

# ecoLogical Solutions

Environmental Consultants



May 2026

## Barrytown Mineral Sand Mine Avian Management Plan

Submitted to:  
Tāiko Critical Minerals Limited



water



fauna



flora

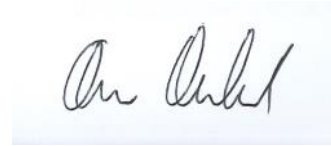


land

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## Appendix A – Wildlife Act (1953) authority to handle absolutely protected wildlife

## 1.0 Introduction

### 1.1 Background

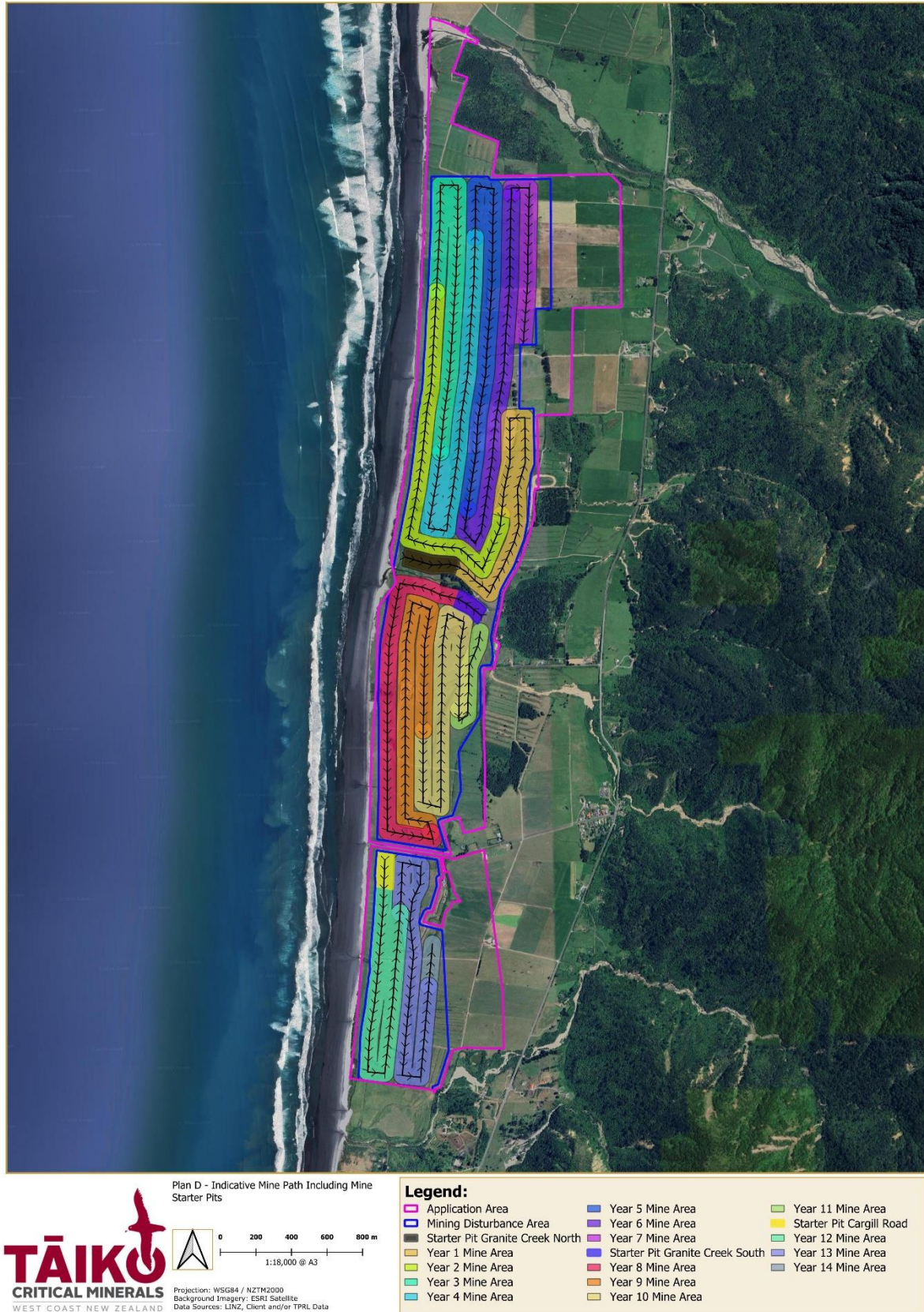
Tāiko Critical Minerals Limited (TCM) holds resource consents for mineral sand mining on farmland near Barrytown, known as 'the Central Block' (CB) and located approximately 36 km north of Greymouth within Mining Permit MP 60785. The CB adjoins several wetlands and other habitats which are used by 'Threatened' and 'At Risk' birds. The CB is also located approximately 3.5 km south of the only known breeding colony of tāiko (Westland petrel, *Procellaria westlandica*). As such, the conditions of consent for the Central Block include a requirement for an Avian Management Plan to minimise effects on avifauna.

TCM are proposing to extend the existing sand mine to an area of farmland south of the CB located between Canoe Creek and Fagan Creek and known as 'the Southern Block' (SB). The Wet Concentrator Plant (WCP) and ancillary infrastructure consented at the CB would be relocated to the SB. The location of the proposed mining area and the SB is shown in Figure 1.

The mining area would be set back from State Highway 6. Setback distances of at least of 20 m from Granite Creek and Fagan Creek and the property boundaries will be maintained. There will be a 50 m setback from Mean High Water Springs.

Vegetation throughout the area to be mined comprises mostly grazed and rough exotic pasture growing on land which has previously been 'humped and hollowed' to improve drainage for farming, as well as small fragments of indigenous coastal shrubland and flaxland. The artificially constructed and small natural wetlands and vegetation fragments could provide habitat for birds. The SB does not adjoin wetland and other habitats regularly used by birds, nonetheless 'Threatened' and 'At Risk' birds may use the small areas of habitat present and immediate surrounds within the mining area. This management plan has been prepared to minimise potential effects on those birds occupying the SB and provides for detection and monitoring of breeding birds within the mining area, deterrents and physical barriers to deter use by at risk species such as tūturiwhatu (dotterels *Charadrius bicinctus*) and kororā (little blue penguin, *Eudyptula minor*), restrictions on lighting and traffic movements to avoid effects on tāiko, management of any grounded tāiko and monitoring of birds using the site to inform operational decisions and species management.

Mining would take place using a floating dredge in progressive strips along the site moving from west to east and north to south. The dredge would float in a 1 ha dredge pond with topsoil and overburden removed in advance and tailings returned to the rear of the pond to be used as part of the progressive rehabilitation. There would be no more than 16 ha disturbed area at any one time (including up to 2 ha of earthworks outside the mining disturbance area to provide fill to assist in recontouring and rehabilitating the mined area, but excluding the 4 ha occupied by the WCP and ancillary infrastructure). The area would be mined in three sections, as shown in Figure 1.



**Figure 1: Location and mine path of the proposed mineral sand mine at Barrytown.**

The data collected as part of implementing this plan will be compiled and presented in an annual report, to be used to inform adaptive management of risks to birds within and surrounding the site. These reports will be provided to Greymouth District Council, Te Rūnanga o Ngāti Waewae and the Department of Conservation Māwhera / Greymouth (lizards) and Kawatiri / Buller (birds) offices and the West Coast Penguin Trust.

## 1.2 Relevant Consent Conditions

TCM has been granted resource consents (**NUMBER**) under the Fast-track Approvals Act 2024 to construct and operate the mine subject to conditions. The relevant conditions are detailed below as well as information on where the matters identified are addressed in this Avian Management Plan.

