



TĀIKO CRITICAL MINERALS LIMITED  
SOUTHERN RESOURCE BLOCK  
ASSESSMENT OF NOISE EFFECTS

Rp 003 R01 20240333 | 9 March 2026

**Project:** **SOUTHERN RESOURCE BLOCK**

**Prepared for:** **Tāiko Critical Minerals Limited  
c/o Tai Poutini Resources  
100 Mackay Street  
Greymouth 7805**

**Attention:** **Luke McNeish**

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## SUMMARY

Marshall Day Acoustics has conducted a noise assessment for Tāiko Critical Minerals Limited (TCM) proposed Southern Resource Block (SRB) under the Fast Track Approvals Act 2024 (FTAA). This assessment evaluates potential noise effects from various operational phases over the mine's life, focusing on nearby sensitive receivers and considers whether there is any unreasonable emission of noise (Schedule 5, Clause 7 of the FTAA).

Based on our review of appropriate New Zealand standards, international guidance, the Grey District Plan (BDP) and the Te Tai o Poutini Plan (TTPP), we recommend the following noise limits to ensure appropriate protection of residential amenity at the notional boundary of dwellings:

- Daytime                      0700 to 2200 hrs                      55 dB  $L_{Aeq(15\ min)}$
- Night-time                      2200 to 0700 hrs                      45 dB  $L_{Aeq(15\ min)}$  and 75 dB  $L_{AFmax}$

These limits match those established in TCM's existing consent for the Central Resource Block (CRB).

Our calculations, based on measurements of similar mining equipment at comparable sites, demonstrate that operational noise levels will remain considerably below the proposed 55 dB  $L_{Aeq}$  daytime limit such that, at most dwellings, operations can proceed between 0600 and 0700 hrs (classified as night-time under the District Plan) while still complying with the 45 dB  $L_{Aeq}$  noise limit.

The highest predicted noise levels will occur during the relatively brief periods when excavation and extraction take place within approximately 250 metres of dwellings on Warren and Cargill Roads. These dwellings are identified in Table 8, and we note that at all times, noise levels will remain below 55 dB  $L_{Aeq}$  and will be less than 45 dB  $L_{Aeq}$  for the majority of the time.

The existing acoustic environment features local traffic along the State Highway, surf noise, farm activities, and wildlife. Notably, surf noise forms a consistent element of the night-time soundscape, resulting in elevated ambient noise levels compared to a typical rural area.

Pre-mining construction noise will be managed according to NZS 6803: 1999 *Acoustics - Construction Noise*. Given the predicted noise levels will be significantly below the recommended limits in this Standard, construction noise effects are expected to be minimal.

Noise mitigation measures incorporated into the project design include:

- Noise control bunds: Three-metre-high earth bunds at key locations identified in Figure 4.
- Non-tonal reversing alarms: Use of broadband alarms to prevent disruptive tonal noise.

Our assessment confirms that all proposed stages of the SRB can occur below the proposed noise limits, ensuring acceptable noise effects in the context of the rural-residential receiving environment and with no unreasonable emission of noise.

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## 1.0 INTRODUCTION

Marshall Day Acoustics has been engaged by Tāiko Critical Minerals Limited (TCM) to assess the potential noise effects of the proposed Southern Resource Block, for which approvals are sought under the Fast Track Approvals Act 2024 (FTAA).

This report relates to the approval sought under Schedule 5 of the FTAA.

### Scope of report

This report provides:

- An overview of the proposed activity and key sources of noise generation;
- Details of the existing noise environment;
- Relevant noise performance standards;
- Proposed noise mitigation measures;
- Predicted noise levels from the proposed activity;
- An assessment of the potential noise effects; and
- Recommended consent conditions relating to noise, which address proposed mitigation and monitoring measures.

A glossary of the technical terminology used in this report is provided in Appendix A.

