

Our Ref V9019

Contact Andrew Mack

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Colleen Murphy  
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Dear Colleen

## **MATILDA ZIRCON LIMITED – NOISE MANAGEMENT**

Cardno WA Pty Ltd (Cardno) was recently engaged to undertake a review of various documents pertaining to the mineral sands mine proposed by Matilda Zircon Ltd (MZL) to be located within the Shire of Serpentine-Jarrahdale (the Shire) within the Keysbrook area. The operations also straddle the neighbouring Shire of Murray boundary.

The review specifically focussed on documents pertaining to the assessment and management of noise from the proposed operations and will form part of any consideration by the Shire of the proponent's Application for the proposed operations. The review is based on the documentation supplied by the Shire, current industry practice as well as the Shire's Policy in relation to mineral sands mining within its jurisdiction.

### **Background**

#### **The Proposal**

A referral to the Environmental Protection Authority (EPA) for a mineral sands mine was made pursuant to Section 38 of the *Environmental Protection Act 1986* in May 2005. On 25 July 2005 the EPA set a level of assessment for the proposal at a Public Environmental Review (PER) with an eight-week public review period.

Following this assessment (including consideration of a range of public submissions) the EPA's report on the matter (Bulletin 1269) was released in October 2007. On 19 October 2009, the Minister for Environment; Youth issued Statement No. 810 which approved the proposal subject to a range of conditions (of which Condition 14 specifically related to noise and its management).

According to Ministerial Statement No. 810, the proposal involves the processing of approximately 920,000 tonnes of heavy mineral concentrate over an 8 year life of mine. The proposal has an area of some 1,366 hectares with an average depth of mine of 2 metres below ground level, and up to 6 metres on locations with sandy dunes.

Through the PER process, the matter of noise was raised through the range of documentation generally associated with a process of environmental impact assessment. In particular, Section 9.10 of the PER specifically relates to the assessment and management of noise and directly draws on work completed by a sub-consultant, Lloyd Acoustics (now known as Lloyd George Acoustics). This work was provided as an Appendix to the PER (Appendix 9) and was completed in February 2006.

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Following the assessment completed by the EPA, a range of issues were noted and highlighted with the EPA's report on the proposal. The EPA also noted that a Noise Management Plan (MBS 2007) had been prepared, but that there were still some residual concerns regarding potential noise impacts, particularly at night, and noted that the recommended noise levels (a daytime noise level of 50dB(A), evening noise limit of 40dB(A), and a night time noise limit of 35dB(A)) would predispose the operations to daytime activity only. Ministerial Statement No. 810 was subsequently released and contained the following condition relating to noise management:

**14 Noise Management**

**14-1** Unless otherwise agreed in writing between the proponent and the owner and any occupier of noise sensitive premises:

- a. the proposal must comply with the Noise Regulations at any building associated with a noise sensitive use at any noise sensitive premises; and
- b. outside the hours 0700 to 1900 Monday to Saturday, or on public holidays, no mining activity is to be undertaken within 1,500 metres of any building associated with a noise sensitive use at any noise sensitive premises.

**14-2** Prior to an agreement being executed under 14-1, the proponent is to ensure owners and occupiers obtain independent legal advice on the meaning and effect of any such agreement.

**14-3** Unless registered on the relevant land title, an agreement obtained under 14-1 does not bind successive owners or occupiers.

**14-4** Noise monitoring shall be undertaken in a manner consistent with the Noise Monitoring Plan, and shall include monitoring of noise levels at a location or locations representative of the noise sensitive premises closest to the active mining area for which the proponent does not have written agreement in place under 14-1.

**14-5** The proponent shall submit quarterly reports to the CEO, prepared by an independent acoustic expert, which include the following:

- a. reviews noise monitoring methodology and results for the quarter;
- b. an assessment of the extent to which noise emissions from the proposal comply with the Noise Regulations; and
- c. details of any management or other measures that the proponent has implemented, or proposes to implement, to abate emissions, and to prevent non-compliance with the Noise Regulations, and the effectiveness of any measures that have been implemented.

**14-6** The report referred to in 14-5 is to be provided to the CEO within four weeks of the end of the quarter to which it relates, with the first report due within four months of the commencement of operations.

**14-7** Within six weeks of the end of the first 12 months following the commencement of operations, the proponent is to submit a report to the CEO, prepared by an independent acoustic expert, which includes the following:

- a. an assessment of the extent to which noise emissions from the proposal comply with the Noise Regulations;
- b. details and effectiveness of management or other measures the proponent has implemented to reduce or abate noise emissions;
- c. details of what, if any, modifications are recommended to these conditions to more effectively manage noise emissions from the proposal.