13.0 Avian Management		
13.1	<p>a. Prior to and during each breeding season, the Consent Holder shall undertake regular surveys of all areas scheduled for mining to identify any bird breeding or nesting activity. Where surveys indicate that nesting is likely to occur, the Consent Holder shall implement appropriate deterrence measures, including walkovers, visual cues, audio bird scarers, and strategic placement of machinery, to discourage birds from establishing nests.</p> <p>Advice Note:</p> <ul style="list-style-type: none"> <li>• <i>Conditions relating to the Avian Management Plan are Conditions 13.7 – 13.9.</i></li> </ul>	<p>Surveys: Sections 3.0, 4.0, 5.0, 6.0</p> <p>Deterrents: Section 3.2</p>
13.2	Staff, contractors and visitors associated with the mining activity must not be permitted to bring dogs to the site at any time, except for conservation purposes.	
13.3	<p>a. 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.</p> <p>b. 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.</p> <p>c. 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.</p>	Sections 4.2, 6.3
13.4	<p>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 basis from 1 November to 31 January each year, and on a monthly basis from 1 February to 31 October.</p> <p>b. Footage must be made available to the Department of Conservation and the consenting authority as set out in Condition 13.3.</p>	Section 7.1

	<ul style="list-style-type: none"> <li>c. Any grounded taiko discovered must be reported to the Department of Conservation via their 0800 DOC HOT line as soon as possible.</li> <li>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.</li> </ul>	
13.5	<ul style="list-style-type: none"> <li>a. The Consent Holder must engage a suitably qualified expert to carry out annual penguin surveys of Pakiroa beach and the mine area within 500 m of the mining disturbance area to detect the presence of Kororā. If available, the Consent Holder must use a 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.</li> <li>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.</li> <li>c. If penguins or burrows are detected the GPS location must be recorded and the Consent Holder must undertake the following management actions: <ul style="list-style-type: none"> <li>i. 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).</li> <li>ii. Any potential penguin burrows identified must be investigated, including use of a burrowscope, to determine whether Kororā are using them.</li> <li>iii. 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.</li> <li>iv. If penguins are found within the application 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 reimbursed for reasonable time and expenses associated with consultation on the Penguin Management Plan.</li> <li>v. Any deceased penguins found on or near the mine site must be provided to the Department of Conservation for necropsy.</li> </ul> </li> </ul>	<p>Section 4.2</p> <p>Section 6.4</p> <p>Section 4.2</p>
13.6	<ul style="list-style-type: none"> <li>a. The Consent Holder must erect and maintain a penguin fence for each mining stage identified in the current Annual Work Plan to deter Kororā from entering hazardous areas.</li> <li>b. The penguin fence must be comprised of geosynthetic mesh to a height of at least 900 mm above ground and buried at least 300 mm below the ground and with posts no greater than 4 m apart.</li> </ul>	Section 4.4

	<p>c. The fence installation must be certified by a suitably qualified ecologist as preventing the ingress of Korora to the active mine disturbance area.</p> <p>d. The certification must be supplied to the Consent Authority prior to mining commencing.</p> <p>e. Upon completion of all mining activities and associated site rehabilitation, all penguin fencing must be removed.</p> <p>Advice Note:</p> <ul style="list-style-type: none"> <li>• <i>The requirement to erect a penguin fence only applies if Kororā are detected within 500 m proximity of the active mining disturbance area during pre-mining surveys. If no Kororā are detected within 500 m of the active mine disturbance area a penguin fence is deemed unnecessary.</i></li> </ul>	
13.7	<p>The Consent Holder must conduct activities on site in general accordance with an Avian Management Plan (AMP) prepared by a suitably qualified ecologist or ornithologist. The objectives of the AMP are:</p> <p>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.</p> <p>b. To ensure safe ongoing use of the site and its environs by the birds which currently occur in the area.</p> <p>Advice Note:</p> <ul style="list-style-type: none"> <li>• <i>All Management Plans are required to adhere to the requirements of Condition 6.0.</i></li> <li>• <i>Threatened or at-risk bird species refers to the Conservation Status according to the New Zealand Threat Classification System.</i></li> </ul>	Section 1.4
13.8	<p>The AMP must detail:</p>	
	<p>a. A description of the site</p> <p>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</p> <p>c. A description of the measures that are required to be implemented to avoid effects on threatened and at risk indigenous birds.</p> <p>d. A procedure for managing and responding to Westland Petrel or other wildlife being found on the mine site;</p> <p>e. Details of the penguin fence described in condition 13.6.</p> <p>f. Lighting management at the site to comply with the guidelines</p> <p>g. A description of the monitoring requirements to assess the effectiveness of the AMP.</p>	<p>Section 2.0</p> <p>Section 2.0</p> <p>Sections 3.0, 4.0, 5.0</p> <p>Sections 3.0, 4.0, 5.0</p> <p>Section 4.0</p> <p>Sections 4.0, 5.0</p> <p>Section 6.0</p>
13.9	<p>The AMP must be reviewed annually by the Consent Holder. Any proposed amendments to the AMP must be submitted to Council for certification and must:</p>	Section 7.0

	<p>a. Achieve the AMP's objectives including avoiding effects on any threatened or at-risk indigenous bird species;</p> <p>b. Comply with the conditions of this resource consent;</p> <p>c. Have been reviewed by an appropriately qualified and experienced ecologist or ornithologist;</p> <p>d. Have been provided in advance to Te Rūnanga o Ngāti Waewae and the Buller/Kawatiri office of the Department of Conservation for comment (and feedback received collated and submitted with the amendments to be provided to Council); and</p> <p>e. Follow the certification process set out in Condition 6.1.</p> <p>Advice Note:</p> <ul style="list-style-type: none"> <li>• <i>Any disturbance or relocation of avifauna may require a permit from the Department of Conservation under the Wildlife Act (1953).</i></li> </ul>	
13.10	<p>a. The Consent Holder must engage a suitably qualified expert(s) to undertake all monitoring of avian species from the commencement of consent until at least one year following the cessation of mining activities on this site.</p> <p>b. The monitoring must be carried out in accordance with the monitoring requirements in the AMP.</p>	Section 6.0
13.11	<p>An annual bird management report must be provided to the Consent Authority, Te Rūnanga 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: <a href="mailto:environment@nzta.govt.nz">environment@nzta.govt.nz</a>), no later than 30 June each year. The report must include the following matters:</p> <p>a. The timing and duration of any mining within 100m of the proposed SNA Site PUN-049;</p> <p>b. Results of seasonal bird surveys at the site;</p> <p>c. Timing of nest detection surveys and observations relating to nesting or other behaviours observed within the area to be mined;</p> <p>d. Efforts to deter any attempts at nesting within the area to be mined and the outcome of those efforts;</p> <p>e. Species attempting to nest within the area to be mined (including threatened and at risk species);</p> <p>f. Date of first nesting attempts (if any) for threatened and at risk species within the area to be mined;</p> <p>g. Number and location of nesting attempts by threatened and at risk species within the area to be mined;</p> <p>h. Outcome of individual nesting attempts by threatened and at risk species within the area to be mined;</p> <p>i. Results of annual Kororā surveys on Pakiroa Beach, the implications for mine operations and any management actions undertaken;</p> <p>j. Number, dates and location of any mining operation vehicle strikes or near misses involving the Westland Petrel or Kororā;</p> <p>k. Autopsy outcomes for any dead Westland Petrel or Kororā collected;</p>	Section 7.0

	l. The findings of any lighting audits undertaken during the year and steps taken to resolve any issues identified; m. A summary of any revisions made to the AMP and the reasons for the changes; n. The date and duration of any operational shut-downs.	
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### 1.3 Purpose

The purpose of this Avian Management Plan is 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.

### 1.4 Scope

This AMP includes:

- Identification of species which may be adversely affected by mining activities;
- A copy of the relevant consent conditions intended to reduce effects of the mining activity on birds;
- Details of the monitoring required to identify 'At Risk' species present and inform management;
- Where available, best practice methods to be used to protect such species
- Specific management actions for those species considered likely to be present or that may breed within mining areas; and
- Monitoring and reporting requirements.

### 1.5 Updates

This plan will be updated annually by a suitably qualified and experienced ecologist/ornithologist taking into account the mining proposed for the coming year, as well as the results of the previous year's avian monitoring and the outcome of any management actions undertaken to protect birds in the preceding year.

## 2.0 Ecological Context

### 2.1 Avifauna That May Use the Site

The birds identified via desktop analysis and pre-mining avian surveys as using the site or surrounds are generally common exotic and native species typical of urban and rural environments. This species mix likely reflects the highly modified state of the habitats within the SB. Bird species of conservation interest that have been detected within or near the site are primarily associated with coastal, wetland or forest habitats located off site, though some may temporarily use the habitats within the SB. The species of conservation interest recorded during surveys in either the SB or the CB and considered likely to use the SB are shown in Table 1. None of these species are likely to rely solely on the pasture habitat present in the mining area, but may visit such areas for feeding (especially in disturbed soil),

loafing, or in the case of kororā / little blue penguin, may cross the site to access habitats inland. While tāiko (Westland petrel) have not been detected on site, the only known breeding colony is located approximately 4.5 km to the north and tāiko are likely to be passing the site when leaving or returning to the colony.