## 2.0 SITE & ACTIVITY DESCRIPTION

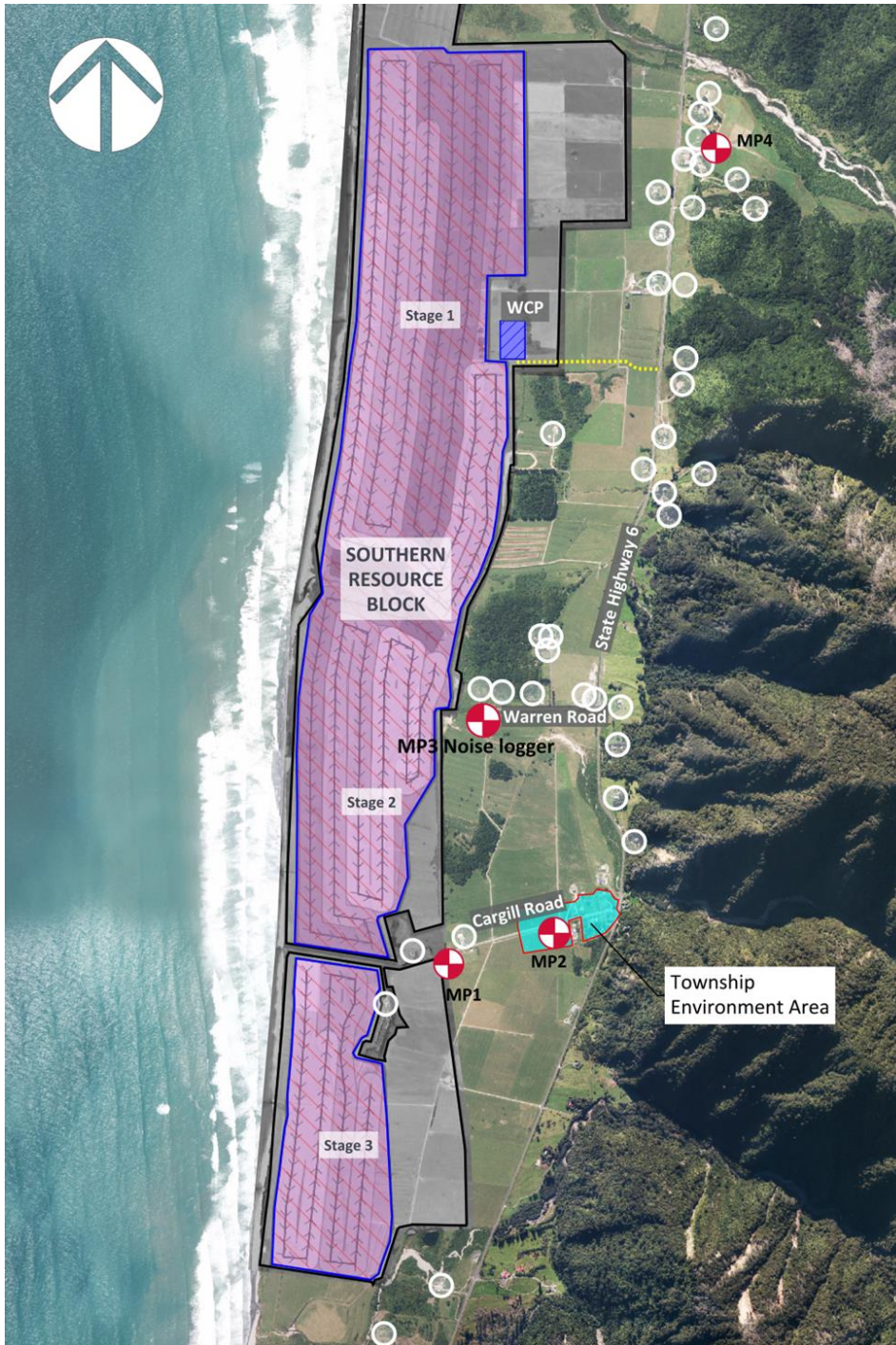
### 2.1 Proposed Site

The applicant has obtained consents for a similar mineral sands project, known as the Central Resource Block (CRB) and for the associated Wet Concentrator Plant (WCP). The extent of the current proposal, referred to as the Southern Resource Block (SRB), is indicated in Figure 1. The nearest noise sensitive locations to the proposed SRB are identified by white circles.

The mine site and surrounding land is zoned *Rural Environmental Area* under the Grey District Plan. The area around the Barrytown settlement (school and dwellings) is zoned *Township Environment Area*.

Under the Te Tai o Poutini Plan - Decisions Version (TTPP), the mine site and surrounding land is zoned as *General Rural Zone and Rural Lifestyle Zone*. The Barrytown settlement is zoned as *Settlement Zone*.

Figure 1: Proposed mine area, nearest dwellings, and ambient noise measurement positions (MP).



## 2.2 Proposed Activity

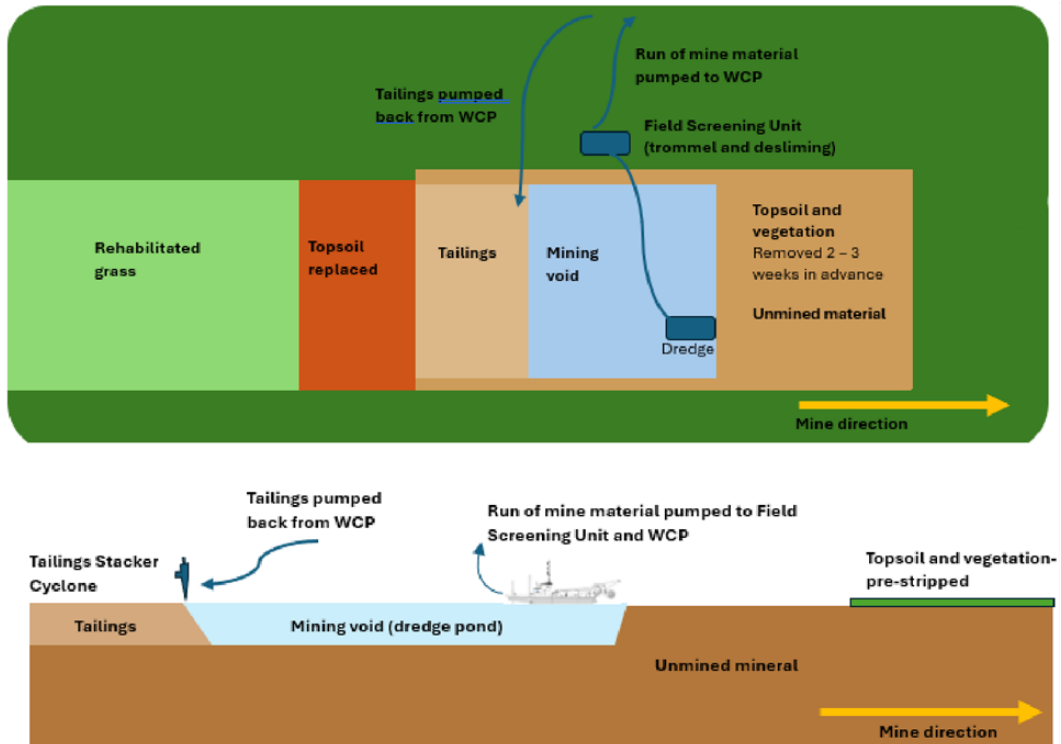
The following aspects of the project have the greatest potential to generate noise-related impacts.

- The pre-mining sequence will commence with the construction of bunds and other site preparation work. Noise sources will include mobile earthmoving machinery.
- Mineral sand extraction will first occur north of Granite Creek and move in generally north – south strips in three discrete sections as illustrated in Figure 1.
- With reference to Figure 2, the mining sequence includes the removal of topsoil and overburden by mobile machinery in advance of a floating dredge which is used for mineral extraction. The extracted material is screened and then pumped to the WCP for processing. Following processing, tailings will be returned to the rear of the dredge pond and distributed by mobile machinery as part of the rehabilitation process.
- Table 1 provides a broad description of each noise generating aspect of the activity. Noise emissions from each component are provided in Section 5.2.
- Mining activities associated with the extraction of material will be undertaken during daylight hours only, consistent with the existing consent granted for the Central Resource Block (Coates Block). Except that, mining shall not occur between the hours of 0600 and 0700 within 500 metres of the dwellings located at Lot 2 DP2178, 37, 41, 43 and 50 Warren Road, and 64, 86 and 114 Cargill Road, or on Sundays.

**Table 1: Summary of noise generating components of the activity**

Activity	Description
Topsoil removal / rehabilitation	Excavators, bulldozer, grader and trucks working in advance and behind the dredge, removing topsoil and distributing tailings
Dredge	Located below existing ground level within the excavated pond.
Field Screening Unit, pump	Field Screening Unit and pump at existing ground level beside pond. Our assessment assumes power will be provided by grid electricity.

Figure 2: Schematic plan and section view of the mining methodology



### 3.0 EXISTING AMBIENT NOISE ENVIRONMENT

To assess the existing noise environment near the proposed site, noise measurements were conducted on 14 and 15 August 2024 at four measurement positions labelled MP1 to MP4 in Figure 1. Attended measurements were conducted on a cyclical basis and unattended noise logging instrumentation was installed next to 50 Warren Road (MP3), to record noise levels during the night hours as shown below in Figure 3.

All measurements followed the New Zealand Standard NZS 6801:2008 *Acoustics – Measurement of environmental sound*. The measurement results, summarised in Table 2, were based on 15-minute measurement intervals. Further information such as equipment and calibration details are provided in Appendix B.

