IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	of an application for resource consents by **TIGA MINERALS AND METALS LTD**
AND	
IN THE MATTER	of a submission by the
	COAST ROAD RESILIENCE GROUP INC

Lay witness statement of evidence of Suzanne Hills
For COAST ROAD RESILIENCE GROUP INC
Topic Climate Change

Dated: 2 February 2024

Coast Road Resilience Group Inc

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INTRODUCTION

1. My full name is Suzanne Denise Hills. I have a B.Tech (Hons) in Biotechnology and Bioprocess Engineering, Massey University, 1992. I had a career in the food industry in New Zealand and the UK in technologist, technical management and auditing roles for 17 years. Before moving to the West Coast I spent 8 years on a life's sailing adventure. I hold current roles of West Coast branch chair of Forest & Bird; chair of Coast Road Dawn Chorus Inc, and trustee of the West Coast Penguin Trust.

2. I am a member of the Coast Road Resilience Group Inc. (CRRG).I have been asked by the CRRG to provide lay witness evidence in relation to climate change. I am not an expert in this matter and this report is not intended as expert evidence. I have prepared this statement of evidence for the CRRG in relation to this application.

3. I am familiar with the TIGA application site because I have lived on the Barrytown Flats for 7 years.

4. In preparing this statement of evidence, I have reviewed the following documents:

   TiGa RC Application AEE Final and all of the application's attachments; all of the Amendment to Application documents; and all of the Request for Information documents.

   - Final Terrestrial Ecology Peer Review by Mike Harding
   - Both WGA hydrological and hydrogeological Peer Reviews
   - Statement of evidence of Dr James Renwick
   - Statement of evidence of Dr Susan Waugh
   - Statement of evidence of Professor Brian L. McGlynn
   - Statement of evidence of Jens Haaye Rekker
   - Statement of evidence of Gary Bramley
   - Statement of evidence of Robert Brand
   - Statement of evidence of Cameron Andrew Wylie
   - Statement of evidence of Gary Charles Teear
   - Statement of evidence of Michael George Fitzpatrick
   - Statement of evidence of Mark Roper
   - Statement of evidence of Thomas John Lawson
   - Submissions 237, 301, 338
   - GDC and WCRC s42a Officers Reports
   - Grey District Significant Natural Areas Assessment – 1 June 2006 [PUN-W034]

5. In addition to providing this statement in support of the CRRG, I also lodged a personal submission in relation to the TIGA Minerals and Metals Ltd application.

SCOPE OF EVIDENCE

6. This evidence focusses on climate change. Other CRRG members and expert witnesses will be providing evidence on other aspects of the application.

Summary

1. The proposal would have adverse effects both on and of climate change.

2. The entire proposal is diesel fuelled from mining to processing, loadout and trucking. It is a new greenhouse gas emission intensive activity; it is not low emission.

3. Carbon emissions from the proposal would generate more than minor effects during a government declared climate crisis, contributing to the myriad of adverse effects from global warming.

4. The application lacks an emissions report, and this critical lack of information means the proposal cannot be measured against the climate change provisions of the RMA Amendment Act 2020 and the Climate Change Response [Zero Carbon] Amendment Act.

5. An air discharge consent is being sought which triggers the need to have regard to any greenhouse gas emissions from the activity.

6. The application is in opposition to targets and actions of the statutory Emissions Reduction Plan.

7. The proposed mining would reduce the average land elevation by 1.2m, potentially exacerbating climate impacts of coastal erosion and seawater incursion into groundwater from sea level rise and storm surges in a warming climate.

Specific Concerns

Effects on climate change

8. The applicant has not supplied an emission report. The entire operation is diesel-fuelled, including the primary processing from diesel-fuelled generators for an unspecified timeframe. There would also likely be a proportion of staff who would be fly in – fly out because of the tight labour market on the West Coast (particularly for skilled positions).

9. Robert Brand's evidence in paragraph 38 states:

> *TiGa has committed to connecting to the West Coast power grid instead of using diesel for its processing plant power requirements. Westpower Limited owns and operates the electricity distribution network on the West Coast of New Zealand's South Island. There is currently insufficient transmission capacity on the line from*

Rapahoe to Punakaiki. TiGa has committed to upgrading the electricity transmission lines to 33 kV between Rapahoe and the mine site at a likely cost of $5M. TiGa has engaged ElectroNet Services to conduct an initial design study and early indications are that the upgraded power supply is feasible and achievable within the Company's development timeline and budget.

I note the stated commitment to supplying the processing plant with electricity from the West Coast power grid, rather than from diesel generators as stated in the application, has not been proposed as a condition of consent.

10. Mr Brand's statement of evidence also signals use of a mini-van service for staff and future use of EVs and electric trucks in paragraph 40. Again, none of these initiatives are stated in the proposed conditions of consent.