For the SB there have been three bird surveys undertaken to date (July, October 2024 and February 2025) recording a total of 33 species. This information was combined with database records in eBird, and monitoring undertaken at the CB, to identify the species likely to be present at the site, which are shown in Table 1.

**Table 1: Threatened and At-Risk birds which may use the Southern Block.**

Common name	Scientific name	Conservation status (Robertson et al. 2021)
Tūturiwhatu / banded dotterel	<i>Anarhynchus b. bicinctus</i>	At Risk – Declining
Tarāpuka / black billed gull	<i>Chroicocephalus bulleri</i>	At Risk – Declining
Māpunga / black shag	<i>Phalacrocorax carbo novaehollandiae</i>	At Risk – Relict
Kawaupaka / little shag	<i>Microcarbo melanoleucos brevirostris</i>	At Risk – Relict
Kororā / little blue penguin	<i>Eudyptula minor</i>	At Risk – Declining
Koekoeā / long-tailed cuckoo	<i>Eudynamys taitensis</i>	Threatened – Nationally Vulnerable
Tarāpunga / red-billed gull	<i>Chroicocephalus novaehollandiae</i>	At Risk – Declining
Kōtuku ngutupapa / royal spoonbill	<i>Platalea regia</i>	At Risk – Naturally Uncommon
Mātātā / South Island fernbird	<i>Poodytes p. punctatus</i>	At Risk – Declining
Tōrea / South Island pied oystercatcher	<i>Haematopus finschi</i>	At Risk – Declining
Kārearea / New Zealand falcon ('bush')	<i>Falco novaeseelandiae</i>	At Risk – Declining
Tōrea tai / variable oystercatcher	<i>Haematopus unicolor</i>	At Risk – Recovering
Pārerā / Pacific black duck	<i>Anas superciliosa</i>	Threatened – Nationally Vulnerable
Tara / white-fronted tern	<i>Sterna s. striata</i>	At Risk – Declining

## 2.2 Important Avian Habitat

The bird species confirmed present within and surrounding the site are mainly species which would use the habitats therein for foraging, roosting or occasional visitation (e.g., oystercatchers, dotterels, gulls) with primary foraging and nesting habitat located elsewhere. Only common native and exotic birds are likely to be nesting within the mining area, although kororā / little blue penguin may cross the site to reach burrows inland. Tāiko, and perhaps other seabirds, could be affected by lighting at night, although mining is only proposed during daylight hours, which substantially reduces the risk to seabirds. The important habitats for birds are therefore areas of indigenous shrubland and flaxland or

riparian vegetation surrounding creeks (particularly Granite Creek), which species such as kororā may use as cover when navigating through the landscape. A small number of species may use the pasture habitat for foraging, roosting and breeding.

The site is privately owned and predominantly actively farmed. The site is adjacent to an area identified by Boffa Miskell (2006) on behalf of the Grey District Council as a potential Significant Natural Area ('SNA', Site PUN-049) and south of another SNA (Site PUN W034). There are other potential SNAs identified on the wider Barrytown Flats as well as the Canoe Creek Scenic Reserve to the north of the project area. These areas are shown in Figure 2.



**Figure 2: Significant Natural Areas near the SB identified in the proposed Te Tai o Poutini Plan.**

## 2.3 General Management Approach

The species of 'Threatened' or 'At Risk' birds which have either been confirmed using the site and surrounds or may use the site occasionally are shown in Table 1. Of these birds, different species are expected to be affected by different activities. The majority are not likely to use habitats within the site, rather using the adjoining beach or nearby lagoon or SNA habitats and would therefore be predominantly affected by noise, human activities and vehicle movements near their habitats, particularly during the breeding season. The general setbacks (20 m from Granite Creek and Fagan Creek, 20 m from property boundaries and 50 m from Mean High Water Springs) are expected to assist in that regard. Given the lack of forested habitat within the site, including limited foraging habitat and no potential daytime roosts, it is unlikely that rōroa (great spotted kiwi, *Apteryx maxima*) or other forest birds use the habitats within the SB and therefore there are no specific management activities proposed for rōroa or forest birds. Habitat for wetland species is minimal and of low quality within the Site, consisting of palustrine, floodplain and constructed hump and hollow wetlands with vegetative cover for cryptic bird species. Australasian bittern (*Botaurus poiciloptilus*) and New Zealand fernbird (*Poodytes punctatus*) have both been detected within 10 km of the SB and fernbird have been detected as part of monitoring data collection for the CB, however data surveys within the SB have not detected either species. Given the fact that the SB has a distinct lack of appropriate habitat for these species, they are not considered likely to be negatively affected by the proposed activity within the SB.

In order to avoid adverse effects on 'Threatened' and 'At Risk' species, as well as manage effects on common natives and exotics, the following general avian management actions are proposed:

- Seasonal surveys and frequent trail camera monitoring of birds to inform mining operations so that risks to birds of conservation concern can be identified in advance and mitigated as required.
- Commencement of mining in the south west of Section 1 (Granite Creek North), avoiding mining near important avian habitats such as the indigenous coastal shrubland and flaxland during the breeding season, and allowing for rehabilitated wetland habitat to be created in advance of clearance of these habitats.
- Maintenance of a 50 m mining setback buffer from the mining disturbance area to Mean High Water Springs and a 20 m buffer from the consent boundary, private property boundaries, Significant Natural Areas, Granite Creek and Fagan Creek. This boundary is to be permanently marked so as to avoid crossing it inadvertently.
- Progressive rehabilitation to replace and create additional wetland vegetation, revegetate riparian margins and buffer forest/shrubland habitat (required by Condition 9.1).
- Management of lighting in accordance with Commonwealth of Australia guidelines (May 2023 or subsequent amendments, required by Condition 17).

Specific management actions are outlined for 'Threatened' or 'At Risk' species that are considered likely to be present within the site during mining operations, or may use the site for breeding or access to breeding sites. Management for these species is described in Sections 3.0–5.0.

Note that ongoing monitoring as addressed in Section 6.0 will detect the presence of species not considered for specific management actions and contingency has been provided for updates to this AMP as a result of monitoring data.

## 2.4 Birds to be Managed

### 2.4.1 Introduction

Of the birds identified in Table 1, site surveys of the SB indicate a small subset is considered likely to visit the mining area frequently and/or may nest within, or in close proximity to, the mining disturbance area. For these species, specific management activities are proposed. The six species for which specific management actions will be provided are shown in

Table 2. Kororā have not been observed within the site during surveys, however evidence of birds has been seen near the mining disturbance area and penguins are most likely to be observed at night when transiting the site to forage and approach burrows, and have therefore been included here. While tāiko have not been observed within site boundaries either, due to the proximity of the site to their only documented breeding colony, they will also be managed if required.

**Table 2: Threatened and At-Risk birds to be managed at the Barrytown Site.**

Common name	Scientific name	Threat classification
Tūturiwhatu / banded dotterel	<i>Anarhynchus b. bicinctus</i>	Threatened – Nationally Vulnerable
Tarāpunga / red-billed gull	<i>Chroicocephalus novaehollandiae</i>	At Risk – Declining
Kororā / little blue penguin	<i>Eudyptula minor</i>	At Risk – Declining
Tōrea / South Island pied oystercatcher	<i>Haematopus finschi</i>	At Risk – Declining
Tōrea tai / variable oystercatcher	<i>Haematopus unicolor</i>	At Risk - Recovering
Tāiko / Westland petrel	<i>Procellaria westlandica</i>	At Risk – Naturally Uncommon

Specific management actions are set out in Section 3.0 for tūturiwhatu / red-billed gull, tōrea tai / variable oystercatcher and tōrea / South Island pied oystercatcher if they are detected at the site during ongoing monitoring. Sections 4.0 and 5.0 set out the management proposed for kororā and tāiko respectively.

### 2.4.2 Tūturiwhatu / New Zealand banded dotterel

Tūturiwhatu (banded dotterel) are the most common small plover of New Zealand seashores, estuaries and riverbeds. They are readily identified by their brown upperparts and complete or partial chestnut breast band, which is quite obvious when in breeding plumage. Their movements are characteristic of dotterels in general, with their body held erect and a run-stop-peck-run foraging behaviour as they feed on shoreline invertebrates.

Banded dotterels will breed on vegetated riverbeds, herb fields, beaches and sometimes farmland, and they are sometimes attracted to open earth worked areas for breeding. On that basis, recently excavated areas for mining may attract dotterels.

