

**BEFORE THE ENVIRONMENTAL PROTECTION AUTHORITY**

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

**AND**

**IN THE MATTER** of an Application under Section 38 of the Act for  
Marine Consent by Trans-Tasman Resources Limited (TTRL)  
in relation to the iron sand extraction and processing  
application (the Application)

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**JOINT STATEMENT OF EXPERTS IN THE FIELD OF  
EFFECTS ON ECONOMICS**

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**Dated Monday, 20th February, 2017**

## **INTRODUCTION**

1. Expert conferencing of the Economics experts took place in person and by video conference on Friday, 17th February, 2017.
2. The conference was attended by:
  - a) Mr. Jim Binney
  - b) Mr. Jason Leung-Wai
3. Mr Wenceslaus van Lint had agreed to participate but was not present at the expert conferencing. However, he has reviewed and is comfortable signing the joint statement.

## **CODE OF CONDUCT**

4. We confirm that we have read the Environment Court's Code of Conduct 2014 and agree to comply with it. We confirm that the issues addressed in this Joint Statement are within our area of expertise.

## **SCOPE OF STATEMENT**

5. In our conference we discussed the issues relevant to the Application which arise within our field of expertise, namely the economic benefits and costs of the iron sands project. Prior to attending the conference we each read the relevant parts of the Application, the evidence and independent reports prepared by the other expert(s) and circulated.
6. Issues discussed were based on the report, evidence and submissions and were considered across four key areas as noted below:
  - a) The appropriateness of the analysis
  - b) The appropriateness and reliability of the IO multiplier analysis
  - c) The transparency of the inputs and the approach taken in the analysis
  - d) The accuracy and transparency of the GDP and employment estimates.
7. We discussed points of agreement and disagreement in each area. We then considered how our discussion related to the questions on economic effects as specified on pages 15 to 18 of Minute 21 issued by the EPA. Our points of agreement and disagreement for relevant questions are attached in Table 1.

8. In this Joint Statement we report the outcome of our discussions in relation to each issue by reference to points of agreement and disagreement relating to the issues. Where we are not agreed in relation to any issue, we have set out the nature and basis of that disagreement in the discussion.
9. We did not consider the draft marine consent conditions proposed by the Applicant and have not considered whether they are sufficient and appropriate having regard to our opinions, should the EPA grant the consents sought by the Applicant.

## **LIST OF ISSUES**

10. The issues discussed could be collated into four key themes. We discuss each of these themes in turn.

### **A. Appropriateness of the analysis**

11. The issue was whether IO Multiplier Analysis, which identified economic benefits of the iron sands project in terms of employment and GDP was appropriate to determine the net benefits of the iron sands project.
12. The key focus of the discussion was whether IO Multiplier Analysis met the requirements of the EEZ and Continental Shelf (Environmental Effects) Act 2012, namely S59(2)(F) – that the EPA must take into account “the economic benefit to New Zealand of allowing the application”.
13. There was a broader issue discussed, around whether determining the economic benefits through an EIA was sufficient to support the EPA’s consideration of the application; or whether the decision-making process would be best served by undertaking a full Benefit-Cost Analysis (BCA).

### **Agreement**

14. We agreed that the Economic Benefits Analysis undertaken by Martin Jenkins likely met the condition of the *EEZ Act*. We note that the term ‘economic benefit’ does not appear to be defined in either the *EEZ Act* or the *EPA Act*.
15. We agreed that a full BCA could be a useful analysis to support decision-making in that it could capture and reflect all the costs and benefits associated with the project, allowing for a fully informed decision. It would also assess the

net benefits of the project, whereas the current analysis is an estimate of economic benefit only. The results would also be more difficult for some stakeholders to interpret.