The ambient monitoring positions are described below:

- Position MP1: Approximately 600 metres from State Highway 6. This position is intended to capture ambient noise levels similar to the closest dwelling to the southern boundary of the proposed mining site, located at 86 Cargill Road.
- Position MP2: Approximately 200 metres west of State Highway 6. This position is intended to capture ambient noise levels within the Barrytown Township, including Barrytown School.
- Position MP3 (Noise Logger): Located next to 50 Warren Road, this position was selected to monitor noise levels during the night-time at the closest dwellings near the western boundary of the proposed site near Warren Road. This position is likely to be representative of the night-time noise environment in the broader area when there are no passing vehicles on State Highway 6.
- Position MP4: Approximately 100 metres from the edge of State Highway 6 on Prospector Place. This elevated position is intended to capture ambient noise levels similar to those experienced at the surrounding dwellings on Prospector Place.

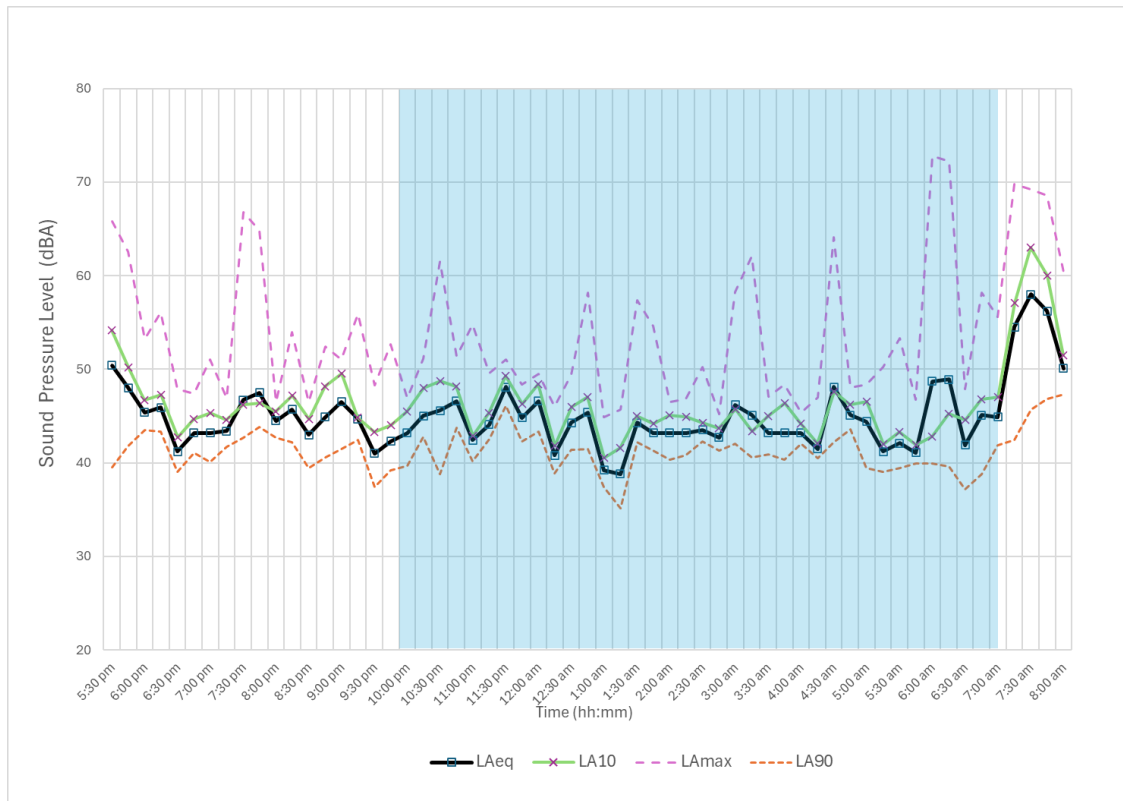
The daytime noise environment at all locations is dominated by surf noise, traffic along the State Highway 6, farm machinery, and occasional contributions from birds and insects.

A summary of our ambient noise survey results is provided in Table 2.

**Table 2: Summary of ambient noise survey results**

Position	Time(hh:mm)	Measured noise levels			
		dB LAeq	dB LA10	dB LA90	dB LAFmax
<b>Daytime</b>					
MP1	11:58	46	48	38	61
MP2	12:24	55	47	36	80
MP3	Average	50	48	42	56
MP4	12:49	45	46	36	67
<b>Night-time</b>					
MP1	23:39	48	50	46	57
MP2	23:25	46	47	45	62
MP3	Average	45	45	41	52
MP4	23:45	48	50	44	56

**Figure 3: Measured ambient noise level data at MP3 (Night-time period shaded blue)**



The noise environment at all dwellings is influenced by surf noise and traffic. Traffic noise is more prominent for those dwellings closer to the State Highway. Daytime noise levels are typically in the range 45 to 55 dB  $L_{Aeq}$ .

At positions further away from the State Highway, surf noise provides a consistent noise environment during the day and night, with levels in the mid to high 40s dB  $L_{Aeq}$ . Figure 3 shows the relatively constant noise environment between 1800 to 0700 hrs which ranges between 39 to 49 dB  $L_{Aeq}$  associated with constant surf noise and natural sounds from birds and insects.

#### 4.0 NOISE ASSESSMENT CRITERIA

In this section we discuss appropriate criteria for assessing noise effects and the underlying District Plan noise limits.

#### 4.1 Te Tai O Poutini Plan Decisions Version Noise Standards

The Te Tai O Poutini Plan Decisions Version (TTPP) was notified on 10 October 2025 and is partially operative, replacing the relevant parts of the Grey District Plan. The provisions set out below are currently under appeal.

The site surrounding and adjacent properties are zoned *General Rural*, *Rural Lifestyle* or *Settlement* under the TTPP. The relevant noise limits for these zones are set out in Rule NOISE-R5 and summarised in Table 3.

**Table 3: TTPP Decision Version Plan noise limits –NOISE- R5.2**

Assessment location	Time period		Noise limit
<b>NOISE- R5.1</b>			
<b>At any point at or within the boundary of any site</b>			
<b>SETZ Settlement Zone</b>	0700 - 2200	Monday – Friday	55 LAeq (15 min)
	0700 - 2200	Saturday, Sundays and Public Holidays	50 LAeq (15 min)
	2200 – 0700	Night-time	45 dB LAeq (15 min) 70 dB LAFmax
<b>NOISE- R5.2</b>			
<b>At any point at the notional boundary<sup>1</sup> of any site,</b>			
<b>GRUZ General Rural Zone</b>	0700 - 1900	Monday – Friday	55 LAeq (15 min)
	1900 – 2200	Monday – Friday	50 LAeq (15 min)
<b>RLZ Rural Lifestyle Zone</b>	0700 - 2200	Saturday, Sundays and Public Holidays	
	2200 – 0700	Night-time	45 dB LAeq (15 min) 70 dB LAFmax

<sup>1</sup> A line 20 metres from any side of a dwelling, or the legal boundary where this is closer to the dwelling

The TTPP requires that sound shall be measured in accordance with NZS 6801:2008 *Acoustics – Measurement of environmental sound* and assessed in accordance with New Zealand Standard NZS 6802:2008 *Acoustics - Environmental Noise*.

