Before the Hearing Commissioners
appointed by the Grey District Council and
West Coast Regional Council

Under	the Resource Management Act 1991
In the matter of	Resource consent applications by TiGa Minerals and Metals Ltd to establish and operate a mineral sands mine on State Highway 6, Barrytown (RC-2023-0046; LUN3154/23)

Statement of evidence of Robert George Brand

19 January 2024

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Qualifications and experience

1 My full name is Robert George Brand.

2 I am the Managing Director of TiGa Minerals & Metals Limited (**TiGa**) and have held this role since February 2023. Prior to this, between March and June 2020, I was engaged by TiGa (then called Barrytown JV Limited (BJV)) as a consultant to prepare a Development Plan for the Barrytown Mineral Sands Project.

3 I am a Mechanical Engineer, graduating from the Curtin University of Technology of Western Australia with more than 40 years previous work experience in the mineral sands industry including leading established mining companies GMA Garnet, the world's largest garnet producer, Barton Mines International, the world's oldest garnet producer since 1878, and as founder and developer of the Harts Range Mine for Australian Industrial Minerals. GMA and the Harts Range Mine produced significant qualities of ilmenite in addition to their primary garnet products. I have experience in developing and operating mineral sands (garnet and ilmenite specific) mining projects, and distributing garnet and ilmenite products worldwide.

4 In my evidence I provide information about the company formation, the Barrytown resource, site selection, project operations, sustainability, engagement, housing provision, working with the landowner for rehabilitation, and TiGa's proposed scholarship programme and local jobs.

Who is TiGa?

5 By way of background, in 2012 Pacific Mineral Resources Limited (later known as Westland Titanium Limited (**WTL**)) was funded by a group of New Zealand investors to acquire Exploration Permit EP51803 and explore the mineral sands deposits contained in the permit that covered an area of about 1,352ha of the Barrytown Flats.

6 In October 2015, as the requirement for additional funding grew, WTL entered into a joint venture with Barrytown Resources Limited (**BRL**) by way of an incorporated joint venture Barrytown JV limited (**BJV**), such that WTL and BRL were shareholders in BJV. BJV was governed by an arrangement where BRL would be the sole financier.

7 In June 2018 this arrangement ceased and BJV became an ordinary company and new investors were allowed onto the register. In February 2019 BJV shareholder WTL distributed its entire BJV holding to its individual shareholders.

8 In February 2022, BJV changed its name to TiGa Minerals & Metals Limited (TiGa) to better reflect its activities as a producer of minerals; ilmenite (titanium dioxide) and garnet, and potentially metals; titanium.

9 The original New Zealand shareholders in WTL remain as shareholders in TiGa, and TiGa continues as the original New Zealand registered company owned by investors in New Zealand and Australia but with additional shareholders added to the register.

10 TiGa has Mining Permit MP60785 that covers an area of about 800ha of the northern section of the Barrytown Flats, of which TiGa has a Land Access Agreement with the land owner covering an area of 388ha. This resource consent application proposes to mine 63ha of that area.

TiGa's Barrytown Mineral Sands Project

11 The Barrytown Flats are an area about 15km long and 1.7km wide between the ocean and the Southern Alps that contains a number of north/south running mineral rich strandline deposits of heavy minerals. Mineral sands deposits are typically formed by tidal and wave action along coastlines where the heavy minerals are concentrated into well-defined strandlines that become stranded as the ocean recedes and the coastline is exposed over many thousands, often millions, of years.

12 The Barrytown Mineral Sands Project is based on this world class deposit on the Barrytown Flats with a unique mineral suite that produces two core product streams, Ilmenite and garnet, and two by product streams, zircon and gold.

13 It has been designed with a market entry focus such that it can establish itself as a substantial and sustainable supplier of heavy mineral products, especially ilmenite and garnet, that are the dominate minerals in the deposit.

14 Ilmenite is the mineralised form of titanium, and is the feedstock to the titanium dioxide market that produces:

(a) TiO2 pigment that is UV resistant and inert, and imparts whiteness and opacity in the manufacture of paints, plastics, paper, sunscreen and food additives.

