

Sustainability Report

TiGa Minerals & Metals Limited

(Barrytown Mineral Sands Project)

Prepared by Dr Danny Samson
17 January 2024

This report describes and evaluates the plans and policies of TiGa Minerals & Metals Limited and its proposed Barrytown mine.

Table of contents

	Page
<u>Introduction and Executive Summary</u>	2
<u>Planning and Leadership of Sustainability</u>	3
Sustainability within organisational values and strategic intent	3
Senior leadership commitment and involvement	5
Planning for sustainability progress	5
<u>Environmental practices and initiatives</u>	5
Lowering emissions and pollution	5
Use of water/ exhaustible resources	6
Preservation of natural environment, ecology	6
<u>Social practices and Initiatives</u>	7
Respectful treatment of stakeholders	7
Supplier management and community outcomes	8
Contribution to diversity and human rights	9
<u>Concluding remarks</u>	10

Introduction and Executive Summary

This report has been created to document and evaluate the sustainability actions and plans for the Barrytown Mineral Sands Project organisation and planned operations. It covers the strategic leadership of sustainability and the plans and actions to date particularly concerning environmental and social sustainability associated with the Barrytown operations. It is based on information provided by the company including numerous documents and extensive interview/ discussion with the company's Managing Director, Robert Brand.

Leadership and strategic intent of the company's sustainability plans is strong. Key stakeholders, such as investors and the local community groups including iwi representatives have been specifically included and consulted in numerous discussions about all key aspects of this initiative, and both environmental and social sustainability have strongly influenced it. The board and Managing Director clearly recognise the importance and indeed the centrality of sustainability in this initiative and have planned for implementing a mining operation that is very high in its sustainability values, processes, actions and outcomes.

Environmental practices and initiatives of this mining operation are designed to minimise the environmental impact and footprint, and to indeed lead to an improved state of mined land once rehabilitated areas are returned to farming operations. Emissions of greenhouse gases will be minimised, for example through the intended use of an electric powered bus that will transport employees to and from Greymouth each day, replacing some individual employee cars, and electricity used on the site will come from a new powerline that the company is intending investing in, connecting the site to the national grid.

No chemicals or other exhaustible resources will be used, with the exception of water, which is not in short supply in this region, and will be used, treated and returned through recycling to its original resource, ensuring that water sources and bodies are not mixed, as with iwi preferences and traditions. The natural environment, particularly the land being mined will be not just rehabilitated, but indeed re-contoured in agreement with the landowner, in order to make that land more productive, for example for cropping as a new option for farmers who currently only farm animals. TiGa has committed to engage in research and practices that will improve the outcomes of local birdlife inhabitants. Finally, taking a global perspective, the minerals produced at this site will in being mined and processed in a highly environmental manner, lead to a net reduction in environmental impact because of its replacement of such minerals currently produced in countries that do not enforce such high standards, hence there is a net benefit to the planet, despite the fact that all mining operations have a non-zero environmental footprint, that in this case is effectively minimised. Social sustainability is strongly embedded into all aspects of the mine design and operations plans. Multiple meetings have been held with many local community groups, from local town meetings to iwi community leaders and others, whose interests have been comprehensively included in project design decisions. Some 57 new jobs will be created that will bring significant economic and social benefits to the local region, and skill-building and education will be brought by the company that will need local people to undertake jobs ranging from equipment operators to laboratory technicians. Since the equipment used on the site comprises only standard earthmoving equipment, investment in these capital items and ongoing maintenance and spares will be locally procured, boosting the local economic multiplier effect.

The company's position on diversity and inclusion is to employ the best available person for each job, and it is known (from community consultations) that these new jobs, from

truckdriver to mine operator, lab technician to administrative staff, will be attractive to local people of all cultural backgrounds, gender, and other diversity dimensions, which the company eagerly looks forward to engaging with.

In summary, TiGa strongly intends this investment and operation to be a 'top shelf' sustainable business, with the sustainability interests of stakeholders and the environment 'designed in' to be strongly aligned to the company's purpose and long-term interests in contributing to the sustainable development of Barrytown and the local region.

The report is structured into three major categories of:

- planning and leadership of sustainability,
- environmental sustainability, and
- social sustainability.