### **Disagreement**

16. There was disagreement as to whether or not a full BCA should have been undertaken to inform the project.

### **Discussion**

17. The initial discussion confirmed that the analysis was not trying to determine net benefits to New Zealand but was rather identifying the economic benefits (activity) of the iron sands project. There was agreement that this is what the report actually did.
18. This moved the discussion as to whether the report should have gone further and undertaken a full BCA to better inform the EPA's considerations. It was at this stage that the experts agreed to disagree.
19. On one hand, efforts to monetise and present all possible costs and benefits would provide a richer understanding of the value of the potential costs and benefits associated with the project, allowing a more informed decision to be made, based on assessing the potential economic benefits against the environmental, social and cultural costs. Monetisation of possible costs and benefits would also be consistent with the requirements of the *RMA Act* that actually defines benefits and costs as "*benefits and costs include benefits and costs of any kind, whether monetary or non-monetary.*" The use of BCA would also provide an estimate of the net benefits of the project to New Zealand. The use of BCA for major projects has been common practice for decades, including estimates on non-market values (e.g. value of biodiversity).<sup>1</sup>
20. On the other hand, the difficulties around agreeing, identifying and estimating the potential costs and benefits to a full BCA would increase both the complexity of the analysis and the uncertainty around the results. Given the uncertainties, this would also necessitate the presentation of a range of possible results and more sensitivity analysis.<sup>2</sup> The current approach of

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<sup>1</sup> Lincoln University maintains a database on NZ-only non-market valuation studies. The database currently contains details on 172 studies.

<sup>2</sup> Best practice would also suggest that the IO analysis should also present a range of outputs.

separating the potential environmental and social risks and the economic benefits allows each area to be assessed on its own merits and puts the onus on the DMC to value tradeoffs between economic activity and environmental and social risk attributable to the project and determine if the project provides a net benefit to New Zealand.

21. This flowed into a discussion around the DMC being particularly conscious of not 'double counting' any 'costs' associated with the environmental effects.<sup>3</sup> We clarified that this related to ensuring that we are careful not to consider the environmental impacts in both the environmental risks discussion and the economic benefits discussion. This caution was the basis of our disagreement of what factors should be considered within a BCA, and whether a BCA would add value, or confuse, the analysis. Generally the risks of double counting are reduced if the BCA is done correctly.

## **B. Appropriateness of the model**

22. The issue was around whether the IO Multiplier Analysis used was the most appropriate model to assess the economic benefits of the iron sands project. In particular, how did it compare to a Computable General Equilibrium (CGE) model.

### **Agreement**

23. There was agreement that, **at the local and regional scales**, the IO Multiplier Analysis was the appropriate model for estimating economic benefits.

### **Disagreement**

24. There were no areas of material disagreement.

### **Discussion**

25. We discussed the rationale for moving to an IO Multiplier Analysis approach from the CGE analysis used in the previous application.
26. There was agreement that an IO Multiplier Analysis was appropriate based on the:

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<sup>3</sup> EPA Key Issues Report (para 121)

- a. desire to identify impacts at a local and regional level
- b. nature of the project and the impact it would have on the broader economy
- c. consistency with other analysis around the energy and mineral extraction sectors.

27. Generally, a CGE model would be better for determining national impacts due to the dynamic nature of the model and its ability to address changes in prices and inputs. However, considering the nature of the project, the CGE model may not be appropriate.

28. A CGE model is more appropriate for determining major shocks to an economy or industry, such as a change in taxation, labour or cost of capital, inputs (eg fuel or energy costs) or a technological change that impacts on productivity in or across industries, for example transport efficiencies. The iron sands project is very unlikely to have a significant impact on prices, investment or labour in other industries at a regional or national level. This is largely due to the fact that the iron sands project is too small to materially impact on economic variables such as input prices (e.g. labour rates).

### **Appropriateness of the inputs and application in the modelling**

29. The issue was whether using TTR's expenditure and employment estimates from their Pre-Feasibility Studies, and how they were applied in the IO Multiplier Analysis, were appropriate.

### **Agreement**

30. We agreed that the application of TTR's expenditure and employment estimates and how they were applied were appropriate as they relate to the direct expenditure and employment.

### **Disagreement**

31. There were no areas of material disagreement.

### **Discussion**

32. We discussed whether using TTR's estimates of expenditure and employment were appropriate and how confident we were around the accuracy of those

estimates. From an application perspective, these were likely the best inputs to use in the model as they reflect the likely expenditure at the level of detail required. As non-experts in the area we could not verify the accuracy of those estimates. However, the fact that these estimates were developed and tested by and through discussion with major contractors and suppliers suggest they are a fair reflection of likely expenditure and employment. Further, considering that the estimates form a key part of the business case for the project and to seek investment, it was unlikely that they would be over-estimated.