(b) Titanium metal that is light, strong, corrosion resistant and used in renewable energy, aerospace and medical devices.

(c) Flux applications such as welding rods.

15 Barrytown's mineral sands is unique in that it also contains garnet as a high grade co-product. Garnet is hard, tough, inert and used as an industrial abrasive in abrasive blasting, waterjet cutting, abrasive powders and water filtration.

16 Garnet, due to its high hardness, doesn't break up like silica and is used as the safe alternative in waterjet cutting and as an abrasive replacement for silica based sand blasting. Waterjet cutting is the environmentally friendly, high-technology cutting used to cut through metal, ceramics, composites, glass and stone using ultra-high pressure water and garnet. Waterjet cutting is extensively used in high technology industries such as the aerospace, computer chip and automotive industries.

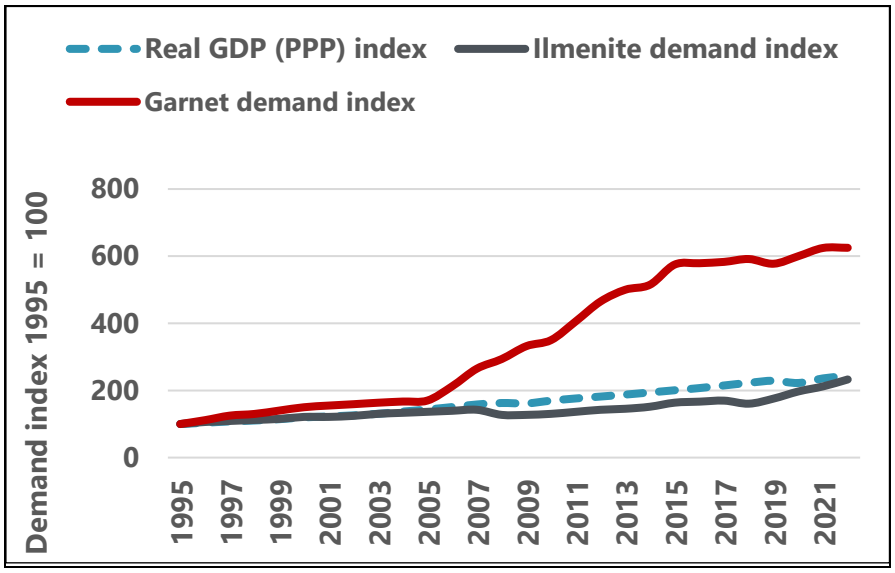
17 Production of heavy minerals is typically market driven and global demand for heavy minerals is rising.

18 Demand for TiGa's products is driven by global GDP growth and urbanisation in emerging markets and prices trend above global CPI and are less cyclical given the rising demand for minerals overseas as countries move to a low emission carbon economy and produce more renewable energy.

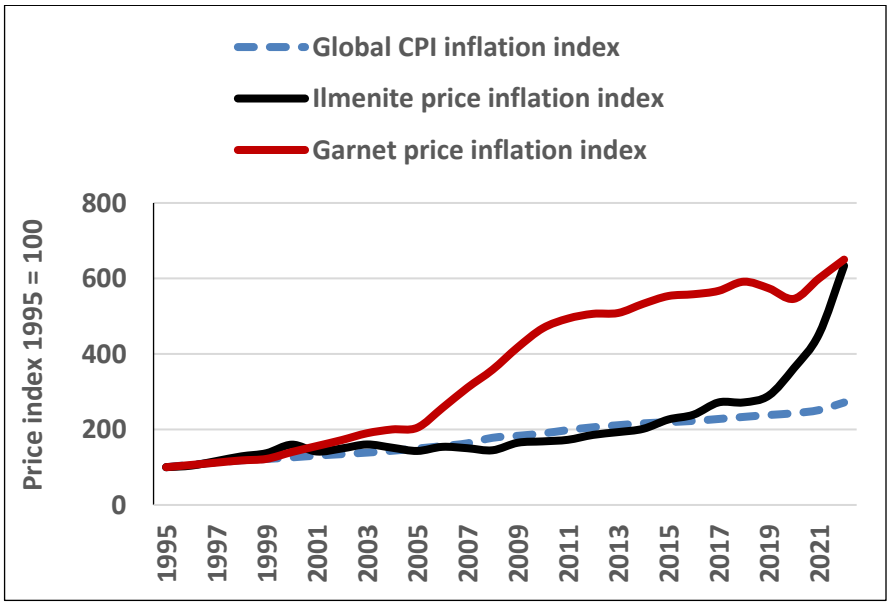
19 I have prepared some graphs to demonstrate this below. The graphs incorporate World Bank inflation and GDP data, and internal data on price and volume. They were prepared with the assistance of Mr Ballingall.