Banded dotterel pairs are solitary and territorial, but will sometimes congregate in higher densities in quality habitats. Birds will arrive and initiate territories in winter (July) with eggs laid August-November. Nesting areas are usually shallow scrapes in gravel, sand or soil and are sometimes lined with tiny stones or shells. Clutch size is usually three eggs, which are grey to pale-green or olive with small dark spots. Incubation is performed by both adults for c. 4 weeks and chicks fledge after another 5–6 weeks.

Management of tūturiwhatu is discussed in more detail in Section 3.0 below.

### 2.4.3 Tarāpunga / red-billed gull

Tarāpunga (red-billed gull) is the most common gull in coastal locations in New Zealand, but it is only rarely found inland. Tarāpunga are often seen in coastal towns, wharves, and areas where they can scavenge human rubbish and offal. On mainland New Zealand, breeding occurs in dense colonies, mainly restricted to the eastern coasts of the North and South Islands on stacks, cliffs, river mouths and sandy and rocky shores. Red-billed gulls tend to nest at the same locality from one season to the next, and offspring mostly return to their natal colony to breed. They have an extremely long egg-laying period that can extend from mid-September to January. They are monogamous, sharing parental duties equally. Nests consist of grass, seaweed or twigs and they produce between one and three eggs. Eggs are mainly brownish or greenish-grey with dark brown spots or blotches. Incubation lasts 21-25 days and chicks begin to fly at 35 days and continue to be fed for another c. 30 days. Management of red-billed gulls is discussed in Section 3.0 below.

### 2.4.4 Tōrea / oystercatchers

Tōrea (South Island pied oystercatchers) and tōrea tai (variable oystercatchers) have both been recorded using the coastal area adjoining the site. Tōrea have conspicuous black and white plumage whilst mature tōrea tai's plumage is black. Both species have a long red bill. Tōrea are found on most estuaries and many coastal locations, with numbers greatest during the period December to July. Fewer tōrea remain in coastal areas during the rest of the year, with most of the population moving to inland South Island riverbeds and farmland to breed. Tōrea tai are site attached in coastal areas throughout the year.

Tōrea and tōrea tai breed in spring and summer. Nests are unlined scrapes on a mound or raised area of sand, gravel or soil with good visibility all around. Both members of the pair incubate the 1-3 eggs and care for the young. Incubation takes 24-28 days, and the young fledge 28-42 days after hatching. Both species have a conservation status of 'At Risk (Declining)'.

There is a possibility that oystercatchers of either species may choose to nest within the mining area on newly excavated soils or stockpiles. Management of oystercatchers will focus on monitoring and then deterrence from nesting in areas to be mined within the breeding season.

Management of tōrea and tōrea tai is discussed in more detail in Section 3.0 below.

### 2.4.5 Kororā / little blue penguin

Kororā (little blue penguin) occur throughout New Zealand and are thought to have a large, but declining population.

Kororā typically breed in small colonies numbering from a few up to 20–30 pairs, sometimes semi-colonially, or sometimes as isolated pairs. Birds can be found nesting some distance inland, and in a variety of habitats (Marchant and Higgins 1990). Birds nest in a burrow, sometimes digging their own, sometimes adopting burrows of other birds, and sometimes making use of small crevices or gaps in the substrate. They also make use of small spaces under buildings, in dense vegetation and in nest boxes where these are provided. Penguin burrows are used throughout the year and the same site is often used for nesting over many years.

During moult, the bird will stay in or close to the burrow and is not able to enter the water to feed because they are not waterproof. Activities after moulting are uncertain, some birds continue to use burrows, but many disappear for weeks or months until the next breeding season.

Only low numbers of kororā have been detected at Barrytown, but suitable nesting habitat is common. Management of kororā is discussed in more detail in Section 4.0 below.

### 2.4.6 Tāiko / Westland petrel

Tāiko (Westland petrel) are the largest species of burrowing petrel still breeding on the New Zealand mainland. Tāiko breed in coastal broadleaf forest in the coastal ranges near Punakaiki (north of the Southern Block), before migrating to western South America in the non-breeding season during the austral summer. During the breeding season, they are found in a single large colony. They form long-term monogamous pair bonds, sharing both incubation and chick care. Tāiko lay a single, large egg in May or June which is nested within a 1–2 m deep burrow. Chicks usually hatch in late July and fledge between early November and mid-January. They may live as long as 37 years (but typically approximately 10 years), initiating breeding from five years old. Their diet consists mainly of fish, including a strong component of fisheries waste. Although their population size is considered relatively stable, they are at significant risk of mortality from fisheries activities, having been killed by both tuna longline and trawl fisheries, due to their predisposition to follow and forage around fisheries vessels. Management of tāiko is discussed in more detail in Section 5.0 below.

## 3.0 General Species Management

### 3.1 Seasonal Surveys

Seasonal surveys, initiated in July 2024, will be continued for the duration of the project and involve five-minute bird counts (5MBCs) and acoustic monitoring at points designed to provide adequate coverage of the site and its varying habitats as shown in Figure 3.

### 3.2 Discouraging Nesting

To reduce the likelihood of birds establishing nests in areas about to be mined, birds prospecting for nest sites will be discouraged from settling (beginning 10 July each year) in the area to be mined during the upcoming breeding season (as defined in the Annual Work Plan) using one or more of the following methods:

- (i) Use of regular / frequent livestock grazing over the winter – spring period in order to prevent birds settling.
- (ii) Completing a disruptive site walkover regularly between the 1st August and the onset of breeding.
- (iii) Installing streamers/tapes that flutter in breeding habitats to deter birds from nesting. Note that this method is effective over the short term (up to three weeks) but decreases over time as birds become accustomed to it.
- (iv) Parking earthworks machinery in future stage locations, starting the engine from time to time, but not moving equipment.
- (v) Use of acoustic deterrents including bird scarers and the use of playback alarm or predator calls.

Birds habituate to these devices and approaches relatively quickly and they may need to be regularly alternated and / or combined with another of the above methods so as to maintain their effectiveness.

### 3.3 Pre-breeding Detection Surveys

The breeding season for most seasonally breeding birds in New Zealand starts between June and September with most breeding being undertaken between September and January. Some birds will attempt second clutches and breeding can extend through until February or March. Site works and other activity is likely to deter most birds from

establishing nests near that activity, forcing them to nest elsewhere in less disturbed habitat. However, several species are known to nest in disturbed areas, including dotterels and oystercatchers.

In advance of each breeding season, a pre-season detection survey will follow a general detection route across both the area to be mined during the upcoming breeding season (as prescribed in the Annual Work Plan) and adjoining areas (within 50 m) which will be used to detect birds using the site.

Fortnightly detection surveys will be undertaken between 10 July and the onset of breeding (or the 14th September, whichever is earliest) and weekly detection surveys between the commencement of breeding and 31 January.

During these detection surveys, observers will walk over the predetermined route which will cover areas intended to be mined during the forthcoming breeding season plus adjoining areas within 50 m, in order to detect breeding behaviour or nesting that indicates species management should begin (see below).

Fortnightly detection surveys were chosen so that:

- (i) There is a high probability that birds will be detected soon after their arrival at the site, ensuring early intervention and management.
- (ii) The behaviour of birds can be observed regularly, and if necessary, they can be discouraged from nesting where the presence of nests or dependent young would either put them at risk or obstruct mining activity.
- (iii) The probability of detecting nest attempts is increased.
- (iv) Nests which are abandoned or vacated (and isolated from other nests) will be detected quickly so as to minimise disruption to mining.
- (v) The fate of nesting attempts and nestlings can be monitored so as to determine whether this management plan is effective at protecting the target species.

During detection surveys all birds seen or heard will be recorded, and their location will be marked using a GPS. The number of birds observed and their behaviour will be recorded, and if behaviours are consistent with breeding (e.g., territorial defense (e.g. calling, displaying), nest building, feeding young), then individuals will be observed from a distance for a period of at least five minutes to see if a nest can be located. All nest attempts, including locations, date and time of nest observations, stage of breeding and the outcome (where known) will be recorded.

### 3.4 Management of Nest Sites

Where achievable, any nests of 'Threatened' or 'At Risk' species located which are detected early enough and can practicably be left in situ and managed will be subject to management and protection until such time as the chicks have successfully fledged.

