CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

Date xx June 2026

Text in blue italics flags content that must be completed or confirmed with site-specific information (consent conditions, monitoring locations, site constants and project descriptions) before issue.

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1.0 PLAN OBJECTIVE

This construction noise and vibration management plan (CNVMP) details noise and vibration criteria, predicted levels, mitigation measures, monitoring requirements, and communication and complaint procedures, for the Bendigo Ophir Gold Project

The objective of this plan is to provide a framework for construction noise and vibration management to ensure that noise and vibration levels at neighbouring buildings remain within reasonable limits throughout the works.

A glossary of acoustic terminology is provided in Appendix A

Insert the specific consent references, conditions and any corporate environmental standards that apply to the project.

2.0 ROLE AND RESPONSIBILITIES

Role	Responsibilities
Site Manager	• The Site Manager is responsible for implementing this Noise Management Plan
Acoustics Specialist	• Provide expert guidance and develop noise mitigation strategies to minimize potential noise and vibration impacts at nearby receivers. • Conduct noise and vibration assessments and compliance monitoring. • Advise on appropriate noise control technologies and best practices. • Review and update the NVMP as required.
All Site Personnel	• Participate in noise induction training. Adhere to all procedures and guidelines outlined in this NVMP. • Minimize noise generation through good work practices (e.g., avoiding unnecessary revving, dropping materials, shouting). • Report any excessive noise or vibration issues to their supervisor or the Site Manager.
Maintenance Manager	• Ensure all plant and equipment are regularly maintained to prevent unnecessary noise and vibration. • Oversee the fitting and maintenance of exhaust silencers and other noise reduction components. • Coordinate repairs for equipment identified as a source of excessive noise. • Ensure access roads and working surfaces are maintained to minimize vehicle rattling and associated noise.

All site personnel will be required to read and sign the construction noise and vibration induction form appended to this plan and any relevant schedules. If required, specific training will be provided for site personnel

4.0 CONSENT CONDITIONS RELATING TO BLASTING

The relevant consent conditions will be inserted here:
[PLACEHOLDER]

Construction activities are required to comply with the following noise limits taken from New Zealand Standard NZS 6803: 1999 Acoustics - Construction Noise, measured at one metre from the façades of the nearest neighbours:

Table 1: Construction noise limits at residential zones and dwellings in rural areas

Time of week	Time period	Noise criteria, dB	
		L_{Aeq}	L_{AFmax}
Weekdays	0630-0730	55	75
	0730-1800	70	85
	1800-2000	65	80
	2000-0630	45	75
Saturdays	0630-0730	45	75
	0730-1800	70	85
	1800-2000	45	75
	2000-0630	45	75
Sundays and public holidays	0630-0730	45	75
	0730-1800	55	85
	1800-2000	45	75
	2000-0630	45	75

Any blasting during the construction phase must be conducted in accordance with the Blasting Noise and Vibration management plan.

Apart from blasting, no significant sources of vibration are anticipated. However, in general, vibration limits from *DIN 4150-3 Vibrations in buildings – Part 3: Effects on structures* should be adopted. Advice should be sought from the Acoustics Specialist.

5.0 PREDICTED NOISE LEVELS

The separation distances between construction activities and the nearest dwellings are relatively large and, as result, construction noise levels will be relatively low. For example, the processing plant is approximately 2.5 km from the nearest dwelling. The Ardgour Infrastructure Area will be approximately 600 metres at its closest point.

Table 2 provides predicted noise levels for a range of high-noise construction activities and illustrates how noise levels reduce with distance. The right-most column provides the separation distance required to comply with the applicable NZS 6803: 1999 noise limit of 70 dB L_{Aeq}. For example, compliance would be achieved at distances greater than 132 metres for a Concrete /rock breaker with a sound power level of 121 dB L_{Aw}. In the context of the separation distances at the proposed site, we expect that construction noise levels will be substantially below the 70 dB L_{Aeq} limit.