Each of these has subcategories.

Planning and Leadership of Sustainability

Sustainability within organisational values and strategic intent

The company understands that for its own success as well as for the success of all stakeholders involved in this operation, that harmony and a balanced approach to all stakeholder requirements is a key part of its strategic intent and its value system. This view was strongly expressed by Robert Brand, the company's managing director. It is also understood and shared by the company's board of directors. This means taking a 'high sustainability' approach to the green environment as well as to all members of the community that will have a relevant stake and impact with respect to the Barrytown operation.

TiGa has the expressed intent of making a positive contribution to the community and to the environment and certainly to not engage in any activities that could be detrimental to such key stakeholders.

Alignment of stakeholders with ESG approach

The company's board recognises that it is working towards the aligned interests of its shareholders and the environment and the citizens and communities of New Zealand to take a strongly proactive approach to 'doing well by doing good' in terms of all aspects of sustainability. There is strong recognition within the company and its value system that this project is the first of its kind in New Zealand and that it will be a significant project in the local community within which it will be situated. It does not take the responsibilities that come with this set of circumstances lightly, but rather feels a strong responsibility to ensure that environmental sustainability and social sustainability are managed to a very high level of outcomes and impacts, which it recognises must be ultimately fully aligned with the shareholders' interests as well.

The company's philosophy can be summarised as expressed by the Managing Director as "benign integration" into the local community and environment from both a business and social perspective. This company's growth is expected to be a welcome opportunity for local mining professionals and operating staff in terms of employment and use of their skills. The company will be setting up local infrastructure, local bank accounts, and local operational management, in order to implement this approach to benign integration and local contribution, which contrasts from the global and international approaches of larger mining companies: the focus is on balancing local needs and requirements including economic, social and environmental requirements, with those of both local and other shareholders. It is a local stand-alone business, and will conduct local projects to the benefit of the local community and environment, such as the sponsored research that it undertakes concerning the Westland petrel, which it is acutely aware of as a unique species that must be preserved and protected.

Senior leadership commitment and involvement

The company's board and senior leaders take the approach that a proactive approach to sustainability issues (both environmental and social) will provide mutually beneficial outcomes for all stakeholders. This is evidenced by the plans and actions already in place, such as for the local community, workforce, training and education, land rehabilitation, local ecology, and many other initiatives.

Planning for sustainability progress

The company already has plans for all aspects of ongoing improvements in environmental and social sustainability. An example is to further support active sustainability initiatives associated with local bird life, including and beyond the petrel, and an expressed desire to work with the local Polytechnic, to develop curriculum which will benefit potential and existing employees as well as others in the local community. These plans exist for even further sustainability initiatives developing in real time as the company approaches its project build and operations stages, and as it continues to engage broadly and deeply with local community and cultural groups.

Environmental practices and initiatives

Lowering emissions and pollution

Despite the fact that it is a miner, the scale of the company's operations lead it to believe that it will be classified as a low level emitter, using approximately 2 megawatts of power during its operational hours. The most environmentally sustainable way to generate the necessary electricity for this operation is not to create and use local diesel powered electricity generation but to build a new power line from the grid which is the company's firm intent. This infrastructure which the company will pay for is expected to have other benefits across the community.

The proposed 33 KVA line that the company intends to build will provide infrastructure that will benefit other community groups, such as a nearby Māori community centre.

On the operating site, the only emissions will be from the mobile operating equipment such as the company's grader and some earth moving equipment (eg bulldozers). The additional emissions will be 50 truck trips per day, of 30 tonne trucks, to transport the product. The company will provide and use a fully electric bus to transport employees to and from Greymouth each working day to reduce greenhouse gas emissions from employees cars.

A further element of environmental improvement (rather than potential for degradation) is associated with the rehabilitation of the land that is used in this mining operation. As expressed by the first farmer who is expected to be involved in the operation, mined and rehabilitated land will be suitable for growing crops which is presently not the case. The current farming operations are purely for livestock including deer and other species which emit greenhouse gases such as methane. The improvement in farm productivity as a result of the increased porosity and re-contoured land is expected to improve the suitability for a variety of farming activities and raise the productivity of the farmed land by a factor of

three, as estimated by the company's Managing Director on the basis of expert advice obtained.