#### 4.2 Grey District Plan Noise Standards

The proposed SRB and surrounding properties are zoned *Rural Environmental Area* under the Grey District Plan. The relevant District Plan noise standards are provided in Rule 19.7.16 and can be summarised as follows:

**Table 4: Summary of applicable Grey District Plan noise limits**

Location	Daytime (0700 – 2200 hours)		Night-time (2200 – 0700 hours)	
	dB LA10	dB LAmax	dB LA10	dB LAmax
Any activity shall be conducted such that the following noise limits are not exceeded at any point within the notional boundary of any <i>Rural</i> dwelling, other than the site from which the noise is created:				
Monday to Saturday	55	-	45	75
Sunday	45	-	45	75

The Grey District Plan also states that sound shall be measured in accordance with NZS 6801:1999 “Acoustics – Measurement of Environmental Sound” and assessed in accordance with NZS 6802:1991 “Assessment of Environmental Sound”. Construction noise shall be measured and assessed in accordance with NZS 6803:1999 “Acoustics – Construction Noise”.

### 4.3 World Health Organisation Guidelines

The World Health Organisation (WHO) Guidelines for Community Noise (Berglund, Lindvall and Schwela, 1999) provide guidelines for environmental noise exposure. For community or environmental noise, the critical health effects (those effects which occur at the lowest exposure levels) are sleep disturbance and annoyance.

These guideline values are the exposure levels that represent the onset of the effect for the general population.

**Table 5: WHO guideline values for the critical health effects of community or environmental noise**

Specific Environment	Critical health effect(s)	dB LAeq	Time base (hours)	dB LAFmax
Outdoor living area	Serious annoyance, daytime & evening	55	16	-
	Moderate annoyance, daytime & evening	50	16	-
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

### 4.4 NZS 6802:2008 Guideline Upper Noise Limits

The 2008 version of NZS 6802:2008 “Acoustics - Environmental Noise” makes reference to the following guideline upper limits of sound exposure at or within the notional boundary of a rural dwelling:

- Daytime: 55 dB LAeq(15min)
- Night-time: 45 dB LAeq(15min) and 75 dB LAFmax

### 4.5 Central Resource Block (CRB) consented noise levels

The consented noise limits for the CRB are:

“17.1 The consent holder must ensure that all operational mining and processing activities on the site do not exceed the following noise limits at or within the notional boundary of any dwelling existing at the date consent is granted on any other site except 3261 Coast Road:

- a. Daytime (0700-2200): 55 dB LAeq(15 min)
- b. Night-time (2200-0700): 45 dB LAeq(15 min) and 75 dB LAFmax

when measured and assessed in accordance with the latest New Zealand noise standards: NZS 6801:2008 “Acoustics – Measurement of environmental sound” and NZS 6802:2008 “Acoustics -Environmental Noise”.

These limits reflect guidance from WHO and NZS 6802. At the Hearing, the Commissioners accepted these noise limits as appropriate to maintain residential amenity on every day of the week, rather than the fragmented weekday/weekend approach adopted by the Grey District Plan that was operative at the time.

#### 4.6 NZS 6803:1999 Construction Noise Standard

Both the BDP and TTPP requires that noise from any construction activity must be measured and assessed in accordance with the requirements of New Zealand Standard NZS 6803:1999 *Acoustics – Construction Noise* which sets out the following noise limits:

Residential zones and dwellings in rural areas:

Table 2 – Recommended upper limits for construction noise received in residential zones and dwellings in rural areas

Time of week	Time period	Duration of work					
		Typical duration (dBA)		Short-term duration (dBA)		Long-term duration (dBA)	
		Leq	Lmax	Leq	Lmax	Leq	Lmax
Weekdays	0630-0730	60	75	65	75	55	75
	0730-1800	75	90	80	95	70	85
	1800-2000	70	85	75	90	65	80
	2000-0630	45	75	45	75	45	75
Saturdays	0630-0730	45	75	45	75	45	75
	0730-1800	75	90	80	95	70	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75
Sundays and public holidays	0630-0730	45	75	45	75	45	75
	0730-1800	55	85	55	85	55	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75

In table 2:

- a) “Short-term” means construction work at any one location for up to 14 calendar days;
- b) “Typical duration” means construction work at any one location for more than 14 calendar days but less than 20 weeks; and
- c) “Long-term” means construction work at any one location with a duration exceeding 20 weeks.

#### 4.7 Discussion of Noise Assessment Criteria

Both the BDP and TTPP daytime noise standards of 55 dB  $L_{A10VAeq}$  are numerically consistent with upper guideline noise limits provided in the latest version of NZS 6802 and the WHO guideline value to minimise the onset of serious annoyance. However, the BDP uses  $L_{A10}$  parameter rather than  $L_{Aeq}$ . The  $L_{Aeq}$  parameter is the average noise level which is used in the National Planning Standards and is consistent with industry best practice and the current New Zealand noise assessment standards.

The TTPP's three-period structure provides an intermediate evening and weekend limit of 50 dB  $L_{Aeq}$  whereas the Grey District Plan applies stricter daytime limits on Sundays of 45 dB  $L_{A10}$ . As reflected in

the consented noise limits for the CRB, we do not consider that a lower noise limit is necessary at weekends to provide appropriate residential amenity. Our measurements of the existing noise environment show that many of the neighbouring dwellings adjacent to the State Highway already experience elevated traffic noise environment and we consider that 55 dB  $L_{Aeq}$  is an appropriate limit every day to maintain residential amenity

Regarding night-time noise limits, the TTPP and BDP night-time noise limit of 45 dB  $L_{Aeq/A10}$  is again consistent with the relevant guidance provided by the WHO and in the latest version of NZS 6802 night-time maximum levels also differ, with the TTPP specifying 70 dB  $L_{Amax}$  compared to the Grey District Plan's 75 dB  $L_{Amax}$

Based on our analysis, we consider the same noise limits that were adopted for the CRB project are also appropriate for the SRB, and have been established to maintain residential noise amenity in line with the published guidance, as follows:

- 0700 to 2200 hrs                      55 dB  $L_{Aeq(15\ min)}$
- 2200 to 0700 hrs                      45 dB  $L_{Aeq(15\ min)}$  and 75 dB  $L_{AFmax}$

when measured and assessed in accordance with the latest New Zealand noise standards: NZS 6801:2008 "*Acoustics – Measurement of environmental sound*" and NZS 6802:2008 "*Acoustics - Environmental Noise*".

We note there are several dwellings in the vicinity of Warren and Cargill Roads that receive a lower noise level environment compared to those next to the State Highway. In order to ensure appropriate noise amenity, the Applicant is also proposing the following additional controls:

- Mining shall not occur between the hours of 0600 and 0700 within 500 metres 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 occur on Sundays

Construction activities such as the construction of building and access roads and the formation of earth bunds for noise control purposes must be planned and managed in accordance with New Zealand Standard NZS 6803: 1999 "*Acoustics - Construction Noise*".