Table 2: Indicative noise levels at a building façade

Phase	Equipment	Sound Power	Façade Noise Level (dB L_{Aeq}) at distance:			Setback distance (m) to achieve70 dB L_{Aeq}
		(dB L_{wA})	500m	1000m	2000m	
Demolition	Concrete/rock breaker (20-30T)	121	56	48	40	132
	Concrete cutting	115	50	42	34	76
	Excavator pulveriser	104	39	31	23	28
Piling	Impact piling (casing & dolly)	114	49	41	33	69
	Vibratory sheet piling	116	51	43	35	83
	Bored or screw piling (excavator)	103	38	30	22	25
	Diaphragm wall piling	110	45	37	29	48
Excavation	Hydrovac excavator	107	42	34	26	36
	Excavator (20T)	103	38	30	22	25
	Excavator (5T)	102	37	29	21	22
Quarrying	Semi-mobile crusher	118	53	45	37	100
	Wheeled loader	110	45	37	29	48
	Excavator (20T)	103	38	30	22	25
	Pulveriser mounted on excavator	104	39	31	23	28
General	Grinder (handtools)	108	43	35	27	40
	Directional drilling	105	40	32	24	30
	Concrete truck and pump	103	38	30	22	25
	Mobile Crane (35T) operating	98	33	25	17	14
	Hydraulic power pack	97	32	24	16	13
	Generator (150kVA)	93	28	20	12	8
	Pump (150mm dia)	93	28	20	12	8
	Compressor	93	28	20	12	8
	Truck idling	91	26	18	10	6
Road	Milling machine	110	45	37	29	48
	Plate compactor	108	43	35	27	40
	Paving machine	103	38	30	22	25
	Static or vibratory roller	103	38	30	22	25

5.0 BLAST SCHEDULING AND NOTIFICATION

Predictability of blasting times is recognised as an effective means of reducing and mitigating blast vibration effects on people. Where practicable, the Operator should:

- restrict blasting to defined daily windows agreed with the consent authority, and keep each firing close to a similar time each day
- provide prior and timely notification of the proposed blast schedule via the operators website, SMS/email notification or other agreed method.

6.0 STAKEHOLDER ENGAGEMENT

Communication

A key aspect of this construction noise and vibration management plan is communication with the local community. While the noise and vibration risks are low, a contact person should be available on site, and their contact details will be prominently displayed at the entrance to the site so that they are clearly visible to the public.

Complaints

The following procedure shall be followed for all noise and vibration complaints:

1. All noise and vibration complaints should be immediately directed to the Site Manager.
2. As soon as the complaint is received, an initial response will be made and recorded.
3. 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.
4. All actions will be recorded on the project complaints register or project web page and the complaint will then be closed.

7.0 TRAFFIC ON PUBLIC ROADS

To minimise potential noise disturbance from construction traffic to our neighbours on Ardgour Road and Thomson Gorge Road, we will adopt the following noise control measures as far as practicable:

- Construction trucks will access the site generally between 0700 and 2000 hrs
- Truck speeds will be limited to 50 km/hr on Ardgour Road and Thomson Gorge Road
- Vehicle horns shall only be used in emergencies
- Traffic should avoid excessive engine revving and drive in a consistent steady manner
- No excessive amplified music is permitted inside vehicle cabs
- Any potholes or corrugations in the road surface shall be reported to the site manager
- Shouting, door slamming, and banging of tail gates shall be avoided

8.0 MITIGATION AND MANAGEMENT

Indicative calculations have been conducted for the main items of equipment based on the outline construction methodology and minimum distances to the nearest neighbours. On this basis the following general noise and vibration control measures have been identified as likely to be required to maintain compliance with the construction noise and vibration criteria and conform to good practice.

Training

All staff will participate in an induction training session prior to the start of construction, with attention given to the following matters:

- Construction noise and vibration limits
- Activities with the potential to generate high levels of noise and/or vibration
- Noise and vibration mitigation and management procedures
- The sensitivity of receivers and any operational requirements and constraints identified through stakeholder communication and consultation

A general site induction form is provided in in the CNVMP. Awareness of current noise and vibration matters on, or near active worksites, will be addressed during regular site meetings and/or 'toolbox' training sessions.