20 GDP measures the monetary value of goods and services that are bought by the final user. Since ilmenite and garnet are used to produce goods that are bought by final users, comparing their demand against global GDP growth is an appropriate method to illustrate the strength of their demand – as global demand for finished goods increases, so does the demand for ilmenite and garnet – demonstrating the non cyclical nature of demand.

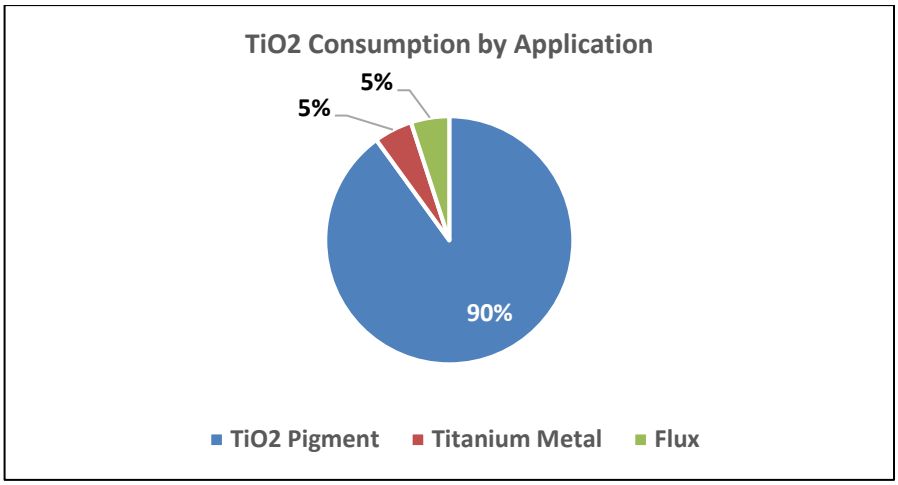
21 Calculating global GDP growth, and ilmenite and garnet demand as an index from the same base (in this case 100) provides a convenient visual comparison of the growth of each from a common starting point.



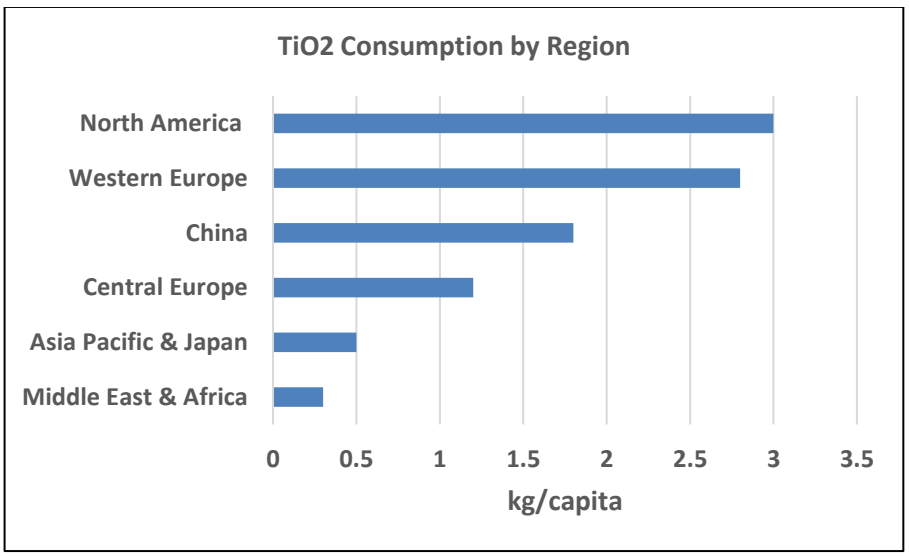
22 The concept of global CPI inflation is well understood. As before using an index (of 100) provides a convenient visual comparison of how the ilmenite and garnet prices compare to inflation from the same starting point.



