

BEFORE AN EXPERT PANEL **FTAA-2605-1238**
BARRYTOWN MINERALS PROJECT – SOUTHERN BLOCK

UNDER THE **FAST-TRACK APPROVALS ACT 2024**

IN THE MATTER OF an application by Tāiko Critical Minerals Ltd

**STATEMENT OF EVIDENCE OF DR SUSAN MARY MICOL FOR THE ROYAL FOREST
AND BIRD PROTECTION SOCIETY INC.**

AVIFAUNA

28 September 2026

Royal Forest and Bird Protection Society of New Zealand

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Introduction

1. My name is Susan Mary Micol (née Waugh).
2. I have been engaged by the Royal Forest & Bird Protection Society of New Zealand Inc. (**Forest & Bird**) to provide ecological evidence in respect of the applications for resource consents and permissions by Tāiko Critical Minerals Limited (**TCML**) for the Barrytown Minerals Project – Southern Block, which is a Schedule 2 listed project under the Fast Track Approvals Act 2024 (**FTTA**).
3. TCML seeks approvals necessary to establish and operate a mine site for mineral sand extraction activities on the Southern Block (between Fagan Creek and Canoe Creek) at Barrytown on the West Coast. The total application area comprises approximately 408 hectares, with a mine disturbance area of 280 hectares.¹
4. This evidence relates to avifauna.

Qualifications and Experience

5. I am an independent Environmental Consultant in Wellington. I have held this position since September 2026 with my work focussing on conservation biology and environmental management. Until May 2026, I worked at BirdLife International's "Preventing Extinctions Programme" as the Senior Programme Manager. In this role I ran their species recovery programme across 35 countries – targeting conservation actions for 100 highly threatened bird species, including community conservation actions. I held this position for three years.
 - a. I have worked as a biologist for more than 25 years in New Zealand, France and UK. One of my areas of work has been studying seabird species, other threatened species and their conservation biology. My previous roles include: Chief Advisor Programmes the Office of the Parliamentary Commissioner for the Environment (2019 – 2021) where I provided advice on taxonomic research collection, marine species management, estuarine management, among other things.
 - b. Senior Curator Natural Environment and Head of Natural History, Museum of New Zealand Te Papa Tongarewa (2011 – 2019) where I led the science programme with their work on describing the status and conservation biology of fauna and flora of New Zealand. During this time, I led research programmes on Westland Petrel conservation biology, the foraging ecology of marine birds in central and southern New Zealand including blue penguins, Buller's Albatross and Fiordland penguin.

¹ Section 1.13, p.3 of the application.

- c. A Principal Scientist at the Ministry of Fisheries (2002-2007), which included managing a large programme of work on fishing interactions with protected species, including estimating species population sizes and trends.
6. I hold the degrees of Doctor in Biology from Rennes I University (France), Master of Philosophy in Polar Studies from the University of Cambridge, and Bachelor of Science, Zoology from the University of Canterbury.
7. I have authored and co-authored 60 peer-reviewed publications and two books. Most of my peer-reviewed journal publications have centred on the conservation biology of seabird species.
8. My more relevant publications include:
 - a. Waugh, S.M.; Barbraud, C.; Adams, L.; Freeman, A.N.D.; Wilson, K-J.; Wood, G.; Landers, T.J.; Baker, G. B. 2015. Modelling the demography and population dynamics of a subtropical seabird, and the influence of environmental factors. *The Condor* 117: 147-164.
 - b. Waugh, S.M.; Wilson, K-J. 2017. Threats and threat status of the Westland petrel (*Procellaria westlandica*). *Marine Ornithology* 45: 195-203.
 - c. Waugh, S.M., Poupart, T. Wilson, K-J. 2015. Storm damage to Westland petrel colonies in 2014 from cyclone Ita. *Notornis* 62: 165-168
 - d. Waugh, S.M.; Griffiths, J.W.; Poupart, T.A.; Filippi, D.P.; Rogers, K.; Arnould, J.Y.P. 2018. Environmental factors and fisheries influence the foraging patterns of a subtropical seabird, the Westland Petrel (*Procellaria westlandica*), in the Tasman Sea. *The Condor* 120: 371-387.
 - e. Waugh, S.M, Barbraud, C., Delord, K., Simister, K.L.J., Baker, G.B., Hedley G.K., Wilson, K.-J. & Rands, D.R.D. 2020. Trends in density, abundance, and response to storm damage for Westland Petrels *Procellaria westlandica*, 2007–2019. *Marine Ornithology* 48: 273–281.
9. My experience with site the subject of this application includes:
 - a. Site visits and research activities to the petrel colonies during 2000 – 2002 as part of my post-doctoral studies at Otago University, including burrow-scoping study of Westland Petrel nest occupancy and mark-recapture work on petrel survivorship.
 - b. Site visits and research work to the petrel colonies during 2010 – 2019 to conduct demographic and population estimation work, with two annual visits most years.
10. As part of my research work on the ecology of petrels and penguins in the Westland Region I have worked with Department of Conservation, iwi, and West Coast Penguin Trust, Centre Nationale de la Recherche Scientifique (France), and Deakin University (AU).

11. I note that I am providing technical expertise on my area of knowledge around New Zealand avifauna. I acknowledge that seabirds have a great importance to tangata whenua.

Code of Conduct

12. Although these proceedings are not before the Environment Court, I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note (2023), and I agree to comply with it as if these proceedings were before the Court. My qualifications as an expert are set out above. This evidence is within my area of expertise, except where I state that I am relying upon the specified evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.
13. I advise that I have been involved in submissions on TCML's (formerly known as TiGA Minerals and Metals) earlier consent application under the Resource Management Act 1991 to establish and operate a mineral sand mine and associated processing plant at the Central Block in 2024. I provided a personal submission on the application and later provided expert evidence on behalf of the Coast Road Resilience Group Inc at the Council hearing, however I did not attend Environment Court facilitated mediation. For the avoidance of any doubt, in providing this evidence as an expert witness in accordance with the code, I confirm that my overriding duty is to impartially assist the Panel on matters within my area of expertise.

Scope of Evidence

- 14 My evidence will address:
- a. Avifauna present at the site;
 - b. The effects of the Proposal on Threatened and At-Risk bird species and their habitats.
 - c. TCML's proposed effects management approach and proposed conditions related to seabirds and other Threatened and At-Risk species; and
 - d. My conclusions.

Materials Considered

- 15 In preparing this evidence I have reviewed:
- a. From the TCML FTAA application:
 - i. The parts of the application relating to avifauna;
 - ii. The proposed resource consent conditions relating to avifauna (Appendix P1 in the TCML application);
 - iii. The draft Avian Management Plan (AMP) (Appendix M2 in the TCML application);
 - iv. Evidence of Dr Gary Neil Bramley dated 23 March 2026;

- b. From previous TCML hearing processes under the Resource Management Act 1991:
 - i. Consent Order 2024 NZEnvC 238 setting out the Central Block conditions.
 - ii. Evidence of Mike Harding on behalf of Grey District Council dated 12 December 2023 in relation to application by TiGA Minerals and Metals for mining at Barrytown Flats (LUN3154/23);
 - iii. Supplementary Statement of Evidence of Mike Harding on behalf of Grey District Council dated 18 March 2024 in relation to application by TiGA Minerals and Metals for mining at Barrytown Flats (LUN3154/123)
- c. Other documents from the fast-track application:
 - i. Comments from West Coast Penguin Trust dated 7 September 2026.
 - ii. Appendix-F7-Response from Department of Conservation

Executive Summary

- 16 I reviewed the information about the ecological significance of the site and the proposed activities. I also reviewed the Applicant's proposed approaches to mitigating risk to Threatened and At-Risk avifauna known to be occurring, or likely to be occurring, at the site.
- 17 I consider that the proposed mining activities will not avoid adverse effects on tāiko/Westland Petrels (*Procellaria westlandica*), kororā/Little Penguins (*Eudyptula minor*) and matuku/Australasian bitterns (*Botaurus poiciloptilus*) (hereafter "**bittern**"), and they may not avoid adverse effects on other shorebirds and seabirds present at the site.
- 18 I consider the potential impacts associated with the proposal, alongside existing threats (climate change, predation, accidental mortality in fisheries), and cumulative effects to have the potential to result in significant adverse effects on native birds, particularly the global population of Westland Petrel
- 19 Having reviewed the information presented by Dr Bramley dated 23 March 2026, I consider that the ecological importance of the site has been understated. He states that the effects of vegetation removal at the site will have greater impact than "low" on common bird species, and that effects on Threatened and At-Risk species are managed under the AMP. The Barrytown flats are home to globally important populations of Westland Petrel, and matuku/Australasian bittern. The site, and adjacent areas such as Canoe Creek lagoon are of high importance for resident and migratory species, including Threatened and At-Risk species such as little penguins, koitareke/marsh crake (*Porzana pusilla affinis*), pūweto/spotless crake (*Porzana tabuensis tabuensis*) (hereafter "**crakes**") and Australasian bittern. For the crakes and the bittern there is no provision within the Avian Management Plan to manage the effects of the activity on their habitat and populations. Further provision should be

made for ensuring adverse effects on species such as banded dotterels, bittern, crakes, little penguins and Westland petrels are avoided.

