

**BEFORE THE FAST TRACK PANEL
AT WELLINGTON**

**I MUA I TE KŌTI TAIAO O AOTEAROA
TE WHANGANUI-A-TARA ROHE**

UNDER

the Fast Track Approvals Act 2024 (the
“**Act**”)

IN THE MATTER

of an application by Trans-Tasman
Resources (TTR) for marine and discharge
consents to undertake iron sand extraction
in the South Taranaki Bight

The ‘Taranaki VTM Project’
[**FTAA-2504-1048**]

BETWEEN

**TRANS-TASMAN RESOURCES LIMITED
(TTRL)**
Applicant

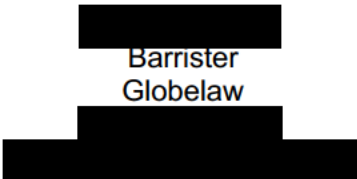
AND

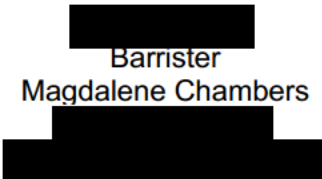
**THE ENVIRONMENTAL PROTECTION
AUTHORITY**
The EPA

**STATEMENT OF EVIDENCE OF JILL COOPER
(Feasibility and Mining Operations)**

**FILED ON BEHALF OF KIWIS AGAINST SEABED MINING INCORPORATED,
GREENPEACE AOTEAROA INCORPORATED**

Dated 6 October 2025


Barrister
Globelaw


Barrister
Magdalene Chambers

STATEMENT OF EVIDENCE OF JILL COOPER

INTRODUCTION

1. My name is Jillian Wendy Cooper.
2. I provide this statement of evidence in support of the Kiwis Against Seabed Mining, Inc. (KASM) and Greenpeace Aotearoa Inc. (Greenpeace) submission on the TTR Fast Track Application
3. My experience relative to this statement of evidence includes:
 - a. 40 years of experience in materials engineering, including 20 years at BHP Research and BHP Steel. BHP is one of the largest iron ore miners globally, and at that stage BlueScope Steel was part of BHP and called BHP Steel.
 - b. 10 years of experience in processing and production of steel from titanomagnetite ironsands at BlueScope NZ Steel including extraction of minerals from minings tailings
4. I have been asked by KASM and Greenpeace to provide a statement of evidence on the feasibility and limitations of the proposed TTRL Taranaki VTM Project.
5. In preparing this statement of evidence I have reviewed the following documents:
 - a. The TTRL application under Fast Track
 - b. [https://openaccess.wgtn.ac.nz/articles/thesis/Extraction of Vanadium from New Zealand Titanomagnetite Sand and Vanadium Recovery Concentrate/19326137?file=34323587](https://openaccess.wgtn.ac.nz/articles/thesis/Extraction_of_Vanadium_from_New_Zealand_Titanomagnetite_Sand_and_Vanadium_Recovery_Concentrate/19326137?file=34323587)
 - c. <https://www.oecd.org/en/about/news/press-releases/2025/05/surging-excess-capacity-threatens-steel-market-stability-employment-and-decarbonisation-plans.html>

CODE OF CONDUCT

6. I confirm that I have read the Code of Conduct for Expert Witnesses as contained in the Environment Court Practice Note dated 1 January 2023. 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.

PREMIUM ON IRON ORE OVERSTATED

7. I have read the applicant's NZIER report which projects considerable income to TTRL from vanadium. However, this is based on the assumption that the vanadium and titanium contaminants of the magnetite can be either economically extracted from the ironsand or used to create ferrovanadium.
8. In my experience working in the mining industry in Australasia for over 40 years, premiums for vanadium come and go and are reliant on a number of factors. Expectations that vanadium prices will rise due to increased demand for vanadium enhanced rebar and for flow batteries have not been realised in 2025.¹
9. There is currently a glut in global iron ore reserves, with China producing steel well beyond overall global requirements, which are estimated to exceed 700 million tonnes annually by 2027². There is no indication that those supplying China with high quality iron (Australia, Brazil and a number of countries in Africa), that their reserves are nearing depletion. Accordingly, production volumes from China are expected to remain stable for the foreseeable future, likely continuing for potentially 5 to 10 years
10. . I have read in the TTR Siecap pre-feasibility study report at page 152 where TTR expects there could be a premium on the price paid for iron ore coming from New

¹ As per this article in Investing News Network, dated January 16 2025:
<https://investingnews.com/vanadium-forecast/>

²<https://www.oecd.org/en/about/news/press-releases/2025/05/surging-excess-capacity-threatens-steel-market-stability-employment-and-decarbonisation-plans.html>.