If a nest of any 'Threatened' or 'At Risk' species (including those listed in Table 1) is discovered within the area to be mined, but the nest is far enough in advance of mining that the nest could realistically fledge chicks, the following plan would be implemented:

- (i) Establish a "no go" zone approximately 20 m around the nest using tape and markers so as to minimise the risk of nest abandonment.
- (ii) Minimise time spent near the nest to avoid attracting ground predators such as rats and stoats and aerial predators such as gulls.
- (iii) Monitor the area at least twice weekly from outside the "no go" area in order to assist in estimating the time of fledging. Maintain the "no go" zone until the chicks have fledged. This monitoring is described in more detail in Section 6.0 below.



**Figure 3: Location of seasonal bird monitoring sites at Barrytown.**

## 4.0 Kororā, Little Blue Penguin

### 4.1 Potential Effects on Kororā

Kororā (little blue penguin) are found in small colonies across the West Coast, with many colonies comprising fewer than five breeding pairs, and the largest supporting between 20 and 40 pairs. Nesting sites are varied and can include coastal dunes, forested areas, rocky shorelines, and farmland – sometimes located up to 200 m inland. Kororā may be present on West Coast beaches throughout much of the year, either during the breeding season or while moulting.

Whilst there is limited data on kororā activity specifically within this part of the Barrytown Flats, at least one known pair has been observed nesting under a house situated between the proposed mining disturbance area and State Highway 6. Further south, the beach scarp rises in height, which may act as a physical barrier to penguin access. However, nearby creek mouths may serve as alternative access routes inland.

Kororā are particularly sensitive to disturbance, habitat modification, and disorientation caused by artificial lighting and human activity. These risks are heightened in industrial environments, such as mining areas. As such, a precautionary approach to kororā management has been adopted. The following section outlines mitigation measures aimed at minimising adverse effects on this species within the project area.

### 4.2 Kororā Detection and Monitoring

Due to the limited information currently available on the presence of kororā at this site, pre-mining monitoring will be conducted for a minimum of two years prior to the commencement of mining activity.

If penguins are found within the application site, a specific Penguin Management Plan must be developed by a suitably qualified and experienced ecologist on behalf of TCM and in consultation with the West Coast Penguin Trust who will be reimbursed for any reasonable time and associated expenses for consultation on the plan.

Pre-mining and ongoing monitoring will include:

- Engagement of a certified conservation dog trained in detecting kororā presence and nesting sites. There are a limited number of trained penguin detection dogs and their time can be at a premium, so efforts will be made to secure these services early and monitoring must include other methods in case a dog is unavailable for any reason.
- Annual conservation dog surveys will be carried out during the period of 1 August – 30 November, aligning with the breeding season, with the first survey being conducted within the first 12 months of the commencement date of the resource consent. At least two annual surveys must be completed before mining commences.
- Fortnightly beach walk surveys will be conducted during the period 1 August – 30 November by a trained observer to look for evidence (footprints, guano, sightings) to assist in determining where kororā are crossing the beach.
- Use of wildlife cameras at low spots and creek mouths along the coastal edge of the mine disturbance area to inform where penguins are coming ashore. These cameras must be equipped with infrared motion sensors and be installed by a suitably qualified ecologist and set to record at least 10 nights each month. Footage will be reviewed for wildlife interactions at least weekly by a suitably qualified ecologist, retained for a minimum of six months and made available to the Consent Authority or Department of Conservation on request.

- Identification of active burrows and breeding pairs to inform the development of site-specific management plans for each confirmed nesting pair. 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/moult period).
- Investigation of all potential burrows, by a suitably qualified ecologist, including use of a burrow scope, to confirm whether kororā are using them.
- Where any penguin burrows are compromised by mining, replacement artificial burrows or nest boxes must be installed at a rate of 2:1 (i.e., two nest boxes for every natural burrow). Any additional nest boxes provided must be located within the vegetated coastal foreshore habitat associated with accessways identified using the methods set out above.

## 4.3 Lighting Management

### 4.3.1 Fixed Lighting

In order to reduce the effects of lighting at the mine, only daylight mining operations are proposed. The WCP will operate 24 hours, so the possibility of equipment failure means that use of lighting may be required during occasional night time operations to repair equipment or deal with other unexpected events.

The WCP and loadout area is already consented, however condition 17 (particularly 17.2) of the proposed consent conditions for mining within the SB requires minimisation of the amount of light at the site, which includes the WCP. This condition is to be achieved via adherence to the Australian Government’s National Light Pollution Guidelines for Wildlife May 2023 (or subsequent revision), including but not limited to pointing all fixed lighting downward, shielding to avoid light spill, screening bunds, and use of the yellow-orange spectrum. In addition, lights should only illuminate the object or area intended and be mounted as close to the ground as possible<sup>1</sup>. Loading of trucks will be undertaken on the eastern side of the building via roller doors which can be closed when not loading. These actions are expected to reduce visible light from the processing plant.

### 4.3.2 Dredge Pond Lighting

Since operations are limited to daylight hours, lighting at the dredge pond is only likely to be required in the event of equipment failure at night, meaning that lighting will be of limited duration. Nonetheless, the possibility remains that kororā may become disoriented by lighting at the dredge pond, although this risk is considered to be very low.

The following actions will be deployed as appropriate at the site:

- Consideration will be given to using motion detectors, timing switches or similar methods to limit lighting to when it is required;
- Lighting will be used to light only the object or area intended;
- Lights will be deployed close to the ground, directed and shielded near coastal and bush interface zones to prevent disorientation of kororā;
- The lowest intensity lighting appropriate for the task will be used; and
- Non-reflective, dark-coloured surfaces will be used in preference to light or reflective surfaces.

<sup>1</sup> These are based on best practice lighting design, Appendix A of the Australian Government Light Pollution Guidelines available at <http://www.environment.gov.au/system/files/resources/2eb379de-931b-4547-8bcc-f96c73065f54/files/national-light-pollution-guidelines-wildlife.pdf>

### 4.3.3 Vehicles Within and Surrounding the Site

Given that mining and trucking movements (to the south) from the site would not occur during the hours of darkness, any vehicle movements between the processing plant and pit would be extremely limited. Nonetheless, vehicle movements are possible while staff are in attendance at night, for any repair or maintenance work being carried out outside of normal operating hours, or near to sunset or sunrise. In these cases, there remains a risk of vehicle strike and lighting disorientation within the site for kororā. Actions intended to protect kororā from accidental death due to collision with vehicles within the site include:

- Limiting the speed of vehicles to 15 km per hour while on site
- Requiring headlights to be dipped at all times within the site.
- Monitoring and reporting of all encounters with kororā by all site vehicles throughout the year. In the event that a vehicle collides with a kororā within the site this management plan will be reviewed (including consideration of further reducing speed limits) with a view to avoiding any further mortality.

Similar methods have been implemented elsewhere, such as at Westland Mineral Sands Limited's Okari Road site (where kororā also occur) and no mortalities have occurred since activities commenced there in late 2022

## 4.4 Fencing

Fencing will be constructed along the coastline and extending inland around each active mining section so as to deter kororā from entering the active mining area and to encourage their movement toward safer, suitable nesting habitats.

The fencing will be designed to:

- Prevent penguins from entering hazardous or high-traffic operational areas.
- Guide penguins safely inland to designated nesting areas outside the mine footprint.
- Extend along site perimeters and natural creek corridors to:
  - Create safe inland migration routes to bush and vegetated nesting areas.
  - Deter movement through the mine site, reducing the risk of disorientation, injury, or mortality.

The penguin fence must surround the mining areas identified in the current Annual Work Plan and will have the following specifications:

- Comprised of geosynthetic mesh.
- Be at least 900 mm above ground and buried at least 300 mm below ground.
- No posts greater than 4 m apart.
- Installation must be certified by a suitably qualified ecologist to ensure it will prevent the ingress of kororā to the active mine disturbance area.
- Certification must be provided to the Consent Authority prior to mining commencing.
- At the completion of mining activity, all penguin fencing must be removed.

Mining across the SB will be carried out in three distinct sections, and fencing will be staged accordingly. The following measures will apply across all areas:

- A penguin-proof exclusion fence will be installed as appropriate at a location inland from the Mean High Water Springs (MHWS) along the coastline adjacent to the site.

- Within this buffer zone, nesting boxes and other habitat enhancement measures (such as planting) will be implemented as required.
- Where existing penguin burrows, or access across the mine site, may be affected by mining activity, replacement artificial burrows or nest boxes must be installed at a ratio of 2:1 (i.e., two boxes for every known burrow and access track).
- Additional nest boxes will be located within vegetated coastal foreshore habitats, particularly near identified penguin accessways, such as creek mouths and natural corridors.