33. We discussed and were comfortable with the approach to how expenditure was assigned to determine the amount that would be spent within each study area.

34. We discussed the approach of over-riding direct employment where direct TTR employment estimates were available and agreed that this approach would improve the accuracy of the results.

### **Accuracy and transparency of the findings**

35. The issues were around whether the estimates of GDP and employment were accurate and reflected what might transpire in reality.

### **Agreement**

36. We agreed that the estimates as determined by the model were a fair reflection of the likely employment and GDP impacts from the iron sands project.

37. We agreed that the jobs estimated are unlikely to be all new jobs and that some of those jobs should be interpreted as maintaining economic activity to sustain existing jobs, particularly when looking at indirect and induced employment.

38. We agreed that the level of accuracy is likely to be higher at the regional level (Taranaki/Whanganui) than in the local area (South Taranaki/Whanganui), due to the greater possibility of economic activity leaking into New Plymouth.

39. We agreed that more clarity needed to be included in the discussion in the report as to where that employment might occur and the regional and industry context within which the iron sands project operated. For example, would the

shift staff working on the IMV and FSO reside in the region, or would they live elsewhere? This issue is only relevant to the extent that the location of where employees live is a concern to decision makers.

## **Disagreement**

40. There were no material areas of disagreement.

## **Discussion**

41. We had a general discussion around the New Plymouth, South Taranaki and Whanganui economies. This included the high levels of oil and gas sector activity in New Plymouth, and the sluggish economic and population growth in South Taranaki and Whanganui.

42. Similarly, the fact that the Whanganui and South Taranaki economies are rural and have performed relatively poorly from an economic and population perspective suggests that jobs identified through the modelling could be absorbed by existing employees, particularly where they are performing at below capacity. This is most likely the case with indirect and induced jobs, as the TTR direct employee numbers in the report are based on actual requirements for the project.

43. We discussed providing further context around the sector to put in perspective and provide more clarity on the impacts of the iron sands project. The report provided some context around the quantum of the impact at a local, regional and national level but not for the sector. There was also some discussion around the economic performance of the three study areas. However, there was no context in relation to the relevant sectors. For example, the oil and gas sector in Taranaki in 2014 was estimated to directly employ around 4,300 FTEs, and contribute \$980m in GDP and \$370m in royalties.<sup>4</sup> The iron sands project's direct contributions at a regional level were estimated at around 370 FTEs and \$30m GDP. The project also contributed about \$6m in royalties.

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<sup>4</sup> Venture Taranaki (2015). The Wealth Beneath our Feet The Next Steps. (P 3)

## **References**

44. We have referred to the following documents in our discussions:

- a. MartinJenkins (2015) Economic Impact Analysis of Trans-Tasman Resources Offshore Iron Sands Project.
- b. GHD (2016). Review of Report by MartinJenkins – Economic Impact Analysis of Trans-Tasman Resources Offshore Iron Sands Project.
- c. Jason Leung-Wai. (15 December 2016). Expert Evidence on Behalf of Trans Tasman Resources Limited
- d. James Binney (24 January 2017). Statement of Evidence on Behalf of Kiwis Against Seabed Mining Incorporated.
- e. Jason Leung-Wai (7 February 2017). Expert Rebuttal Evidence of on Behalf of Trans Tasman Resources Limited.
- f. EPA (2016). EPA Key Issues Report.
- g. Venture Taranaki (2015). The Wealth Beneath our Feet The Next Steps.
- h. Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012

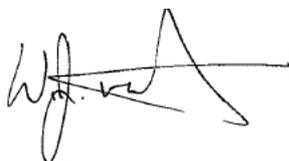
### **Signatures of the experts:**



**Jason Leung Wai**



**James Binney**



**Wenceslaus van Lint**



## Questions to Jason Leung-Wai

45. The following questions put to Jason Leung-Wai are relevant to, and can be informed by, our joint statement. We provide comment on the area of agreement or disagreement.

