

**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 an application for marine consent under section 38 of
the EEZ Act and an application for marine discharge
consent under section 87B 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 (TTRL)**
Applicant

AND **Environmental Protection Authority (EPA)**

**EXPERT EVIDENCE OF ROBERT EWOUT LIEFFERING ON CONDITIONS AS
REQUESTED BY THE EPA FOR THE DMC**

Dated: 15 March 2017

Qualifications and experience

1. My name is Robert Ewout Lieffering. I have a BSc and an MSc (Hons), both in Earth Sciences, from Massey University, and a PhD, also in Earth Sciences, from the University of Waikato. I am a full member of the New Zealand Planning Institute (NZPI) and an accredited hearings commissioner (Chair endorsement) under the Resource Management Act 1991 (RMA).
2. I currently work for MWH New Zealand Limited as a Senior Environmental Consultant and also work privately as an independent hearings commissioner (under the RMA). My previous work experience includes holding the position of Consents Manager at Northland Regional Council and also Tasman District Council. In 2014 I worked for the EPA (on contract) as the decision support writer for two marine consent applications associated with offshore exploratory drilling in the Taranaki Basin.
3. I prepared the EPA's Key Issues Report (September 2016) and also the Conditions Report (February 2017). I took part in the Planning and Conditions Expert Conferencing, including preparation of the Joint Witness Statement from that conferencing. The Joint Witness Statement includes, in paragraph 2, a note that I participated in the joint conference, and was initially involved in post-conference discussions, but that I was unavailable for the remaining discussions and final agreement, and accordingly, I was not able to sign the Statement. I record here that I have reviewed the final Joint Witness Statement and agree that it accurately records my positions on the matters that it covers – I confirmed this by way of email to the facilitator and provided an electronic version of my signature accordingly.
4. I have also been engaged by the EPA to prepare a further Conditions Report which will be based on the final set of conditions that will be proposed by TTRL towards the end of the formal part of the hearing.
5. I have read TTRL's application forms, the impact assessment (IA) and its appendices, the supporting technical documents, and the EPA's technical expert reviews.
6. I have read the briefs of evidence of the experts who attended the Planning and Conditions Expert Conferencing¹, including the rebuttal evidence of Dr Mitchell and Mr Govier. However, I record here that I have not read all the evidence that has been presented at the hearing nor have I read the daily transcripts.

¹ Dr Mitchell, Mr Govier, Ms Anderson, Ms Sitarz, Mr Young, and Mr Clarke.

Code of Conduct

7. I confirm that I have read the Code of Conduct for Expert Witnesses as contained in the Environment Court Practice Note dated 1 December 2014. I agree to comply with this Code. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express – noting again that I have not read all the evidence that has been presented at the hearing nor have I read the daily transcripts.

Scope of Evidence

8. My instructions from the EPA in respect of this Statement of Evidence were to:
 - a) Outline my views on the nature of conditions already proposed by TTRL² in the context of adaptive management;
 - b) Outline my views on splitting conditions between the marine consent activities and the marine discharge consent activities; and
 - c) Outline a process that could be followed by the DMC from this point on to address the key issues.
9. This Statement of Evidence does not summarise the Key Issues Report or the Conditions Report which I previously prepared.

Nature of TTRL Conditions in the Context of Adaptive Management

10. Whilst there are many conditions being proposed by TTRL covering a range of matters, the main focus of the conditions relates to the monitoring of suspended sediment concentrations (SSCs) and seabed sediment quality (concentration of metals) at several sensitive sites within the receiving environment. The proposed conditions require:
 - a) Operational responses to be implemented should specified Response Limits be exceeded; and
 - b) Temporary cessation of operations should specified Compliance Limits be exceeded.
11. In particular, under proposed condition 5, if the measured SSC or seabed sediment quality exceeds a Response Limit (but not the Compliance Limit) then TTRL would notify the EPA, review the data, including the Operational Sediment Plume Model (OSPM), and collect additional samples to determine whether the exceedance is a result of the mining activities. If the additional

² These being the conditions attached to Dr Mitchell's primary statement of evidence as Attachment Three, a tracked changed copy of which was attached as Appendix 3 to the EPA Conditions Report (February 2017).

sampling again shows an exceedance of the Response Limit (but not the Compliance Limit) then TTRL proposes to instigate an operational response to ensure no further exceedances occur. Details of possible operational responses are listed in section 5.5.3.3 (page 213) of the IA.