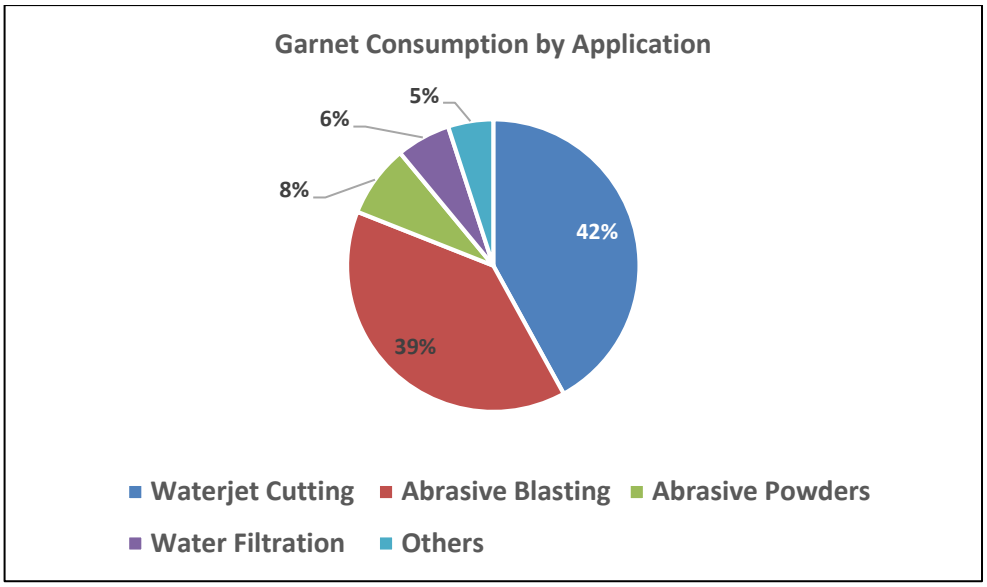
23 Ilmenite is the feedstock for the titanium dioxide (TiO2) market that is used in the further manufacture of finished goods. This graph shows how the TiO2 is consumed in these manufacturing applications.



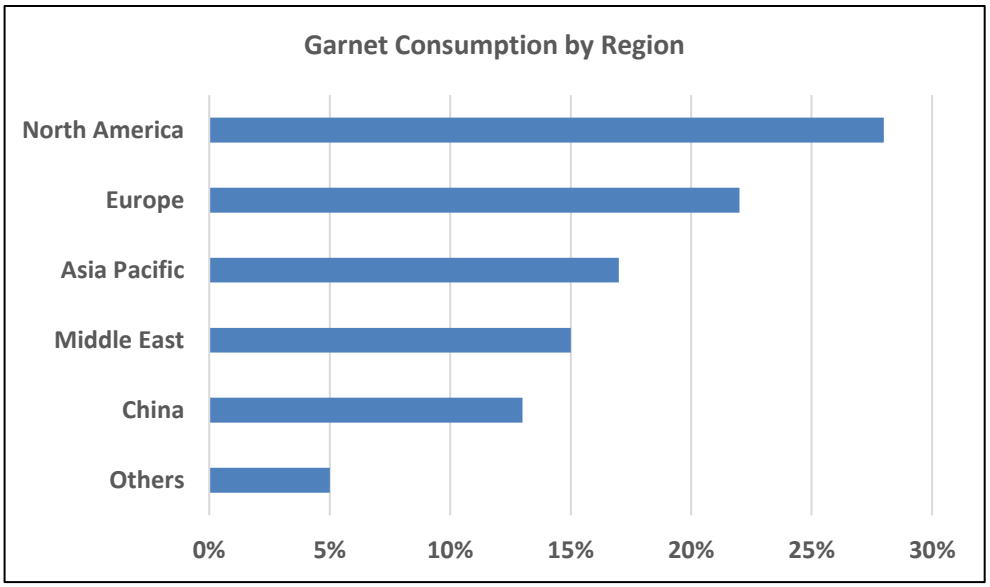
24 Given that about 90% of TiO2 produced is used in the manufacture of such products as paints, plastics and paper, it is not surprising that developed economies are the dominant uses. This graph shows the TiO2 consumption on a kg/capita basis.