### **Section 1: Canoe Creek to Granite Creek**

- Fencing will extend along the coastline between Canoe Creek and Granite Creek.
- From each creek mouth, fencing will be installed inland along the natural creek corridors toward established bush areas to facilitate penguin access to safe nesting habitat and across the eastern (inland) edge of the mining area so as to prevent penguins travelling to sea from getting stuck behind the fence.

### **Section 2: South of Granite Creek to Cargill Road**

- The penguin-proof fence will run along the coastal edge and up Granite Creek to the adjacent bush area.
- Along Cargill Road, the fence will extend along the roadside to incorporate the bunded and planted buffer zone.
- The fence will extend along the eastern inland edge of the mining area so as to prevent penguins travelling to sea from getting stuck behind the fence.

### **Section 3: South of Cargill Road to Southern Boundary**

- Fencing will run up the southern side of Cargill Road, enclosing the bunded and planted area through to the driveway of 114 Cargill Road.
- At the southern boundary of the active mining area, the fence will extend inland to the established bush area surrounding Fagan Creek, providing a natural retreat zone for penguins.
- The fence will extend along the eastern inland edge of the mining area so as to prevent penguins travelling to sea from getting stuck behind the fence.

Upon completion of mining activities and associated rehabilitation works, coastal and site fencing will be removed.

## **4.5 Accidental Discovery Management**

### **4.5.1 Detecting Kororā**

It is the responsibility of the Consent Holder to provide training so as to ensure staff are appropriately informed and able to implement the accidental discovery protocol set out below. It is the responsibility of all employees based at the site to be alert to the possibility that they might encounter a kororā and to know how to respond appropriately. In addition, the specific location, date and time any birds are detected is to be recorded by the personnel who discover the bird(s), and this information is to be provided to the Mine Manager.

Staff must be made aware that kororā may seek shelter under parked vehicles, machinery, sheds, or other structures, especially during the day.

- A mandatory visual inspection of vehicles and equipment must be carried out before use each day, particularly in areas near known kororā habitat.
- Temporary shelters or covers in safe zones may be provided to discourage kororā from seeking refuge in operational spaces. The consent holder should avoid storing piles of materials (timber, rocks, building materials and the like) that could be accessed by kororā and used as a nest/burrow.

#### 4.5.2 Accidental Discovery Protocol for Kororā

In the event an uninjured kororā is found on site, individuals may attempt to shepherd lone birds from their at-risk location by encouraging them toward safe areas. Shepherding must not involve any physical contact with birds directly and involves making gentle noises and directing the bird with directional movements.

**NOTE** an authority under the Wildlife Act 1953 is required to handle absolutely protected wildlife (including, but not limited to kororā) if any are recovered. This authority will be obtained as part of the Fast Track Approval Act application and a copy of the permit will be attached to this plan as Appendix A.

If kororā are not able to be safely shepherded without physical contact, only DOC-permitted kororā handlers (named in the Wildlife Act Authority Application), will catch the bird with minimum disturbance and relocate it to an unoccupied burrow along the fenced coastal edge. If injured or displaying signs of illness, the kororā will be placed in a suitable enclosure in a warm dark place and transferred as quickly as possible to the Māwhera / Greymouth Department of Conservation office. The DOC emergency hotline should be called immediately for advice on care and to confirm the appropriate location to take injured birds (0800 DOC HOT (0800 362 468)). The Department of Conservation will determine if it is fit for release and will undertake the release and inform the Mine Manager of the outcome.

The incident must be logged, the rationale behind the identification of the likely cause and steps taken to reduce/eliminate the risk must be documented and authorised by the Mine Manager. These steps and the outcomes should be included in the annual monitoring report.

#### 4.5.3 Discovery of Dead Kororā

In the event of any dead birds (including kororā) being located at the site the Māwhera / Greymouth Department of Conservation office in Greymouth and Te Rūnanga o Ngāti Waewae will be informed and collection by or delivery to the Department of Conservation will be arranged.

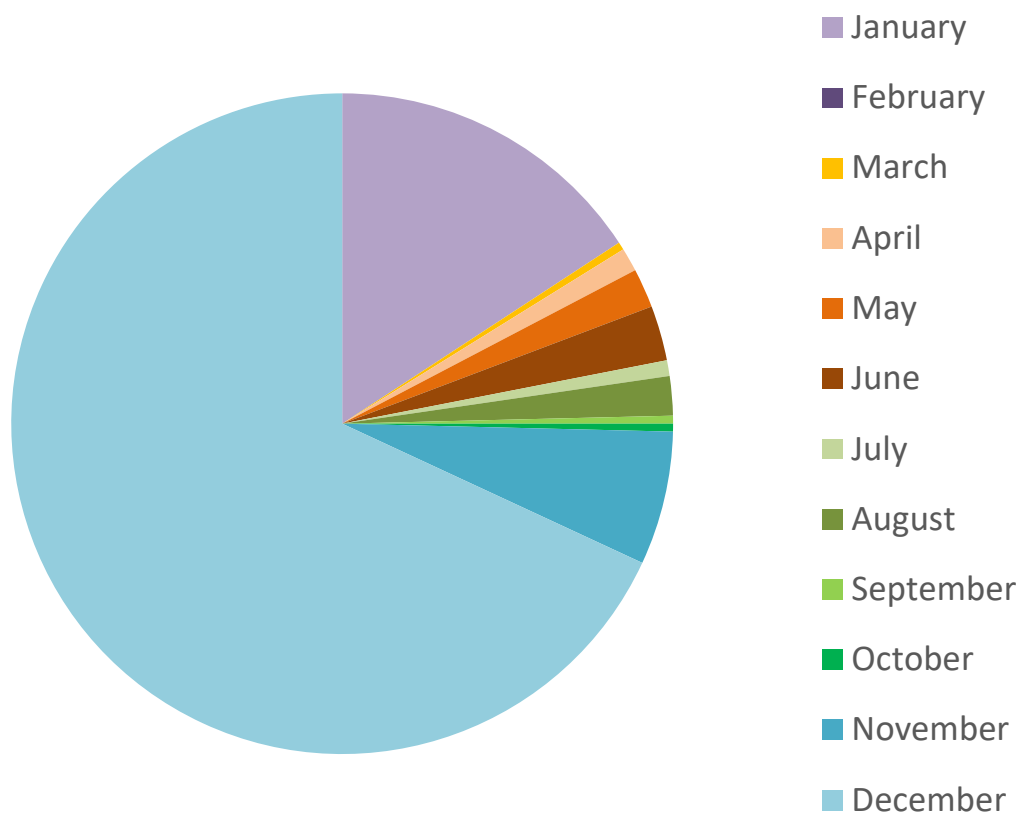
In the event that a dead kororā is discovered within 50 m of the pit or WCP and load out area the following steps will be taken:

- If recently dead, the animal should be frozen immediately and an autopsy arranged.
- An attempt to identify the potential cause of mortality should be undertaken immediately. If the likely cause can be identified and the reason can be modified or eliminated immediately, this will be done.
- The incident must be logged, the rationale behind the identification of the likely cause and steps taken to reduce/eliminate the risk must be documented and authorised by the Mine Manager. These steps and the outcomes should be included in the annual monitoring report.

## 5.0 Tāiko/Westland Petrel

### 5.1 Potential Effects on Tāiko

While tāiko have not been recorded within the site during desktop analyses or site surveys, the area to be mined is located approximately 4.5 km south of the only known colony of tāiko/Westland petrel and therefore potential risks to tāiko must be considered. The WCP and access road to the processing area are located approximately 5.8 km south of the colony's indicative boundary. Tāiko breeding occurs between March and November. Adult birds entering and departing the colony, and at sea close to shore, are known to be disoriented and attracted by artificial lighting and can become grounded. Young tāiko are also known to be disoriented by lights when leaving the breeding colony and this can result in juvenile birds being grounded. Groundings are most likely to occur between November and January, with a peak in early December as shown in Figure 4.



**Figure 4: Records of grounded tāiko recorded between 2007 and 2022 categorised by month of occurrence (Data from Department of Conservation).**

## 5.2 Lighting Management

### 5.2.1 Fixed Lighting

In order to reduce the effects of lighting at the mine, mining operations will only occur during daylight hours.