11. The application area is likely to contain peat in the sub soils given the area is a modified wetland. Exposure of peat to air results in the organic carbon decomposing and releasing carbon dioxide (source: wetlands.org). The Hydrological Impact Assessment 2.4.2 states: *Dunes are shaped and reshaped by wind action. Wetlands have a role in laying down layers of proto-peat and peat comprising dead wetlands vegetation.*

12. Consent of this new emission intensive industry would lock in fossil fuel assets long-term. Although this resource consent is for 12 years, it is part of the applicant's bigger and longer-term plan to mine the Barrytown Flats over a period of several decades.

13. This new industry has emissions which are difficult to abate as there are currently no technically or economically feasible alternatives to diesel-fuelled mine machinery and trucking. Consent would therefore lock in difficult to abate emissions for years, and potentially decades, to come.

14. The proposal's total emissions are in the order of **65,015 – 102,723 tonnes** over the life of the proposal and may carry an emission reduction cost in the order of **$6.6 – $10.4 million.** Refer to Appendix 1: Estimated Carbon Emissions.

15. The applicant has not complied with best practices to reduce emissions such as through the preparation of an emissions reduction plan to identify where savings could be made. Nor does the West Coast Regional Council appear to have requested such information.

16. Robert Brand's evidence in paragraph 37 states:

The mine plan and methodology has been developed to ensure efficient operations and reduction in emissions, and the Company has engaged with Professor Dr Danny Samson, from the University of Melbourne to provide an initial Sustainability Report into its proposed operations, followed by a comprehensive Environment, Sustainability and Governance Policy (ESG) to comply with the listing rules on a

public exchange. TiGa will voluntarily report emissions and energy consumption performance of its operations (as is standard practice now).

Despite this statement, the applicant has not supplied an emissions report with the application. And, emission reporting has not been included in the updated proposed consent conditions as of 29 January 2024.

Effects of climate change

17. Carbon emissions from the proposal would generate more than minor effects during a government declared climate crisis, contributing to the myriad of adverse effects from global warming. There are specific adverse effects on the endemic Westland petrel from climate change [Ref: lay witness statement of evidence for CRRG on the Westland petrel] and other local species [Ref: lay witness statement of evidence for CRRG on Indigenous Biodiversity].

18. The proposed mining would reduce the average land elevation by 1.2m, potentially exacerbating climate impacts of coastal erosion and seawater incursion into coastal lagoons and groundwater from sea level rise and storm surges in a warming climate. The coastal lagoon at the western end of the site has been breached by the Tasman Sea in recent years. Canoe Creek, just to the south of the proposed site, lies at a pivot point between coastal erosion to the south and accretion to the north.

19. The proposal's Clean Water Facility consists of two water management ponds situated in the northwest corner of the application area, adjacent to the Canoe Creek lagoon, Rusty Lagoon and the northern drain. The area is low elevation land and close to the MHWS level. The new Coastal Hazards Map from the notified Te Tai o Poutini Plan (TTPP) overlays the site of these proposed water management ponds (and parts of the mining panels). The new coastal hazard maps are based on more accurate LiDAR data and modelling. https://ttpp.nz/coastal-hazards-variation/

    From the applicant's Landscape Assessment, the Clean Water Facility excavations would total 150,000m^3. Both the pond and the mining panel excavations are in an entirely inappropriate location given predicted sea level rise and exacerbated storm surges in a warming climate.

    Section 9 *Coastal Environment of The West Coast Regional Policy Statement 2020* states:

    Climate change can potentially affect the coastal environment via sea level rise, and changes to the intensity and frequency of storm surges and waves. This can affect river mouth migration and lagoon flood levels. The coast is a highly dynamic environment because of a combination of marine, terrestrial and tectonic environments, and this, combined with climate change, means that more frequent or greater erosion and inundation can be expected in coming decades. Inappropriate subdivision, use and development can increase the exposure of people and

communities to risks from coastal hazards. This Chapter proposes guidance on allowing appropriate development in the coastal environment while managing inappropriate development that increases the risk of hazards that affect people and communities. A risk-based approach to assessing coastal hazard risk includes taking a precautionary 41 approach as required by the NZCPS 2010.

And section 11 *Natural Hazards* states:

The West Coast is expected to have both more severe and frequent extreme weather events in future decades. This can exacerbate potential natural hazards and good planning is needed to avoid locating inappropriate land uses in high risk areas.

Avoid or mitigate adverse effects on the environment arising from climate change by recognising and providing for the development and protection of the built environment and infrastructure in a manner that takes into account the potential effects of rising sea levels and the potential for more variable and extreme weather patterns in coming decades.

Policy 3 recognises that adverse effects arising from climate change may be significant in certain areas. While there is some uncertainty over the possibility, extent and timing of climate change effects, when assessing natural hazard risk, councils should use the latest national guidance and the best available information on the impacts of climate change on natural hazard events. Local authorities, as managers of significant infrastructural assets and through their statutory resource management and emergency 50 management responsibilities, will, as opportunities arise and as practicable, plan and prepare for the anticipated effects of climate change.