25 This graph shows how the garnet market is segmented by application.



26 This graph shows the garnet consumption by region. It can be seen that consumption is highest in developed economies that have high tech manufacturing industries (i.e. waterjet cutting) and large steel fabrication (i.e. abrasive blasting) capacity.



27 The mineral sands industry is characterised by long term producing assets with demand for its products closely following global GDP growth and prices outstripping the pace of global inflation, ensuring long lasting positive outcomes for the West Coast community and New Zealand more generally.

Site selection

28 Mineral discoveries occur over long periods of time and only after many exploration campaigns, often by successive parties, that build on previous knowledge and progressively define an economic resource. The mineral deposits in the Barrytown

Flats have been known for many years but active exploration is recorded to have commenced in the 1960's.

29 Each ilmenite and garnet mineral sands deposit produces ilmenite and garnet of a different specification resulting in their performance in application being location dependant. The input cost of ilmenite and garnet in relation to the consequential cost of them failing to perform in application is minute. As a result customers require long term offtake agreements that ensure consistent specification, reliable supply and total traceability to the source of manufacture.

30 The location of the Project was selected as:

(a) it is on approved Mining Permit MP60785;

(b) it is in a large area of private land subject to an access arrangement;

(c) it contains a significant mineral resource which is JORC compliant[1];

(d) it was rural land which is relatively remote from near neighbors (4 immediate neighbours) and the Barrytown community (over 6km away);

(e) it was supported by consultants on environmental grounds, in particular its distance from the taiko colony (nearly 4km away).

Mineral sand operations

29 Mineral sands projects comprise three separate and distinct units of operations before its products are ready for global distribution and sale at their highest and best value.

Mining

30 After extensive exploration, drilling and testing a Mine Plan is able to be produced that defines the location and extent of the mineral resource. As noted above, the mineral resource occurs as distinct strandlines and the mining operation is carefully designed taking into consideration site specific constraints and environmental sensitivities. Mining is carried out by standard earthmoving equipment feeding a Mobile Mining Unit (**MMU**) that is moved as mining progresses enabling small areas to be mined and rehabilitation to be carried out as mining progresses. The mined ore is pumped to a Wet Concentration Plant via a slurry pipeline.

[1] The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code) establishes standards for public reporting, emphasising principles of transparency and materiality. All companies listed on Australian or New Zealand Stock Exchanges are required to comply with the JORC Code.

*Wet Concentration Plant (**WCP**)*

31 The WCP is a fixed plant located such that it can receive mined ore from the MMU at the various locations as it is moved throughout the mineral resource. The WCP process uses water to transport and separate the valuable heavy minerals in the mined ore from their less valuable host minerals. It is economically and environmentally beneficial that the WCP is located at the mine site. The wet concentration process produces a Heavy Mineral Concentrate (**HMC**) that contains the valuable heavy minerals and is a saleable product in its own right, however at a lower value than the sum of the individual minerals contained within it.

*Mineral Separation Plant (**MSP**)*

32 This process uses magnetic and electrostatic techniques to separate the components of the HMC into individual products that are significantly more valuable than when combined as HMC. The MSP is typically located as close to major transport and/or port facilities as possible for export to the global distribution network.

