

Worsley Mine Development

CONTINUING OPERATIONS

The **objective** for this component of the environmental review is to **protect social surroundings from significant harm**.

Within this assessment Social Surroundings includes the aesthetic, cultural, economic and social surroundings to the extent that those surroundings directly affect or are affected by physical or biological surroundings.

INTRODUCTION

South32 Worsley Alumina is an integrated bauxite mining and alumina refining operation in the South West of Western Australia with a proud track record spanning more than 35 years.

The Worsley Mine Development is the next phase of bauxite mining, providing access to future reserves and resources to sustain production at our Worsley Alumina refinery near Collie.

The project is a key enabler for Worsley Alumina to continue to deliver benefits to the Peel and South West regions, and Western Australia more broadly, for many years to come.

The project is currently subject to a State and Commonwealth environmental approvals process, with a comprehensive environmental review undertaken and an eight-week public review period.

BACKGROUND

The information described in this factsheet is focused on the Noise and Vibration component of the overall Social Surroundings review and should be read in conjunction with the summary information provided for Social Surroundings.

NOISE

Worsley Alumina's mining activities, refinery and the Overland Bauxite Conveyors (OBC) currently operate on a 24-hour, 7-day a week basis, which will continue following development of the project. The primary sources of noise emissions from mining operations at the Boddington Bauxite Mine (BBM) include vegetation clearing, earthworks, drilling and blasting, haulage, primary and secondary crushing of ore and the OBC. Background noise levels at the BBM are dominated by agriculture and traffic related noise. Fauna (native and non-native) also provide a natural background source of noise. The Newmont Boddington Gold Mine overlaps with the north-eastern extent of the Primary Assessment Area (PAA) and is also a source of mining and blasting noise in the local area.

The closest urban residential area to the BBM is the Boddington town site, located approximately 5 km to the east. The noise sensitive receptors relative to the existing BBM operations include residences in the town of Boddington and surrounding agricultural land, as well as a public recreation site; the Tullis Bridge. Refinery operation is the predominant noise source near the proposed southern portion of the PAA as no mining activity currently occurs in the area. Due to the refinery being surrounded predominantly by State Forest and private land (the majority of which is Worsley Joint Venture owned land), forest management activities (including logging) and agricultural activities contribute to local background noise levels. The nearest urban residential area to the refinery is the Allanson town site, located approximately 9 km to the southeast. The noise sensitive receptors relative to the existing refinery operations include scattered residences in surrounding semi-rural land and forest. The nearest of these residences is approximately 3.7km from existing refinery operations.

BLASTING NOISE AND VIBRATION

Air-blast commonly causes a 'startle' reaction in humans, as adrenaline is released and an autonomic 'fight or flight' response ensues (DEC, 2013b). This reaction can become severe at high air-blast levels, which is often exacerbated by rattling of lightweight building components such as windows and ceilings, as the low frequency component of the air-blast wave passes over the dwelling. These effects are usually perceived as ground borne vibration.

Ground borne vibration from mining activities has the potential to impact on sensitive receptors through reduced amenity and the potential to damage the structural integrity of infrastructure at these receptors. The largest source of vibration from mining at Worsley Alumina is from blasting. In compliance with Worsley Alumina's commitments vibration is monitored during blasting events against an internal limit. On review of the previous six annual blast reports, it was shown that all vibration measurements taken were below the blast threshold levels for structural damage and human comfort. Site management practice has minimised the potential impact of vibration to a non-issue, as demonstrated through the monitoring results.

POTENTIAL IMPACTS

Noise and vibration emissions are generated from operations and have the potential to impact on the amenity of sensitive receptors, such as residences, public recreation sites and heritage sites.

The noise modelling results gathered to support the project indicated that predicted levels at receptors are highly variable and are dependent on the mining activities occurring in the area and applied meteorological conditions.

Noise modelling results confirmed that noise emissions are unlikely to impact on the amenity of public recreation sites, including Tullis Bridge and the Bibbulmun track (Mount Wells Camp). Noise modelling indicated that, at most residences, the predicted noise emissions for the proposed and continuing operations will be able to be managed in compliance with the Noise Regulations.

MITIGATION

All noise emissions from activities associated with the project are managed, and will continue to be managed, through the implementation of the Noise Management Plan (Mining and Blasting).

The Plan describes strategies and procedures that have been implemented to ensure Worsley Alumina complies with its obligations and objectives regarding noise management. The Plan includes a number of measures including but not limited to:

- Noise modelling as part of mine planning, and for day-to-day decision-making (flexible mine planning);
- Operation and maintenance of a noise monitoring network;
- Airblast over-pressure noise and vibration monitoring and design modifications for all blasts;
- Noise suppression activities/specifications, including on-site management and engineering controls.

The forecasting of operational noise and mine planning is informed by noise modelling, and there are several measures in place to minimise noise emissions including engineering controls, monitoring and training. The results of the noise modelling assessment undertaken for the project provided confirmation that the management measure of incorporating meteorological conditions into scheduling mining activities is a credible and effective mitigation approach. Furthermore, the noise monitoring network allows for proactive management and mitigation of noise from Worsley Alumina's operations. Management procedures and practices are in place if modelling or monitoring identifies that noise levels are approaching thresholds.

PREDICTED OUTCOME

Noise modelling indicated that, at most residences, the predicted noise emissions for the proposed and continuing operations will be able to be managed in compliance with the Noise Regulations.

For residences where modelling of noise emissions under worst-case conditions indicated a risk category of 'Critical', 'Major' and 'Moderate', future control measures will be applied in accordance with those outlined in the relevant standards, management plans and operating procedures. There is a well-established noise management approach at the BBM, which is considered as valid and effective to continue through the project. The results of the noise modelling indicate that noise emissions are not likely to impact on sensitive receptors surrounding the Contingency Bauxite Mining Envelope (CBME), and vibration is not expected to impact on sensitive receptors at either the BBM or CBME.

More detailed information is provided in Section 5.7 of the Environmental Review Document.