**Table 1. Questions and areas of agreement and disagreement**

Ref no	Question	Jason Leung-Wai's comment	Area of agreement or disagreement
JL4	Is it normal for economic analysis of proposed activities relying on incomplete baseline information about the receiving environment to assume zero economic risk to surrounding established activities?	Yes. Economic analysis is very often contending with, and is largely designed to determine, an outcome based on incomplete information. However, I have not assumed zero economic risk but rather not addressed it in my analysis, which focuses on the economic benefit from activity.	Agreed that a full BCA would be useful to support decision making in that it would capture and reflect all the costs and benefits associated with the project.  Disagreed as to whether a full BCA is possible and whether partial or incomplete analysis would be helpful or a hindrance to decision-making.
JL5	Should you have taken a precautionary approach to your evidence and considered potential significant risks, notwithstanding your contention the likelihood of any impact occurring on commercial fisheries is low?	No. the focus of the analysis was on the economic benefit that would accrue from the Ironsands activity	Agreed that a full BCA would be useful to support decision making in that it would capture and reflect all the costs and benefits associated with the project.  Disagreed as to whether a full BCA is possible and whether partial or incomplete analysis would be helpful or a hindrance to decision-making.
JL13	Can you provide independent references to support your methodology of including TTR employees AND subcontracted employees as DIRECT labour? (see page 101 of my non-expert evidence, for Berl definition of DIRECT, INDIRECT AND INDUCED).	The standard approach is to use direct expenditure to derive direct labour. However, I considered that the actual estimates of TTR employees determined in their pre-feasibility study provided a more accurate estimate of TTR's direct employment than what would be determined by the model. However the local spend by TTR is on more than just their own employment and includes purchasing goods and services, which supports employment. Direct labour is therefore the TTR employees AND the employees directly employed as a result of TTR expenditure. This is consistent with the BERL and any other definition of direct employment.	Agreed with the points raised by Mr Leung-Wai.

Ref no	Question	Jason Leung-Wai's comment	Area of agreement or disagreement
JL16	<p>At para 65 you estimate royalties at royalties at \$6.15m? Do you accept that is a small percentage of export earnings of around \$400 million a year (Alan Eggers para 29)? Do you accept that royalties revenue received by New Zealand, are supposed to represent the economic compensation for the permanent loss of the mineral resource? (Binney para 12)</p>	<p>I wouldn't compare royalties to export earnings but rather profits, which are likely to be much lower than \$400m export earnings as you would exclude expenditure. As shown in my report (figure 6, p 24), royalties and taxes would increase as the price of iron ore increased, particularly when the ad veloreum royalty (AVR) shifted to accounting profits rather than net sales. This is because the royalty paid varies depending upon the price received by the producer. (I would also note the benefit to New Zealand of an increase in export earnings of around \$400m annually).</p> <p>According to NZPAM, royalties are set to ensure the Crown receives a fair financial return for the development of its minerals to the benefit of New Zealand. In the ironsands case the AVR stipulates the payment of the higher of 2 percent of net sales revenue or 10 percent of accounting profits.</p>	<p>Agreed with the points raised by Mr Leung-Wai.</p>
JL18	<p>Para 86: even if it is difficult to monetise benefits and costs over a defined time period, do you accept that it should be attempted? Do you dispute that environmental cost is a cost?</p>	<p>Due to methodological issues in identifying and monetising environmental costs attempting to capture them would only muddy the waters. This is the same reason why we don't consider or try to capture intangible or associated benefits, for example technology transfer and increased resiliency, in our analysis.</p>	<p>Agreed that a full BCA would be useful to support decision making in that it would capture and reflect all the costs and benefits associated with the project.</p> <p>Disagreed as to whether a full BCA is possible and whether partial or incomplete analysis would be helpful or a hindrance to decision-making.</p>
JL20	<p>Have you read Jim Binney's evidence for KASM and Greenpeace? He said that (para 9) he is of the firm view that a comprehensive benefit-costs analysis (BCA) is the only appropriate economic assessment methodology to inform the regulatory approvals process. This should include all relevant environmental and social values that could be adversely impacted by the project. Do you disagree with this? Do you accept that your analysis cannot be used to demonstrate the net worth of the project to New Zealanders.</p>	<p>No. As noted earlier a comprehensive BCA would simply make the analysis less robust, open to criticism and interpretation, and therefore more difficult to assess.</p> <p>I accept that my analysis only measures the benefits to the study areas and is not net of potential costs.</p>	<p>Agreed that a full BCA would be useful to support decision making in that it would capture and reflect all the costs and benefits associated with the project.</p> <p>Disagreed as to whether a full BCA is possible and whether partial or incomplete analysis would be helpful or a hindrance to decision-making.</p>