33 TiGa is also considering future plans for an MSP on the West Coast close to port or rail facilities. The MSP will enable refinement of the HMC which gives the resulting products a significantly higher value for export. These are future opportunities and do not form part of this resource consent application, but are relevant to the long-term potential of the development of the industry.

34 The HMC produced from the Application Area and any future products from an MSP will require exporting for further processing in the case of the HMC and into global distribution networks in case of the MSP products. In both cases this will result in the improvement of transport infrastructure that will be especially beneficial for the region. Upgraded and improved road, rail and port facilities linking the West Coast up with other parts of the country and global shipping networks will have positive flow on effects for other industries, which will in turn help bolster economic activity in the region.

Sustainability

35 TiGa recognises the importance and indeed the centrality of sustainability for the Barrytown Mineral Sands Project and have planned for implementing a mining operation that is very high in its sustainability values, processes, actions and outcomes.

36 TiGa intends to help shape the industry by leading sustainable environmental practices, and reduce emissions through the method of mining, mobile machinery configuration and connecting the site to the West Coast power grid.

37 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).

38 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.

39 Discussions with Westpower confirm that the upgraded power supply will improve security of supply and future proof the network as well as enable future benefits such as a new electric vehicle charging station along this line. There are currently no electric vehicle (**EV**) charging stations in the 102 km distance between Greymouth and Westport, and this is due to the current transmission capacity constraints. Westpower submitted in support of the proposal.

40 TiGa will also continue to look to have its mobile fleet established with a mix of low emission machines or electric vehicles to minimise greenhouse gas emissions. TiGa will encourage the use of the mini-van service for all staff and contractors, which will collect personnel from pre-determined locations to the site. TiGa is currently investigating the use of an electric service. TiGa is investigating the use of electric trucks in conjunction with the transport operator, as the haulage will be contracted to a local operator. Given current indications on supply, it is unlikely that the project will start with electric trucks.

41 TiGa is committed to planting and restoration as part of rehabilitating the application site, and has committed to local and regional biodiversity initiatives through a partnership with mana whenua and the Paparoa Wildlife Trust.

42 TiGa strongly intends this investment and operation to be an exemplar sustainable business, strongly aligned to the company's purpose and long term interests in contributing to the sustainable development of Barrytown and the local region.

Engagement

Mana whenua

43 TiGa have actively engaged with Te Rūnanga o Ngāti Waewae (**Ngāti Waewae**) regularly throughout this project from its inception. Engagement by my predecessors commenced on 24 April 2020 and was frequent (monthly) leading up to and during the company's first resource consent application, which was initially opposed by Ngāti Waewae[2]. I have continued engaging with Francois Tumahai, as chair of Te Rūnanga o Ngāti Waewae in person or over zoom[3]. TiGa has actively responded and addressed any concerns raised. We are pleased that mana whenua have submitted in support of the Project.

44 We value and respect our relationship with mana whenua and have recently committed to a partnership with Te Runanga o Ngati Waewae and the Paparoa Wildlife Trust where we will provide funding to improve biodiversity through predator control and other conservation activities as well as improving our understanding of the Westland Petrel Tāiko through further research with Mātauranga Māori central to this work. The partnership will engage with the Department of Conservation, West Coast Penguin Trust, Westland Petrel Tāiko conservation groups, academic institutions, the community, and local government, and opportunities for collaboration to improve biodiversity will be explored.

45 TiGa is also a partner of the iwi owned research institute the New Zealand Institute for Minerals to Materials Research (**NZIMMR**). NZIMMR was established in August 2017 as one of four Regional Research Institutes and is based in Greymouth on the West Coast. NZIMMR was provided seed funding under contract to the Ministry of Business, Innovation and Employment to establish the institute with a focus on adding value through its research and development works to the minerals sector. Two state-of-the-art laboratories have been constructed at Dunollie, a minerals processing laboratory and a minerals to materials laboratory. This Project will contribute to the success and utilisation of the NZIMMR facilities that will undertake day to day laboratory services to support the project as well as partnering on research to investigate environmentally sound opportunities to add value to the industry and retain as much value in the West Coast region.