- 20 The effects of light, machinery, vehicles and human activity are likely to disturb, and adversely affect nocturnally active and crepuscular avifauna (particularly Westland petrels, little penguins, bitterns and crakes). These effects may result in injury, death and behavioural alterations to individuals. Because of the fragile populations of these species, and their need for undisturbed access to habitat, including the flyway above the site. Even minor changes in behaviour, survival or breeding output are likely to result in population level changes (global population for bitterns and Westland petrels; local populations for little penguins).
- 21 The measures proposed do not appear to adequately address the risk to these species, and would not avoid adverse effects.
- 22 The monitoring and reporting of the proposed approaches are not adequate to ensure that the procedures will achieve the purpose of the Avian Management Plan to ensure:
- a) Adverse effects on the 'Threatened' and 'At Risk' birds present in the vicinity of the site and any other 'Threatened' and 'At Risk' species detected by subsequent monitoring are avoided.*
- b) Safe ongoing use of the site and its environs by the birds which currently occur in the area as mining proceeds.*
- 23 The Response from the Department of Conservation (DOC)² in their statement notes that proposed conditions should align with the final version of the Central Block conditions. I largely agree with that assessment. If the approvals were granted, it would be desirable if the proposed conditions and associated AMP for the 2026 Application included all the points in the Central Block consent conditions, with the exception of the condition relating to petrel interactions. This is because the proposal still includes activities that will occur at night on the site (e.g loading from the WCP, maintenance and occasional use of mobile lights, and lighting around the dredge pond). Therefore, there is a need to carry out nighttime surveys, management and monitoring of effects, and reporting of this monitoring. Where I do not agree is with respect to condition 18.8 of the 2024 conditions for the Central Block, which allows 2 or more Westland petrel interactions in a 3-month period, when I consider this should be limited to 1 per year.
- 24 Evidence from population research on the Westland petrels, and my expert opinion, indicates that one or more removals or mortalities of Westland Petrels would likely cause adverse population effects. If approvals were granted, a condition should be established that the mining operation cease if, in any calendar year, one or more Westland petrels are found on the site, around infrastructure, vehicle pathways and lighting, with a 50 m buffer zone. This condition should apply to all mining activity, cumulatively, across the whole of the Barrytown flats.

² Appendix F7 – Response from Department of Conservation

AVIFAUNA PRESENT AT THE SITE

Importance of the site for avifauna

- 25 The Barrytown flats contains a mosaic of habitats from forest remnants, intact and modified wetlands, pasture, and coastal scrub. Although overall, the landscape is modified, its low intensity uses for pasture and habitation areas, mixed with natural sites make it home to many species of birds, including several Threatened and At-Risk species. There are few sites with intact vegetation and high water quality on the West Coast. The identification of several Significant Natural Areas (proposed, or confirmed) on the Barrytown flats not only indicates the special character of the habitat, but the wider mosaic of small patches of wetland habitat, sedges, raupo, flax and scrub also provide a rich habitat that supports a high diversity of bird species. This habitat is irreplaceable, with little possibility that over time, or in the immediate future, that individuals or populations displaced from these multiple habitat patches will find a similar quality of habitat on the West Coast.
- 26 Birds identified at the Barrytown flats are all mobile species, and if surveyed at one site within the wider Barrytown flats area, are highly likely to occur at another site within the wider flats area. For example, bitterns and crakes, identified in earlier work in other locations on the Barrytown flats, will likely be present at the proposed mining site, and in the adjacent Canoe Creek lagoon complex.
- 27 The proposed Avian Management Plan (AMP) does not contain an exhaustive list of Threatened and At-Risk which use the site (table 1). Westland petrel use the site (the airspace overhead the proposed mining site) as part of their flyway. Earlier ecological assessments at the site (Harding 2023) also confirm that other bird species that are difficult to detect may be present in the area – if only seasonally. These include include: Australasian bittern; reef heron (*Egretta sacra sacra*); marsh crake; and, spotless crake (Harding, 2023, paragraph 42). The 14 bird species identified include those listed in the AMP (AMP table 1), and the additional species I have referred, represent a moderate-to-high diversity of species.
- 28 Mr Harding reviewed terrestrial ecological matters on behalf of Grey District Council with respect to the 2023 application for the neighbouring Central Block.³ I consider Mr Harding's ecological assessment and information is also relevant to the current application due to the adjacency of the two sites. Mr Harding notes that some of the Threatened and At-Risk species use open pasture as feeding and breeding habitat (paragraph 18, citing South Island pied oystercatcher). The fact that they were not identified in surveys commissioned by the Applicant does not mean they are not present, and specific sampling techniques are likely to need to be applied to detect rare or cryptic species (Thompson, 2004).
- 29 Having reviewed the information presented by Dr Bramley dated 23 March 2026, I consider that the ecological importance of the site has been understated. The site is

³ Harding, M "Grey District Plan LU3154-23, Review – Terrestrial Ecology" dated 12 December 2023

used by shy and cryptic species, which are difficult to identify in short-term monitoring. The Threatened and At-Risk species identified in the Avian Management Plan (Table 1, page 8) include several, such as fernbird and long-tailed cuckoo which are difficult to detect. Other species, not listed, such as Australasian bittern, marsh crake and spotless crake are likely to be using the habitat at the margins of pasture, in creeks, flax and other vegetation. These habitats are very important for bitterns and other shy wetland species for feeding, breeding and resting. Occasional use of these refuges can be vital for the survival of individuals. Dr Bramley in his statement of evidence, notes: "Vegetation within the site is predominantly of 'negligible' ecological value and therefore clearance results in a 'very low' level of effect" (paragraph 27).

- 30 In earlier submissions on mining activity proposed by TiGA at the Barrytown flats, the status and possible effects of the activity on bitterns were analysed by Mike Harding, ecologist, who gave evidence to the Grey District Council in 2023. Mr Harding noted (para 54):

One species that is sensitive to disturbance, and is known to utilise habitats in the area, is matuku/Australasian bittern. The earlier hearing decision noted that there was evidence that the mining activity may cause the displacement of matuku from what is regarded as the best habitat in the ecological district, and that the loss of one individual would affect the matuku population.

- 31 He further noted (para 55), referring to the Canoe Creek Lagoon "that matuku have been observed previously in "the lagoon area"" and that "suitable habitat is present."

- 32 I note the proposed mining site would meet the criteria for the "coastal environment" under the New Zealand Coastal Policy Statement:

- a. The site comprises "areas where coastal processes, influences or qualities are significant, including coastal lakes, lagoons, tidal estuaries, saltmarshes, coastal wetlands, and the margins of these". Harding (2023) observes Barrytown Flats is a coastal plain supporting numerous – ecologically interconnected – areas of lagoon, wetland, flaxland, shrubland and forest (para 33).
- b. The area is "at risk from coastal hazards". Harding (2023) observes the Barrytown flats are susceptible to storm surges (paragraph 77-78).
- c. The habitat constitutes "coastal vegetation and the habitat of indigenous species including migratory birds" (under NZCPS Policy (2)(e)). As is outlined below, the habitat is used by coastal species, such as Westland Petrel and Little blue penguin.

Bitterns

- 33 Williams (2013) notes that bitterns (Threatened - Nationally Critical) in New Zealand are estimated to number fewer than 1000 individuals. He states:

"Bittern numbers in New Zealand declined greatly following destruction of 90% of their wetland habitat to create farmland and towns. Ongoing habitat loss is still considered one of their greatest threats, although predators, poor water quality, and

reduced food availability may have contributed to population declines...Bitterns are extremely sensitive to disturbance...A bird's ability to see and stab their prey is suspected to be important for bittern foraging and survival. This is a concern in New Zealand, as water quality and depths vary considerably..."