Ref no	Question	Jason Leung-Wai's comment	Area of agreement or disagreement
JL21	Do you consider that environmental and social values need not be valued? Do you accept that (Binney para 38) no significant attempts have been made by the project proponents to evaluate the potential value of the costs to the environment attributable to the project? Do you accept that the ocean produces goods as well as ecosystem services? (Binney para 39)? That these include exchanges of matter, energy and biodiversity? Are you aware that the ocean creates 50% of the oxygen we breathe? And recycles most carbon? And has absorbed over 93% of anthropogenic heat? Are you aware of provisioning services, regulating services, habitat, and cultural services? (Binney para 43).	I accept that I have made no attempt to evaluate the potential value of the environmental and social costs attributable to the project.	Agreed that a full BCA would be useful to support decision making in that it would capture and reflect all the costs and benefits associated with the project.  Disagreed as to whether a full BCA is possible and whether partial or incomplete analysis would be helpful or a hindrance to decision-making.
JL22	Mr Binney also said (para 10) that you have adopted an I/O approach and that is generally considered to be an inferior approach to estimating impact assessment as it tends to overestimate impacts. Do you accept that?	No. In my report I explain why it was decided to apply an I/O approach, specifically that it provided a better estimate at a regional level. I also do not accept that it tends to overestimate impacts. If the analysis is undertaken correctly, and addresses additionality and displacement it is just as likely to underestimate as it is to overestimate.	Agreed that, at a regional level, an IO Multiplier Analysis is appropriate model for estimating economic benefits of for the iron sands project.
JL23	Do you accept that environmental risks do have economic values? (Binney 12) He estimated a range of the present value of the environmental damage could be in the range of \$28 – 543 million. (para 12) Do you accept that?	Yes but they are inherently difficult to measure and open to interpretation and misuse. For example, Binney's estimates are based on values not specific to the STB, consider that any damage to the area occurs in year 1, and that damage completely reduces the value of the environment to zero and is irreparable for 20 years.	Disagreed as to whether a full BCA is possible and whether partial or incomplete analysis would be helpful or a hindrance to decision-making.  Project-specific estimates of environmental and social costs could be developed for inclusion within a BCA. However, it should be noted that this task is not trivial as different methods would need to be used to estimate the range of values for different types of environmental costs.
JL24	Do you accept that the flow on effects identify a measure of activity, not a measure of net benefits from the project, which needs to include social and environmental effects? (Binney 35)	The flow on effects are the indirect and induced benefits that occur as a result of the initial activity and do not measure net benefits.	Agreed with the points raised by Mr Leung-Wai.
JL25	Do you accept that the flow on effects identify a measure of activity, not a measure of net benefits from the project, which needs to include social and environmental effects? (Binney 35)	The economic benefit is not net of possible costs. It provides a best estimate of the likely benefits that would accrue in the local, regional and national economies. The jobs and value that would accrue to and support growth and sustainability in the local and regional economies over a 20 year period are a compelling reason for considering the project.	Agreed with the points raised by Mr Leung-Wai, although an inability to scrutinise the development of the IO tables and multipliers still remains.  Also, see paragraph 42 of the joint witness statement which states that the flow on employment generation would be a mix of new jobs and demand to maintain some existing jobs in sectors providing inputs for the project.

Ref no	Question	Jason Leung-Wai's comment	Area of agreement or disagreement
	<p>Mr Binney concluded (para 13) that the use of an inappropriate approach to the economic analysis, a lack of transparency, and no real attempt to incorporate environmental risks into the economic analysis, means that the economic analysis does not demonstrate that the project would deliver a net benefit to New Zealanders. Do you accept that? Do you accept that the economic analysis undertaken by Martin Jenkins and Associates on behalf of TTR does not provide a solid economic argument that the project should be approved? (Binney para 48), and that the application of the I-O modelling has not been done in a transparent fashion and any results should be treated with extreme caution?</p>	<p>The modelling was very transparent in terms of the methodology, and how the inputs that went into the model were determined. The limitations of the model were also made clear, as was the rationale and approach used to address or consider those limitations.</p>	