Policy 25 of the New Zealand Coastal Policy Statement 2010 requires that in areas potentially affected by coastal hazards over at least the next 100 years, increased risk of harm from such hazards must be avoided.

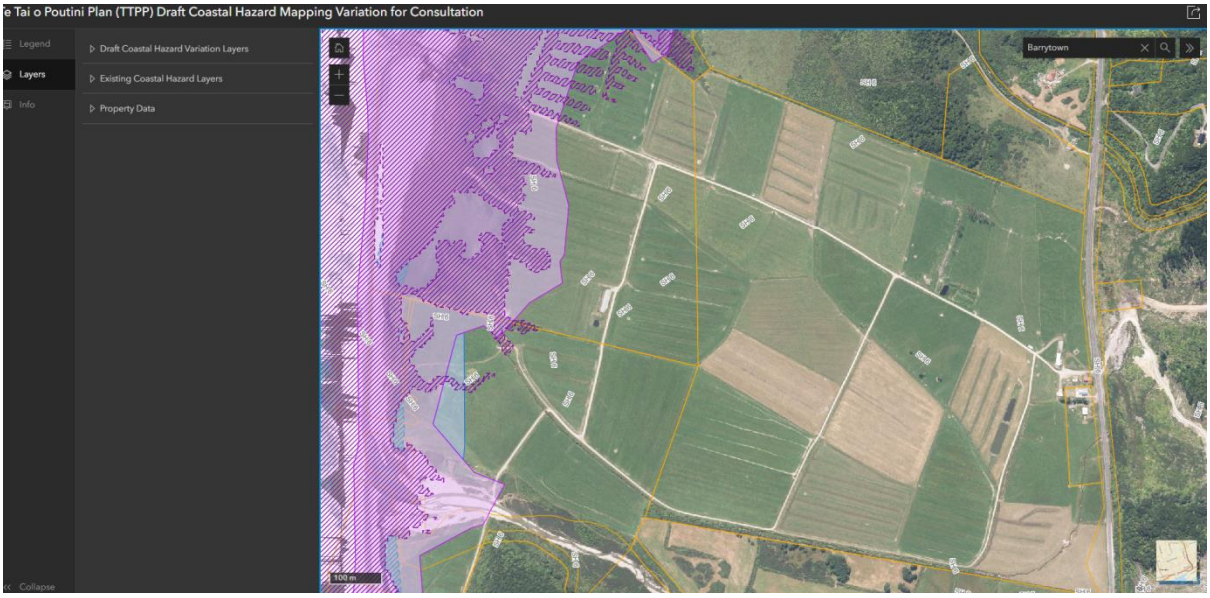

Figure 1 - Coastal Hazards Map from TTPP

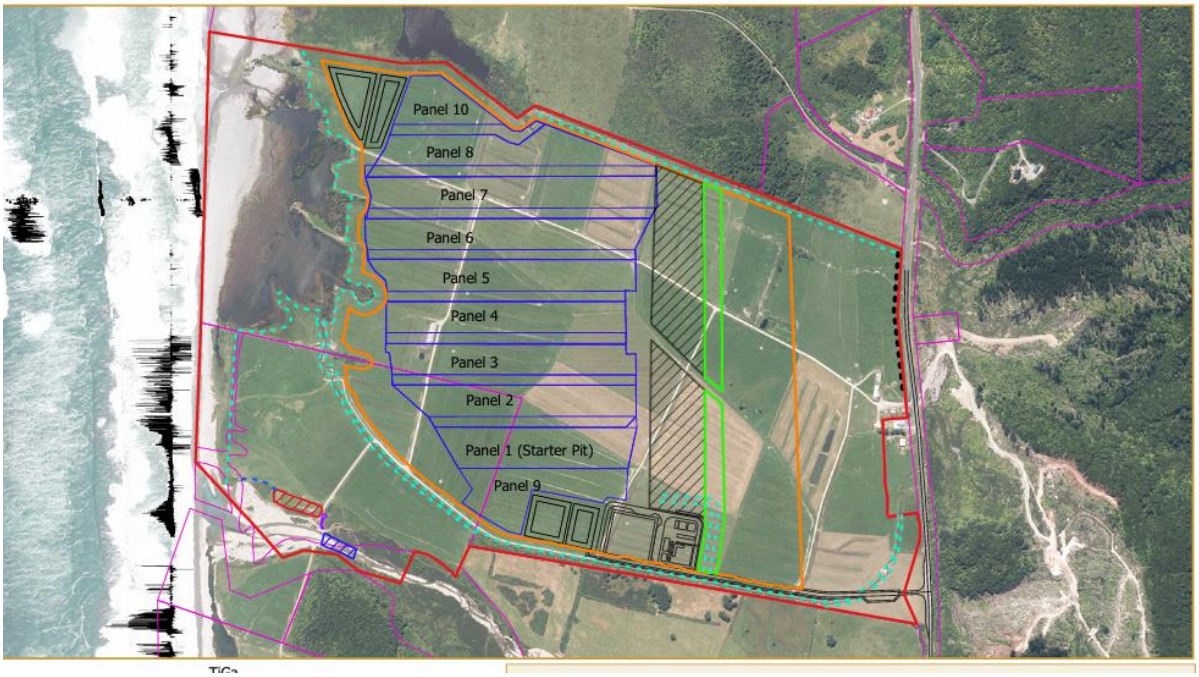

Figure 2 - Application Map showing Clean Water Facility in NW corner

20. A multi-generational member of the Coast Road community estimates on average 20m of horizontal distance has eroded over the past 20 years from Barrytown beach – it is highly variable, in some places more, others less. Below are some recent photos.

Figure 3 – the temporary fence was originally 30m from the land edge

Figure 4 - driftwood pushed up onto farmland

Figure 5 - typical Barrytown beach erosion

Figure 6 - end of Cargill Rd, salt wash

Figure 7 - lumps of freshly eroded land

Figure 8 - salt inundation, Paramount Rd

Statutory Framework

21. The application lacks an emissions report, and this critical lack of information means the proposal cannot be measured against the climate change provisions of the RMA Amendment Act 2020 and the Climate Change Response [Zero Carbon] Amendment Act.

22. I note that s5ZN of the *Climate Change Response (Zero Carbon) Amendment Act 2019 states:*

    2050 target and emission budget are permissive considerations
    If they think fit, a person or body may, in exercising or performing a public function, power, or duty, conferred on that person or body by or under law, take into account –

- *the 2050 target; or*
- *an emission budget; or*
- *an emission reduction plan.*

23. I refer to the MfE document *Resource Management Amendment Act 2020: Overview of changes introduced by the Resource Management Amendment Act 2020* which states:

    Councils may consider discharges to air of greenhouse gas emissions, as the sections prohibiting councils from considering discharges are repealed (that is, sections 70A, 70B, 104E and 104F) – in force from 31 December 2021 (unless extended by an Order in Council).

    The repeal of the above was extended by an Order in Council to 30thNovember 2022.

24. I note under s30(1)(f) of the RMA, regional councils have the function of *the control of discharges of contaminants into or onto land, air, or water and discharges of water into water.* Therefore regional councils have the function of controlling the discharge of industrial greenhouse gas emissions (a contaminant) into air with the repeal of s70A and should, in a climate crisis, consider the climate change implications of these discharges. An air discharge consent is being sought which triggers the need to have regard to any greenhouse gas emissions from the activity.