## 5.0 PREDICTED NOISE LEVELS

### 5.1 Prediction Methodology

To accurately predict noise levels, the noise modelling software SoundPLAN has been used. Calculations in SoundPLAN are based on ISO 9613-2:2024 *Acoustics — Attenuation of sound during propagation outdoors "Part 2: Engineering method for the prediction of sound pressure levels outdoors"*. This method has the scope to consider a range of factors affecting the sound propagation including:

- The magnitude of the noise source in terms of sound power;
- The distance between source and receiver;
- The presence of obstacles such as screens or barriers in the propagation path;
- The presence of reflecting surfaces;
- The hardness of the ground between the source and receiver;
- Attenuation due to atmospheric absorption; and
- Meteorological effects such as wind gradient, temperature gradient and humidity.

In ISO 9613, the effect of meteorological conditions is significantly simplified by calculating the average downwind sound pressure level. The Standard adopts the conservative approach of

assuming that wind is always blowing from the noise sources to the receiver locations. The equations and calculations also hold for average propagation under a well developed moderate ground-based temperature inversion, such as commonly occurs on clear, calm nights.

## 5.2 Input Noise Source Data

During the operational phase of the mine, the principal noise sources will be located at the excavation area and these will progress around the site as material is extracted. Our modelling has been based on noise source data collected through noise measurements of similar equipment of mineral sand mining and processing operations around New Zealand.

We have used the sound power levels provided in Table 6 for our predictions.

**Table 6: Sound power levels of mining plant and equipment**

Quantity	Plant and equipment	Model	Sound power level ( $L_{Aeq}$ basis), dB $L_{AW}$
1	Electric Suction Dredge (Neumann)	Series 350	104
2	Excavator (Long stick) (Hitachi)	ZX890LCH	108
2	Excavator (30-40 tonne)	ZX345USLC	106
2	Dozer (Komatsu)	D71PX-24	105
1	Field screening unit -Trommel (Bespoke)	--	97
1	Grader (Komatsu)	GD655-7	108
3	Integrated tool carrier (Hitachi)	XW220-5	109
3	Dump truck (Hitachi))	B45E	86 dB $L_{AE}$ at 10m

Staff vehicle movements will occur on site on a daily basis but these are considered to be negligible in the context of overall noise emission from mining activity and have therefore been excluded from our modelling.

The previously consented WCP will be operating at the same time as extraction is occurring in the SRB and there is a potential cumulative noise effect that should be considered. We discuss this further in Section 5.5.

## 5.3 Proposed Noise Mitigation Measures

The predicted noise levels in Section 5.4 include the following noise mitigation measures:

- Minimum three-metre-high noise control bunds at the locations shown in Figure 4 as listed below. These have been adopted into the landscape architects drawings and are included as a condition of consent:
  - Lot 2 DP 2178 Bund
  - Granite Creek Bunds
  - Cargill Road North Bund
  - Cargill Road South Bund
- Our model assumes that no site vehicles will have tonal reversing alarms, and we have proposed a consent condition to this effect.

Figure 4: Proposed minimum three-metre-high noise bund locations



## 5.4 Modelling Scenarios & Predicted Noise Levels

The greatest potential for adverse noise effects is when mineral extraction is occurring closest to the existing residences to the east and south of the project area. To assess the highest potential adverse noise effects during the day, we have predicted worst case noise levels for the scenarios described in Table 7 that align with the mining sequence graphic in Figure 1.

**Table 7: Modelled scenarios**

Scenario	Year	Location
1	Year 6	Stage 1 North
2	Year 1	Stage 1 Adjacent Lot 1 DP2178
3	Year 1	Stage 1 North of Granite Creek
4	Year 7	Stage 2 North of Cargill Road
5	Year 13	Stage 3 South of Cargill Road
6	Year 6	Cumulative noise – As per Scenario 1 plus WCP

Predicted noise levels for the worst affected dwellings are provided in Table 8. Predicted noise levels for all the nearest dwellings are provided in Appendix C. Noise contour plots are presented in Appendix D.

Our assessment shows that mining activity will be significantly below the proposed project day and night noise limits of 55 and 45 dB  $L_{Aeq}$  at all dwellings. However, extraction should be avoided within 500 metres of the dwellings identified in Table 8 during the 0600–0700 hrs summer operating period. This measure is necessary to ensure that noise effects are consistent with the 45 dB  $L_{Aeq}$  night-time limit, which applies during that hour. We confirm that the 75 dB  $L_{AFmax}$  night-time noise limit will be met at all locations.

**Table 8: Predicted extraction (DAYTIME) noise levels at worst-affected dwellings (Scenarios 1 to 6)**

Receiver	Predicted noise level at notional boundary, dB $L_{Aeq}$						Compliance with 55 dB $L_{Aeq}$ (15min)?
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	
Lot 2 DP 2178	38	52	44	33	24	38	✓
23 Warren Road	32	40	48	40	32	32	✓
37 Warren Road	32	41	54	40	31	32	✓
41 Warren Road	32	42	50	39	32	32	✓
43 Warren Road	33	43	52	39	31	33	✓
50 Warren Road	32	40	50	42	33	32	✓
64 Cargill Road	28	33	37	51	44	28	✓
67 Cargill Road	28	32	37	48	43	28	✓
86 Cargill Road	28	32	37	51	50	28	✓
101 Cargill Road	28	32	36	43	55	28	