Zealand under the guise of hydrogen-produced “Green steel”, citing clean energy credits in the US, but those credits have now been rolled back under the Trump Administration’s Big Beautiful Bill Act³.

11. There are also a range of other high-value iron ore sources globally, creating a highly competitive market. Therefore, even if in the next ten years the supply to China starts to slow down, there is no indication or confidence that the supply from New Zealand would be competitive with other sources.
12. In the next 20 years, the steelmaking industry is expected to transform from one dominated by Blast Furnaces and virgin ores to one dominated by EAFs utilizing scrap and directly reduced iron. This will significantly impact the value of virgin ore, not simply because there will be less required but also because the ore must be suitable for low carbon direct reduction methods.
13. As a general trend, when economies mature, more scrap is available for steelmaking and their reliance on external sources of iron ore decreases. China in particular has pledged to build fewer blast furnaces, decommission older furnaces and install more EAFs as a key part of reducing their greenhouse gas emissions. As their ability to recycle and use scrap metal increases, it is projected that China will gradually reduce its demand for imported ore over the longer term. ⁴
14. Overall, current market analysis presents a **poor outlook for new iron ore projects**, for those that cannot compete on scale, cost or where the impurity profiles prevent them from being utilised for green steel.

VANADIUM AND TITANIUM CONTENT

15. The vanadium and titanium content figures quoted by TTR relate primarily to oxides that occur as by-products of the initial beneficiation process. Improved magnetic sorting could reduce the presence of these oxides. However, the majority of titanium and

³ Reference

<https://warrenaverett.com/insights/one-big-beautiful-bill-energy-tax-credits/>.

⁴<https://www.energyconnects.com/news/renewables/2025/september/china-s-green-steel-transition-set-back-by-low-electric-furnace-output/>

vanadium within the iron sand occurs in a solid solution within the iron ore itself, where titanium and vanadium atoms substitute for iron atoms in the magnetite structure.

16. Extracting titanium and vanadium from a solid solution is significantly more complex and costly than processing oxide ores. The challenge is not limited to differences in melting points; it also involves the precise chemical and physical conditions required to oxidise and separate these metals, whether through direct oxidation or acid leaching processes. Because of these difficulties, most processors prefer to source oxide ores rather than attempt to extract titanium and vanadium from magnetite solid solutions.
17. The extracted ore will also contain a high level of water. At Glenbrook, where iron sand is currently processed, the ore is stored in large piles to allow water to drain off before processing. Even with this step, a significant proportion of the emissions visible from the MHF and Kiln stacks — visible from as far as 60 kilometres away — consists of water vapour being driven off during processing. This demonstrates the substantial volume of water present in the iron sand, which TTR will also need to manage.
18. It is my understanding that TTR has no plans to stockpile the material, so if material was required to be stored to allow water to drain off, this would need to be done by the purchaser at their expense, thus driving down the value of the ore.
19. Once water has been allowed to drain off naturally, the only way to remove the rest of the water is through evaporation via the application of heat, usually through the normal ironmaking processes, such as in the pelletizing plant, which adds cost to the iron makers

FEASIBILITY OF DESALINATION PLANTS

20. From information available, I understand that TTR intends to remove the salt from the extracted iron sand using fresh water produced by four desalination plants on board its mining vessel. In my opinion, the effectiveness of this proposed process is highly uncertain.
21. Blast furnace operators will not accept sodium levels in the ore above a certain very low amount as sodium, once introduced into the blast furnace, never leaves but rather will

volatilize and then precipitate out in the upper levels where it destroys the refractory lining.