    For the year ending 2022 the West Coast region ranks at #5for emission intensity at 445t/$ million GDP. Mining contributes 12.2% of total emissions and 7.7% of GDP. The region ranks #3 per capita at 34.2t/capita. [Source: stats.govt.nz]

25. I note *Part 2, s7 Other matters* of the RMA states:

    In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to—
    (i) the effects of climate change

Emissions Reduction Plan

26. The application is in opposition to targets and actions of the statutory Emissions Reduction Plan, including reducing freight emissions by 35% by 2035, and providing new jobs in low-emissions industries. Trucking emissions amount to approximately 4398 tonnes p.a. The operation provides high emission jobs at **190-300 tonnes p.a./direct job** and **1141 to 1802 tonnes/direct job** over the life of the proposal.

    Aotearoa New Zealand's First Emissions Reduction Plan states:

    The Government will enable sustainable supply chains by:
    *► supporting businesses to improve energy efficiency, reduce costs and **switch from fossil fuels to low-emissions alternatives** [bold our emphasis] through continuing the*

Energy Efficiency and Conservation Authority's business programmes and expanding the Government Investment in Decarbonising Industry fund.

The Government will enable sustainable supply chains by: ***ensuring emissions from freight transport are reduced by 35 per cent by 2035*** *through initiatives such as the Sustainable Biofuels Obligation, supporting uptake of zero emissions trucks and enabling low- and zero-carbon shipping on key trade routes.*

The plan includes actions to ensure an equitable transition, for example:
► ***providing new jobs in low-emissions industries****[bold our emphasis]*
► ***supporting regions and communities to plan for the transition****[bold our emphasis]*
► Carbon Neutral Government Programme will use native forests to help sequester emissions from 2025.
►Multi-million-dollar co-investment in industry decarbonisation and economic growth
[bold my emphasis]

27. I refer to the MfE document: *National adaptation plan and emissions reduction plan: Resource Management Act 1991 guidance note* published November 2022. Under *Scope of this guidance note,* it states:

This guidance note: may also support local government to consider the national adaptation plan and emissions reduction plan in other RMA instruments, such as resource consents,[2] and future development strategies required by the National Policy Statement on Urban Development (NPS-UD)

2. If a local government chooses to do so, it can consider under section 104(1)(c) of the RMA, which allows a consent authority to have regard to any other matter it considers relevant and reasonably necessary to determine the consent.