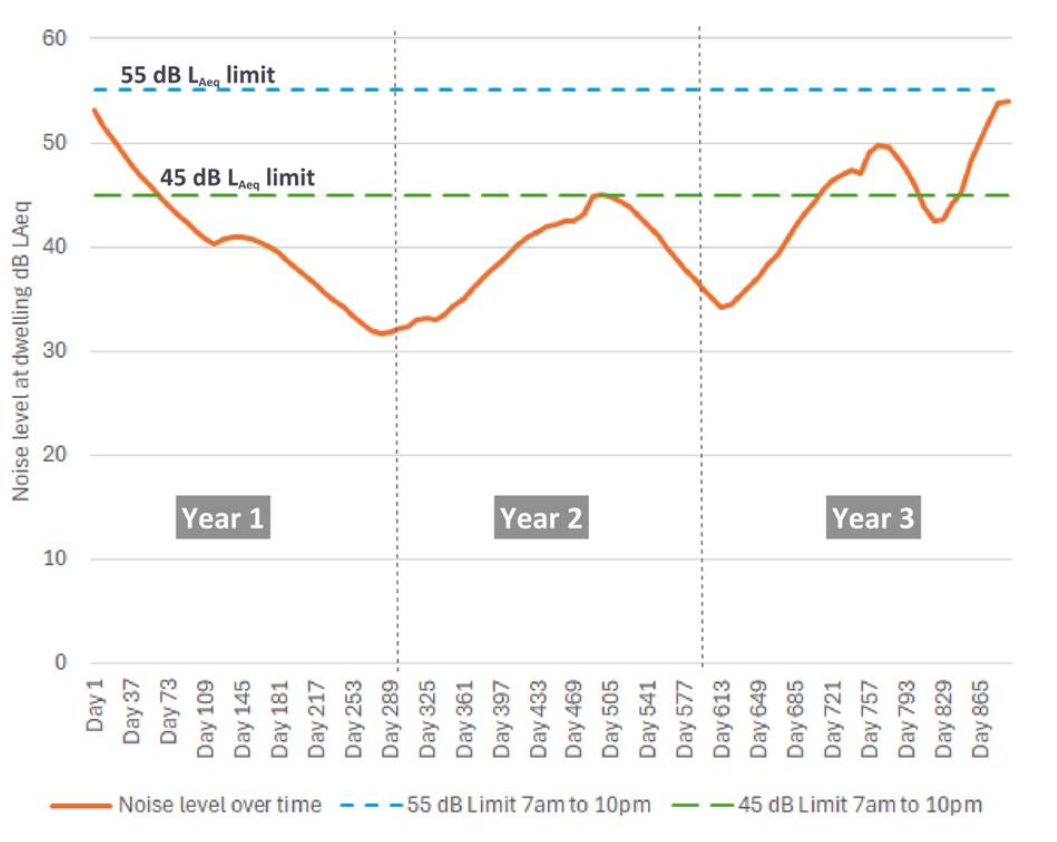
Green shading indicates where work cannot occur within approximately 500 metres between 0600 and 0700 hrs (when the 45 dB  $L_{Aeq}$  noise limit applies).

#### 5.4.1 Noise level variation over time

The predicted noise levels presented in Table 8 and Appendix C represent the highest levels expected over the life of the mine. However, as the dredge moves around the site, noise levels at nearby dwellings will generally be lower for most of the time. To demonstrate how noise varies, Figure 5 illustrates the predicted noise levels at the most affected dwelling, located at 37 Warren Road, during Stage 2 extraction (south of Granite Creek). The highest predicted noise level of 54 dB  $L_{Aeq}$  will only occur at the beginning and end of the extract period. For the majority of the time, noise levels are expected to remain below the night-time limit of 45 dB  $L_{Aeq}$ .

The dredge is expected to progress at an average rate of approximately 2,200 metres per year or approximately 166 metres per month or 6 metres per day (based on 26 working days in a month).

Figure 5: Indicative variation in noise level over time at 37 Warren Road during Stage 2 extraction



#### 5.4.2 Comparison to the District Plan permitted activity standards

Site activities will comply with the BDP daytime permitted activity standard of 55 dB  $L_{A10}$  at all times. The predicted noise levels in Table 8 and Appendix C indicate that mining activities will generally comply with the BDP and TPP permitted activity night-time noise limits, provided that the 500 metre setback is maintained for the dwellings in Table 8 between 0600 and 0700 hrs.

The TPP applies a 50 dB  $L_{Aeq}$  noise limit between 0700 and 2200 hrs at weekends, and between 1900 and 2200 hrs on weekdays. We expect that this limit will be breached if excavation was to occur within approximately 250 metres of dwellings during these time frames (noting that mining will not occur on Sundays). As shown in Table 8, approximately seven dwellings may experience these minor exceedances. Any such exceedance will result in acceptable noise effects, as noise levels will remain below the project noise limit of 55 dB  $L_{Aeq}$ .

## 5.5 Cumulative noise with the WCP

Scenario 6 in Table 8 (and Appendix C) shows the predicted cumulative noise levels from both the previously consented WCP and proposed Stage 1 mining. Predicted noise levels remain below both the day and night project noise limits of 55 and 45 dB  $L_{Aeq}$  at all dwellings.

## 5.6 Construction noise

Construction activities will primarily relate to erection of the noise control bunds and will feature mobile plant including excavators, trucks, loaders, graders etc.

As a result of the separation distances between the construction activity and the nearest dwellings, worst case construction noise is unlikely to be higher than approximately 60 dB  $L_{Aeq}$ . As a result, all construction noise during normal working hours of 0730 to 1800 hours Monday to Saturday, will comfortably comply with the applicable NZS 6803 noise limit of 70 dB  $L_{Aeq}$ .

## 6.0 ASSESSMENT OF NOISE EFFECTS

We have evaluated noise effects from several operational scenarios, taking into account both daytime and night-time activities at different stages of the mining process. The highest noise levels are expected when excavation is occurring near Cargill and Warren Road dwellings, therefore, several noise control bunds are proposed at these locations.

- In line with current best practice, and to align with the CRB consent conditions, we propose day and night noise limits of 55 and 45 dB  $L_{Aeq}$  respectively.
- Noise levels from the mining and processing activities are predicted to comply with these proposed noise limits, which reflect the recommended criteria set out in New Zealand Standard NZS 6802:2008 and World Health Organisation published guidance.
- Noise levels from the mining activities are predicted to comply with both the Grey District Plan Te Tai o Poutini Plan daytime and night-time permitted activity noise limits of 55 and 45 dB  $L_{Aeq}V_{10}$  respectively. The potential exceptions arise when extraction occurs within approximately 250 metres of dwellings during the day on Saturdays, or on weekdays between 1900 and 2200 when the TTPP limit of 50 dB  $L_{Aeq}$  applies. Approximately seven dwellings will be affected by this breach to a minor extent and any adverse noise effects will be acceptable as noise levels will remain below the project noise limit of 55 dB  $L_{Aeq}$ .
- The existing daytime ambient noise environment at most dwellings is dominated by traffic on the State Highway, surf noise and farm activities. For the majority of the mine life, mining activity is expected to be only just audible at most dwellings during lulls in traffic or when surf noise decreases.
- To further minimise noise impacts and ensure compliance with regulatory requirements, the following mitigation strategies have been incorporated into the project design and noise modelling:
  - Noise control bunds: Construction of three-metre-high earth bunds at the strategic locations indicated in Figure 4.
  - Non-tonal reversing alarms: Implementation of broadband reversing alarms on site vehicles to reduce the potential for disruptive tonal noise.
- We consider the potential for adverse effects will change over time depending on the proximity of extraction activity to dwellings. For the majority of dwellings, daytime noise effects will be minimal in the context of the existing rural noise environment.
- In the outdoor areas of the following dwellings, daytime mining activity will be most noticeable when occurring within approximately 250 metres. This corresponds to a duration of approximately two months as mining progresses past each dwelling. During this period, noise levels will be in the range 50 to 55 dB  $L_{Aeq}$  and will therefore remain below the WHO and NZS 6802 guideline value of 55 dB  $L_{Aeq}$  for outdoor residential amenity. Inside each dwelling over this time period, noise will be either inaudible or only barely audible with minimal noise effect:
  - Lot 2 DP 2178
  - 37, 41, 43 and 50 Warren Road
  - 64, 86 and 101 Cargill Road
- We have reviewed the proposed conditions of consent attached to the Application and confirm the noise limits and noise bund mitigation measures are appropriate to ensure that noise effects are consistent with our assessment.