Consents have been granted for the WCP and loadout area, however Condition 17 (particularly 17.2) of the proposed consent conditions for mining at the SB requires

minimisation of the amount of light at the site, which includes the WCP. This condition will be achieved via adherence to the Australian Government's National Light Pollution Guidelines for Wildlife May 2023 (or subsequent revision)<sup>2</sup>, including but not limited to pointing all fixed lighting downward, shielding to avoid light spill, screening bunds, and use of the yellow-orange spectrum. In addition, lights should only illuminate the object or area intended and be mounted as close to the ground as possible. Loading of trucks will be undertaken on the eastern side of the building via roller doors which can be closed when not loading. These actions are expected to reduce visible light from the processing plant.

### 5.2.2 Dredge Pond Lighting

Mining will only take place during daylight hours. Lighting may be required at the dredge pond for health and safety reasons or outside daylight hours if emergency repairs are required. In addition, the following actions will be deployed:

- Lighting to be used only when and where it is required;
- Lighting will be used to light only the object or area intended;
- Lights will be deployed close to the ground, directed and shielded to avoid light spill as required;
- The lowest intensity lighting appropriate for the task will be used;
- Non-reflective, dark-coloured surfaces will be used in preference to light or reflective surfaces; and
- Light in the yellow-orange spectrum only to be used.

While the possibility remains that tāiko might be grounded by lighting at the pit this risk is considered very low.

### 5.2.3 Vehicles Within the Site

Given that mining will not occur during the night and trucking movements from the site would also only occur during daylight hours (to the south), transport movements between the processing plant and pit would be extremely limited. Actions intended to protect tāiko from accidental death due to collision with vehicles within the site include:

- Limiting the speed of vehicles to 15 km per hour while on site.
- Requiring headlights to be dipped at all times within the site. The effectiveness of this action in avoiding tāiko remains unknown, but it may assist. This practice will be trialled for at least three months. In the event that it proves unhelpful (e.g., if it becomes difficult to see tāiko) this practice will be discontinued.
- Monitoring and reporting of all encounters with tāiko by all site vehicles throughout the year. In the event that a tāiko collides with a vehicle within the site this management plan will be reviewed immediately (including consideration of banning night time vehicle movements) with a view to avoiding any further mortality.

## 5.3 Accidental Discovery Management

### 5.3.1 Detecting Grounded Tāiko

Mining will only take place during daylight hours, year-round within the SB and so lighting

<sup>2</sup> These are based on best practice lighting design, Appendix A of the Australian Government Light Pollution Guidelines available at <http://www.environment.gov.au/system/files/resources/2eb379de-931b-4547-8bcc-f96c73065f54/files/national-light-pollution-guidelines-wildlife.pdf>

activity presents a low risk of grounding for tāiko. The most likely location for tāiko to be grounded is near any area where lights are being used (the processing plant and load out area, the internal road within the site and along State Highway 6).

It is the Consent Holder's responsibility to provide training so as to ensure staff are appropriately informed and able to implement the accidental discovery protocol set out below. It is the responsibility of all employees based at the site to be alert to the possibility that they might encounter a grounded tāiko and to know how to respond appropriately.

**NOTE** an authority under the Wildlife Act 1953 is required to handle absolutely protected wildlife (including, but not limited to tāiko) if any are recovered. This authority will be obtained as part of the Fast Track Approval Act application and a copy of the permit will be attached to this plan as Appendix A.

In the event that grounded tāiko are discovered, the specific location, date and time any grounded birds are detected is to be recorded by the personnel who discover the bird(s), and this information is to be provided to the Mine Manager.

All trucking and other contractors and staff leaving the site at night (including those travelling to and from work past the colony) are required to report any vehicle strike of birds, as well as near misses, to the Mine Manager as soon as practicable after they occur.

Reports are to include the date, time, approximate location and number of birds (if known). The Mine Manager will be responsible for maintaining an incident log and upon receiving a report of a bird strike will notify the Department of Conservation as soon as practicable.

Data relating to near misses will be reviewed annually in order to determine whether any changes to operations are required for the coming season.

Live birds seen on the road at any time of day/night, should be reported to 0800 DOC HOT (0800 362 468) as soon as possible.

### 5.3.2 Accidental Discovery Protocol for Grounded Tāiko

A sturdy net suitable for catching grounded birds, leather gloves for handling birds and a suitable enclosure (lined box, crate or cage) will be held on site and all staff will be informed of their location and trained in their safe use to ensure bird welfare. Best practice guidelines for species translocations indicate a white flute-board or cardboard pet (cat) box with a dark interior lining is suitable for a single bird to be contained until a qualified handler can be accessed (Gummer et al. 2014). Boxes must have ventilation and a secured entry/exit point to ensure accidental release does not occur and to avoid injury.

In the event that a live grounded tāiko is discovered within the site, a person with the appropriate qualifications and permits will catch the bird, place it in a suitable enclosure in a warm dark place, and call the Department of Conservation line (0800 DOC HOT, (0800 362 468)) as soon as possible for advice on care and relocation. If the bird is to be transferred to a care facility, it should be moved as quickly as practicable to the local (Māwhera / Greymouth Department of Conservation office (or as advised by the DOC hot line). The Department of Conservation will determine if it is fit for release and will undertake the release and inform the Mine Manager of the outcome. If injured the local Department of Conservation office will take responsibility for the bird and keep the Mine Manager up to date with progress.

In the event that a live tāiko is recovered from within 50 m of the dredge pond or the processing plant and loadout area, the following steps will be instigated:

- An attempt to identify the potential reason for grounding should be undertaken immediately. If the likely cause can be identified and the reason can be modified or eliminated immediately, this will be done.

- The incident must be logged, the rationale behind the identification of the likely cause and steps taken to reduce/eliminate the risk must be documented and authorised by the Mine Manager. These steps and the outcomes should be included in the annual monitoring report.
- If the cause of grounding is identified as a light source which cannot be modified or eliminated, Tāiko will seek advice from a suitably qualified and experienced ecologist and the Māwhera / Greymouth Department of Conservation office.
- A lighting audit will be undertaken at the commencement of mining to ensure lighting at the site complies with the requirements set out in this Avian Management Plan and the latest version of the Australian Government National Light Pollution Guidelines for Wildlife including marine turtles, seabirds and migratory shore birds. Another audit will be undertaken if any grounded seabirds are recorded.
- This management plan will be reviewed annually by a suitably qualified and experienced ecologist in consultation with the Department of Conservation and any other changes to management protocols including, but not limited to: changes to light colour, intensity or timing; additional bunding or planting; the use of black out curtains; tinted windows or other methods to reduce light spill, and the risk of grounding will be considered with a view to implementing them as required.
- Any potential management protocol changes to reduce the risk of grounding during the review of this management plan will be implemented as soon as practicable.

### 5.3.3 Discovery of a Dead Tāiko

In the event of any dead birds (including tāiko) being discovered at the site, the Māwhera / Greymouth Department of Conservation office and Te Rūnanga o Ngāti Waewae will be informed and collection by or delivery to the Department of Conservation will be arranged.

In the event that a dead tāiko is discovered within 50 m of the pit or processing plant and load out area the following steps will be taken:

- An attempt to identify the potential reason for grounding should be undertaken immediately. If the likely cause can be identified and the reason can be modified or eliminated immediately, this will be done.
- If recently dead, the bird should be frozen immediately for collection and autopsy.
- The incident must be logged, the rationale behind the identification of the likely cause and steps taken to reduce/eliminate the risk must be documented and authorised by the Mine Manager. These steps and the outcomes should be included in the annual monitoring report.
- If the cause of grounding is identified as a light source which cannot be modified or eliminated, TiGa will seek advice from a suitably qualified and experienced ecologist and the Māwhera / Greymouth Department of Conservation office.
- A lighting audit will be undertaken to ensure lighting at the site complies with the requirements set out in this Avian Management Plan and the latest version of the Australian Government National Light Pollution Guidelines for Wildlife including marine turtles, seabirds and migratory shore birds.
- This management plan will be reviewed by a suitably qualified and experienced ecologist in consultation with the Māwhera / Greymouth Department of Conservation office and any other changes to management including, but not limited to, changes to light colour, intensity or timing, additional bunding or planting, the use of black out curtains, tinted windows or other methods to reduce light spill and the risk of grounding will be considered with a view to implementing them as required.

- Any potential management changes identified as likely to contribute to reducing the risk of grounding during the review of this management plan will be implemented as soon as practicable.

If, after any necessary amendments to site management and this management plan are implemented, a second bird (alive or dead) is found within 50m of the dredge pond or WCP and load out area within four weeks of the first finding, operations and use of external lights at the pond and processing plant will cease. Interior lighting and operations can continue during the hours of darkness, provided any lights are not visible from the exterior.