Little Penguins

- 34 The Barrytown flats have a population of little penguins that use the area throughout the year for breeding, roosting and moulting. Little penguins are nationally declining, and the West Coast population represents one of its strongest sub-populations. They are listed as "At-Risk, Declining" under the Department of Conservation Threat Classification system.
- 35 Little penguins are particularly susceptible to disturbance, vehicle collisions, dog predation and habitat loss. These factors can lead to behavioural changes, loss of breeding opportunities and mortality.

Westland petrels

- 36 This species is listed as "Endangered" by the IUCN, and "At-Risk - Naturally Uncommon – with mention Conservation Dependent, Conservation Research Needed, One Location" under the New Zealand Threat Classification System. It has one global population, which nests in the cliffs immediately inland from the Barrytown flats. It is very sensitive to light and can be disoriented, which can result in birds coming to ground, which can be fatal because their wing structure means they can't take off from flat ground. They can become dehydrated, can suffer predation or be killed by vehicles. The majority of the population travels over the Barrytown flats each time birds go to sea, and the entire Barrytown Flats area is part of its natural flyway. Birds circle from dusk onwards each evening during the breeding period (March to January), and can spend one or more hours flying over the Barrytown flats before joining their colonies. Birds depart for sea from the colonies anytime between dusk and dawn. Fledglings leave for their first flight to sea from November onwards. The hours of departure of fledglings are not well documented, but are likely to occur throughout night time hours. The breeding site, made up of over 20 sub-colonies, is globally important and is recognised by the Agreement for the Conservation of Albatrosses and Petrels as an important site, and listed on their website (ACAP 2026). The Punakaiki Important Bird Area is recognised by BirdLife International as a globally important site for nesting of the Westland Petrel (BirdLife International 2006).
- 37 Climate change poses an ongoing threat to the Westland petrel because of the increased frequency and severity of storms that affects their single breeding ground. I documented significant habitat damage from severe storms that occurred in 2014 and subsequently (Waugh et al 2015, 2020). Heavy rainfall and high winds stripped away soil and vegetation, removing all of the soil layer in which birds build their burrows. I also documented the demographic impacts of these storms on the breeding output of the birds, with greater divorce rates and reduced breeding output following storm disturbance (Waugh et al 2020).

EFFECTS OF THE PROPOSAL ON SEABIRDS AND OTHER AVIFAUNA

Effects on bitterns and other wetland species

- 38 The proposed activity may have adverse effects on the habitat of wetland species, such as bitterns, crakes, Royal spoonbills, and others (see para 27, above). The adverse effects generated by the proposal may include:
- a. Sedimentation of waterways;
 - b. Changes in water level;
 - c. Habitat loss;
 - d. Change in prey availability;
 - e. Reduction in areas and quality of undisturbed habitat for feeding, roosting and breeding;
 - f. Disturbance of individuals, including potentially by light and noise.
- 39 These effects would likely lead to changes in bird behaviour, and could result in loss of nests and nestlings, loss of food supply, and potentially mortality.
- 40 Dr Bramley notes (para 28) “A small number of ‘At-Risk’ bird species are likely to use the site for foraging, roosting or breeding and may be at risk of injury or mortality due to mining activities”. I consider that these bird species will be put at risk of injury or mortality due to mining activities, and understand that under the New Zealand Coastal Policy Statement that adverse effects on any Threatened or At-Risk species are to be avoided.
- 41 In his assessment Dr Bramley does not consider managing the effects of the activity on bittern and crane species. These should be included in the Avian Management Plan, and measures taken to preserve habitat as it exists within and at the margins of the site. It’s also very important to rehabilitate habitats so that individuals are not displaced away from the area, during the operation of the mine.
- 42 The characteristics of bitterns mean that the small numbers of these birds known to be present in Barrytown flats have a requirement to use existing habitat, including small patches of wetlands for feeding and breeding.
- 43 In my opinion, the habitat provided to the bitterns by the wetlands on the Barrytown flats is regionally significant. Mr Harding (2023) noted (para 34) that “Canoe Creek Lagoon, and its surrounding riparian vegetation and habitat, is ecologically significant; it should be regarded as an SNA”.
- 44 As a consequence:
- a. The removal or degradation of any of this habitat will likely have an adverse impact on individual fecundity and survival.
 - b. Degradation of the water quality in adjacent wetlands and those remnant patches of wetlands within the mine site, due to sedimentation, dust, debris entering from the mine site will adversely affect the bittern population in the region, and hence the global population of this species.

- c. Birds disturbed by the mine activities do not necessarily have alternative habitats to move to, due to the reduction of quality lowland wetlands in the West Coast region.
- 45 These points also apply to crakes and other shy wetland species noted at the site and in adjacent areas.
- 46 Failure to preserve the wetland habitats across the Barrytown flats will likely contribute to further extinction risk of several species including banded dotterels, Australasian bittern, spotless crake, marsh crake, royal spoonbills, South Island fernbird, white heron, and reef heron.
- 47 In conclusion, the effects of the mine on bitterns and crakes, as well as other wetland species will be reduction in habitat availability and quality, and are likely to include disturbance. These effects will significantly adversely affect the bitterns and crakes at a population level, and with reduction of habitat quantity and quality could lead to mortalities and loss of breeding output. This would increase the global extinction risk for these species, already Nationally Critical for bitterns.

Effects of lighting on Westland Petrels

- 48 The effects of light on seabirds are increasing well documented. At La Reunion Island (France), over 40,000 seabirds have been recovered after being affected by lights in the last 25 years. I consider that the experience of the La Reunion scientists and species directly relevant to Westland petrels, which would behave in a similar way to the Barau's petrel. The example cited below is of a very similar nature to that encountered for Westland petrel, describing a small isolated village which is near petrel nesting areas. Chevillon et al (2022) describes this occurrence for Barau's petrel (*Pterodroma baraui*), in a small isolated village of Cilaos:

“the town of Cilaos gathers a very large number of Barau's petrel groundings, because all colonies of this species are located in the mountains right above. Some birds also seem to have been found grounded in unlit areas these places are actually isolated dwellings which have some lights, but in too small amount to be detected by satellite sensors. Despite producing very little light pollution compared to big coastal cities, these isolated dwellings still cause groundings because of their proximity to breeding colonies from where the young petrels fledge”.

- 49 Mr Chevillon also observed:

“From January 1996 to December 2021, the rescue campaign carried out by the SEOR [Societe d' Etudes Ornithologiques de la Reunion] prevented the death of more than 35,000 birds. Maintaining the rescue campaign is essential for the

conservation of all four petrel species on Reunion Island. It remains the most effective way to reduce light-induced mortality...”

- 50 In 2024, I visited La Reunion and Mr Chevillon.⁴ In summary, SEOR use volunteers to search for petrels from dusk into the night for 3-4 hours at Cilaos during the fledging period, anywhere around the village streets, including dark areas away from lit public areas. They use trained search dogs, and consider this the most effective way to find grounded birds, which can be hidden in bushes, under buildings, or have moved away from open areas. Because of the long experience (25 years) and magnitude of bird fallout experienced at La Reunion, their practices are considered best practice in managing light-related fall out. These practices would be equally applicable to the Westland petrel.
- 51 In several places, the AMP refers to activities involving lighting at night (for example, the operation of the WCP including loading of vehicles at roller doors, and mobile lighting to carry out maintenance). It is therefore necessary to put in place measures to avoid adverse effects of lighting on Threatened and At-Risk species, including to monitor, report on and review the effectiveness of the measures.
- 52 Best practice is to locate birds before they become dehydrated, depredated or run over by vehicles show that nightly searches assisted by conservation dogs are the most effective search methods.