28. Under the Transport sector the above guidance states:

The emissions reduction plan supports low-emission transport infrastructure and urban form outcomes that: ...• decarbonises heavy transport and freight

reduces or discourages activities that can increase transport emissions

supports the transition to decarbonisation of freight, public transport, aviation, and maritime transport

29. Under the Energy and industry sector the guidance states:

Support the decarbonisation of Aotearoa industries by managing the discharge to air of emissions from the production of heat for industrial processes, and support working towards the managed phase out of fossil fuels in energy and industry.

Native planting offsetting

30. Using Tanes Tree Trust calculator (https://toolkit.tanestrees.org.nz/carbon-calculator/) to calculate the number of native trees required to offset the trucking emissions of 4,398 tonnes annually within 20 years requires 80,197 trees, and equates to 16ha of planting annually at 5000 stems/ha. Over the 5-7 year life of the mine, 80 – 112ha would need to be planted to sequester just the trucking emissions within 20 years. I have chosen 20 years as the limit, given added emissions in the mid to late 2020s need to be removed as quickly as possible to have a chance of keeping below 2°C global warming. That is, it is of little use having emissions emitted in the mid to late 2020s not being significantly sequestered after 2050.

31. The small amount of riparian planting proposed along Collins Creek and the coastal lagoon is insignificant compared to the planting required to sequester the proposal's emissions within 20 years. Native planting offsetting would require more than the entire site to be planted just for the trucking emissions. For the estimated total emissions over the life of the project of **65,015 – 102,723 tonnes**, the area required would be 237 – 375ha. As a comparison, the Barrytown Flats are approximately 1600ha in total, so it would require up to almost a quarter of the flats to be planted.

New Zealand Petroleum and Minerals recommendation report for the applicant's mining permit

32. The applicant holds an 800ha mining permit covering the vast majority of the northern half of the Barrytown Flats. The NZ Petroleum and Minerals recommendation report for the issue of this permit [Refer to CRRG Indigenous Biodiversity Submission Attachment 1] states:

    Para 153: The emissions reduction plan does not contain any specific policies related to the activities undertaken in exploration and mining of non-fossil fuels. However, the emission reduction plan does outline policies to reduce the emissions intensity of transport fuel by 10% by 2035 through biofuel mandates and regulation of heavy vehicle emissions.

    Para 155: The CCRA provided for the implementation, operation, and administration of the Emissions Trading Scheme (ETS) ***which is the Government's main tool for the reduction of emissions in New Zealand*** [bold our emphasis]*. The ETS creates a price on emissions and therefore allows the market to decide on the most economically efficient way to reduce emissions.*

    Para 158: Officials note that on 30 November 2022 there will be changes to the RMA which will repeal the existing limitations on a council's ability to consider the effects of climate change as part of resource consent applications. Therefore, any application for a resource consent or to vary an existing resource consent will be subject to considerations of the proposed activities on climate change. However, this assessment under the RMA process does not eliminate your obligations under 5ZN when considering this application.

Para 159: Consideration of the Net Zero Factors Officials consider that the proposed activities outlined in this application will likely have a low impact on the Net Zero Factors as the emissions from the proposed operations ***are only from the combustion of liquid fossil fuels in plant and machinery***

Para 162: In the interests of consistent and transparent decision-making, officials recommend a low weighting is placed on the permissive considerations under s5ZN of the CCRA in the decision on this application. ***This is because the emissions from the proposed activities are low and result from the combustion of liquid fossil fuels in plant and machinery. The emissions from the proposed activities are captured by the ETS which is the government's main tool for emission reductions*** [bold my emphasis].

33. The ETS cannot be the main tool in reducing emissions because since its inception it has clearly failed to do so. This is evidenced by the enactment of the Climate Change Response (Zero Carbon) Amendment Act 2019 with prescribed emission budgets and emissions reduction plans to reduce emissions. This point was made during the Climate Leaders Debate on 03/10/2023 on RNZ's Morning Report. https://www.rnz.co.nz/national/programmes/morningreport/audio/2018909473/climate-leaders-debate

34. Para 159 and 162 refer to 'plant and machinery' and do not include heavy vehicle transport.

35. Para 162 claim of '*emissions...are low*' is made without qualification or data.

36. Given the above evidence I conclude the emission assessment for the mining permit cannot be relied on. It is therefore imperative that through this resource consent process the greenhouse gas effects are considered with great care.

Greenwashing/climate-washing

37. From the applicant's AEE:
6.39 The New Zealand Government published a Minerals and Petroleum Resource Strategy in November 2019 (the Strategy). The Strategy seeks to support New Zealand's transition to a carbon neutral economy by 2050, and recognises the importance of titanium in relation to cleantech uses such as electric vehicles.