Equipment Selection

When selecting construction equipment, where practicable:

- Prioritise quieter construction methodologies where appropriate (e.g. use of an excavator instead of hydrovac)
- Prioritise electric motors over diesel engines
- Prioritise rubber tracked equipment over steel tracked equipment
- Equipment will be suitably sized for the proposed task
- Equipment will be maintained and fitted with exhaust silencers and engine covers
- Avoid tonal reversing or warning alarms (suitable alternatives may include flashing lights, broadband audible alarms or reversing cameras inside vehicles)

General Measures

Complaints can arise regardless of noise and vibration levels complying with the Project limits. To avoid noise and vibration related complaints, general mitigation and management measures include, but are not limited to:

- Avoid unnecessary noise, such as shouting, the use of horns, loud site radios, rough handling of material and equipment, and banging or shaking excavator buckets
- Avoid high engine revs through appropriate equipment selection and turn engines off when idle
- Mitigate track squeal from tracked equipment, such as excavators (may include tensioning and or lubricating the tracks regularly)
- Minimise construction duration near sensitive receivers
- Stationary equipment (e.g. generators) will be located away from noise sensitive receivers
- Orient mobile machinery to maximise the distance between the engine exhaust and the nearest sensitive building façade (e.g. excavators)
- Utilise noise barriers and enclosures where appropriate
- Undertake monitoring as appropriate

Noise Barriers

Temporary noise barriers should be used when practical where a construction noise limit is predicted to be exceeded, and the barriers would noticeably reduce the construction noise level. They will be installed prior to works commencing and maintained throughout the works. Effective noise barriers typically reduce the received noise level by 10 decibels.

Where practicable, the following guidelines will be incorporated in the design and utilisation of temporary noise barriers:

- The panels will be constructed from materials with a minimum surface mass of 6.5 kg/m^2. Suitable panels include 12 mm plywood or the following proprietary 'noise curtains':
    - SealedAir 'WhisperFence 24dB' (www.sealedair.com)
    - Hushtec 'Premium Series Noise Barrier' (www.duraflex.co.nz)
    - Soundbuffer 'Performance Acoustic Curtain' (soundbuffer.co.nz)
    - Hoardfast 'Fast Wall Premium PVC partition panels' (www.ultimate-solutions.co.nz)
    - Safesmart 'Acoustic Curtain 6.5kg/m^2' (www.safesmartaccess.co.nz)
    - Alternatives will be approved by a suitably qualified and experienced acoustic specialist
- The panels will be a minimum height of 2m, and higher if practicable to block line-of-sight
- The panels will be abutted or overlapped to provide a continuous screen without gaps at the bottom or sides of the panels
- The panels will be positioned as close as practicable to the noisy construction activity to block line-of-sight between the activity and noise sensitive receivers. Where positioned on the site boundary, additional local barriers will be considered near the activity to ensure effective mitigation for sensitive receivers on upper floor levels.

Concrete/Rock Breaking

Avoid evening and night-time periods and Sundays/public holidays, and ensure:

- An initial perimeter saw cut will be made at the perimeter to reduce vibration transfer to nearby buildings
- Minimise the volume of breaking (e.g. use a crushing shear or pulveriser attachment in place of a breaker, or use a cut and lift approach to enable breaking offsite) where practicable
- Minimise the duration of breaking, and the number of breaking periods (e.g. complete all breaking in one extended period rather than two shorter periods with the same overall duration) where practicable
- Match the size of breaker to the scale of the works (i.e. large enough to undertake the works efficiently, but avoiding oversized units and unnecessary noise and vibration levels)
- Match the chisel/tip type to the material and use a dampened bit to avoid ringing
- Avoid 'blank' firing by engaging the material before commencing and stopping before it fires through the material

9.0 MONITORING

If noise or vibration monitoring is deemed to be appropriate, for example, following a complaint, measurements shall be conducted by the following staff in accordance with:

- Noise - NZS 6801:2008 *Acoustics – Measurement of environmental sound and* NZS 6803: 1999 *Acoustics - Construction Noise*

- Vibration - ISO 4866:2010 “Mechanical vibration and shock – Vibration of fixed structures – Guidelines of the measurement of vibrations and evaluation of their effects on structures”;

The requirement to monitor noise and vibration is outlined in the flowcharts in Figures 1 and 2 respectively.

