

Fingerboards Mineral Sands Project Inquiry and Advisory Committee
Technical note

TN No: TN 005

Date: 8 February 2021

Subject: Response to IAC Request for Information – Part 2.2, question 3.

INTRODUCTION

The IAC's request relevantly provides:

2.2 Scheduling

(i) Reference

It is not clear to the IAC how particular activities are likely to be scheduled during construction and operation.

(ii) Request

3. The Proponent should provide an **outline scheduling plan for major construction and operation activities onsite and offsite (product transport, water intake pipeline, powerline establishment) including:**
 - a. the expected years lifecycle of the mining operations, including identification of the years of peak expected production and activity
 - b. how (a) might occur on a seasonal basis across the year
 - c. an anticipated daily schedule during construction and operation including those activities (and machinery proposed) which may occur on a 24 hour basis and the associated night time impacts on and off site (see also Section 10.5 of this report).

RESPONSE

Construction

Construction activities are summarised at Section 3.3 of the EES, and are assumed in the EES to take up to two years.

Subject to the exceptions listed below, all **construction activities on-site and off-site are proposed to occur on weekdays between 7am and 7pm**, although the noise and vibration assessment considered the potential for general construction activities to continue between these hours on Saturdays (Appendix 010, Section 3.2). However, the Proponent can advise that it is not seeking permission to undertake general construction activities on Saturdays, except for the exceptions described below.

The construction schedule assessed in the EES proposes construction of the freshwater storage dam over 24 hours, seven days per week. This is a critical-path project component, as it could store winter fill while the balance of the project is being constructed.

In practical terms however, the Proponent would only propose to undertake any construction activities at night if required due to scheduling constraints – see NV17 in the Mitigation Register at EES Attachment H. The main scheduling constraint associated with the freshwater storage dam is the time of year at which a final investment decision is taken, following completion of the approvals process. This date sets the time available for construction until the onset of the next winter fill period in July. To the extent that it is achievable in the project schedule, the construction activities will only be undertaken during daytime.

The EES also assesses the impact of overburden removal activities over a 24 hour cycle during the two year construction period, although in fact topsoil and overburden removal is really the commencement of mining activities, and is proposed to continue throughout the life of the project.

The machinery proposed to be used during construction activities - including the proposed 24 hour operations - are listed in Table 51 of EES Appendix 010, and the modelled location of this equipment is depicted on Figures 42 and 43.

The predicted night time noise impacts of construction activities are described in EES Main Volume Section 9.6.2 and EES Appendix 010 Section 8.4.

The general sequence of construction activities over the two-year construction period is shown in the summary table below.

Selected overburden extraction as a source of construction material for the freshwater dam, TSF and the Perry Gully catchment dam, is included in the respective construction item. Mining activities associated with overburden and ore mining, as part of the commencement of operational activities, are shown separately.

Project Activity	Start Month	End Month
Final investment decision	Month 0	
Detail design	Month 1	Month 8
Procurement of equipment and contractor	Month 3	Month 11
Offsite manufacturing and delivery to site	Month 6	Month 18
Construction Activities		
Plant access roads, haul road and rail siding	Month 8	Month 18
Process plant bulk earthworks	Month 8	Month 12
Construct freshwater dam	Month 10	Month 17
External road diversions (initial roads)	Month 9	Month 20
Temporary TSF (Initial cells)	Month 12	Month 18
River water supply PS and pipeline	Month 10	Month 14
Perry Gully catchment dam	Month 11	Month 18
Ore mining unit #1	Month 14	Month 16
Field piping	Month 13	Month 16
Process plant WCP and WHIMS	Month 11	Month 19
Plant admin and support buildings	Month 13	Month 18
Power supply OHPL and substation	Month 10	Month 18
Overburden mining commences	Month 19	
Ore mining commences	Month 22	
Plant commissioning	Month 19	Month 22

Mine production

The mining production profile is dictated by the **strip ratio** (i.e. the ratio of overburden tons that must be moved to expose 1ton of ore), which varies due to natural topographic changes above the ore zone. After the initial ramp-up period of production over the first three years, **the ore mining rate is steady at 12 million tonnes per annum (Mtpa)**. **Overburden movement required to maintain this ore mining rate varies between a low of 14.9 Mtpa in Year 8 to a maximum of 39.6 Mtpa in Year 12.**

The mining schedule initially targets the high grade and shallow ore at the northern part of the site, and will progress gradually south to the lower grade and deeper ore body. Because of this, **only one MUP is proposed for the first year as the project benefits from extracting the high grade ore.** The second MUP is proposed to be brought on-line after about 12 months of mining.