Direct effects on Westland Petrels

- 53 As currently drafted, the proposed application would allow TCML to continue activities at the site following the discovery of one or more grounded Westland Petrel (alive or dead) within a four-week period (AMP section 5.3.3). In my opinion, and based on my detailed knowledge of the population research on the Westland petrels, one or more Westland petrel removals or mortalities would likely cause adverse population effects. Therefore, the proposal that more than one Westland petrel can be removed, suffer mortality, be grounded because of activities at the site, or “otherwise affected” would not avoid adverse effects on the population.
- 54 I completed research modelling of the Westland petrel population published in 2015 (Waugh et al. 2015). This research showed, using a 45-year dataset, that the population was stable to slightly-increasing, driven by high adult survival, moderate breeding success and high recruitment of juvenile birds to the breeding population. However, in long-lived species such as Procellariiform petrels, slight changes in survivorship (e.g. by mortality of breeding adults, of non-breeding adults, or lower survival to recruitment of fledglings) can lead to population declines. For the Westland petrels, survivorship of all three demographic groups (breeders, non-breeders, juveniles at fledging) contribute to finely balancing the current stable-to-slightly-positive population trend. Removal of any individual from the population or a change

⁴ I presented information about their methodologies to the hearing for the proposed mining operations at the Central Block.

in breeding behaviour, chick feeding frequency or other behaviours that negatively affect these life-history parameters, would likely lead to population decreases, thus increasing their extinction risk.

- 55 Further scientific work has shown that Westland Petrels are subject to multiple threats in their at-sea environment and on the breeding colony (Waugh and Wilson 2017). Multiple factors are negatively affecting their population currently, including mortality in New Zealand fisheries, mortality in fisheries in their non-breeding migratory range, changes in sea-surface temperature affecting food availability in the Tasman Sea and other New Zealand offshore and coastal areas, climate change affecting the prevalence and intensity of storms which have led to major landslide events affecting the breeding colonies, and an isolated incident of incursion of feral pigs into the breeding habitat. Further adverse effects, including mortality, injury or behavioural changes for petrels that result from lighting, noise, and human disturbance within their flight path over the Barrytown flats will negatively affect the Westland petrel population.
- 56 Harding (2023) observed (at paragraph 98) that the “precarious state of the tāiko population means that the loss of any individual from the population should be considered an adverse effect. Avoidance of such an adverse effect is required by the NZCPS”. I agree with this statement.
- 57 Based on the information presented above, I consider that the Westland petrel population cannot sustain any mortality or behavioural disturbance that would negatively impact its fecundity. The adverse effects of the proposed mine should be limited to zero petrel deaths, injuries or groundings within a year. Harding (2024) found that:
- The loss of an individual taiko would be an adverse effect. The magnitude of this adverse effect would depend on the health of the taiko population. The evidence is clear that this species faces numerous threats, some of which are likely to increase, such as storm events and warming sea temperatures. If the loss of a taiko coincides with adverse effects from other population-level threats, the adverse effects on the taiko population will be significant.*
- 58 I agree with that statement. As zero is a difficult number of animals to measure, one petrel grounded, injured or killed should be treated as the effective limit (or trigger for further actions) – regardless of whether it occurs as a result of this proposal, other mining operations on Barrytown flats, including the existing consented activities, WCP-related, or any new activities. Any additional death, injury or grounding would only compound the adverse effect, particularly where the population is already exposed to other serious threats. I am aware the existing consents for the Central Block allows for a greater number of deaths, and the conditions for the Wet Concentrator Plant do not address this. In these circumstances, these other activities pose additional population-level threats, and if the loss of a single Westland petrel from the proposal for the Southern Block coincides with adverse effects created by extant threats, the adverse effect will be significant and cannot be sustained.

Missing information on Petrel searches

- 59 Best practice in detecting petrel fallout (groundings) is exemplified by the conservation workers at La Reunion Island, described by Chevillon et al. (2022).
- 60 Grounded petrels are likely to fall at some distance from any lighting, buildings or infrastructure. This is due to their fast flight speed, and the fact that they can move once grounded. A distance of 50 m from any infrastructure, vehicle passage, cables or lighting is recommended as the search range.
- 61 To detect whether petrels (and other species, including penguins) are being affected by the mine activity, it is necessary to carry out searches for the birds at night. Such searches should be carried out by a trained ecologist. They should include programmed searches during the first period (e.g. 3 months) of the mining operation to identify whether petrels are susceptible to grounding under the conditions present.
- 62 Searches should be undertaken annually throughout the mining operation, during the fledging period (1 November to 31 January), and be conducted in accordance with timings and frequency agreed by DOC.
- 63 In addition, searches should be conducted if any outdoor lighting is used during the operation, in agreement with timings and frequency agreed by DOC.
- 64 Such searches are not identified in the Avian Management Plan, but in my opinion they should be.

Effects on Little Blue Penguin/Kororā

- 65 Details of processes to reduce the effects of the activity on penguins are detailed in the AMP. However, some measures, in particular, those relating to deterring breeding by penguins do not avoid adverse effects.
- 66 The measures suggested under section 3.0 of the AMP ("General species management"), if applied to Threatened and At-Risk species such as penguins or dotterels will create adverse effects. For example:
- a. grazing stock,
 - b. completing disruptive sight walkovers,
 - c. installing streamers/tapes that flutter to deter birds from breeding,
 - d. parking earthworks machinery, and starting the engine from time to time,
 - e. use of acoustic deterrents.
- 67 It is unclear what evidential basis has been relied on to suggest these measures would deter species from nesting. It appears that the measures proposed are to deliberately disrupt the nesting and any activities of Threatened and At-Risk species. This would result in adverse effects such as displacement of birds, mortality of nestlings or eggs, stress, and may lead to missed nesting opportunities. Such actions would not avoid adverse effects.

- 68 For penguins, works that would affect accessways outside of the breeding and moult period would destroy their habitat, and adversely affect them (condition 13.5 of the Proposed Resource Consent Conditions). Penguins use routes, often over many years and even decades, to access safe nesting and roosting sites. Removing these accessways would increase their risk of predation, increase stress, and could result in penguin mortality.

EFFECTS MANAGEMENT AND CONDITIONS

- 69 In my view, the measures proposed in the application to mitigate potential impacts of the proposal are inadequate in terms of providing assurance that effects on Threatened and At-Risk bird species at the site would be avoided. In my opinion, the measures proposed would not ensure effects were less than minor.
- 70 Section 3.4 of the proposed AMP addresses the management of nest sites and states that a 20 m perimeter around any Threatened and At-Risk species nests identified will be created and the area avoided to enable nesting birds to fledge their chicks. It states that these nests will be monitored and nesting outcomes reported. The 20 m perimeter is insufficient, and in my opinion would likely not avoid nest failure. The perimeter should be wider, for example a distance at which birds are not flushed from their nests or observed to respond to humans or machinery approaching. These distances will be variable depending on the terrain and vegetation cover, and in open areas could be as far as 500 m from a nest site for sensitive species.

Avoiding mortality caused by overhead wires and cables

- 71 Effects caused by the dredges and where associated buildings or other infrastructure have cables or overhead wires has not been adequately assessed and described. Cables and overhead wires are extremely dangerous for petrels, and can lead to mortality. Should the proposed application be approved, there should be an explicit condition stating that there be no overhead cables or wires used in the operations or on its infrastructure at the site.

Habitat rehabilitation for penguins

- 72 In terms of Little Blue Penguin management (section 4.0), it would be beneficial to have penguin habitat reconstructed in the rehabilitated areas following mining, to ensure safe havens for this species, and others, to enable the population to expand following mining.
- 73 Mitigation of adverse effects of the mine activity on some species, such as penguins and ground-nesting birds can be undertaken by reducing other pressures on the species' populations. It is recommended that mammalian predator trapping is included in the management activities. It would be beneficial if the West Coast Penguin Trust and Department of Conservation would agree with the Applicant on the frequency and extent of trapping efforts.

Management of noise

- 74 I note that mechanical and motor noise can attract petrels, particularly in low visibility conditions, such as fog and rainy weather. For example, generator sheds in sub-Antarctic Bases are known to attract, and lead to grounding of some petrels, commonly storm petrel and prion species. A recent review by Brown et al. (2022) details this for petrels. Searches for grounded petrels (of multiple species) and management of grounded birds should be included in the Avian Management Plan. At Barrytown, in some weather conditions, species such as prions may be attracted to the site, be grounded and require recovery, as in the 2011 massive prion grounding event, when around 300,000 prions were recovered from the length of the New Zealand coastline on the western side of the country.
- 75 Noise effects covered in the Noise Management Plan are focused on the effects of the activity on nearby residences, and do not take into account the effects of noise on wildlife. I consider the potential impacts associated with noise pollution to have the potential to result in significant adverse effects on avifauna, particularly the local, threatened population of bittern.