There is no other projected air pollution, land pollution, or water pollution expected from this operation, apart from that described above.

Use of water/ exhaustible resources

The company is highly cognizant of and respectful of the iwi tradition and belief system which in this case relates to not mixing sources of and streams of water. This principle will be designed into the mining and processing operations to ensure that the use of water complies with this tradition and belief. A comprehensive hydrology plan has been developed over the past two years which will be implemented: it ensures that streams of water and creeks will not be mixed.

Plans are in place to measure monitor and control water quality elements such as turbidity as well as naturally occurring chemical and other contents. These comprehensive hydrology studies have also included being connected to local water- oriented ecology studies, all of which illustrate the top shelf approach to sustainability being taken by the company.

This operation will remove the valuable minerals only and result in all land being fully rehabilitated and left in an improved state of suitability for mixed farming and higher productivity.

Radiation levels associated with this mining operation have also been studied and tested and found to be at negligible levels.

Preservation of natural environment, ecology

The ultimate production schedule for this operation is to mine a total of nine panels in sequence. The plan will involve self-contained digging, operation to extract the valuable minerals and rehabilitation as a continuing process, panel by panel. Hence the impact at any particular time is relatively low and is in keeping with the company's overall philosophy of 'benign integration' of its operations with the local environment and community.

The benign nature of the operation is one that is solely of earth moving, and there is indeed no drilling and blasting. The separation process does not use any chemicals or any heating but does use local water to separate the valuable materials from those that will be returned as part of the rehabilitation activity. The water is used purely for transport and separation of the minerals and is then returned. This is a mechanical process and is not a chemical/ metallurgical process.

The natural environment will also be preserved through the implementation of a local dust mitigation/ management plan which has been formulated: the mineral product is heavy/dense and the high moisture content contributes to that dust mitigation strategy effectiveness. All stockpiles of product and trucks containing the product will be fully covered so as to minimise any dust escape.

The final environmental factor to consider is the global competitive and comparison point of this planned operation in New Zealand relative to other mineral sands operations in countries such as Sierra Leone: this operation will produce the important minerals required on the world market under much tighter environmental controls and constraints than in many other places and therefore can be considered not only in terms of its local environmental compliance and high performance but in terms of its capacity to ultimately replace capacity in jurisdictions where the environmental and potentially the social sustainability is not so highly controlled and led. This is a point of global benefit, for example in terms of greenhouse gases, assuming a fixed demand for these products. Further, the Barrytown deposit has the superior property of being close to a 50:50 split between ilmenite and garnet which is extremely unusual in these sand mining operations and indeed in the whole sector globally. This implies that the total amount of extraction and processed material is approximately half of that where most of the other world's deposits are rich in only one of these two minerals with a very small proportion of the other. The total environmental footprint deposit is therefore significantly more environmentally efficient because of this content superiority, and the halving of total soil material being processed, relative to the world's other deposits.

Social practices and Initiatives

Respectful treatment of stakeholders

In the planning stages of this project, the company has been conducting a variety of different types of community consultations with many different local groups for over three years. The company has a policy for example which is resulted from its concern for ecological and social sustainability to not ever conduct mining or trucking operations during hours of darkness. The Westland petrel leaves it's home base between dawn and dusk. The company is cognizant of not disturbing these animals hence will be only conducting its mining and transport operations when that petrel is away from its home base. Traffic safety will also be optimised through not having trucks on the road in the hours of darkness. The trucks that will be used for transporting the product will be fitted with noise attenuators and will not be fitted with air brakes as they are of a modern sustainable design, and this will be to the significant benefit of citizens and animal life in terms of noise and other elements of impact. Further, discussions with the local school principal and school board members have led to the policy of not using the trucks near the school in any way that might intersect with school pick up and drop off times.

The company is setting up a local consultative committee which will allow for further issues to be considered and acted upon as they arise once the operation gets started, which is an acknowledgment that in practical terms not every community issue can always be known in advance.

A final important point about the company's approach to a high level of community sustainability and in particular it's process transparency is that even though the company qualified for a closed approval approach for example with local councils, the company voluntarily chose a more expensive and expansive open approach which involved higher

levels of public awareness and consultation, by requesting that the project be publicly notified.