**14-8** The reports referred to in condition 14-5 and 14-7 shall be made available to the public in a manner approved by the CEO.

## Noise

Environmental noise in Western Australia is governed by the *Environmental Protection Act 1986*, through the *Environmental Protection (Noise) Regulations 1997* (the Regulations). Regulation 7 defines the prescribed standard for noise emissions as follows:

- "7. (1) Noise emitted from any premises or public place when received at other premises –
- (a) Must not cause or *significantly contribute to*, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind; and
  - (b) Must be free of –
    - i. Tonality;
    - ii. Impulsiveness; and
    - iii. Modulation".



A "...noise emission is taken to *significantly contribute* to a level of noise if the noise emission exceeds a value which is 5dB below the assigned level..." and tonality, impulsiveness and modulation are defined in Regulation 9 of the Regulations.

Generally, an assessment of the potential impacts of noise is undertaken through a modelling programme that utilises specific default data from a range of equipment (that is, estimated noise emission levels from the operational equipment to be used within the proposal) and couples these with a meteorological dataset to produce a suite of noise level contours for a particular activity. Activities that are situated in one particular location are modelled differently to those which are 'transient' and move throughout a site (eg vehicle movements). The work generally takes into account background noise as well as potential cumulative impacts and is then used to determine the likely impacts of noise on the nearest sensitive receptors. From this, an assessment of the appropriateness of the proposal can be made as well as any recommendation in terms of noise mitigation and/or management.

Once the proposal commences on the land in question (ie the proposal to undertake mineral sands mining is approved and mining activities begin), it is classed as 'Industrial' under Schedule 1 Part A of the Regulations and, as such, residences and other sensitive land uses will need to have an influencing factor due to this industrial use. These would need to be calculated for each of the receptors considered within the overall assessment.

In terms of the monitoring proposed, Part 2 Clause 7(3) of the Regulations notes that a level of noise can either be:

- measured at its point of reception, when to the extent practicable, other contributing sources are not present; or
- Calculation of the level at its point of reception based on measurement of the noise emission at a reference point suitably determined to be a location where the relationship between the noise emission as measured at the reference point and the point of reception can be established.

Based on a review of the supplied documentation, the work undertaken by MZL has generally been consistent with this approach and it would appear that future work is also likely to satisfy these requirements.

### **Documentation**

The following documentation has been considered in the review of the assessment and proposed management of noise from the proposal:

- Keysbrook Titanium Minerals Proposal Noise Impact Assessment (February 2006, Lloyd Acoustics)
- Keysbrook Mineral Sand Project Public Environmental Review (June 2006, MBS Environmental)
- Keysbrook Mineral Sand Project Public Noise Management Plan (May 2007, MBS Environmental)
- Keysbrook Mineral Sand Project Public Environmental Review, Response to Submissions (June 2007, MBS Environmental)
- EPA Bulletin 1269 (October 2007, EPA)
- Ministerial Statement No. 810 (19 October 2009, Minister for the Environment)
- Application for Development Approval (stamped as being received on 8 February 2010, Planning Solutions); and
- Local Planning Policy No.30, Mineral Sands Extraction (Final Draft, 10 February 2010, Shire of Serpentine-Jarrahdale)

Cardno previously undertook a review of the PER documentation (although not the Noise Management Plan) in 2006 for the Shire. It is worth noting that noise was not raised as an issue of concern within correspondence from Cardno provided to the Shire dated 10 August 2006.



## Review

Noise Assessments in Western Australia are generally required to be undertaken to be consistent with the EPA's draft Guidance Statement No. 8 (May 2007) titled "Guidance for the Assessment of Environmental Factors – Environmental Noise". The EPA preliminary draft Guidance Statement No 14, "Road and Rail Transportation Noise" is also considered when looking at proposals that cause an increase in traffic flow on existing infrastructure.

As previously indicated within this correspondence, Cardno undertook a review of the PER documentation some 4 years ago following its Referral to the EPA. Generally speaking, the work undertaken to assess the potential noise impacts was determined to be appropriate and likely to be of minimal consequence assuming the recommendations identified were indeed implemented. The study undertaken by Lloyd Acoustics (and later reflected within the PER) noted that there are a number of residences within the subject site (which covers two Local Government Authorities).

In terms of the proposal currently before the Shire, the Application for Development Approval notes that whilst there are no residences within the planned excavation area, there are three occupied residences located within Lots 1 and 52. Of the three residences, two are 2,000 metres from the excavation area. According to the Application for Development Approval, a newly constructed colorbond iron shed has also been adapted as a residence within 250 metres of the excavation area on Lot 1. It is unclear whether this building has been considered as a "sensitive premises" for the purpose of any noise assessment.