6.40 The activity involves the extraction of minerals which will be used for clean/green technologies which could support New Zealand's transition to a carbon neutral economy, includes a significant number of mitigation measures and has provided substantial information to ensure that the potential effects on the environment, ecosystems and biodiversity will be minor in nature, which is consistent with this Strategy.

38. Ilmenite, garnet, zircon and gold have diverse uses and to state they ***will be used for clean/green technologies*** avoids the myriad of alternative uses such as aerospace,

military, industrial processes, automotive, medical, jewellery, electronics etc. Ilmenite of the grade found in the Barrytown Flats deposits is likely to be used as a white pigment in paints and coatings, and not as an ore for titanium production. Garnets are used for metal cutting, as an abrasive and as a water filtration media. Zircon has uses in ceramic manufacture and also nuclear fuel rods, catalytic fuel converters and in air and water purification. Gold is of course primarily used as currency, with lesser amounts for jewellery and various industrial uses (we have of course already extracted enough gold, stored in bank vaults, to supply industrial use for many decades).

39. The Barrytown flats deposits also contain monazite (thorium bearing) from which rare earth elements can be recovered through further processing. Rare earth elements have diverse applications in electrical and electronic components, magnetic materials and industrial processes, including in military hardware. An important word of caution comes from World Nuclear Association:
https://www.world-nuclear.org/information-library/safety-and-security/radiation-and-health/appendicies/mineral-sands-appendix-to-norm-information-paper.aspx

"While the main products of mineral sands mining are titanium oxide and zircon, monazite is also a significant component. In some deposits xenotime also occurs. Monazite and xenotime may be processed to recover rare earth oxides, which are used in electronics and other specialist fields, but the presence of thorium makes them commercially unattractive. Between 1980 and 1995 some 160,000 tonnes of monazite was sourced from mineral sand mining in Western Australia and exported to France for processing to recover rare earth minerals, but the French plant was closed due to its operators being unable to dispose of the radioactive wastes. Monazite is thus normally returned to the mine and dispersed with the tailings."

40. The Strategic Directions section of the proposed Te Tai o Poutini Plan (TTPP) failed to include an objective on emissions reduction. Currently TTPP is at the hearing stage and the s42A report for Strategic Directions recommended the following objective:

> *CC -03: To support technologies and activities that enable greenhouse gas emissions reductions and the transition to a low carbon emissions economy, while ensuring their adverse effects are well managed.*

This objective is centred on the support of activities such as mineral extraction and is using the green tech transition as justification. The objective fails to address regional emissions reduction measures and fails to reference alignment with national ERPs.

Submissions and peer reviews

41. I endorse Mike Harding's terrestrial ecology peer review and highlight his references to climate change impacts in paragraphs 79, 90, 91, 94, 113 and 150.

42. I endorse the Forest & Bird (237) submission and highlight paragraph 6: *Forest & Bird also considers that the activity is inconsistent with Aotearoa New Zealand's Emissions Reduction Plan as required by the Climate Change Response Act 2002.*

43. I note many individual community members raised concerns regarding the impacts on and of climate change and highlight the following two submissions as examples:
    - Submission 338 by K Klempel on coastal erosion and sea level rise
    - Submission 301 by J Martel on emissions and climate change

Comment on s42a Officers Report for WCRC

44. I note the s42a Officers Report for WCRC considers the effects *on* climate change of greenhouses gases, but does not consider the effects *of* climate change. Paragraph 403 of the s42a Officers Report for Grey District Council states: *Effects of climate change...are for WCRC to consider.*

45. I agree with paragraph [40] that a discharge permit (to air) is required to discharge combustion emissions, including of greenhouse gases, from operational machinery. As discussed below, this should include all emissions associated with the proposal, including transportation.

46. I agree with paragraph 206: *The climate-changing effects of fossil fuel emissions of greenhouse gases are now within scope for potential consideration at s104 of the RMA. Carbon dioxide is a stock pollutant that accumulates in the atmosphere over time and, cumulatively, brings about an effect on climate. These emissions should therefore be considered as contaminant discharges under the RMA and their effects should be considered.*

47. I do not agree with paragraphs 208 and 209 that: *The scope for assessment below is limited by s15;* and *only those emissions occurring from the site are within scope.* As there is no case law and the Ministry for the Environment is yet to provide guidance (outside of process heat emissions), a *liberal approach* should be taken, rather than a narrow view of applying s15 to the letter of the law. It is the intent of the repeal of sections 70A, 70B, 104E and 104F prohibiting councils from considering emissions discharges that is important, particularly in a climate crisis.