12. Under proposed condition 6, if the SSC or sediment quality exceeds the Compliance Limit and the exceedance is shown to be due to the mining activity, then TTRL proposes to cease mining activities. No resumption of mining activities would occur until TTRL has satisfied the EPA that compliance is able to be achieved.
13. As directed by section 87F(4) of the EEZ Act, marine discharge consents cannot include conditions that together '*amount or contribute to an adaptive management approach*'. In my opinion, whether or not TTRL's proposed conditions amount to, or contribute to, an adaptive management approach is dependent on whether the DMC has been provided with sufficient evidence to be certain that compliance with the proposed Compliance Limits will prevent unacceptable effects occurring, such that it is unnecessary to impose conditions expressly contemplating TTRL **permanently** ceasing (discontinuing) the activities altogether, in the sense of effectively relinquishing its consents (as well as an alternative potential response of the activity continuing, with or without amendment). If this is the case then any changes that TTRL needs to make to its activities to achieve the Compliance Limits, be they continuing the activities with amendments or **temporary** cessation, are not, in my opinion 'adaptive management' – they constitute operational responses to achieve compliance with specified effects threshold limits. In my opinion this would be no different to, say, a water permit issued under the RMA which authorises the taking of water from a river that included a minimum flow condition or water column dissolved oxygen (DO) concentration limit (including monitoring requirements) set to ensure unacceptable instream effects do not occur. The permit holder may need to reduce its rate of take as flows in the river drop or if DO concentrations approach the limits set in the conditions, and may also be required to cease taking once flows reach a specific level – in my view this is not 'adaptive management', a concept which has variously been described as 'structured learning by doing' and one which has generally used where there is a high degree of uncertainty on effects of a proposal.
14. Two Compliance Limits are proposed by TTRL, one relating to seabed sediment quality and uses the ANZECC ISQG-High concentrations. These, in my opinion, are effects threshold limits as they are based on ecotoxicological data and an important issue for the DMC to determine is whether it can have confidence that unacceptable environmental effects will not occur if the concentrations remain below the ISQG-High concentrations. If so, no 'adaptive management approach', expressly contemplating the activity being permanently discontinued altogether in the case of an exceedance (or the activity continuing, with or without amendment) would be required, even if imposing such conditions were an option available to the DMC.

15. The second Compliance Limit proposed is the 95th percentile SSC limit. Initial Compliance Limits have been developed for the seven monitoring locations and TTRL proposes to verify/update these following the two year baseline (pre-activity) monitoring programme. The appropriateness of using a statistically derived SSC Compliance Limit as an effects threshold limit is outside my area of expertise but it is an important matter that the DMC needs to test in my opinion.
16. The Key Issues Report and the Conditions Report both include discussion on having conditions that address not only the frequency of elevated SSCs but also the duration – otherwise there is a risk that the conditions would allow TTRL to ‘discharge up to’ the SSC Response and Compliance Limits thereby changing the SSC distribution profile of the receiving waters. TTRL has advised that this matter is dealt with by proposed condition 20(b) which outlines what monitoring is to be undertaken during mining and it states that the monitoring is:

to ensure that the activities authorised by these consents:

- a. Comply with the ‘Compliance Levels’ or ‘Updated Compliance Limits’ identified in Condition 4: and*
- b. Do not result in any adverse effects that were not anticipated at the time of the granting of these consents.*

Without limiting the requirement of b. above, an adverse effect will be deemed to have occurred if the actual 25, 50, 80 and 95 percentile Suspended Sediment Concentration values during any six (6) month period (as calculated from observed turbidity measurements) are, for that same period and in the opinion of the EPA, significantly greater than the background (no mining) percentile values predicted by the validated Operational Sediment Plume Model (Condition 18) or the values specified in Schedule 2.

17. The paragraph following clause (b) makes it clear that TTRL’s activities may not result in a ‘significant’ (undefined) increase in the SSC at the seven monitoring sites compared to a no mining scenario. What constitutes a ‘significant’ increase is not defined in the condition but it is clear that this condition seeks to limit the allowable increase in SSC at the seven sites over the entire statistical distribution of SSCs – that is, the shape of the SSC distribution curve (sometimes referred to as the ‘bell curve’, but the actual shape of the curve will be dependent on the skewness of the data) will not be significantly different to what would exist if no mining occurred. This approach is, in my opinion, preferable to a ‘cease operation’ if the 95th percentile SSC Compliance Limit is exceeded, and as recommended in the Conditions Report, Condition 20(b) should be more explicitly included as Compliance Limits.
18. In my opinion, conditions of consent do not amount to, or contribute to, an adaptive management approach if they include explicit limits/standards, be they receiving environment limits/standard or discharge limits/standard, which

TTRL must meet, but do not specify complete cessation of the activity (in the sense of TTRL effectively relinquishing the consent) in the case of exceedance. Further, how TTRL meets the limits/standards does not need to be outlined in the conditions, that is something that can be outlined in a management plan, but the DMC needs to be satisfied that TTRL is able to meet them (such that a 'discontinuance' condition is unnecessary). Importantly, the DMC needs to ensure that if the specified limits/standards are met that unacceptable effects do not occur. Such conditions, in my opinion, do not amount to, or contribute to an adaptive management approach.

