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Project: **BARRYTOWN MINERAL SANDS MINE**

Prepared for: **TiGa Minerals and Metals**

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1.0 INTRODUCTION

The purpose of this Noise Management Plan (NMP) is to detail the procedures we will adopt to ensure that disturbance to neighbours bordering our site is avoided or minimised. Our aim is to adopt the best practicable options available to meet this objective while managing activities on site.

Key Elements of the Plan are:

- Avoid or minimise the impact of noise from our site to residential neighbours.
- Identification of the primary noise sources
- Detailed steps to manage, as far as reasonably possible, noise from and around our premises that we have control over.
- Noise measurement to check compliance with the Plan through monitoring and feedback from neighbours and others to make appropriate adjustments to the Plan as necessary.
- Training our staff to increase awareness noise generated through their day-to-day activities.

A glossary of acoustic terminology is included in Appendix A for reference.

1.1 Background

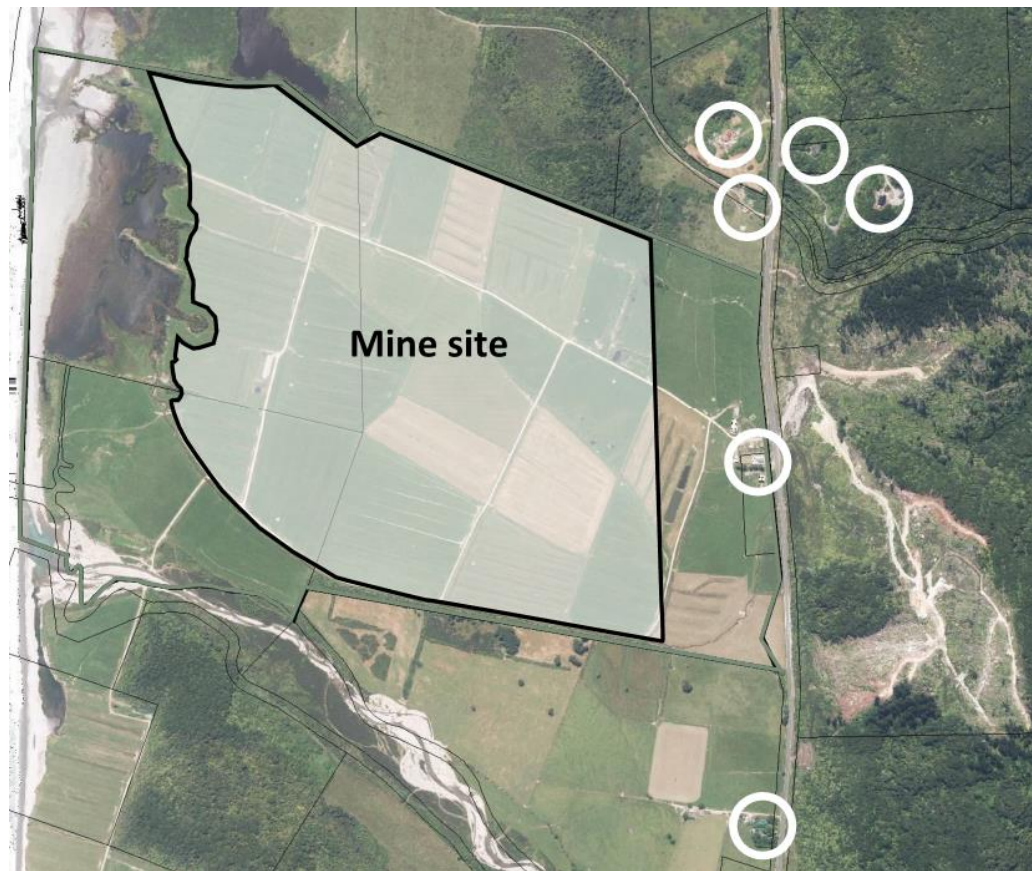
The Barrytown site operates a range of stationary and mobile mechanical plant for the extraction and processing of mineral sands which have the potential to generate noise.