Monitoring and reporting

- 76 Monitoring and Reporting provisions against the AMP for the 2024 consents for the central block generally seemed adequate. Should approvals be granted, I consider many requirements from the 2024 consent conditions need to be replicated. I set out in Appendix One further details on the conditions from the Central Block which, should the Panel consider approvals should be granted, need to be included in the conditions.
- 77 It would be preferable if the monitoring for species effects, and in particular petrel groundings be undertaken and reported by an independent contractor who reports to DOC and the consenting authority. I consider it best practice that this activity be funded by the Applicant.
- 78 The conditions do not specify who will be authorised to do lighting audits (at commencement of mining and if/when any grounded or dead seabirds are recorded).
- 79 Lighting specifications need to be included in the conditions and should be as for the Central Block consent conditions, including with the requirement for a Lighting Management Plan. It is not clear why the conditions for the Central Block are not replicated in this application, given that the risks to Westland petrels are the same. The areas covered are within the flight paths of petrels returning to their colonies, and so all the same considerations should be in place, as for the Central Block. DOC also makes this point in their response.
- 80 It also needs to be considered that habitat lost for wetland species (including bitterns) and other ground-nesting birds in the early stages of the mining operations will not be replaced quickly enough to enable affected individuals to find suitable habitat within the site. These displaced individuals would likely have lower breeding success and survivorship, and this needs to be addressed. Noting that many of these species have long lifespans, this displacement may lead to mortality and have a rapid and

deleterious effect on their local and global populations. If the application is approved, the management of these aspects also need to be reported upon, and reviewed annually to ensure the measures taken are having the effect of avoiding adverse impacts on these species.

- 81 Section 4.3 Lighting management (for penguins) and section 5.2 (for petrels) of the AMP states mobile lighting is identified to deal with “Equipment failure... to repair equipment and deal with other unexpected events”. In my opinion, measures from the Central Block conditions should be carried over. In particular,
- a. that mobile and dredge pond lighting will be required to adhere to the Australian National Light Pollution for Wildlife Guidelines (2023),
 - b. deploying the seabird light toolbox.
- 82 Reporting the use of mobile lighting is not detailed. It would be unfortunate if mobile lighting was used as part of regular works. Use of mobile lighting should be reported upon, and a limit to the number of hours per month set in consent conditions, any impacts on wildlife monitored and reported upon, and the use of mobile lighting reviewed if there are adverse effects on Threatened and At-Risk species.
- 83 No Lighting Management Plan is required to be prepared, and in my opinion, it should be required. The references to the Australian Government’s National Light Pollution Guidelines for Wildlife May 2023 (Australian Guidelines) are insufficient. The application of the Australian Guidelines is incomplete and only apply to design, not installation and operation.
- 84 For transparency and monitoring, it would be beneficial to have all the information relating to lighting, and the application of the Australian Guidelines set out in one place, and reported on to relevant agencies.

CONCLUSIONS

- 85 After considering TCML’s application, proposed conditions and draft AMP, it is my opinion that the monitoring and reporting of the proposed approaches are not adequate to ensure the purpose of the Avian Management Plan will be achieved – that a) “Adverse effects on the ‘Threatened’ and ‘At Risk’ birds present in the vicinity of the site and any other ‘Threatened’ and ‘At Risk’ species detected by subsequent monitoring are avoided;” and b) “Safe ongoing use of the site and its environs by the birds which currently occur in the area as mining proceeds.” TCML has failed to adequately address the adverse effects on native bird species.
- 86 I consider the potential impacts associated with the proposal, alongside existing threats (climate change, predation, accidental mortality in fisheries) and cumulative effects, to have the potential to result in significant adverse effects on native birds, particularly the global population of Westland Petrel.
- 87 If granted, it will be necessary to include the measures outlined in the above sections to reduce adverse effects of the proposed activity on Threatened and At-Risks avian

species. Even with those measures in place, I consider that risks remain for Australasian bittern, reef heron, spotless and marsh crakes.

- 88 Independence of monitoring for species effects, through contracting independent specialist workers, and reporting to DOC and Grey District Council, to a dedicated liaison person will be necessary to ensure there is transparency and quality assurance around the measures. This is vital as the potential for adverse effects on several Threatened and At-Risk species, which are present in globally significant populations at and in the immediate vicinity of the proposed mining site.

A handwritten signature in black ink, appearing to read 'Susan Micol', is positioned above the printed name.

Dr Susan Micol

28 September 2026

APPENDIX – References

- (a) Leo Chevallon, Julie Tourmetz, Jérôme Dubos, Yahaïa Soulaïmana-Mattoir, Clémence Hollinger, Patrick Pinet, François-Xavier Couzi, Martin Riethmuller, Matthieu Le Corre. (2022). 25 years of light-induced petrel groundings in Reunion Island: Retrospective analysis and predicted trends. *Global Ecology and Conservation*, Volume 38, <https://doi.org/10.1016/j.gecco.2022.e02232>
- (b) Brown, T. M., Wilhelm, S. I., Mastromonaco, G. F., & Burness, G. (2023). A path forward in the investigation of seabird strandings attributed to light attraction. *Conservation Science and Practice*, 5(1), e12852. <https://doi.org/10.1111/csp2.12852>
- (c) Williams, E. 2013 [updated 2022]. Australasian bittern | matuku-hūrepo. In Miskelly, C.M. (ed.) *New Zealand Birds Online*. www.nzbirdsonline.org.nz
- (d) Thompson, W.L. 2004. Sampling rare or elusive species, concepts, designs and techniques for estimating population parameters. Island Press, Washington DC.
- (e) ACAP 2026. <https://www.acap.aq/news/news-archive/2013-news-archive/acap-breeding-sites-no-48-punakaiki-south-island-new-zealand-forest-home-of-the-westland-petrel>. Accessed 21/9/2026.
- (f) BirdLife International 2026. <https://datazone.birdlife.org/site/factsheet/27408-punakaiki>. Accessed 21/9/26.

Appendix One

Issue	2024 conditions for “Central Block”	Proposed condition under FTAA	Advice
Review of conditions	3.2 <u>Notwithstanding the annual review, the Consent Authority may review the conditions of this consent at any time to avoid adverse effects on Westland Petrel, in response to reporting under conditions 18.7, 18.8 or 18.15, where an interaction or interactions have continued to occur despite implementation of further mitigation measures in accordance with conditions 18.7 or 18.8.</u>	3.1 Pursuant to Section 128(1) of the Resource Management Act 1991, the Consent Authorities may review any of the conditions of these consents by serving notice on the Consent Holder within a period of 60 working days, commencing on each anniversary of the date of commencement of these consents for any of the following purposes: a. To deal with any unanticipated adverse effect on the environment which may arise from the exercise of the consents which is appropriate to deal with at a later stage. b. To assess the effectiveness and appropriateness of imposed monitoring parameters, monitoring regimes and monitoring frequencies and to alter these accordingly. c. To ensure that any management plan required by conditions gives effect to conditions of these consents.	The requirement to review conditions to avoid adverse effects on Westland Petrel should be included.
Management Plans	6.1 At least 240 working days prior to undertaking any activities authorised by these consents, the Consent Holder must submit the following management plans to the Consent Authorities for certification: a. Noise Management Plan b. Avian Management Plan c. Wetland Construction and Riparian Planting Plan d. Dust Management Plan e. Rehabilitation Management Plan f. Water Management Plan and Monitoring and Mitigation Plan g. Erosion and Sediment Control Plan h. Landscape Mitigation Planting Plan i. Transport Management Plan j. Lighting Management Plan <i>Advice Note: These are collectively referred to as 'Management Plans'.</i> <i>Advice Note: Where a plan requires the input of an appropriately qualified professional, the Consent Authorities may engage an appropriately qualified person to peer review the plan as part of the certification process. The cost of any required peer reviews will be met by the Consent Holder</i>	6.1 <u>At least 40 working days prior to undertaking any activities authorised by these consents, the Consent Holder must submit the following management plans to the respective Consent Authorities for certification:</u> a. Noise Management Plan b. Avian Management Plan c. Lizard Management Plan d. Native Freshwater Fish Capture and Relocation Plan e. Dust Management Plan f. Rehabilitation Management Plan g. Water Management Plan h. Erosion and Sediment Control Plan Advice Notes: • <i>These are collectively referred to as 'Management Plans'.</i> • <i>Where a plan requires the input of an appropriately qualified professional, the Consent Authorities may engage an appropriately qualified person to peer review the plan as part of the certification process. The cost of any required peer reviews will be met by the Consent Holder.</i>	The FTAA conditions do not require a lighting management plan. I consider this should be required because It is unknown how the mining operation and other activities at the site might affect the petrels, and adjustments to mitigation actions and monitoring may be needed to