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[2] 2020 - 24/04, 29/04, 1/05, 4/05, 5/05, 18/8, 19/05, 20/08, 11/09, 14/09, 15/09, 6/10, 8/10, 20/10, 30/10, 18/11, 19/11, 25/11, 3/12, 10/12

2021 - 21/01, 25/01, 11/02, 5/03, 11/3, 19/3, 18/04, 15/05, 17/05,

[3] For example, in person meetings March, May, August and October 2023, and on video conference twice in September.

The Barrytown community

46 TiGa requested public notification of the resource consent application and were committed to ensuring mana whenua and the West Coast community had an opportunity to participate in the resource consent process. During the submission period, to enable discussions with the community TiGa arranged a public meeting in the evening at the Barrytown Hall (10 October), and drop-in sessions in Greymouth (5 October) and Barrytown (10 October) which myself and Mr Berry attended. These opportunities for engagement were advertised in advance through the Councils' websites, TiGa's social media and print media, and we were pleased with the interest shown and attendance by the community.

47 We have also met with the Principal and Board members of Barrytown School, and the Coast Road Resilience Group to listen to their concerns. TiGa has offered a condition that trucks shall not leave the application site during school drop off and pick up times in response to concerns raised by the school. I have also emailed and met with the neighbouring family, the Langridge family[4].

Provision of housing

48 TiGa has been engaging with the Hagley Group who are developing a 127-section development plan for Kaiata, and a 41-section development plan for Paroa. It is anticipated that TiGa will underwrite this development and therefore be able to ensure residential units are available for its employees.

Rehabilitation - productive farmland

49 TiGa will be operating on private land which is currently productive farmland. Operations will generally be short term and transitory, in other words, there will be a limited area of disturbance while operations are underway, followed by progressive rehabilitation. It is planned the mined area will be returned to a far more productive agricultural use once rehabilitation is completed.

50 TiGa has been actively engaging with the landowner in relation to rehabilitation. The landowner (who is a fifth generation local farmer) has an Agricultural Science degree and a keen interest in the improvement of soils and infrastructure for farming on the Barrytown flats.

51 The landowners and TiGa are currently working on a Trial block (approximately 100m from the proposed mined area), with the aim of this work being to ensure better environmental outcomes – i.e. rehabilitated soils have improved fertility, and

[4] In 2023, March, 11/05/23, 18/05/23 (Meeting), 25/05/23, 21/06/23, 12/7/23, 19/07/23, 7/08/23, 14/08/23.

there is less chance of soil particles washing into waterways. The following is being considered:

(a) the soil– including particle size, organic matter and fertility;

(b) the suitability of plant species, and whether there are any new species that may be better suited to the soil conditions; and

(c) slope and the ability for moving water off the pasture to prevent soil damage by farm animals.

Scholarship programme and local jobs

52 The majority of products and services required for the mine can and will be sourced locally in the West Coast Region. The mine will be operated by experienced New Zealand based staff and contractors, the majority being based in Westport and Greymouth. I have had productive discussions with suitable and experienced local mining contractors, potential site managers and haulage operators.

53 TiGa is in the early stages of establishing a scholarship programme to encourage local school leavers to study with, or be employed by TiGa, to work on the Barrytown Project and its other future aspirations. Employment opportunities for young people will assist to secure the future of the small communities on the West Coast.

54 TiGa estimates its mining operations will generate around $63 million of export earnings per year from the production and export of gold, garnet, ilmenite, and zircon. This will also result in $6.6 million in wages and $27.4 million in non-wage spending for the local economy. More broadly, mineral extraction is a high value industry, and has the potential to benefit the region by generating significant employment (with high salaries), which will in turn deliver new economic opportunities for other businesses including construction, sciences, engineering, transport (including rail and shipping), hospitality, and accommodation. Mr Ballingall has addressed economic benefits in his evidence.

Conclusion

55 TiGa is committed to meeting its environmental and social responsibilities for its mining operations. TiGa intends to be a good neighbour and be a constructive and public-spirited part of the Barrytown and wider West Coast community.

Robert George Brand

Dated this 19th day of January 2024