

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)

Supplementary Statement of Stephen Jeffrey Miller

7 March 2024 – revised 11 March 2024

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- 1 My full name is Stephen Jeffrey Miller.
- 2 I have previously provided a Statement of Evidence dated 19 January 2024. My qualifications and experience are set out in that statement of evidence. I have been asked to provide additional information in relation to carbon emissions for this Application in response to submissions made by the Department of Conservation.
- 3 This is a preliminary assessment and focusses on primary emission sources (haulage, mining and processing). As I set out in my statement of evidence, identification of further options to reduce the projects carbon footprint will occur in the Front End Engineering Design (FEED) and detailed design stage (i.e. we still have two more stages of work which will seek to further minimise emissions)¹.
- 4 By way of background, Palaris has a proven track record in supporting clients on their decarbonisation journey through completion of Decarbonisation Concept Studies, Federal Government Legislation impact reports in Australia and Decarbonisation Opportunity Assessments, having completed over 50+ decarbonisation projects to date:
 - (a) Decarbonisation concept studies require the mapping of energy emissions for operating assets, review existing decarbonisation technologies in place within the assets, undertake external assessment of potential technologies (existing and emerging), and identify implementation plans for select technologies;
 - (b) Federal Government Legislation impact reports require an independent review of proposals to reduce GHG emissions and requires the technical, legislative and operational knowledge to formulate an effective response; and
 - (c) Decarbonisation Opportunity Assessments assist owners to meet emissions targets through a phased approach where we map the carbon footprint, identify abatement opportunities, and prioritise pathways including marginal abatement cost curve development.
- 5 In preparing the calculations for the emissions from the Application, I followed the Measuring emissions: Detailed Guide 2023 (ME1764)² published by the Ministry for the Environment.

¹ Statement of Evidence at [37].

²Sections 3 and section 8 of the "Measuring emissions: A guide for organisations document: https://environment.govt.nz/assets/publications/Measuring-Emissions-Guidance_DetailedGuide_2023_ME1764.pdf

- 6 Formal carbon emissions calculations always refer to CO₂ equivalents (CO₂ -e) and not just CO₂. However, I have provided both values here for completeness.
- 7 The following assumptions were made in the calculations:
- (a) The Mining fleet is as presented in the Application;
 - (b) Product haulage off site was based on a 30 km one way loaded trip plus a 30km unloaded return trip;
 - (c) A total of 25 full truck loads plus 25 unloaded truck movements per day was allowed for, totaling 50 truck movements per day for off-site product haulage;
 - (d) On highway currently-available 30t trucks were the selected vehicle for product haulage.

Results

- 8 Table 1 below lays out the CO₂ and CO₂ equivalent emission estimates for the project as annualised values broken down into **Mining** (which covers the mining mobile vehicle fleet) **Power Generation** (covering the diesel generators) and the **Road Haul** (covering the concentrate haulage vehicles assuming 30t diesel road trucks).
- 9 The Base Case shows the case that included the requirement for initial power generation on site prior to planned connection to the local power grid. The Scenario 1 case shows the updated proposal where the mains connection is done prior to project start up negating the need for the diesel power generation. For completeness, it is recorded that further calculations will be done as part of the FEED study, where all project emissions will be reviewed.

		Base Case	Scenario 1
Emissions Estimate (CO₂)			
Mining	t CO ₂ pa.	1,583	1,583
Power Generation	t CO ₂ pa.	6,355	-
Road haul*	t CO ₂ pa.	812	812
Total Emissions	t CO₂ pa.	8,750	2,395
Emissions Estimate (CO_{2-e})			
Mining	t CO _{2-e} pa.	1,583	1,583
Power Generation	t CO _{2-e} pa.	6,376	-
Road haul	t CO _{2-e} pa.	1,126	1,126
Total Emissions	t CO_{2-e} pa.	9,085	2,709
Total Budget Emissions - NZ Emissions Budget 2023			
All Gases Emissions Net AR5 (2026-30) ¹ /year	Mt CO _{2-e} pa.	61.00	61.00
Estimated emissions as % of total annual average (t CO _{2-e})	%	0.01489%	0.00444%
Energy and Industry (2026-30) ² /year	Mt CO _{2-e} pa.	14.56	14.56
Estimated emissions as % of total annual average (t CO _{2-e})	%	0.05466%	0.01087%
Transport Sector Emissions (2026-30) ³ /year	Mt CO _{2-e} pa.	15.20	15.20
Estimated emissions as % of total annual average (t CO _{2-e}) ⁴	%	0.00741%	0.00741%

* Estimated using L/km methodology

1. Second emissions Budget Annual Average (2026-30) from Table 1.1 All Gases Annual Average 2023 (<https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>)

2. Compared to mining and power generation component of estimated emissions

3. Second emissions Budget (2026-30) Transport Sector Annual Average from Table 1.2 NZ Emissions Reduction Plan 2023 (<https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf>)

4. Compared to road haulage component of estimated emissions

10 I understand TiGa seeks to mine as soon as possible if consent is granted, so the calculations in Table 1 above have used the second emissions budget period (2026-30) which is when the majority of the mining and road haulage activity will occur.

Comparison with CRRG calculation

11 I have reviewed the carbon emissions calculation in Appendix 1 of the climate change lay witness statement of Ms Suzanne Hills for the Coast Road Resilience Group. I note that Ms Hills' calculations produce a larger volume of carbon emissions than my calculations in Table 1. The proposal has changed since Ms Hills prepared her calculations.

12 In addition, I would also note some points below indicating that the original haulage emissions estimate was established using incorrectly applied methodologies:

- (a) Section 8.2 of the 'Measuring emissions: Detailed Guide 2023' states that the emissions factor (EF) for 'all trucks' should be used for a large fleet with a good mix of small and large trucks. TiGa's proposal will utilise a fleet of large trucks only. Applying the 'long-haul heavy truck' EF is therefore more appropriate. The EF for 'long haul heavy truck' (0.105 kg CO₂-e / tkm) is smaller than the EF for 'all trucks' (0.135 kg CO₂-e / tkm).
- (b) Section 8.2 also provides guidance for calculating tonne kilometer (tkm) units. The guidance states that the tkm unit is to be defined as the distance travelled multiplied by the weight of the freight carried by the heavy goods vehicle (HGV). The methodology applied in Appendix 1 of Ms Hills' evidence included the weight of the truck and trailer in the calculation in addition to weight of the load.

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