Fingerboards Mineral Sands

EES Panel Hearing

Christophe Delaire

MARSHALL DAY Acoustics

Summary

- Noise is an important environmental consideration that will need to be carefully managed during the design, construction and operation states of the Project
- Detailed design modelling to verify and specify required mitigation measures and inform the Environment Management Plan
- Ongoing noise monitoring and management measures will be required throughout the Project
- Noise impact can be managed in accordance with relevant guidelines and assessment criteria
- The proposed mineral sands operation can be accommodated at the site and address all relevant noise and vibration considerations

MARSHALL DAY Acoustics

Legislation, policy and guidelines

Consideration	Relevant criteria
Operational noise (continuous noise)	EPA Publication 1411 *Noise from Industry in Regional Victoria* (NIRV) Recommended noise levels (day / evening / night)
Operational noise (short term events)	NSW *Road Noise Policy* Sleep disturbance criteria (night only)
Operational noise (off-site traffic)	NSW *Road Noise Policy* Relative threshold criteria Sleep disturbance criteria (night only)
Construction noise	EPA Publication 1254 *Noise Control Guidelines* Managerial controls (normal working hours) Guideline criteria (evening / night)
Operational & construction vibration	Various Australian and international standards and guidelines Vibration criteria for human response and structural damage

Legislation, policy and guidelines

Recent updates

- EPA Publication 1834 *Civil construction, building and demolition guide*
  - Supersedes the construction noise guidance from Section 2 of EPA Publication 1254
  - Applicable since November 2020
  - Construction assessment meets the assessment requirements of EPA Publication 1834
  - Construction assessment uses more stringent definition of audibility than suggested by EPA Publication 1834

- Environment Protection Regulations (EPR)
- EPA Publication 1826 *Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* (Noise protocol)
  - Intended to apply from 1 July 2021
  - Changes introduced by the Noise Protocol are inconsequential to the operational noise assessment
  - Identical noise criteria
  - Identical method for assessing effective noise levels
  - Saturday afternoons (1300-1800 hrs) are treated in the same way as afternoons on weekdays
  - Demonstrating compliance with NIRV demonstrates compliance with the Noise Protocol

MARSHALL DAY Acoustics

Assessment overview

Modelling scenarios

- Noise and vibration assessment based on indicative project design
- Accounts for a range of good practice engineering noise controls (e.g. considered placement of earth berms, low noise emission plant, proprietary mitigation packages)
- Key worst-case operational scenarios
  - Year 1 and Year 5 – Minimal distance between sources and receivers
  - Year 8 and Year 12 – Peak operations
- Key worst-case construction scenarios
  - Construction activities prior to commencement of production
  - Stripping of overburden and earthmoving to access ore considered in operational scenarios
  - Day period: Fines tailings cells (superseded by proposed centrifuge) / Dam walls
  - Night period: Freshwater dam
  - Scenarios selected based on peak activity that may occur concurrently, and close to receivers
  - Large structures to be fabricated in modular form off-site
  - Most construction activities proposed six-day week between 0700-1900 hrs
  - Sub soil removal and reduced-intensity construction activities proposed on a 24-hour basis
  - Similar equipment used to that proposed for mining

MARSHALL DAY Acoustics

Assessment overview

Noise prediction

- ISO 9613-2 prediction method
  - Conservative propagation conditions (e.g. downwind conditions, simultaneous operation)
- Sound power level data
  - AS 2436:2010 and BS 5228-1:2009
  - MDA's in-house database
  - Acoustic reports for similar projects by other acoustic consultants (MUP and WCP)
  - Early monitoring during construction and operation to verify assumptions and adapt mitigation measures
- Adjustments for duration and noise character
  - Representative 30-minute period
  - All equipment assumed to be fitted with broadband reversing signals
  - No adjustments for noise character
- Noise mitigation
  - Conceptual measures to address the assessed indicative project design
  - Developed in consultation with Kalbar
  - Detail design to be assessed with final project design and specified in the Work Plan / Noise Management Plan
  - Managerial controls (e.g. scheduling of activities)
  - Engineering controls (e.g. low noise plant, mitigation packages, screening)
  - Community consultation

MARSHALL DAY Acoustics

Assessment outcome

Operational noise

- Compliance with NIRV at all assessed receivers provided implementation of mitigation measures
- Risk of sleep disturbance at night is low for operational activities within the site
- All reasonable and practical mitigation measures are recommended to be implemented
- Material transportation - preferred option (new rail siding)
  - Compliance with NIRV at all assessed receivers
- Material transportation – alternative option (off-site road haulage)
  - Predicted change in off-site traffic noise less than the nominated relative threshold criteria
  - Potential for increased sleep disturbance

MARSHALL DAY Acoustics

Assessment outcome

Construction noise

- Predicted construction noise levels below the relevant NIRV recommended levels applicable to operational activities
- Evening period
  - Construction noise levels predicted below the derived criteria at 4 of the 13 assessed receivers
  - Risk of construction noise levels being above the derived criteria at remaining 9 receivers
- Night period
  - Predicted noise levels at night are relatively low and broadly similar to measured background noise levels
  - Construction noise levels likely inaudible internally at 7 of the 13 assessed receivers
  - Risk of construction noise levels being above the derived internal inaudibility criteria at remaining 6 receivers
  - Risk depends on a number of conservative assumptions
- Construction will require careful management to schedule works at less times of day where practicable, and limited as much as practical outside of normal working hours
- EPA's recommended amendments to NV17 (Submission 514) are considered appropriate and provides a pragmatic way of addressing night construction activities

MARSHALL DAY Acoustics

Assessment outcome

Vibration

- No activities are proposed that might typically generate significant ground vibration, such as piling or blasting
- Compliance with the most stringent ground vibration criteria predicted to be achieved at distances greater than 100 m
- The nearest sensitive receiver is located 145 m from the Project boundary
- Vibration from the Project is expected to be well within guideline and standard criteria ranges

MARSHALL DAY Acoustics

Conclusion

Design updates

- Pumping station
  - Proposed 340 m east-southeast of receiver R6
  - Cumulative noise levels comply with the applicable NIRV recommended levels

- Rail siding
  - Freight movements at rail siding limited to the day and evening periods
  - Loading and unloading operations during daylight hours only
  - Increase in number of reach stackers to avoid loading/unloading during night-time period
  - Noise levels predicted to comply with NIRV

MARSHALL DAY Acoustics

Conclusion

Design updates

- Centrifuge plants
  - Eliminates the need for Tailings Storage Facility, including Amphirol plant
  - Additional noise sources operating 24 hours per day (centrifuge plant, front end loader, transformer)
  - Additional haul trucks operating during the day only
  - Conservative assessment - no attenuation for centrifuge plant enclosure considered
  - Compliance with the NIRV at all assessed receivers – actual noise levels expected to be lower

- Newly identified receivers
  - Nearest newly identified receiver is R2004, approximately 280 m southeast of R5
  - Compliance with the NIRV at all newly identified receivers
  - Construction noise levels at R2004 predicted to be marginally higher (3 dB) than at R5 for the evening period
  - Construction noise levels at R2004 predicted to be lower than at R5 for the night period

MARSHALL DAY Acoustics

Thank you for your time

MARSHALL DAY Acoustics