The minor production profile of the mine over its 15 year life is presented in Figure 4-9 of the draft work plan at EES Attachment B, which is reproduced below:

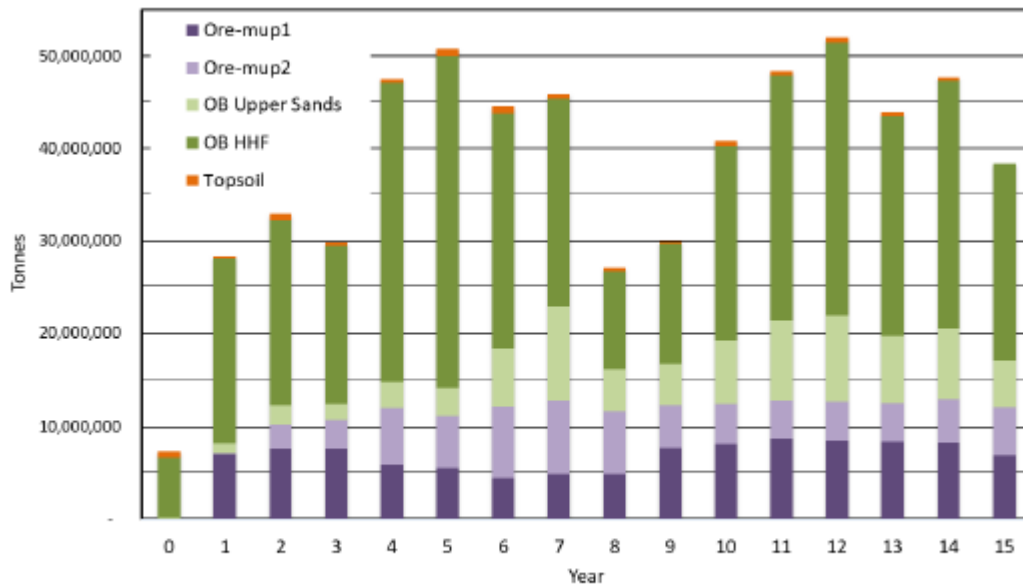


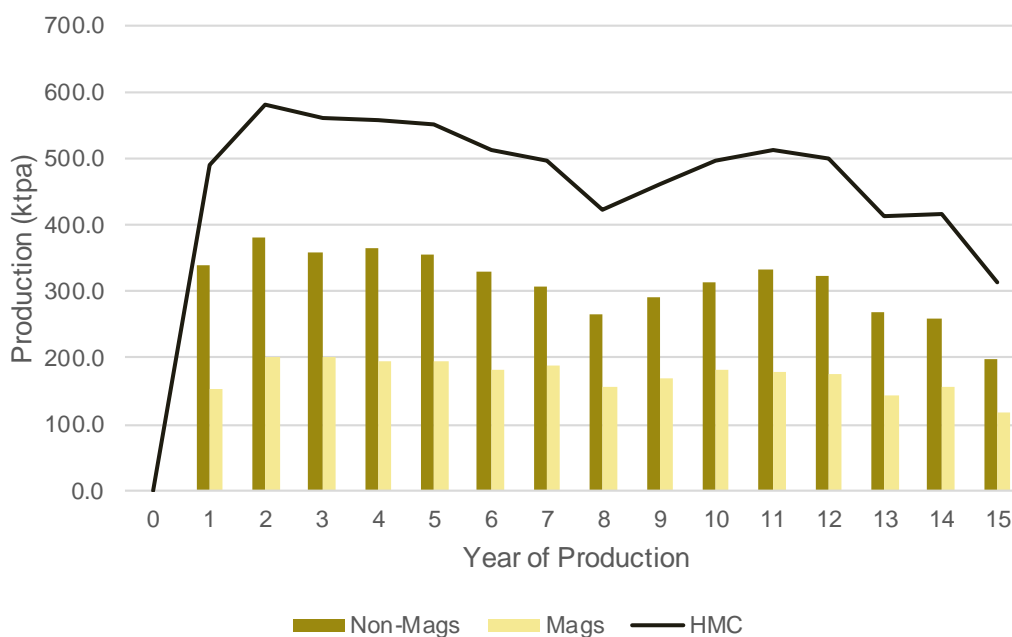
Figure 4-9: Material extraction schedule