Operations requiring lighting will remain suspended until such time as a plan to prevent any additional mortality is prepared, agreed with the Department of Conservation and implemented, or until the 15 January following the discovery, whichever is sooner.

## 6.0 Monitoring

### 6.1 Seasonal Bird Surveys

Seasonal bird surveys at the site commenced in July 2024 and will be undertaken four times each year, once each in spring, summer, autumn and winter using five-minute bird counts and acoustic recorders. These surveys will continue until 12 months after completion of mining at the site. These surveys are intended to detect species using locations closest to the mining area and other adjoining habitats where effects beyond the site are most likely, and may need to be managed with monitoring at the locations shown in Figure 3.

### 6.2 Detection Surveys for Species of Conservation Concern

Detection of 'Threatened' and 'At Risk' species using the site, particularly birds using the current mining area, will rely on fortnightly and/or weekly detection surveys and twice-weekly monitoring of any identified nesting attempts during the breeding season, as outlined in Section 3.0. The number, location and outcome of all nesting attempts will be recorded, along with the number, dates and times of monitoring visits. This information will be compiled into an annual bird monitoring report at the conclusion of the breeding season as discussed in Section 7.0

For kororā, monitoring will consist of regular walk-through surveys conducted throughout the breeding season, as well as an annual conservation dog survey. Both surveys will be undertaken by a trained kororā observer (see Section 4.0 for detail).

For tāiko, the location, date and time of any groundings will be recorded, along with any vehicle strikes and near misses (see Section 5.0 for detail). This information will be included in the annual bird monitoring report.

### 6.3 Wildlife Camera Detection

Wildlife cameras will be deployed at low spots and creek mouths or other sites along the coastal edge of the mine disturbance area deemed appropriate by the project ornithologist as required to monitor for kororā, and around the processing plant area and the access road to monitor for tāiko and any other birds which might be affected by lighting there. These cameras will be equipped with motion sensors and be installed by a suitably qualified ecologist. To detect tāiko, ten cameras will 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 from these cameras will be reviewed for wildlife interactions at least weekly by a suitably qualified ecologist and retained for at least six months.

## 6.4 Annual Work Plan

To ensure that avian mitigation actions are timed appropriately in relation to mining activity, the Annual Work Plan will include a section for avian management as per the approach outlined above. The annual work plan will identify areas to be mined within the next 12 months, and particularly during the upcoming bird breeding season, so as to ensure appropriate deterrents are in place at the appropriate time and that all management activities specifically address effects on avifauna identified as being at risk of mining activity during seasonal surveys.

The relevant phases for work planning include:

Action	Timeframe
WAA	Obtained as part of the fast-track application
Wildlife Surveys – penguin conservation dog survey	24 and 12 months prior to mining
Annual and seasonal surveys	Ongoing
Establishment of deterrents	During the breeding season (specific timing informed by breeding season surveys). Deterrents must be established prior to mining commencing in a particular area identified in the Annual Work Plan and >1 method may be used in a season.
Breeding season surveys	Fortnightly from 1 August until breeding commencement
Nest surveys	Weekly from commencement of breeding to completion
Nest progress surveys	Twice-weekly from breeding initiation to fledging
Annual Reporting	Provided by 30 June annually

## 7.0 Reporting

### 7.1 Ongoing Reporting

Any interactions with wildlife recorded as a result of the monitoring requirements in this Avian Management Plan (including wildlife cameras) 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. Footage from wildlife cameras must be made available on request.

This includes:

- Observations of ‘Threatened’ or ‘At Risk’ species entering the active mining site observed during surveys or using wildlife cameras.
- Any instances of accidental discovery of injured or dead avifauna.
- Any grounded tāiko.
- Any near-misses or vehicle strikes of ‘threatened’ or ‘at risk’ species.

### 7.2 Annual Bird Management Report

An annual bird management report will be prepared which details the following matters:

- The timing and duration of any mining within 100 m of the proposed SNA Site PUN-049.

- Timing of nest detection surveys and observations.
- A summary of data resulting from seasonal, or breeding season surveys.
- The findings of any wildlife camera monitoring.
- Number and location of any kororā detected by the conservation dog survey and/or the walk-through beach surveys.
- Efforts to deter nesting within the area to be mined and the outcome of those efforts (including fence locations, the use of visual or acoustic deterrents, frequency of grazing).
- Date of first nesting attempts (if any) within the area to be mined.
- Number and location of nesting attempts within the area to be mined.
- Species attempting to nest within the area to be mined.
- Outcome of individual nesting attempts within the area to be mined.
- Number and location of any grounded tāiko.
- Management undertaken and the outcome for any grounded tāiko collected.
- Autopsy outcomes for any dead tāiko collected.
- The number, dates and location of any near misses or vehicle strikes of tāiko with vehicles.
- 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 this management plan and the reasons for the changes.
- The date and duration of any operational shut-downs.

The annual bird management report will summarise the above information, identify any trends or patterns and compile any relevant maps. This report will be reviewed by a suitably qualified and experienced independent ecologist/ornithologist who will evaluate the findings and provide any recommendations considered necessary to improve bird management at the site.

The annual bird management report and any updates to this management plan will be provided to the Consent Authority, Te Rūnunga o Ngāti Waewae, the Buller/Kawatiri and Greymouth offices of the Department of Conservation in Westport, the West Coast Penguin Trust, Paproa Wildlife Trust, the Community Liaison Group and Waka Kotahi NZ Transport Agency Environment Sustainability Team (environment@nzta.govt.nz) no later than **30 June** each year.

This Avian Management Plan may be amended to take into account:

- Any positive measure/s to ensure the stated objectives of the management plan are achieved.
- Any changes to further reduce the potential for adverse effects as result of actions identified in the Annual Work Programme.
- Any required actions identified as a result of monitoring to address the above.

Amendments must be undertaken by a suitably qualified person (ie., a qualified ornithologist or ecologist) and must be provided to the Consent Authorities within 20 working days of its review for recertification.

## 8.0 Summary

TCM proposes to undertake mineral sand mining on farmland between Canoe Creek and Fagan Creek in an area known as the Southern Block. The Southern Block includes a mix of artificially constructed and natural wetlands, and small amounts of low-quality indigenous vegetation which can provide habitat for a range of indigenous bird species, some of which are considered to be 'Threatened' or 'At Risk'. The proposed mine is also located 4.5 km south of the only known breeding colony of tāiko (Westland petrel, *Procellaria westlandica*).

A number of threatened and at-risk bird species have been identified in habitats within and adjoining the SB site. The majority of these species would not consistently use habitats within the SB and are unlikely to use the site for breeding, but could be affected by noise, human activities and vehicle movements near their habitats, particularly during the breeding season. A number of management activities (e.g., monitoring surveys, maintaining buffers from key areas of habitat, planting, and lighting management) will be undertaken to minimise impacts on these species.

Specific management actions for at-risk and threatened species considered likely to use the site, who may attempt to breed within the site once mining commences or may be affected by lighting from the site (e.g., tūturiwhatu, tarāpunga, tōrea, kororā, and tāiko) are provided and would be implemented when these species are detected at the site during ongoing monitoring. These management actions include: discouraging birds from establishing nests in the work site via the use of deterrents and fencing; detection surveys prior to, and during, breeding; managing nest sites (via buffers and intensive monitoring); accidental discovery protocols; annual reporting; and ongoing assessment and amendment of the Avian Management Plan in response to avian observations and encounters within the site.

Lighting management is set out within this plan to reduce the effects of mine lighting on both adult and young seabirds including tāiko and kōrora. A number of actions will also be taken to avoid accidental death of tāiko and kororā by vehicles entering or leaving the site at night, including limits on speed and headlight settings, the establishment of accidental discovery protocols and ongoing assessment and amendment of the Avian Management Plan in response to documented encounters with these species.

Annual reporting will include summary and interpretation of monitoring data collected during the preceding year, any management actions undertaken to protect birds within and surrounding the site, any observed nesting attempts and outcomes, accidental discovery of any injured or dead species of conservation concern, the findings of any lighting audits conducted, and any proposed changes to the Avian Management Plan. The data collected will be compiled and presented in an annual bird management report and used in adaptively managing the operations to protect the birds at the site and provided to Greymouth District Council, Te Rūnanga o Ngāti Waewae and the Māwhera Department of Conservation office in Greymouth.

## 9.0 References

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# **APPENDIX A**

## **Wildlife Act (1953) Authority to Handle Absolutely Protected Wildlife**

