposed mining activity commences.

45. In my opinion the current IA has been developed without sufficient knowledge about the receiving environment. I consider that significant uncertainty about the nature of the receiving environment's baseline conditions exists. Little is known about the baseline environment of the STB. Therefore, it is even more important that the complex interactions of this receiving environment are adequately assessed prior to granting consent.

46. Without sufficient baseline information, there is uncertainty over whether potential changes to the receiving environment can be appropriately monitored or addressed through environmental triggers/conditions. It is standard practice to demonstrate an understanding the baseline environment and the effects of a proposed activity on that environment. It is commonly understood, as a matter of practice, that it is not possible to mitigate effects through the use of consent conditions where there is insufficient information concerning the receiving environment and the effects of a proposed activity on that environment.

**DISTINGUISHING AN ADAPTIVE MANAGEMENT APPROACH FROM REQUIREMENTS OF SECTION 87F**

47. An adaptive management approach requires environmental standards that an activity can be measured against, and, depending on the results, the activity can be discontinued or continued with amendment (e.g. change the operation to reduce the amount of material processed) or without amendment on the basis of those effects.

48. In the case of a marine discharge consent, the EEZ Act under section 87F(4) does not allow the use of conditions that together contribute to an adaptive management approach (i.e. the management of known effects of an activity where the potential scale and significance of those effects is uncertain). Accordingly, a marine discharge IA should describe all potential adverse effects, their scale and significance, and the steps that will be taken to avoid remedy or mitigate those effects.

49. Irrespective of whether an adaptive management approach is applied under s.64 EEZ Act, or effects are managed under s.87F, a proposal must be supported by robust current knowledge and baseline information about the receiving environment, in order to be able to assess or manage the impact of potential effects on the receiving environment.

50. In my opinion, in the case of a marine discharge application under the EEZ Act, the effects of that discharge must be known in order that consent can be granted. I consider that the effects of the proposed discharge are uncertain and potentially significant. There is a lack of operational information and therefore significant uncertainty with regard to the how proposed conditions 5 and 6 will be implemented in order to determine whether the environmental impacts of the mining activity can be adequately managed.

**INFORMATION GAPS AND UNCERTAINTIES RAISED IN THE 2014 TTR DECISION**

51. In my primary evidence [25] I outlined the Fisheries Submitter concerns regarding:[26]

    (a) the robustness of the proposed response and compliance limits and the extent of baseline data that the applicant is reliant on; and

    (b) the apparent need for two years of baseline monitoring to verify assessments and trigger limits when the DMC was so critical of the lack of baseline data in the first application.

52. In my opinion, TTR's current application is similar to its 2013 application which was declined by the DMC at the time. The information gaps of the 2013 application, particularly in relation to the effects of the proposal resulting from the sediment plume, and the plumes impacts on primary productivity, still remain unanswered in the 2016 application.

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25 Primary Expert Evidence of Helen Anderson on Environmental Planning on behalf of Fisheries Submitters, dated 23 January 2017, paragraphs [30]

26 Trans-Tasman Resources Ltd Marine Consent Decision, Environmental Protection Authority, dated 17 June 2014, at paragraphs [14] and [15].

53. In the 2014 decision the DMC in the Executive Summary considered that considerable uncertainty existed with respect to the scale of effects of the proposal on the environment, especially in relation to:[27]

    (a) Primary productivity and benthic effects and consequent ecosystem effects;

    (b) Impacts on existing interests, notably iwi and fishing interests;

    (c) Impacts on marine mammals and importance of protecting rare and vulnerable ecosystems and habitats of threatened species.

54. The DMC addressed the uncertainty and inadequacy of information presented at paragraphs [129] to [138] of the 2014 decision. The DMC found (amongst other things) that:

    (a) The natural and temporal variability in the relevant marine environment is not well understood, and that this 'gap' would need to be filled before appropriate trigger values and compliance limits relating to the effects of the applicant's proposed mining operation could be set. The generally accepted view was that this baseline environmental monitoring would take at least two years.[28]

    (b) Not enough was known about the existing environment (and in particular the temporal variability under existing conditions) and how that environment may be effected by the proposed mining to be confident that the stated qualitative Environmental Performance Objectives will be achieved.[29]

55. Following notification of the 2016 application, the hearing process has been subject to numerous directions from the DMC for further information and clarification from the applicant which has led to further review and

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27 Trans-Tasman Resources Ltd Marine Consent Decision, Environmental Protection Authority, dated 17 June 2014, Executive Summary, paragraph [9]

28 Trans-Tasman Resources Ltd Marine Consent Decision, Environmental Protection Authority, dated 17 June 2014, at paragraph [130]

29 Trans-Tasman Resources Ltd Marine Consent Decision, Environmental Protection Authority, dated 17 June 2014, at paragraph [133]

supplementary evidence from submitters. Submitter evidence has continued to confirm that information gaps continue to exist.

56. In my opinion, the DMC's decision in 2014 to refuse consent because considerable uncertainty existed with respect to the scale of effects of the proposal on the environment remains the case. I am not aware that any additional baseline environmental monitoring has been undertaken by TTR since the 2014 decision.

57. TTR through primary evidence, expert rebuttal and supplementary evidence consider that the information presented is satisfactory for the purposes of supporting approval of its application. However, no additional or new information has been provided to corroborate this assertion.

**CONCLUSION**

58. Having robust baseline information is fundamental to determining whether or not there is sufficient certainty as to the impacts of the proposed activity and whether those impacts are acceptable, or whether additional mitigation is required to reduce the effects to acceptable levels. Good international practice provides that baseline sampling for a minimum period of 2 years is necessary in order to determine the sensitivity of the receiving environment and to understand the seasonal specific variability and natural variation.

59. It is my view that developing appropriate and robust consent conditions relies on having sufficient certainty and understanding of the receiving environment, size of the sediment plume, and effects of the sediment plume on the environment and existing interests. The baseline information and subsequent technical assessment of this information then supports and informs the impact assessment and development of any subsequent consent conditions required to mitigate adverse effects.

60. If the baseline information is deficient, both from a qualitative and quantitative perspective, then this raises fundamental questions regarding the robustness of the IA and supporting technical assessments, and whether proposed consent conditions can adequately address the adverse effects of the proposal.

61. I do not consider given the inadequate baseline information on the environment, the uncertainty as to the extent of effects of the sediment plume and extent of adverse effects to be mitigated, consent conditions can be prepared to appropriately control and manage the adverse effects of TTR's proposal.

62. I do not consider that TTR has satisfied the requirements of the EEZ Act. There remains insufficient baseline information and understanding of the receiving environment and existing fishing interests to enable potential changes to be appropriately monitored or addressed through consent conditions. There remains significant uncertainty about how TTR will achieve compliance with consent conditions. There is no robust analysis demonstrating that TTR can meet limits set.

63. Given the information gaps and uncertainties concerning the proposed activity, it is my opinion that the EPA must favour caution and environmental protection, as required by section 87E of the EEZ Act, and refuse consent given it does not have adequate information to determine the application (s.87F(3) EEZ Act).

**Dated this 22nd day of May 2017**

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**Helen Margaret Anderson**