The neighbouring landuses are predominantly used for agriculture and there are five residences located on land adjacent to the subject site. The residences located on Lot 64 to the north-west of the subject site are over 1.2 kilometres from the excavation area with the closest residence approximately 300 metres from the excavation area.

The work undertaken by Lloyd Acoustics determined that, to comply with the Regulations, the wet concentrator plant must be at least 1km from residences, the hopper/screen and pump should be located 2 metres below ground level (mbgl) within a 2m high bund and 215m from residences, and the booster pumps should be at least 200m from residences.

The assessment also noted that the principal equipment for moving the sand to the processing plant was the scraper, and this had the most potential for impacts due to its mobility and sound power level. The work completed identified a stringent range of operating conditions that would minimise the risk of non-conformity with the Regulations and relies upon the prevailing meteorological conditions (wind) to determine whether operations can be undertaken within certain distances from residences. This approach is reliant on a suite of measurements that may not be readily available (the distance from a residence at any given time) and in some instances are highly subjective (eg "winds to be calm or upwind"). Whilst this approach has some merit as a proactive approach (ie when to commence operations in a certain area), it becomes a difficult issue to manage once operations have commenced in a certain area and the winds are 'flukey' or difficult to predict (direction or speed). Certainly in the area of the proposed development, the presence of katabatic winds from the Darling Scarp should be considered in any assessment undertaken.

Similarly an absence of commentary on the potential impacts of the operations noise emissions on the native fauna population utilising the area is also lacking consideration. Whilst this issue is difficult to assess, one of the key characteristics of the proposal was that it would retain areas of native vegetation to provide habitat and foraging areas for various species. Whether such impacts to fauna populations from noise emissions could be considered as 'significant' under the Western Australian or Federal legislation might also require some attention.

Further to this comment, there appears to be little consideration of the potential impacts on the surrounding agricultural land-uses, particularly in terms of the potential for impacts to livestock (horses, sheep and cattle). Whilst this omission is probably a facet of the fact that the Regulations focus on public amenity values, given the locality of the proposal it is likely that this is an issue that the Shire would need to take into account in making its decision.



It is worth pointing out at this time that the EPA's own assessment identified some apparently minor short-comings in the work of Lloyd Acoustics, particularly in relation to the use of a number of items of equipment at any one time (eg two or more scrapers), the lack of substantiation regarding background ambient noise masking tonality and the fact that only the closest residences were considered within the assessment. Notwithstanding this, the EPA found that the work had been completed to their general satisfaction and was able to recommend that noise from the proposed operations could be satisfactorily managed.

It is interesting to note that an assessment of vehicles on the internal roads (within the proposal footprint) was only undertaken in May 2007 (almost a full year after the PER had been submitted). This work found that the noise from these vehicles complied with the requirements of the Regulations. It is not clear however whether the issue of cumulative noise (both from the operations and the truck movements) was ever considered. This could be of particular significance with respect to the modelling of operational noise undertaken (which demonstrated some potential for infringement on the assigned levels within the Regulations).

The Noise Management Plan, compiled by MBS and dated May 2007, appears to acknowledge the work undertaken by Lloyd Acoustics in their assessment and incorporates the various recommendations provided in the acoustic study. Whilst this Plan addresses all issues raised within the work undertaken by Lloyd Acoustics and should be considered to be appropriate for those aspects of the operations, it does not respond to the issues raised above. Queries would still remain from our perspective in terms of some of the cumulative impacts that require consideration as well as the consideration of the prevailing local meteorological conditions that might have an influence on the noise levels measured at any of the sensitive receptors. It will be important to ensure that any monitoring is undertaken in accordance with the requirements detailed within the Regulations (eg Schedule 4 "Rules for Sound Level Monitoring Equipment").

Within the PER 'Response to Submissions' document, there is a range of clarifying information provided in response to a range of queries regarding noise. It is noted however that the issue of cumulative noise receives little if any comment. Certainly in terms of the comment on page 146 of the document in relation to the use of portable generators, whilst the document confirms these will comply with the Regulations, it does not suggest that the potential cumulative impacts of their use coupled with other sources of noise onsite have been considered. Furthermore, on Page 148, the documentation notes that, in relation to the issue of cumulative noise, generally the most dominant noise will mask other minor noise sources. It is Cardno's view that this would generally be true in certain circumstances, but further attention to this is likely to be required as we would suggest that such an appraisal is probably likely to be fairly subjective and will depend on the nature (and source) of the noise in question.

Whilst the submissions on the PER (and particularly pertaining to the issue of noise) raised a suite of concerns, some of which appeared to have obvious merit in terms of the potential impacts from the proposed operations, it is Cardno's view that these were either adequately addressed through the Response to Submissions documentation or through the preparation the preparation of the Noise Management Plan (and requirement for subsequent work as operations commence and progress).