48. On paragraph 211: *New Zealand has committed to a net-zero emissions regime by 2050. However, the proposed consent, if granted, would expire or lapse before 2050. Whilst progress towards achieving that target is relevant context (and could be considered an other matter under s104(1)(c)), granting or refusing this consent will or not affect whether the target is met or not.* While acknowledging the second sentence, I highlight that the cumulative effects of emissions emitted before 2030 and 2050 are critical and will have consequences for hundreds of years to come. New Zealand also has statutory emission budgets to meet before 2030.

49. I agree with paragraph 212: *Nevertheless, as stated above, the effect of emissions is cumulative. Whilst the individual effect of these emissions are not known and likely indecipherable from the effect of emissions at large, all emissions contribute to the cumulative effect .*

    I add that therefore regard must be had to them. I acknowledge the applicant's emissions are very small in comparison to New Zealand's total emissions, however, the same can be said of New Zealand's total emissions in comparison to the global total. This does not dispel our international responsibility to reduce emissions and the same can be said of the applicant with regards to NZ's emissions. This application for a new mineral sand mining activity with new, difficult to abate, emissions is of particular concern.

Conclusions

50. The proposal would add new hard to abate carbon emissions, exacerbating the effects of climate breakdown and directly impact communities, and local at-risk and threatened species.

51. The proposed excavation activities of water management ponds and mining in the coastal hazards overlay of the site is entirely unacceptable and risks exacerbating coastal erosion and seawater incursion into groundwater and coastal lagoons. Likewise the average 1.2m decrease of land elevation in the coastal environment in a warming climate is utterly inappropriate land use and development.

52. The application lacks an emissions report, and this critical lack of information means the proposal cannot be measured against the climate change provisions of the RMA Amendment Act 2020 and the Climate Change Response [Zero Carbon] Amendment Act. An air discharge consent is being sought which triggers the need to have regard to any greenhouse gas emissions from the activity.

53. The application is in opposition to targets and actions of the statutory Emissions Reduction Plan on reducing transport emissions and providing new jobs in low-emissions industries.

"The choices and actions implemented in this decade will have impacts now and for thousands of years" - IPCC report, March 2023.

Appendix1:Estimated Carbon Emissions

1. **Carbon emission sources include:**
   - Pre-mining construction phase: construction of buildings (including embedded carbon of materials), wastewater infrastructure (tanks, ponds and drains), access road and bunds, and the removal of fences.
   - Mining phase: open cast mining (mine machinery and pumping), primary processing, loadout, transport and wastewater treatment operations. Additional transport emissions from the port (Westport or Greymouth) to final bulk carrier shipping to possible customers in India, Malaysia or China. The product may also be trucked to the Rapahoe railhead, then railed to Timaru and shipped from there.
   - Post-mining deconstruction and rehabilitation phase: removal of all buildings (except the 990m^2 one) and infrastructure (tanks etc), filling the wastewater ponds, re-contouring the land, and reinstating internal farm roads and fences.
   - The sub soils contain peat. Exposure of peat to air results in the organic carbon decomposing and releasing carbon dioxide .

2. **Trucking Emissions**

A route either north to Port of Westport (67km) or south to Port of Greymouth (35km) will be used with an average of 50 truck movements per day, operating 365 days of the year. Each movement is a one way trip, giving 25 loaded movements and 25 return (empty) movements per day. The payload is 30tonnes of HMC. The weight of the truck and trailer is approx 20tonnes. The SBN Climate Toolbox uses an emission rate of 0.135Kg CO_2^e per tonne-km for road freight. (https://www.tools.business.govt.nz/climate)

Average gross weight of truck & trailer (50% loaded and 50% unloaded) = 35t

Average distance = 51km/trip

Average trips = 50trips/day, 365 days p.a.

Annual trucking emissions

= 0.135kg CO_2^e/tonne-km x 51km/trip x 50trips/day x 35tonne x 365days/year

= 4,398 tonnes p.a.

3. **Light vehicle emissions**

Light vehicle movements for staff are estimated at 140 per day. It is likely they will be travelling from either Westport or Greymouth, so the same 51km average distance applies.

0.252kg CO_2^e per kilometre for a petrol private car (from SBN Climate Toolbox).

Annual light vehicle emissions (worst case, assumes no car pooling or a mini bus for staff)

= 0.252kg CO_2^e/km x 51km/trip x 140 trips/day x 365days/year

= 657 tonnes p.a.

4. Mining and Processing Emissions

The only information from the proposal is a list of mine machinery and the volumes excavated.

From the Landscape Assessment:

- Total sand ore to be excavated: 4,800,000m^3
- Mine water facility excavations: 135,000m^3
- Clean water facility excavations: 150,000m^3
- Clearing a 2ha area for the processing plant & associated infrastructure.