Overall, noise emissions from the proposed activity can be managed or mitigated to comply with the applicable noise levels for the protection of residential amenity and broadly consistent with the TTPP

permitted activity standards. Noise from the proposal will result in acceptable noise effects and there will be no unreasonable emission of noise.

## APPENDIX A GLOSSARY OF TERMINOLOGY

<b>Noise</b>	A sound that is unwanted by, or distracting to, the receiver.
<b>SPL or <math>L_p</math></b>	<u>Sound Pressure Level</u> A logarithmic ratio of a sound pressure measured at distance, relative to the threshold of hearing (20 $\mu$ Pa RMS) and expressed in decibels.
<b>SWL or <math>L_w</math></b>	<u>Sound Power Level</u> A logarithmic ratio of the acoustic power output of a source relative to $10^{-12}$ watts and expressed in decibels. Sound power level is calculated from measured sound pressure levels and represents the level of total sound power radiated by a sound source.
<b>dB</b>	<u>Decibel</u> The unit of sound level.  Expressed as a logarithmic ratio of sound pressure P relative to a reference pressure of $P_r=20 \mu\text{Pa}$ i.e. $\text{dB} = 20 \times \log(P/P_r)$
<b>A-weighting</b>	The process by which noise levels are corrected to account for the non-linear frequency response of the human ear.
<b><math>L_{Aeq}(t)</math></b>	The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level.  The suffix "t" represents the time period to which the noise level relates, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10 pm and 7 am.
<b><math>L_{A10}</math></b>	The A-weighted noise level equalled or exceeded for 10% of the measurement period. This is commonly referred to as the average maximum noise level.
<b><math>L_{Amax}</math></b>	The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.
<b>SEL or <math>L_{AE}</math></b>	<u>Sound Exposure Level</u> The sound level of one second duration which has the same amount of energy as the actual noise event measured.  Usually used to measure the sound energy of a particular event, such as a train pass-by or an aircraft flyover
<b>NZS 6801:1999</b>	New Zealand Standard NZS 6801:1999 " <i>Acoustics - Measurement of Environmental Sound</i> "
<b>NZS 6801:2008</b>	New Zealand Standard NZS 6801:2008 " <i>Acoustics – Measurement of environmental sound</i> "
<b>NZS 6802:1991</b>	New Zealand Standard NZS 6802:1991 " <i>Assessment of Environmental Sound</i> ".
<b>NZS 6802:2008</b>	New Zealand Standard NZS 6802:2008 " <i>Acoustics – Environmental Noise</i> "
<b>NZS 6803:1999</b>	New Zealand Standard NZS 6803: 1999 " <i>Acoustics - Construction Noise</i> "

## APPENDIX B NOISE SURVEY DETAILS

The key details of our noise surveys are as follows:

- Date:** 14 August 2024 1100hrs to 15 August 2024 1000hrs
- Personnel:** Juan Gaviria, Marshall Day Acoustics
- Weather:** Average temperature 12-18°C, ~2-3 m/s wind from the west
- Instrumentation:** Brüel & Kjær Type 2250 analyser, serial 3010261, calibration due 30/05/2025  
Brüel & Kjær Type 4231 calibrator, serial 3004051, calibration due 12/09/2025  
01dB CUBE Noise Monitoring Terminal, serial 11191, calibration due 22/06/2025
- Calibration:** Field calibration of the equipment was carried out before measurements, and the calibration checked after measurements. Observed change less than 0.1 dB

**APPENDIX C SCHEDULE OF PREDICTED NOISE LEVELS**

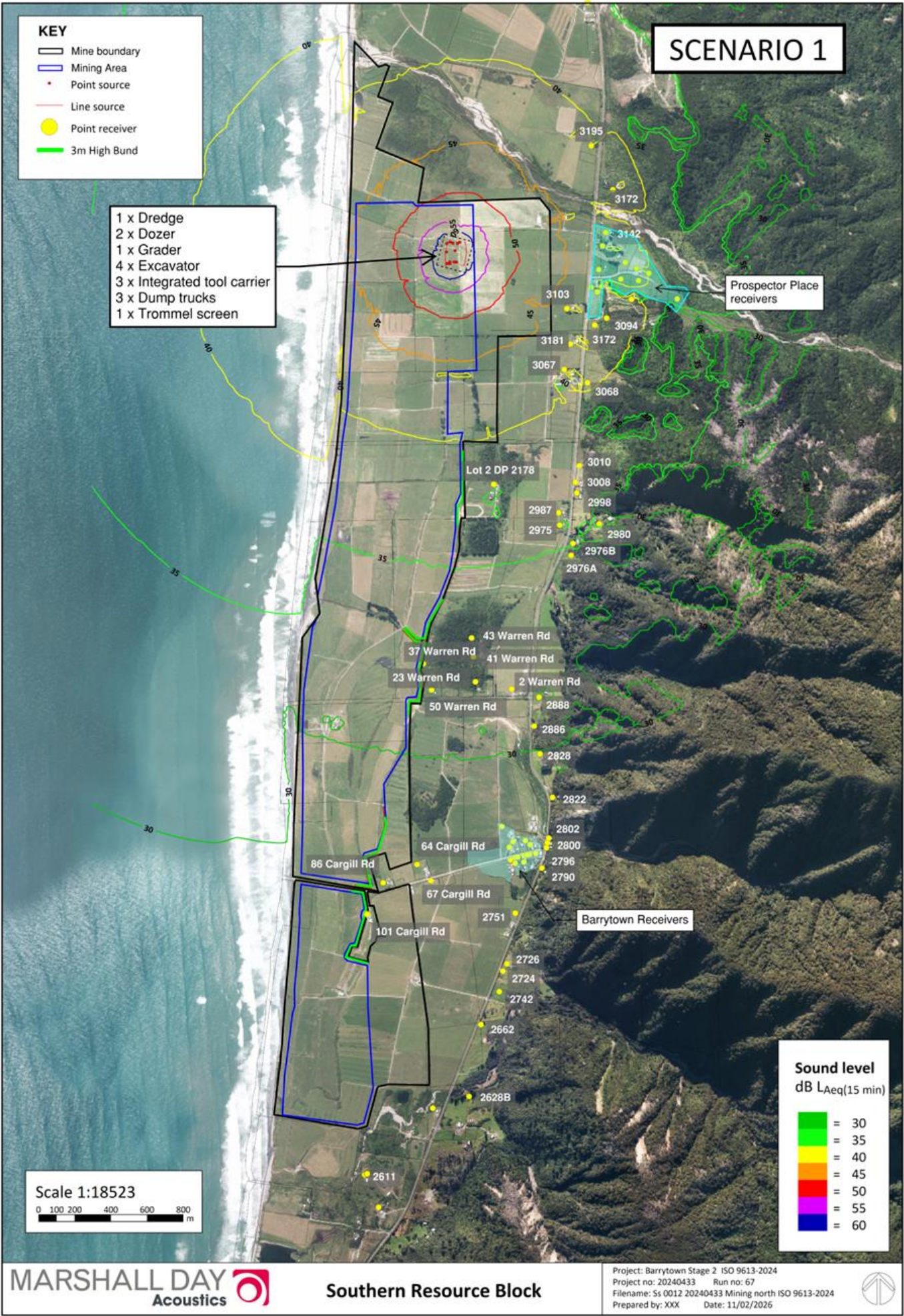
Receiver	Predicted noise level at notional boundary, dB L <sub>Aeq</sub>						Compliance with 55 dB L <sub>Aeq</sub> (15min)?
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	
Lot 2 DP 2178	38	52	43	33	24	38	✓
2 Warren Road	32	39	45	39	32	32	✓
5 Prospector Place	43	36	32	27	21	43	✓
6 Cargill Road	28	33	37	40	36	28	✓
6 Prospector Place	44	37	33	28	22	44	✓
7 Cargill Road	28	33	37	42	34	28	✓
9 Cargill Road	29	34	37	42	35	29	✓
10 Cargill Road	28	33	37	41	37	28	✓
10 Prospector Place	41	36	32	27	17	41	✓
11 Cargill Road	29	34	38	42	36	29	✓
13 Cargill Road	27	33	36	40	35	27	✓
13A Cargill Road	26	31	37	42	31	26	✓
14 Cargill Road	28	33	39	43	37	28	✓
15 Cargill Road	28	33	38	42	38	28	✓
15 Prospector Place,	42	36	32	27	21	42	✓
16 Cargill Road	28	34	38	43	40	28	✓
17 Cargill Road	28	33	36	42	38	28	✓
19 Prospector Place	41	35	32	27	18	41	✓
21 Cargill Road,	28	33	38	43	38	28	✓
21 Prospector Place	42	35	31	26	16	42	✓
22 Cargill Road,	29	34	38	43	37	29	✓
23 Warren Road	32	40	48	40	32	32	✓
26 Prospector Place	41	32	31	26	16	41	✓
28 Prospector Place	40	33	31	26	16	40	✓
28A Prospector Place	38	20	20	21	11	38	✓
37 Warren Road	32	41	54	40	31	32	✓
41 Warren Road	32	42	50	39	32	32	✓
43 Warren Road	33	43	52	39	31	33	✓
50 Warren Road	32	40	50	42	33	32	✓
64 Cargill Road	28	33	37	51	44	28	✓
67 Cargill Road	28	32	37	48	43	28	✓