Figure 1: Noise monitoring flowchart

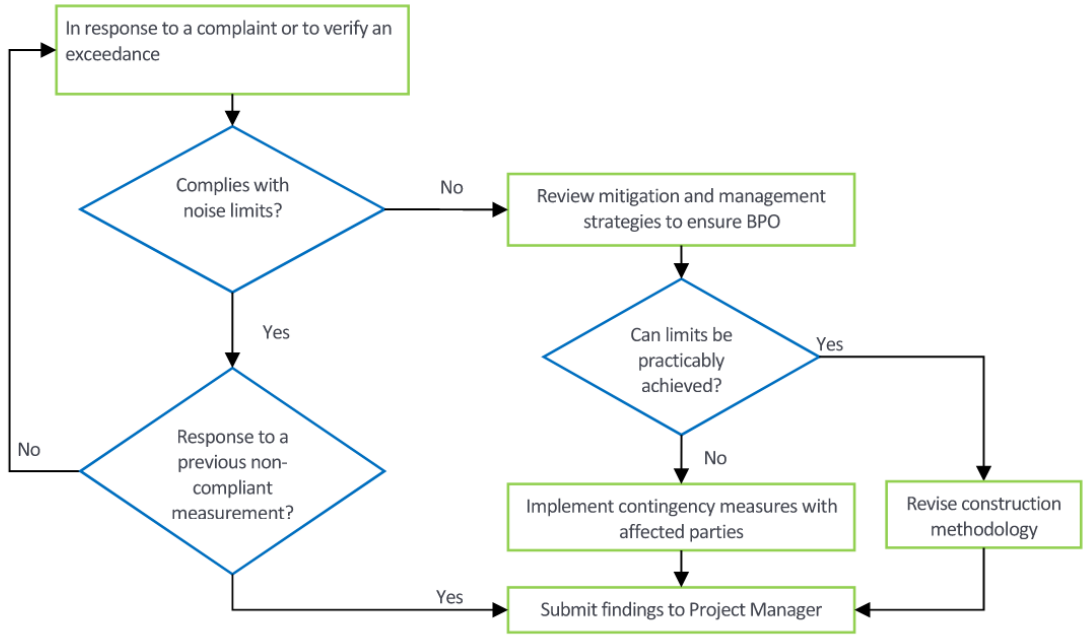
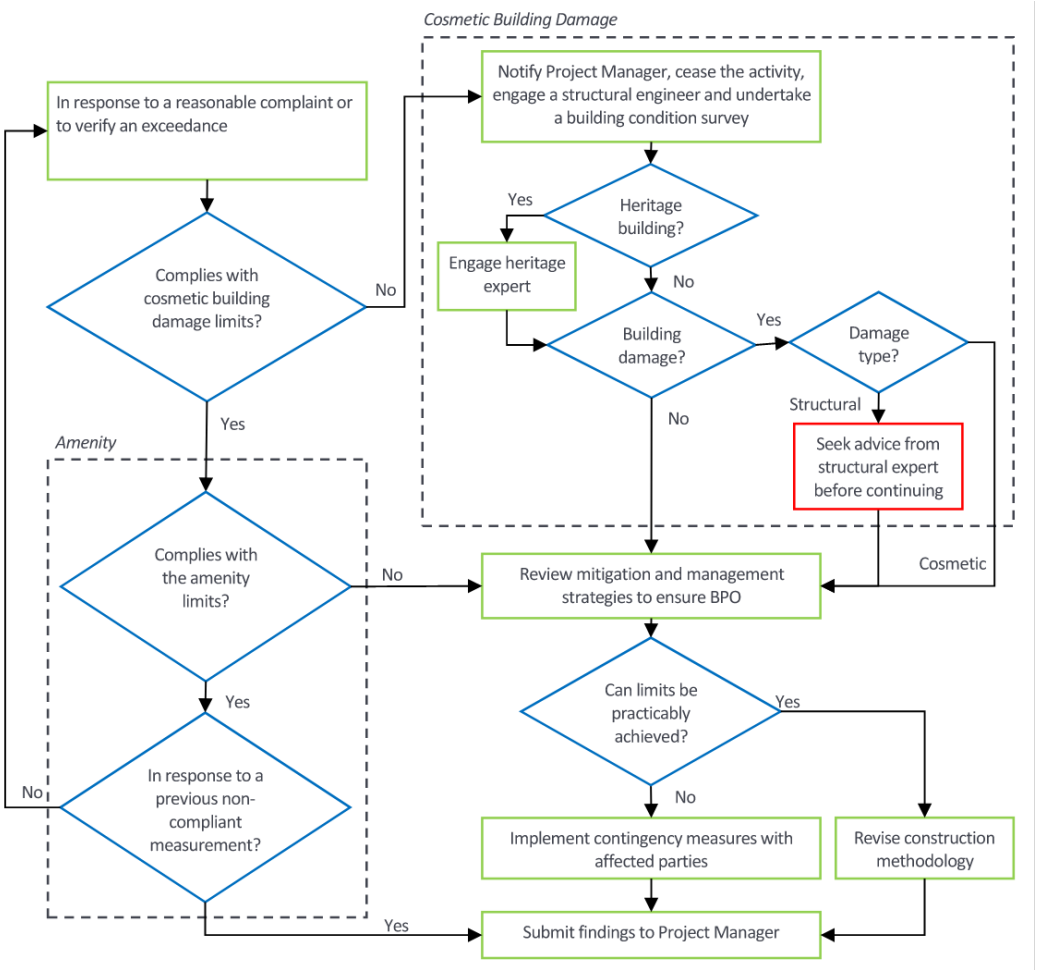