19. In my opinion, conditions which amount to or contribute to an adaptive management approach are those that:
- a. allow a consent holder to undertake its activity on a small scale, for a short duration, or in stages, typically with a 'hold point(s)', with a trigger relating to circumstances when the activity must permanently be discontinued, effectively cancelling the consent. The activity can only continue or be increased in size or duration following review of the results of monitoring/research and there is often a continuous monitoring-feedback loop that is used to decide the scale and intensity or permanent cessation of the activity ; or
 - b. do not include explicit effects based threshold limits/standards, but instead require these to be developed following the grant of consent, meaning that the consent holder may need to permanently reduce the scale of its activities from those initially authorised by the consent to achieve the developed limits/standards, again with the express possibility of the activity being permanently discontinued.
 - c. include interim effects based threshold limits/standards that are reviewed/updated following the granting of a consent based on further investigations/research and, like (b) above, the consent holder may need to permanently reduce the scale of its activities from those initially authorised by the consent to achieve the developed limits/standards, again with the express possibility of the activity being permanently discontinued.
20. In the case of TTRL's proposal, it is not seeking to undertake the discharge activities as outlined in (a) the conditions do not amount to or contribute to an adaptive management approach in that respect.
21. Nor do TTRL's proposed conditions amount or contribute to an adaptive management approach as outlined in (b) or (c) above. TTRL is proposing to validate/update the SSC Compliance Limits following its two year baseline (pre-activity) monitoring. This process may result in lower SSC Compliance Limit concentrations (and Response Limits for that matter) which may also mean that TTRL may need to amend the scale of the activity to comply with the lower limits. However, as discussed in paragraph 13 (above), if the DMC is certain the SSC Compliance Limit setting process, including the validation/updating, results in specified effects thresholds, such that no permanent 'discontinuance' response is expressly provided for in the

conditions, then the conditions do not amount to, or contribute to an adaptive management approach in my opinion.

Splitting of Conditions between Marine Consent Activities and Marine Discharge Consent Activities

22. TTRL has applied for various activities for which marine consents are required under section 20 of the EEZ Act and also marine discharge consents under section 20B of the EEZ Act for various releases of seabed materials and the discharge of de-ored sediment back to the water column from the IMV.
23. In my opinion nearly all the activities for which either marine consents or marine discharge consents are being sought are inextricably linked to such a degree that having separate conditions for the marine consent activities and marine discharge consent activities that are so inextricably linked is impracticable. Further, in my opinion there is no clear benefit in doing so.
24. I note that three of the four activities for which marine discharge consents are being sought, those under section 20B(1) of the EEZ Act, relate to the consequential release of seabed material into the water column (the sea) that will occur as a result of undertaking activities for which marine consents are sought to disturb the seabed – these being the primary activities. The only marine discharge consent activity which is not directly a ‘consequential’ discharge is the discharge of de-ored sediment back to the water column from the IMV (required under section 20C(1)(a) of the EEZ Act). Whilst the discharge of de-ored sediment is the dominant source of predicted off-site suspended sediment, the other consequential seabed discharges certainly have the potential to contribute to off-site suspended sediment loads. Therefore, in my opinion it would not be appropriate to have conditions solely on the marine discharge consent for the discharge of de-ored sediment back to the water column.
25. Separate conditions relating to the long term anchoring of the IMV and the vibrations caused by the IMV and crawler could potentially be imposed as their potential effects are unrelated to the sediment discharges covered by the marine discharge consents. However, in my opinion there is no clear benefit in doing so.
26. A further complication of trying to split the conditions up between the marine consents and marine discharge consents involves the correct place for the ‘Augier’ conditions. These generally relate to addressing specific matters raised by third parties and would apply equally to the marine consent activities as they would to the marine discharge consent activities.
27. In my opinion, in the event that consents are to be granted, the nature of the proposal, in particular the interrelated nature of the activities, lends itself to having a combined set of conditions divided into categories. A suggested framework for the conditions is:

- a. Description specification
- b. Restrictions/limits/standards
- c. Establishment of groups (TRG, KRG)
- d. Management plans (preparation, reviews/amendments and certification process)
- e. Monitoring (locations, frequency, determinands etc may be attached as Schedule)
- f. Reporting
- g. Bond/insurance
- h. Review
- i. Augier conditions
- j. Duration and lapsing.

A handwritten signature in black ink, appearing to read 'Rob Loeffering', with a stylized flourish at the end.

Dr Rob Loeffering
15 March 2017