Receiver	Predicted noise level at notional boundary, dB LAeq						Compliance with 55 dB LAeq (15min)?
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	
86 Cargill Road	28	32	37	51	50	28	✓
101 Cargill Road	28	32	36	43	55	28	
2583 Coast Road	23	25	27	31	28	23	✓
2611 Coast Road	24	27	29	36	36	24	✓
2611 West Coast Road	21	26	28	34	33	21	✓
2628B Coast Road	24	27	30	36	36	24	✓
2662 Coast Road	25	29	32	38	37	25	✓
2724 Coast Road	26	30	33	40	39	26	✓
2726 Coast Road	26	30	33	40	39	26	✓
2742 Coast Road	26	30	33	39	39	26	✓
2751 Coast Road	27	31	35	41	38	27	✓
2787 Coast Road	28	33	35	41	34	28	✓
2790 Coast Road	28	32	36	41	37	28	✓
2796 Coast Road	28	33	37	41	36	28	✓
2800 Coast Road	28	33	37	41	36	28	✓
2802 Coast Road	28	33	37	40	34	28	✓
2822 Coast Road	29	34	38	40	34	29	✓
2828 Coast Road	30	36	40	40	34	30	✓
2866 Coast Road	31	37	42	39	32	31	✓
2888 Coast Road	31	38	43	38	32	31	✓
2975 Coast Road	36	45	41	33	27	36	✓
2976A Coast Road	35	44	41	33	27	35	✓
2976B Coast Road	35	45	41	33	27	35	✓
2980 Coast Road	35	43	39	32	22	35	✓
2987 Coast Road	36	46	41	33	26	36	✓
2998 Coast Road	37	44	40	32	25	37	✓
3008 Coast Road	37	45	40	32	25	37	✓
3010 Coast Road	38	44	38	31	25	38	✓
3067 Coast Road	42	41	36	29	23	42	✓
3068 Coast Road	40	41	35	29	23	40	✓
3081 Coast Road	43	40	35	29	23	43	✓
3094 Coast Road	42	38	33	28	22	42	✓

Receiver	Predicted noise level at notional boundary, dB L <sub>Aeq</sub>						Compliance with 55 dB L <sub>Aeq</sub> (15min)?
	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	
3094B Coast Road	42	37	33	27	22	42	✓
3094C Coast Road	41	22	20	19	10	41	✓
3103 Coast Road	44	39	34	28	22	44	✓
3118 Coast Road	43	37	33	28	22	43	✓
3142 Coast Road	42	35	31	27	21	42	✓
3172 Coast Road	42	39	34	28	22	42	✓
3172 Coast Road	41	34	30	26	20	41	✓
3195 Coast Road	41	33	29	25	19	41	✓
3261 Coast Road	37	29	35	31	18	37	✓

Scenario	Year	Location
1	Year 6	Stage 1 North
2	Year 1	Stage 1 Adjacent Lot 1 DP2178
3	Year 1	Stage 1 North of Granite Creek
4	Year 7	Stage 2 North of Cargill Road
5	Year 13	Stage 3 South of Cargill Road
6	Year 6	Cumulative noise – As per Scenario 1 plus WCP

**APPENDIX D NOISE CONTOUR MAPS**  
(following pages)



# SCENARIO 2

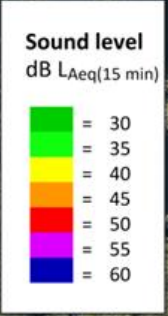
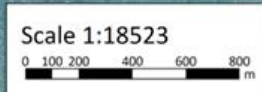
**KEY**

- Mine boundary
- Mining Area
- Point source
- Line source
- Point receiver
- 3m High Bund

- 1 x Dredge
- 2 x Dozer
- 1 x Grader
- 4 x Excavator
- 3 x Integrated tool carrier
- 3 x Dump trucks
- 1 x Trommel screen

Prospector Place receivers

Barrytown Receivers



## Southern Resource Block

Project: Barrytown Stage 2 ISO 9613-2024  
 Project no: 20240433 Run no: 81  
 Filename: Ss 0013 20240433 Mining Centre ISO 9613-2024  
 Prepared by: JG Date: 16/02/2026