Development West Coast have conducted a detailed study of the impact of the mine on local economic and other aspects of development, from which the benefits of the economic multiplier effect were studied, for example showing that the impact on jobs will be significantly more positive in a total basis than just the 57 jobs for employees of the company, through the money that is injected into the local economy, of which a substantial amount will also be spent and circulated in multiple ways throughout the rest of the local economy. It was estimated that the contribution of each job in the mining operation contributes to the economy about \$380,000.

Supplier management and community outcomes

The nature of this mining operation is that all of the capital equipment that is required is standard earth moving and 'agricultural-use' machinery.: TiGa's equipment will be locally procured. The nature of these pieces of equipment is also therefore that they will not need specialist maintenance services to be brought in from outside the region but will rather be locally serviced and maintained and that spare parts will be sourced from local companies. This all adds value to the local economic multiplier effect. The same applies to truck maintenance and spares (to be conducted by a contractor): the company will not need to have an on-site maintenance workshop but will be sourcing these services from the West Coast business community.

Other major capital items involved in this operation will be the use of numerous pumps and a significant amount of plastic piping for water: all of this will be locally sourced and maintained.

Contribution to diversity and human rights

The company plans to set up training programmes for its employees and to select, wherever possible, the 'best person for the job' with no restrictions on these conditions. The workforce will be diverse and will be a solid representative population from the local community. An example of the company's expectations of one aspect of diversity in its workforce is that the company knows that there is a substantial female population of skilled (or potentially skilled and yet to be trained) truck drivers and laboratories technicians as well as grader and bulldozer operators: the company fully expects to reflect all dimensions of diversity represented in the population very effectively within its workforce. They are well aware of the data and research studies that have determined that women take a more gentle and caring approach to truck driving and hence provide beneficial outcomes for the condition of the trucks, as well as in safety performance.

<https://www.businessinsider.com/women-truck-drivers-better-safer-trucker-shortage-2018-12> . The company is committed to having diversity on its board of directors and throughout its management and operational structure.

In terms of the supply of labour for the workforce, the company consciously expects and understands that it may be opportune for some New Zealanders who are currently working as fly-in-fly-out mining industry operators in Australia to return to work in Barrytown where there will be no need to fly to work, but rather they will travel to work each day from home on the company's electric bus. This is expected to bring some net migration of skilled people back to New Zealand which will contribute to GDP and New Zealand's skill base.

In addition, the local Barrytown community and economy has been experiencing having young people leaving at the start of their career/ employment phase of life, leaving the town with a larger than national average population of proportion of ages of people who are younger than 16 or older than 65: the company's 57 new jobs that are created both directly and as a result of the economic stimulus that it provides within the local economy will mitigate against some of the economic and social factors described immediately above.

The company has many other facets to its environmental and social contribution to the community and to New Zealand, above and beyond the main elements espoused above. Its policy of 'benign integration' with the local community and environment also sees it open to conducting research and ecological advancement projects and will provide third party, college or Polytechnic accredited qualifications to laboratory technicians and others as well as trade certifications, for example equipment operators and maintainers.

Concluding remarks

The company fully expects and intends to take a 'top shelf' approach to ensuring that the environmental and social aspects of sustainability from its Barrytown operation represent a level of best practice, across all of the key areas of environment and social outcomes as described in the categories of this report. The business and its operations will be structured so as to ensure the economic, environmental and community/ social success (often termed the 'triple bottom line') is achieved, which will bring a multiplier effect of beneficial outcomes for the labour force and the supporting community companies and their employees in the local region and hence for all elements of the local region. Careful studies and planning have been done by the company and by many other parties that it has worked with such as Development West Coast, all of which have pointed to the successful 'benign integration' of the company and its operations into the Barrytown and West Coast economy and society.

Local councils, farmers and concerned community members, the school board and many others have all been thoroughly consulted and accommodated in the design of the operations and the business model: from the many factors and examples as described in this report and the accompanying documents in the resource consent package of supporting evidence, it can be seen that this mining project should result in significant positive outcomes for all dimensions of sustainability and indeed all aspects of the triple bottom line for this region of New Zealand.