No seasonal variation in mine production is contemplated or expected. The changing topography across the site and depth of overburden are the key determinants of the mine production rate.

Mine processing


The processing production profile at the WCP is dictated by the ore grade and mineral assemblage within the ore.

Total HMC (total of both magnetic and non-magnetic concentrate streams) production rate will vary between a low of 315,000 tons in year 15 to a maximum of 581,000 tons in year 2. The forecast processing rate is depicted below:



No seasonal variations in processing are contemplated or expected.

Daily operational schedule

Subject to the exceptions listed below, mine operations are proposed to occur over a 24 hour period, seven days per week, over two 12-hour shifts from 6am-6pm. Table 4-3 of the draft work plan at EES Attachment B presents an indicative list of the mining and ancillary equipment for mine operations. Appendix G3 of the noise and vibration assessment at EES Appendix 010 also lists the equipment and location of operational equipment that was modelled by Marshall Day Acoustics. A key difference however is that the EES assessments proposed the use of scrapers to extract overburden, but the Proponent now believes that truck and shovel may be a more efficient means of moving overburden that will produce lower dust emissions. This is one of the revised scenarios modelled and discussed in the expert witness statement of Simon Welchman. 

If ore is to be transported to port or the Baimsdale rail siding, then the EES proposes that this occur at night. This is necessary to maintain continuous night mining operations and prevent having to concentrate all ore truck movement during the day time.

However, certain operational activities are not proposed to occur 24/7 under the Fernbank rail siding option:

- Haulage of HMC from the WCP to the rail siding is proposed to occur over an 11 hour period during the day and evening (see NV36 in the Mitigation Register at EES Attachment H); and
- The indicative rail schedule provided by the rail authorities indicate that freight trains will arrive at Fernbank at midday and depart the Fernbank rail siding at 8:30pm, Mondays to Fridays inclusive. The daily haul task from the WCP to the rail siding has been designed such that there is sufficient material stored in container stacks at the rail siding to be available for a rapid turnaround of the train once it arrives. A reach stacker would remove empty a container from the train at the same time that a second reach stacker loads a filled container from the stacks onto the train. Rail haulage is not proposed on weekends.

In addition, maintenance grading of mine haul roads will only occur during day time shifts, and overburden haulage will be restricted to the day and evening shifts during Year 1 because the noise modelling predicts exceedances of the relevant NIRV values (see EES Appendix 010 Section 10.2.1 and NV11 in the Mitigation Register in EES Attachment H). The noise and vibration assessment in EES Appendix 010

indicates that overburden haulage during the evening and night may be possible as topography changes and screening is introduced, and will be possible in Years 5, 8 and 12 with appropriate earth bund screening (see Section 10.2.1).

The predicted night time operational impacts are described in EES Main Volume Section 9.6.3 and Appendix 010 Section 8.2. The air quality impacts of the night time construction activities are detailed in section 3.5.1 of Appendix A009, and the updated modelling discussed in Section 4.1 of Simon Welchman's expert witness statement.

The lighting is described in EES Main Volume Section 3.8.5 and the impacts are described in section 8.4.1 of EES Appendix A014 Landscape and Visual Impact Assessment.

The potential impact of lighting, noise and dust on ecology is described in EES Main Volume Sections 9.1.3.1 and 9.1.4.1 and EES Appendix 005 Section 7.4.5.