Given the work undertaken as part of the PER, through the preparation of the Noise Management Plan and in the Proponent's response to submissions, the EPA's Bulletin No. 1269 noted that there were a few outstanding issues that warranted clarification including the following:

1. Management measures were not provided for dealing with other sources when the scraper is not operating.
2. Only the closest residences were included in the noise assessment report. However, there are residences 400m from the mine area that were not included in the assessment.
3. No background data was provided to support the assertion that ambient noise during the day should mask tonality, thus making a 5dB reduction unnecessary.
4. As night time operations could be unacceptable at distances of less than 1km to residences, the proponent identified that mining in the southern part of the project area would be restricted to daytime only. There are at least 19 residences within 1km of areas to be mined and other areas across the mine area would be similarly affected and have restrictions in night time mining.



Notwithstanding the above, the EPA saw fit to recommend to the Minister for the Environment that an adjustment to the assigned level that the operation is required to comply with during the day should be made, but that the assigned levels for evening and night time operations should remain the same. The recommendations were therefore for daytime noise limits of 50dB(A), evening limits of 40dB(A) and night time limits of 35dB(A)

Within Statement No. 810, the Minister for the Environment gave due consideration to the issue of noise and its proposed management, but chose to impose the statutory limits detailed within the Regulations on the operations (unless otherwise agreed to between the proponent and the occupier of any noise sensitive premises). The Minister also saw fit to restrict operations outside the hours 0700 to 1900 Monday to Saturday, or on public holidays to a distance of no less than 1500 metres from a noise sensitive premises.

Furthermore, the Minister required that monitoring be undertaken in accordance with the Noise Management Plan, that quarterly reports on this monitoring be supplied to the DEC and that an overall assessment of the performance of the operations against the prescribed standards should be completed at the end of the first year of operations incorporating an assessment of the proponent's commitment to continuous improvement in terms of noise reduction from operations.

### **Summary**

Generally speaking, the EPA's approach to environmental impact assessment would involve a critical review of a range of environmental factors to determine whether further consideration and management would be required to ensure that the impact of the proposal on that particular factor would satisfy the EPA's objectives. Noise (and the potential for impacts on amenity and health) is one such issue that was considered in detail by both the proponent and the EPA.

In its assessment, the EPA took into account work completed by Lloyd Acoustics, the PER documentation and Noise Management Plan developed by the proponent as well as the proponent's Response to Submissions document. Despite a number of areas that the EPA determined to warrant further consideration, it was their view that the proposal could be managed to meet the necessary requirements to warrant approval. Furthermore, they recommended a range of conditions, one of which suggested less stringent criteria to be met for daytime noise.

The Minister for the Environment also determined that the proposal could go ahead, subject to a range of conditions. Of particular note is the fact that the Minister required compliance with the Regulations (ie presenting the proponent with more stringent operational criteria) and also required the implementation of a regular monitoring programme which focuses on ongoing environmental improvement.

Despite the potential short-comings in the work undertaken by the proponent, Cardno is of the view that the work undertaken is of sufficient rigour to suggest that the issue of noise has been adequately investigated and addressed. Certainly in terms of the potential issues alluded to within this document, we suggest that the requirements of Condition 14 of Ministerial Statement No.810 will allow for the ongoing appraisal of the operations and a refinement and improvement of any identified noise impacts. We would expect that this work would be able to identify any shortcomings in the work undertaken to date and address any of the necessary information gaps that have been raised through this document and the EPA's assessment.

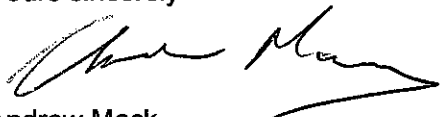
With regard to the Shire's current draft Policy on Mineral Sands Extraction, it is noted that the Policy is in place "To maintain a general presumption against the extraction of mineral sands within the Serpentine-Jarrahdale Shire, unless the proponent has demonstrated that net social, economic and environmental benefits will be delivered in the short, medium and long term." Whilst one could argue that the work undertaken clearly addresses the requirements pertaining to noise as they are detailed within the Policy, Cardno could not support a contention that the proponent has demonstrated any net social, economic or environmental benefit as a result of the proposal purely on the basis of this review alone.



The Shire would need to consider all information provided to support the proposal before determining whether these criteria have been satisfied. Noise is certainly one aspect that warrants consideration but, in Cardno's view, this is an impact that has received adequate and appropriate attention by the proponent.

We trust that this information meets your needs at this time. Should you wish to discuss this matter further, please do not hesitate to contact the undersigned on 9273 3888.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Andrew Mack', with a long, sweeping underline.

Andrew Mack  
Manager – Environmental Services WA  
for **Cardno**