22. TTR should have conducted testing to demonstrate that desalination and subsequent washing of the ore would remove sodium chloride and other salts to acceptable levels and at the required scale, but there is no evidence the company has done so.

23. If the proposed washing system is not sufficiently effective, then the ore would likely be required to go through multiple washing processes and this would likely reduce production rates.

SUMMARY

24. In summary, TTR's proposed processing method raises unresolved questions about:

- a. The effectiveness of salt removal through desalination,
- b. The technical and economic feasibility of extracting titanium and vanadium, and
- c. The challenges posed by the high water content of the ore.

25. These factors contribute to **significant operational and commercial risks** that have not been adequately addressed in TTR's application

SANOFEX REPORT

26. I have been provided a draft of the Sanofex report. The report evaluates the economic and financial claims made by TTRL in their application under the Fast-Track Approvals Act 2024 for the Taranaki Vanadium-Titanomagnetite (VTM) Project. It focuses on the validity of TTRL's revenue projections and the assumptions underpinning their discounted cash flow (DCF) model, especially around iron ore, vanadium, and titanium extraction.

27. I am not an economist and do not give evidence as an expert. However, I wish to comment on how the assertions made in this report align with my experience operating

in the mining industry in New Zealand and through international dealings over the past 40 years.

28. In particular, I have reviewed the statements made regarding the inflated revenue assumptions. I agree that using wet metric tonnes but pricing it as dry tonnes, artificially inflates the revenue. It's not just a matter of the customer paying for the dry weight only, but also removing the moisture is a cost to the customer that they may want to recover through lower dry weight pricing.
29. The relationship between iron content and price is not linear. Removing the impurities is another cost to the customer so they are not just paying for iron units. In the case of ironmaking, these could be the energy costs to melt it and the flux costs to manage the chemistry of the molten slag.
30. TTR are not proposing to remove any titanium or vanadium from their product and create TiO₂ or Vanadium flake but rather collect credits from customers for the Ti and V content and the customer would be either utilising a small amount in their ironmaking operations or extracting the Ti and V themselves.
31. Using VTM ores as a source of vanadium is a double-edged sword, as the Sanofex report points out (page 15). Otherwise, the technology to enable Ti and V extraction from the ores without smelting it is limited. At NZ Steel, titanium is removed as a component of the slag at the melters, and it does not cause a lot of issues with refractory wear. The vanadium is later removed from the liquid iron at the Vanadium Recovery Unit just prior to steelmaking through oxidation to create vanadium rich slag. Both are specialised production units designed specifically for these tasks. Local company Avertana has been trying to extract the titanium from NZ Steel ironmaking slags through hydrometallurgical methods for some years and it doesn't appear that it has been successful in creating a commercially attractive product so far.
32. I agree with the Sanofex estimates that the actual discount should be **27–30%**, vs. TTR's **13.7%**⁵

⁵ Page 9 of NZIER report; Page 13 of Sanofex Report

33. TTR's financial model includes revenue from the extraction of vanadium, but this assumption is not realistic. The extraction of vanadium would require the construction of a large-scale hydrometallurgical plant, with capital costs estimated at approximately US \$400 million. At current vanadium market prices of around US \$4 per pound, there is no viable profit margin to justify such an investment. TTR has also provided no evidence of any offtake agreements or committed buyers for vanadium products. Furthermore, the proposal makes clear that no critical minerals, including vanadium, will be extracted in New Zealand, as the ore will be exported in its raw, unprocessed form. In my opinion, revenue from vanadium extraction is entirely speculative and should not be included in the financial model used to assess the project's economic viability.

EXTRACTED ORE STOCKPILING

34. Unlike land-based iron ore mining operations, TTR will not have the ability to stockpile ore onshore. Land-based miners can hold extracted ore and release it for sale when market prices are favourable, without needing to halt production.

35. TTR's offshore operation does not allow for this flexibility. Once the ore is loaded onto a ship, it must be delivered immediately to a buyer. This lack of storage capacity exposes TTR to commercial risk, as potential purchasers may use this vulnerability to negotiate lower prices, placing downward pressure on revenue.

DATED 6 October 2025