			ensure there are no adverse effects.
Rehabilitation	9.3 The Rehabilitation Plan must include the following: a. A programme of progressive rehabilitation of the pre-mining landform, adhering to maximum disturbed area limits. b. The original and final mine closure topography. c. Contouring of all post-mining landforms. d. Establishment of pasture cover over all disturbed land. f. Restoration of drainage discharge channels <u>that are compatible with the hydrology of the original and constructed wetlands.</u> e. ~~f-e~~ Erosion and sediment runoff control measures. ~~g-f~~ Removal of buildings, equipment, and structures; and ~~h-g~~ Post-mining weed and pest control requirements.	9.3 The Rehabilitation Management Plan must include the following: a. <u>A programme of progressive rehabilitation</u> of the pre-mining landform, adhering to maximum disturbed area limits. b. The original and final mine closure land contours. c. Contouring of all post-mining landforms. d. <u>Establishment of pasture cover over all disturbed land.</u> e. Construction methodology and planting details for the constructed wetland area to achieve the requirements in Condition 16.8. f. Construction methodologies and riparian planting details for the diversion of, and reestablishment of creeks, including to achieve the requirements in Condition 21.2 (the Site Specific Erosion and Sediment Control Plan) and Condition 28.2 (Design requirements). g. Removal of equipment. h. Monitoring and maintenance requirements.	The proposed FTAA conditions do not propose pest control. I consider pest control should be required because it is a mitigation against breeding output losses for penguins, dotterals and other ground-nesting birds, and helps offset the disturbance to these species caused by the mining activity on habitat that they occupied

Hours of operation	12.0 Hours of Operation 12.1 Trucking, <u>loading of trucks</u>, mining, overburden and topsoil stripping, bund development and any related activities must not operate during the hours of darkness. For the purpose of this condition, hours of darkness are between <u>30 minutes after</u> sunset to <u>30 minutes before</u> sunrise. <i>Advice Note:</i> sunrise and sunset times can be found here https://www.sunrise-and-sunset.com/en/sun/new-zealand/westport ~~2024 June~~ <i>Advice Note:</i> In addition to condition 12.1, further restrictions on transport operations are contained in Condition 15.0 Transport, and further noise restrictions are contained in Condition 16.0 Noise. 12.2 - Processing plant and maintenance activities within the processing plant area may operate 24 hours a day and 7 days a week. - Processing plant shifts must operate 0700-1900 and 1900-0700. - Mining shifts must operate only during the hours of daylight. For the purpose of this condition, hours of daylight are between sunrise and sunset. 12.3 Trucking activities must not occur on Sundays.	11.0 Hours of Operation 11.1 - Mining, overburden and topsoil stripping, bund development and any related activities must not operate during the hours of darkness. For the purpose of this condition, hours of darkness are <u>between sunset to sunrise.</u> - Mining shall not occur between the hours of 0600 and 0700 within 500m of the dwellings located at Lot 2 DP2178, 23, 37, 41, 43 and 50 Warren Road, and 64, 67, 86 and 101 Cargill Road. - Mining shall not be undertaken on Sunday. Advice Notes: Sunrise and sunset times can be found at https://www.sunrise-and-sunset.com/en/sun/new-zealand/greymouth In addition to Condition 12.1, further restrictions on noise are contained in Conditions 13.1 – 13.4 Noise.	It is unclear why trucking and loading of trucks are not limited to daytime hours under the FTAA conditions. I consider this is necessary as Westland Petrel can be affected by light from vehicles.
Lighting	16.2 Without limiting Condition 16.3, lighting must be designed, installed and operated in a manner which adheres to the Australian Government's National Light Pollution Guidelines for Wildlife January 2023 (or subsequent revision); including but not limited to: - Utilising the Seabird Light Mitigation Toolbox in Appendix G – Seabirds (Schedule 4); - All fixed lighting must be directed downward, shielded to avoid light spill, with a lighting temperature of no more than 2000K, and be filtered to reduce blue and violet wavelengths; - Lights must only illuminate the object or area intended; - Fixed lights must be mounted as close to the ground as practicable; - External lighting must be minimised on the seaward side of buildings to minimise light spill toward the coast; - External lighting must use the lowest intensity lighting possible, while ensuring compliance with workplace health and safety requirements; - External lighting must be equipped with light minimising technology, including motion sensors or timers; - Any windows must have blackout blinds fitted and those blinds must be closed during the hours of darkness to avoid any light spill from internal lighting within buildings; The consent holder must ensure mobile lighting within the mine site adheres to the above principles, including dipping headlights of vehicles operating on site. Any external doors in the building housing the process plant must be designed to prevent light escaping from the building.	17.2 Lighting must be designed in a manner which adheres to the Australian Government's National Light Pollution Guidelines for Wildlife May 2023 (or subsequent revision), including but not limited to: - All fixed lighting must be directed downward, shielded to avoid light spill outside of permitted limits, operate primarily in the yellow orange spectrum, and be filtered to reduce blue and violet wavelengths; - Lights must only illuminate the object or area intended; - Fixed lights must be mounted as close to the ground as practicable while still achieving site lighting requirements; and - External lighting must use the lowest intensity lighting possible, while ensuring compliance with workplace health and safety requirements.	The risks to Westland Petrel will be the same on the Southern Block, therefore I consider the conditions from the 2024 consent should be carried over.
Avian management	18.1 Mining, topsoil and overburden stripping and rehabilitation activities must not take place within 100m of the site's northern boundary, Canoe Creek Lagoon (as delineated in Condition 7.1) or any wetland between the months of August and December each year.		It is unclear why there are no restrictions near boundaries, lagoons or wetlands under

			FTAA conditions. I consider there should be to avoid sedimentation, dust, water level changes etc as outlined in my submission. A boundary of 100 m or more would reduce the likelihood of adverse effects on a regionally significant wetland and smaller wetlands on bitterns, crakes and other wetland species.
Avian management - buffers	18.2 a. If a nest of a threatened or at risk bird species is detected within an area to be mined during the breeding detection surveys, the nest must be protected by establishing, physically marking and maintaining a 50m buffer between the nest and any works so as to minimise the risk of nest abandonment. All vehicles, machinery and people must be excluded from the area and local pest control implemented until either the nest is abandoned or any chicks fledge in accordance with the management set out in the Avian Management Plan (AMP). b. If a nest is abandoned, the AMP must be reviewed by a suitably qualified ecologist to investigate the reasons for abandonment and if there are any additional measures that should be undertaken to protect nests in future. <i>Advice Note: Conditions relating to the AMP are Conditions 18.11 to 18.14.</i>		It is unclear why there are no buffers or vehicle exclusions required under the FTAA conditions. I consider there should be.

Avian management – predator control	18.4 The Consent Holder must establish a ring of traps and/or bait stations targeting rats and mustelids placed around the perimeter of the property and ~~the coastal lagoon~~Canoe Creek Lagoon in accordance with the AMP. The network of traps must be installed prior to mining commencing and be serviced as required.		It is unclear why pest control is not proposed under the FTAA conditions. Pest control is beneficial for avifauna species.
Avian management – monitoring	18.5 - The Consent Holder must deploy wildlife cameras around the coastal perimeter of the mine disturbance area and other suitable locations as required to monitor for Kororā, and around the processing plant area and the access road to monitor for <i>Procellaria westlandica</i> (Westland Petrel). - The cameras must be equipped with motion sensors, and be installed by a suitably qualified ecologist. 10 cameras to detect Kororā must be placed at suitable locations and set to record for at least 10 nights every month, with the location to be determined by the ecologist. 10 Cameras to detect Westland Petrel must be installed around the processing plant and the length of the access road, operating during the hours of darkness each night, with the location to be determined by the ecologist. ~~Imagery must be reviewed daily for wildlife interactions by a staff member, and imagery~~ must be reviewed ~~for wildlife interactions~~ at least weekly by a suitably qualified ecologist, retained for a minimum of 6 months, and be made available to the Consent Authority or the Department of Conservation on request. ~~Monitoring for Westland Petrel shall also include nightly on-ground searches over the operational areas of the site for the first three months of operation, and throughout the fledging season of 14 November to 14 January for the first two seasons each year, and then as required as detailed in the AMP.~~	13.3 - The Consent Holder must deploy wildlife cameras at suitable locations to detect ~~target~~ wildlife (particularly Kororā and Tāiko) including low spots and creek mouths along the coastal edge of the mine disturbance area and other locations likely to detect activity as determined by a suitably qualified ecologist and set to record for at least 10 nights every month. - The cameras must be equipped with passive infrared receptors (or other mechanisms to enable night vision capability and motion detection) and be installed by a suitably qualified ecologist. - Imagery must be reviewed for ~~wildlife interactions~~ at least weekly by a suitably qualified ecologist, retained for a minimum of 6 months, and be made available to the Consent Authority or the Department of Conservation on request.	The proposed FTAA conditions do not require nightly on ground searches. Nor do they specify the number of cameras to be used. These requirements should be carried over, but with a modification to 18.5(f) to require monitoring to occur between 1 November to 31 January.