3.19 of the AEE lists the mine machinery in Table 1. It consists of:

- *Dozer Komatsu D71PX-24 x2*
- *Grader Komatsu GD655-7 x1*
- *Front End Loader Hitachi ZW370-5 x3*
- *Integrated Tool Carrier Hitachi ZW220-5 x4*
- *Artic 6wd 45 Truck Hitachi B45E x3*
- *Excavator (Long stick) Hitachi ZX890LCH x2*

3.22 of the AEE states: *Additional mining equipment and vehicles will be used on site, including a variety of pumps (including land based, floating and submersible) and light 4-wheel drive vehicles for the transport of mining personnel.*

5. Emissions Estimate

Emissions can be estimated from the West Coast rate of emissions per GPD. For the year ending 2022 the West Coast emission rate was 445t/$million GDP. Mining contributed 12.2% of emissions and made up 7.7% of GDP (source: stats.govt.nz). This gives an emission to GDP ratio of 1.58 for West Coast mining. From the Economic Assessment the applicant estimates the additional GDP of the proposal to be $146.1million. At the West Coast rate of 445t/$million GDP, this equates to **65,015tonnes** over the life of the proposal.Applying the mining 1.58 ratio, the emissions equate to**102,723tonnes**over the life of the proposal.

6. Comparison with the Government Investment in Decarbonising Industry (GIDI) Fund and estimated cost of decarbonisation

<u>GIDI Industrial Fund Comparison</u>

The GIDI Industrial Fund granted to companies from April 2021 to August 2023 is summarised in table below. There were a total of 81 grants. They are funded via proceeds from the ETS, up to 50% of the capital cost.[Source: EECA website and is summarised in attached spreadsheet named decarbonisation fund.xlsx]

Table 1: Summary of GIDI Industrial Fund

	Mean	Median
Co-fund value per applicant ($)	$1,385,157	$798,000
Annual emission reduction per applicant (t)	*5,633t*	*2520t*
Co-fund value/ t annual emission reduction ($/tp.a)	$246/t p.a.	$306/t
Total GIDI co-funding ($)	$112.2 million	
Total private funding ($)	$195.9 million	
Total funding – GIDI & private ($)	$308.1 million	
Total annual emission reduction (t p.a.)	456,600 t p.a.	
Cost of GIDI decarbonisation ($/t annual emission reduction)[1]	$605/t p.a.	

t is metric tonnes

1. Cost of GIDI decarbonisation = $308.1 million / 456,600 t annual emission reduction

   = $675 / t annual emission reduction

   GIDI was funded by the ETS, therefore the $70/talready paid through the ETS should removed from this $675/t rate.

   =>Cost of GIDI decarbonisation = $675/t - $70/t

   = $605/t annual emission reduction

The GIDI funding per applicant has a mean annual emission reduction of 5,633t. This is in the same ballpark asthe proposal's annual trucking emissions of 4,398 t p.a. It demonstrates that this level of emissions is ***significant*** as the government has funded NZ companies through GIDI to reduce their emissions by a similar amount.

7. Estimated cost of decarbonisation

The cost of decarbonisation is highly variable depending on the sector and technologies available. We have used the GIDI Industrial Fund as the closest ballpark estimate currently available.

Table 2: Estimated cost of decarbonisation and emissions per job

	Estimated minimum	Estimated maximum
Estimated total emissions for proposal (t)	65,015 t	102,723 t
Proposal's annual emissions based on 6 year timeframe (t p.a.)	10,836 t p.a.	17,121 t p.a.
Estimated cost of emission reduction using GIDI rate of $605/t p.a. ($million/t annual emission reduction)[2]	$6.6 million/t p.a.	$10.4 million/t p.a.
Emissions per direct job p.a. (t/job p.a.) Based on 57 direct jobs	190 t/job p.a.	300 t/jobp.a.
Emission per direct job (t/job) over life of proposal Based on 57 direct jobs	1141 t/job	1802t/job

2. The GIDI investments are one off capital investments for ongoing annual emission reductions. Applying the $605/t annual reduction may beover estimating the cost when applied to the applicant's proposed average 6yr timescale, as the capital expenditure of the GIDI projects are likely over a longer

timeframe of 15-20 years. The most accurate cost of decarbonisation for this proposal would bethe cost of investing in green hydrogen trucks and mining machinery which is only in early development stage and not currently available. Regardless, these are estimates and give an indication of the emission reduction cost of the proposal.

The true cost of industrial decarbonisation from the GIDI Industrial Fund is $605/t annual emissions reduction, not the current carbon price of around $70/t in the ETS. This equates to a decarbonisation cost of $2,660,790 for TiGa's trucking emissions alone. If TiGa's total emissions are in the order of **65,015 – 102, 723 tonnes** (as estimated above), then the total cost of decarbonisation is approximately **$6.6 – 10.4 million** (based on 6 years) for the proposal. If NZ does not meet its Nationally Determined Contribution (NDC) by 2030, the government will have to buy costly offshore offsets. The latest estimate is that the upper limit of this could now be a very costly $23.7 billion to the NZ government. TiGa's proposal would be contributing to this.