Mining will only occur during the day. Processing will occur 24 hours a day:

- Mining between 0700 and 2200 hrs Monday to Sunday;
- Processing, 24 hours a day, 7 days a week; and
- Trucks will operate to and from the site between 0500 and 2200 hrs, seven days a week.

Our near neighbours are identified by the white circles in the Figure 1

Figure 1: Mine site showing nearest neighbours



1.2 Potential noise emissions

The sound power of the on-site noise sources has been assessed in Marshall Day Acoustics *Assessment of Noise Effects (Feb 2023)* and are reproduced in Table 1 below. That assessment considers that with appropriate noise mitigation and control measures the noise emissions generated by the mining and processing activities will have acceptable effects. The following sections of the NMP detail the noise management risks, requirements, and procedures for all site noise.

Table 1: : Sound power levels of mining plant and equipment

Plant and equipment	Quantity	Source noise data
80 tonne excavator	2	111 dB L _{WA} (L _{A10} basis)
Diesel Generator (enclosed)	2	93 dB L _{WA} (L _{A10} basis)
6 ft trommel/screen (including hopper and conveyor)	1	108 dB L _{WA} (L _{A10} basis)
20 tonne bulldozer	2	105 dB L _{WA} (L _{A10} basis)
16 tonne grader	1	113 L _{WA} (L _{A10} basis)
20 tonne wheeled front end loader	7	108 dB L _{WA} (L _{A10} basis)
40 tonne dump truck drive-by (average)	3	89 dB L _{AE} at 10m
Road truck and trailer drive-by on gravel road (average)	3 per hour	84 dB L _{AE} at 10m
Pumps (de-watering, slurry etc)	5	101 dB L _{WA} (L _{A10} basis)

1.3 Contact Details

Contact details for relevant personnel are listed in Table 2. The Site Manager is responsible for implementing this Noise Management Plan.

Table 2: Contact details

Role	Name	Organisation	Phone	Email
Site Manager	TBC	TBC	TBC	TBC
Acoustics Specialist	TBC	TBC	TBC	TBC

2.0 NOISE CRITERIA

We are required to comply with the following noise limits at the notional boundary of any residential dwelling. The notional boundary is a point 20 metres from the dwelling, or the site boundary, whichever is closer:

Site activities shall not exceed the following noise limits:

- 0700 - 2200 hours: 55 dB $L_{Aeq(15\text{ min})}$
- 2200 – 0700 hours: 45 dB $L_{Aeq(15\text{ min})}$ and 75 dB L_{AFmax}

Noise during the construction of the site buildings, access roads and planted bunds is controlled using the following recommend noise limits from New Zealand Standard NZS 6803: 1999 “Acoustics - Construction Noise” 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)	
		L_{eq}	L_{max}	L_{eq}	L_{max}	L_{eq}	L_{max}
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

"Long-term" means construction work at any one location with a duration exceeding 20 weeks.

All noise related consent conditions are provided in Appendix B.

3.0 NOISE SOURCE RISK ANALYSIS

We will aim to minimise disruption to neighbours by assessing and managing the following noise issues:

Possible Risk	Level of risk	Actions which will be taken to mitigate the risk (if and when applicable)
Equipment and plant selection	High	<p>Plant and equipment procurement contracts will include maximum noise limits that will ensure that we will operate within our noise limits. Maximum noise limits are provided in Table 1.</p> <p>Where possible, low noise equipment/models will be selected in favour of noisy equipment,</p> <p>Exhaust silencers must be fitted to all mobile plant</p> <p>Power from the grid will be used in preference to diesel generators where practicable</p>
Maintenance	High	<p>Vehicles and equipment shall be maintained to avoid unnecessary noise and vibration. This includes replacement of worn parts, maintenance of mufflers, lubrication of moving machinery to avoid squeaks and squeals, and appropriate operation of all equipment</p>
Contractor Trucks	High	<p>Trucking contractors visiting the site will be informed of their expected behaviour on site to minimise noise including:</p> <ul style="list-style-type: none"> - following speed limit restrictions - no unnecessary sounding of horns - no unnecessary revving of engines - engine braking should be avoided - vehicles should be appropriately maintained
HMC loading	Medium	<p>Staff must exercise extreme care loading trucks. Metal-to-metal impacts should be avoided.</p>
Tonal reversing alarms	Medium	<p>All vehicles operating on site must not have tonal reversing alarms.</p>
Site vehicle behaviour	Medium	<p>Site vehicles shall follow speed limits and drive in a consistent steady manner.</p> <p>No amplified music is permitted inside vehicle cabs.</p> <p>Vehicle horns shall only be used in emergencies.</p>

Possible Risk	Level of risk	Actions which will be taken to mitigate the risk (if and when applicable)
Access Roads	Low	The access road and working surfaces in the loading areas shall be maintained free from potholes and corrugations to avoid unnecessary vehicle rattling and truck body slam.
Staff behaviour	Low	Staff shall minimise noise generation at all times as far as practical. For example, shouting, door slamming, and mishandling of equipment should be avoided.
Staff and visitor vehicles	Low	Signage shall be provided to advise staff and visitors of maximum speed limits on site.

4.0 INDUCTION

All our staff will participate in noise induction training on their first day and at least once a year. More frequent training will be implemented if deemed necessary from repetitive noise complaints. The standard induction is provided below, and may be added to over time. A written record will be kept of everyone who has received the induction and when. Contractors will undertake the induction on their first visit to site and the standard induction may be altered to reflect contractors' specific roles.

There are several residential neighbours where noise criteria apply. To ensure criteria are achieved, all staff are responsible for good noise and vibration management.

1. When arriving at work, please drive slowly on site and keep revs to a minimum. Keep stereos off and do not slam doors.
2. No shouting or swearing on site. Either walk over and talk to somebody or use a radio/phone.
3. Be careful with tools and equipment. Place them down and do not drop them.
4. Do not drag materials on the ground. Place them down when you arrive at the work area.
5. Equipment and vehicles should not be left running when not in use.
6. When loading trucks try not to drop material from a height.
7. Noise enclosures should always have all doors/hatches closed when the equipment is in use.
8. All equipment is to be well maintained.
9. No work that could cause noise disturbance shall be conducted outside the hours of 0700h to 2200 hrs Monday to Sunday
10. If you see anything/anyone making unnecessary noise then stop it/them. If the source cannot be stopped then report it to Site Manager.
11. It is essential that good relationships are maintained with the local community. Any queries from members of the public should be responded to politely and referred to Site Manager. Staff shall assist the public to make contact with this person. Staff shall not enter into debate or argue with members of the public.
12. A written record of staff having received this induction shall be documented as follows:

Name	Company	Signed	Date
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5.0 MAINTENANCE

We all need to be vigilant for any features on site that may increase noise and vibration and bring these to the attention of management. Our scheduled maintenance program is set out below.

5.1 Working Surfaces

Site roads and working areas must be kept free of potholes and undulations to avoid vehicle noise and vibration. A yearly inspection of surfaces shall be conducted on [DATE] and shall record:

- Any damage and what action has been taken.
- If no damage is found, this shall also be recorded.

5.2 Equipment

Equipment must be maintained to good working order as part of regular maintenance activities. This will include identifying and mitigating any atypical noises such as the rattling of a loose component, damaged mufflers or squeaking tracks.