Avian management – camera footage	18.6 a. Any ~~interactions with sightings of~~ <u>Kororā wildlife and Westland Petrel</u> recorded as a result of the monitoring requirements in the AMP including the wildlife cameras required by Condition 18.5, must be reported to the Consent Authority and the Department of Conservation on a weekly basis from 1 November to 31 January each year, and on a monthly basis from 1 February to 31 October. b. Footage must be made available to the Department of Conservation and the consenting authority as set out in Condition 18.5.	13.4 a. Any interactions with wildlife recorded as a result of the monitoring requirements in the Avian Management Plan including the wildlife cameras required by Condition 13.3, must be reported to the Consent Authority and the Department of Conservation on a weekly Barrytown Minerals Project – Southern Block – Appendix P1 Date: May 2026 10  TĀIKO CRITICAL MINERALS WEST COAST NEW ZEALAND basis from 1 November to 31 January each year, and on a monthly basis from 1 February to 31 October. b. Footage must be made available to the Department of Conservation and the consenting authority as set out in Condition 13.3. c. Any grounded taiko discovered must be reported to the Department of Conservation via their 0800 DOC HOT line as soon as possible. d. In the event that a grounded seabird is discovered, a lighting audit will be undertaken to ensure lighting at the site complies with the requirements set out in the Avian Management Plan and the latest version of the Australian Government National Light Pollution Guidelines for Wildlife.	The FTAA refers to “interactions” as opposed to sightings. I consider that sightings is more appropriate.
Avian management – Westland petrel interaction	18.8 a. If two <u>or more</u> Westland Petrel interactions are detected <u>within any three month period</u> ~~four-week period~~, all activities during the hours of darkness must cease until a further review of the AMP and Lighting Management Plan by a suitably qualified ecologist and a suitably qualified lighting professional has been carried out, in consultation with the Department of Conservation, to determine the possible causes and additional mitigation measures that can be employed to avoid further interactions with Westland Petrel <u>(such review to include consideration of changes to the operating hours specified in conditions 12.1 and 12.2 and the lighting requirements in conditions 16.1 and 16.2)</u>. b. Mining and processing activities may only recommence following the completion of investigations <u>that demonstrates, to the satisfaction of Grey District Council:</u> i) <u>that the interaction was not likely to have been caused by the consented activities; or</u> ii) <u>that changes to night time operations are implemented to ensure that further interactions with Westland Petrel are avoided (such review to include consideration of changes to the operating hours specified in conditions 12.1 and 12.2 and the lighting requirements in conditions 16.1 and 16.2); and certification of revisions to the AMP and Lighting Management Plan; and/or variation of conditions 12.1, 12.2, 16.1 and 16.2) are completed in accordance with the outcomes of the review in clause a above.</u> ~~b-c and the implementation of any further mitigation measures recommended by the ecologist or suitably qualified lighting professional.~~ <i>Advice Note: Any amendment to the AMP will be required to comply with the certification process under Condition 6.0, and any Wildlife Act Authority requirements.</i>		The requirements from the Central Block conditions for interactions have not been replicated. I consider that they need to be, but with a substantial modification. It should be 1 Westland Petrel interaction per year for the combined

			mining operations on Barrytown flats, as opposed to 2 or more wetland petrel interactions per 3-month period.
Avian management – Kororā/little penguin surveys	18.9 a. The Consent Holder must engage a suitably qualified <u>ecologist or ornithologist expert</u> to carry out annual penguin surveys <u>in the period 1 August – 30 November to detect the presence of Kororā. The survey area is that land within 500m of the mining disturbance area including Pakiroa beach. A certified conservation dog will be used where practicable, of Pakiroa beach and the mine area using a certified conservation dog within 500m of the mining disturbance area to detect the presence of Kororā.</u> b. The first survey must be conducted within the first 12 months of the commencement date of the resource consent, and at least two annual surveys must be completed before mining commences. c. If penguins or burrows are detected the location must be mapped and the Consent Holder must undertake the following management actions: - If penguins are detected using the mining area to access other habitats, any existing access ways must be maintained and/or works affecting that accessway must be completed in the period April – June (outside the breeding and moult period). - Any potential penguin burrows identified must be investigated, including use of a burrowscope, to determine whether Kororā are using them. - Where any penguin burrows are compromised by mining (i.e. there are direct effects), replacement artificial burrows or nest boxes must be installed at a rate of 2:1. Any additional nest boxes provided must be located within the vegetated coastal foreshore habitat associated with any identified accessways. - If penguins are found within the mine site, a specific Penguin Management Plan must be developed by a suitably qualified and experienced ecologist on behalf of the applicant in consultation with the West Coast Penguin Trust. The West Coast Penguin Trust must be	13.5 a. The Consent Holder must engage a suitably qualified expert to carry out annual penguin surveys of Pakiroa beach and <u>the mine area</u> within 500m of the mining disturbance area to detect the presence of Kororā. If available, the Consent Holder must use a <u>certified conservation dog. If a certified conservation dog is unavailable or unable to complete the survey, human surveys and increased camera monitoring will be undertaken in accordance with the advice of a suitably qualified ecologist.</u> b. The first survey must be conducted <u>within the first 12 months of the commencement date of the resource consent</u>, and at least two annual surveys must be completed before mining commences. c. If penguins or burrows are detected the GPS location must be recorded and the Consent Holder must undertake the following management actions: - If penguins are detected using the mining area to access other habitats, <u>any existing access ways must be maintained</u> and/or works affecting that accessway must be completed in the period April – June (outside the breeding and moult period). - Any potential penguin burrows identified must be investigated, including use of a burrowscope, to determine whether Kororā are using them. - Where any penguin burrows are compromised by mining (i.e. there are direct effects), replacement artificial burrows or nest boxes must be installed at a rate of 2:1. Any additional nest boxes provided must be located within the <u>vegetated coastal foreshore habitat associated with any identified accessways.</u> - If penguins <u>are</u> found within the application site, a specific Penguin Management Plan must be <u>developed</u> by a suitably qualified and experienced ecologist on behalf of the applicant in consultation with the West Coast Penguin Trust. The West Coast Penguin Trust must be reimbursed for reasonable time and expenses associated with consultation on the Penguin Management Plan. <u>Any deceased penguins found on or near the mine site must be provided to the Department of Conservation for necropsy.</u>	The requirement for a “suitably qualified ecologist or ornithologist” is more appropriate than a “suitably qualified expert”, and should be replicated. I also consider that the time period of 1 August – 30 November for little penguin surveys should be replicated.