Figure 2: Vibration monitoring flowchart



10.0 CONSTRUCTION NOISE AND VIBRATION INDUCTION

To ensure criteria are achieved and noise to neighbours is minimised, 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. Load softer material at the bottom.
7. Noise enclosures should always have all doors/hatches closed when the equipment is in use.
8. Stationary equipment such as pumps and generators should be located away from neighbours.
9. All equipment is to be well maintained.
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 the 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.

Name	Company	Signed	Date

Appendix A – Glossary of Terminology

Term	Explanation
Noise	A sound that is unwanted by, or distracting to, the receiver.
dB	Decibel (dB) is the unit of sound level. Expressed as a logarithmic ratio of sound pressure (P) relative to a reference pressure (Pr), where dB = 20 x log(P/Pr). The convention is a reference pressure of Pr = 20 μPa in air and Pr = 1 μPa underwater.
dBA	The unit of sound level which has its frequency characteristics modified by a filter (A-weighted) to more closely approximate the frequency bias of the human ear. A-weighting is used in airborne acoustics.
$L_{Aeq\ (t)}$	The equivalent continuous (time-averaged) A-weighted sound level commonly referred to as the average level. The suffix (t) represents the period, 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.
L_{AFmax}	The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.
NZS 6803:1999	New Zealand Standard NZS 6803: 1999 "Acoustics - Construction Noise"
Vibration	When an object vibrates, it moves rapidly up and down or from side to side. The magnitude of the sensation when feeling a vibrating object is related to the vibration velocity. Vibration can occur in any direction. When vibration velocities are described, it can be either the total vibration velocity, which includes all directions, or it can be separated into vertical (up and down vibration), horizontal transverse (side to side) and horizontal longitudinal direction (front to back) components.
PPV	Peak Particle Velocity (PPV) is the measure of the vibration amplitude, zero to maximum, measured in mm/s.
BS 5228:2009	British Standard BS 5228:2009 "Code of practice for noise and vibration control on construction and open sites, Part 1: Noise, Part 2: Vibration"
DIN 4150-3:1999	German Standard DIN 4150-3:1999 *"Structural Vibration - Effects of Vibration on Structures"*
ISO4866:2010	International Standard ISO4866:2010 "Mechanical vibration and shock – Vibration of fixed structures – Guidelines of the measurement of vibration s and evaluation of their effects on structures"