6.0 NOISE MONITORING

[This section will be updated to reflect the consent conditions. Sample text is provided below but noise monitoring requirements would normally have some of the following elements

- Initial monitoring during the startup phase of the mine
- Regular compliance monitoring on a 6 monthly or yearly basis
- Monitoring to verify noise levels from a particular piece of plant
- A regime for report measurements to Grey District Council]

As required by the consent conditions, noise monitoring shall be conducted by the following staff in accordance with:

- New Zealand Standard NZS 6801:2008 *Acoustics – Measurement of environmental sound*
- New Zealand Standard NZS 6802:2008 *Acoustics - Environmental Noise*
- New Zealand Standard NZS 6803: 1999 *Acoustics - Construction Noise*

Trained noise monitoring staff:

- [PERSON XXXX]

Noise monitoring will be conducted using the dedicated sound level meter kit detailed below which will be stored in site administration office. The calibrator will be verified by an accredited laboratory annually and the sound level meter and microphone biannually.

Equipment	Make	Model	Serial	Last verification
Sound level meter				
Software				
Microphone				
Calibrator				
Wind shield				
Tripod				
Other				

Monitoring will be conducted as follows,

- When the works start to verify the sound levels assumed for each of the major items of equipment, and to assess the effectiveness of noise control measures and implementation of this plan.
- At regular intervals during the works, at least every four weeks, to check ongoing compliance with the construction noise criteria.
- During critical phases of construction, such as during the use of heavy earth moving machinery, rock breaking, and other noisy activities within 50 metres of neighbours.
- As required by a construction noise management schedule.
- If required, in response to construction noise related complaints.

Following each noise survey, the results will be reported on the survey report template and any issues discovered will be investigated.

If noise monitoring indicates that project noise criteria are being exceeded then the cause for the exceedance shall be investigated and mitigated as quickly as possible.

7.0 COMPLAINTS

[The complaints procedure should be updated to reflect the conditions of consent including response timeframes and notification processes. Sample text is provided below.]

We take any noise issues raised with us seriously and will commit to resolving any issues as quickly and effectively as possible.

The following procedure shall be followed for all noise complaints:

1. All noise and vibration complaints should be immediately directed to Site Manager.
2. As soon as the complaint is received it will be recorded on the complaints register.
3. An initial response will be made and recorded. Depending on the nature of the complaint the initial response could be to immediately cease the activity pending investigation, or to replace an item of equipment. However, in some cases it might not be practicable to provide immediate relief. The complainant and council will be informed of actions taken.
4. Where the initial response does not address the complaint, further investigation, corrective action and follow-up monitoring shall be undertaken as appropriate. The complainant [and council] will be informed of actions taken.
5. All actions will be recorded on the complaints register and the complaint will then be closed.

APPENDIX A GLOSSARY

A-weighting	<p>A set of frequency-dependent sound level adjustments that are used to better represent how humans hear sounds. Humans are less sensitive to low and very high frequency sounds.</p> <p>Sound levels using an “A” frequency weighting are expressed as dB L_A. Alternative ways of expressing A-weighted decibels are dBA or dB(A).</p>
dB	Decibel. The unit of sound level.
L_{Aeq}	The equivalent continuous A-weighted sound level. Commonly referred to as the average sound level and is measured in dB.
L_{Amax}	The A-weighted maximum sound level. The highest sound level which occurs during the measurement period. Usually measured with a fast time-weighting i.e. L_{AFmax}
L_p	Sound pressure level. The sound level measured at distance from a source. Distinctly different from sound power level (L_w)
L_w	Sound Power Level. The calculated level of total sound power radiated by a sound source. Usually A-weighted i.e. L_{WA} .
Noise	A subjective term used to describe sound that is unwanted by, or distracting to, the receiver.
Notional boundary	<p>A line 20 metres from any side of a dwelling, or the legal boundary where this is closer to the dwelling.</p> <p>This definition is from NZS 6802:2008.</p>
Reference time interval	<p>The time interval over which the time average A-weighted sound pressure levels is determined. Typically 15 minutes.</p> <p>This definition is from NZS 6802:2008.</p>

APPENDIX B NOISE RELATED CONDITIONS OF CONSENT

To be confirmed