Avian management – little penguin fencing	18.10 <u>a. If</u> i. <u>Kororā are detected within 500m of the mine disturbance area; and</u> ii. <u>no Kororā are detected within the mine disturbance area; and</u> iii. <u>no access tracks are detected beyond the coastal margin in the pre-mining surveys required by Condition 18.9.</u> The Consent Holder must erect a penguin fence along the length of the Canoe Creek Lagoon boundary, from Collins Creek to the northern boundary of the mine disturbance area, on the landward side of ~~the the coastal lagoon~~ <u>Canoe Creek Lagoon</u> planting so as to exclude Kororā from entering the mine disturbance area:- i. <u>if Kororā are detected within 500m of the mine disturbance area; and</u> ii. <u>no Kororā are detected within the mine disturbance area; and</u> iii. <u>no access tracks are detected beyond the coastal margin in the pre-mining surveys required by Condition 18.9.</u> <u>a-b.</u> The penguin fence must be comprised of <u>dark grey or black</u> geosynthetic mesh to a height of at least 900mm above ground and buried at least 300mm below the ground and with posts no greater than 4m apart. <u>b-c.</u> The fence installation must be certified as preventing the ingress of Kororā to the mine disturbance area by a suitably qualified ecologist. <u>e-d.</u> The certification must be supplied to the Consent Authority prior to mining commencing. <i>Advice Note: The requirement to erect a penguin fence only applies if Kororā are detected within 500m proximity of the mine disturbance area but are not within the site. If no Kororā are detected near the mine disturbance area, a penguin fence is deemed unnecessary.</i>	13.6 a. <u>The Consent Holder must erect and maintain a penguin fence for each section of mining identified in the Avian Management Plan to deter Kororā from entering hazardous areas.</u> b. The penguin fence must be comprised of geosynthetic mesh to a height of at least 900mm above ground and buried at least 300mm below the ground and with posts no greater than 4m apart. c. <u>The fence installation must be certified by a suitably qualified ecologist as preventing the ingress of Kororā to the active mine disturbance area.</u> d. <u>The certification must be supplied to the Consent Authority prior to mining commencing.</u> e. <u>Upon completion of all mining activities and associated site rehabilitation, all penguin fencing must be removed.</u> Advice Note: ▪ <u>The requirement to erect a penguin fence only applies if Kororā are detected within 500m proximity of the active mining disturbance area during pre-mining surveys. If no Kororā are detected within 500m of the active mine disturbance area a penguin fence is deemed unnecessary.</u>	I consider the FTAA conditions inadequate for protecting little penguins. The specific requirements around when fencing should be erected under the 2024 conditions are more appropriate.
Avian management – AMP requirements	18.11 The Consent Holder must conduct activities on site in <u>general</u> accordance with an Avian Management Plan (AMP) prepared by a suitably qualified ecologist or ornithologist <u>in consultation with Department of Conservation</u>. The objectives of the AMP are: a. To ensure adverse effects on the threatened and at risk birds present in the vicinity of the site and any other threatened and at risk species detected by subsequent monitoring are avoided. b. To ensure significant adverse effects on the rushland, flaxland and other important bird habitats adjoining the mining site including Canoe Creek Lagoon, Rusty Pond and the coastal margin are avoided. c. To ensure safe ongoing use of the site and its environs by the birds which currently occur in the area. <i>Advice Note: All Management Plans are required to adhere to the requirements of Condition 6.0.</i> <i>Advice Note: Threatened or at-risk bird species refers to the Conservation Status according to the Department of Conservation's Threatened Classification System</i>	<u>13.7</u> The Consent Holder must conduct activities on site in <u>general</u> accordance with an Avian Management Plan (AMP) prepared by a suitably qualified ecologist or ornithologist. The objectives of the <u>AMP</u> are: a. To ensure adverse effects on the threatened and at risk birds present in the vicinity of the site and any other threatened and at risk species detected by subsequent monitoring are avoided. b. To ensure safe ongoing use of the site and its environs by the birds which currently occur in the area. Advice Note: • <i>All Management Plans are required to adhere to the requirements of Condition 6.0.</i> • <i>Threatened or at-risk bird species refers to the Conservation Status according to the New Zealand Threat Classification System.</i>	I consider the requirement to develop the AMP in consultation with DOC is best practice and should be replicated in the proposed FTAA conditions. I also consider that 18.11(b) of the 2024 conditions should be replicated, as habitat

			protection gives better assurance that adverse effects on threatened and at-risk species will be avoided.
Avian management - Description of surrounding avian habitats no longer required and reference to detection dogs removed.	18.12 The AMP must detail: a. A description of the site and surrounding avian habitats b. A description of the threatened and at risk indigenous birds likely to be present in these habitats and which species require specific mitigation measures c. A description of the mitigation measures that are required to be implemented to avoid effects on threatened and at risk indigenous birds <u>which may include the use of a specially trained Westland Petrel detection dog (if available)</u>; d. A procedure for managing and responding to Westland Petrel or other wildlife being found on the mine site; e. A description of the monitoring requirements to assess the effectiveness of the AMP	13.8 The AMP must detail: a. A description of the site b. A description of the threatened and at risk indigenous birds likely to be present in these habitats and which species require specific mitigation measures c. A description of the measures that are required to be implemented to avoid effects on threatened and at risk indigenous birds . d. A procedure for managing and responding to Westland Petrel or other wildlife being found on the mine site; e. Details of the penguin fence for each Section of mining described in condition 13.6. f. Lighting management at the site to comply with the guidelines in Condition 17.2. g. A description of the monitoring requirements to assess the effectiveness of the AMP.	I consider the reference to “surrounding avian habitats” should be replicated, and for reasons set out in my body of evidence, reference to specially trained petrel detection dogs should be included.

Avian management - reporting

18.15	An annual bird management report must be provided to the Consent Authority, Te Runanga o Ngāti Waewae, the Buller/Kawatiri office of the Department of Conservation in Westport, the West Coast Penguin Trust, Paparoa Wildlife Trust, the Community Liaison Group and Waka Kotahi NZ Transport Agency Environment and Sustainability Team (via: environment@nzta.govt.nz), no later than 30 June each year. The report must include the following matters: - The timing and duration of any mining within 100m of ~~the coastal lagoon~~ Canoe Creek Lagoon vegetation and SNA Site PUN-W034; - Results of seasonal bird surveys at the site; - Timing of nest detection surveys and observations relating to nesting or other behaviours observed within the area to be mined; - Efforts to deter any attempts at nesting within the area to be mined and the outcome of those efforts; - Species attempting to nest within the area to be mined (including threatened and at risk species); - Date of first nesting attempts (if any) for threatened and at risk species within the area to be mined; - Number and location of nesting attempts by threatened and at risk species within the area to be mined; - Date any pest control commenced, the location of traps and bait stations, the number of pest captures, the amount of bait consumed and any relevant observations; - Outcome of individual nesting attempts by threatened and at risk species within the area to be mined; - Results of annual kororā surveys on Pakiroa Beach, the implications for mine operations and any management actions undertaken; - Number and location of any grounded Westland Petrel and any birds found dead on site; - Management undertaken and the outcome for any grounded Westland Petrel collected; - Number, dates and location of any mining operation or MHC haulage vehicle strikes or near misses involving the Westland Petrel or Kororā; - Autopsy outcomes for any dead Westland Petrel or Kororā collected; - The findings of any lighting audits undertaken during the year and steps taken to resolve any issues identified; - A summary of any revisions made to the AMP and the reasons for the changes; - The date and duration of any operational shut-downs; and - The results of the quarterly walk-through surveys of birds using the lagoon area.
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13.11	An annual bird management report must be provided to the Consent Authority, Te Runanga o Ngāti Waewae, the Buller/Kawatiri office of the Department of Conservation in Westport, the West Coast Penguin Trust and Waka Kotahi NZ Transport Agency Environment and Sustainability Team (via: environment@nzta.govt.nz), no later than 30 June each year. The report must include the following matters: - The timing and duration of any mining within 100m of the proposed SNA Site PUN-049; - Results of seasonal bird surveys at the site; - Timing of nest detection surveys and observations relating to nesting or other behaviours observed within the area to be mined;
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	- Efforts to deter any attempts at nesting within the area to be mined and the outcome of those efforts; - Species attempting to nest within the area to be mined (including threatened and at risk species); - Date of first nesting attempts (if any) for threatened and at risk species within the area to be mined; - Number and location of nesting attempts by threatened and at risk species within the area to be mined; - Outcome of individual nesting attempts by threatened and at risk species within the area to be mined; - Results of annual Kororā surveys on Pakiroa Beach, the implications for mine operations and any management actions undertaken; - Number, dates and location of any mining operation vehicle strikes or near misses involving the Westland Petrel or Kororā; - Autopsy outcomes for any dead Westland Petrel or Kororā collected; - The findings of any lighting audits undertaken during the year and steps taken to resolve any issues identified; - A summary of any revisions made to the AMP and the reasons for the changes; and - The date and duration of any operational shut-downs.
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The 2024 consent conditions sets out more appropriate reporting requirements. Requirements regarding pest control (condition 18.15(h)), grounded petrel or dead birds (condition 18.15(j)), and management undertaken and the outcome of any grounded Westland Petrel collected (condition 18.15(k)) needs to be replicated.