

ASSESSMENT REPORT

RASP ZINC-LEAD-SILVER MINE PROJECT Ventilation Shaft Modification (07_0018 MOD 1)

BACKGROUND

Broken Hill Operations Pty Ltd (the Proponent) has approval to construct and operate the Rasp Zinc-Lead-Silver Mine (the Rasp Mine) in Broken Hill (see Figure 1).



Figure 1: Location of the Rasp Mine

The Rasp Mine was approved by the Director-General under delegation on 31 January 2011 and allows the Proponent to:

- extract up to 8.45 million tonnes of ore over the 15-year life of the proposal, at an average rate of 750,000 tonnes per annum;
- crush and process this ore to produce ore concentrates containing approximately 44,000 tonnes of lead (73% lead and 985 grams per tonne of silver) and 87,000 tonnes of zinc annually;
- transport the crushed ore from the site by road during the first 18 months of the project, until processing facilities have been constructed, after which time crushed ore concentrate would be transported from the site by rail to domestic smelter and port customers (for export); and
- rehabilitate the site.

Since receiving project approval, the Proponent has commenced the construction of the underground mine facilities, surface buildings and associated infrastructure (ie processing plant and rail siding). The Rasp Mine includes the construction and operation of a primary ventilation circuit to draw air through the underground mine workings to clear exhaust fumes, dust and heat resulting from the mining operations and provide fresh

air to the mine. The ventilation shaft was to be constructed within the existing disused Kintore Shaft in the Little Kintore Pit.

In March 2011, a significant rainfall event in Broken Hill led to the collapse of the Kintore Shaft such that it cannot feasibly be restored to accommodate the ventilation infrastructure. Therefore the Proponent is seeking to relocate the proposed ventilation shaft to another location on the site.

PROPOSED MODIFICATION

On 23 November 2011, the Proponent submitted an application to modify the Rasp Mine's project approval under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and accompanying environmental assessment (EA, see Appendix A). The proposed modification involves relocating the ventilation shaft and associated exhaust fans from the Little Kintore Pit to a central location to the northwest of the previously proposed site (see Figures 2 and 3).

The new shaft would be 400 metres (m) deep and 5 m wide, and constructed by excavating from the underground mine upwards towards the surface, known as the 'raise bore' method. Following construction of the shaft, two ventilation fans would be installed underground, one at the base of the shaft and the other 160 m above the base of the shaft. A diffuser approximately 7 m high with a 90 degree bend and a 6 m diameter opening would be installed at the surface of the shaft, within an 8 m deep excavation in an existing waste rock emplacement. This excavated material would be placed in bunds in the adjacent area, as shown in Figure 4. Surface earthmoving activities associated with the construction of the shaft is predicted to take 4 weeks, and construction of the ventilation circuit is predicted to take 3 months in total.

Power to the ventilation fans would be provided by a new 22 kV overhead powerline to be connected to the existing network. Minor modifications to the stormwater management of the mine would be required as a result of the proposal, as shown in Figure 5.

3 STATUTORY CONTEXT

Legislative Framework

The project approval was granted under delegation from the Minister under Part 3A of the EP&A Act. In accordance with clause 3 of Schedule 6A of the EP&A Act, section 75W of the Act as in force immediately before its repeal on 1 October 2011 and as modified by Schedule 6A, continues to apply to transitional Part 3A projects, such as the Rasp Mine project. Consequently, this report has been prepared in accordance with the requirements of section 75W.

Approval Authority

Under section 75W, the Minister for Planning and Infrastructure is the approval authority for this modification application. However, the Executive Director Major Projects Assessment may determine the application under the Minister's delegation of 14 September 2011 as:

- Broken Hill City Council has not objected to the proposal;
- the Proponent has not made any reportable political donations; and
- there are less than 25 public submissions in the nature of objections.

Modification

The proposed modification does not involve major changes to the currently approved project. The proposal is to construct an already approved component of the Rasp Mine in a different location, within an already disturbed area of the site. It does not involve changing the mining or transportation components of the approved project.

The Department is satisfied that the proposed modification and associated environmental impacts are substantially consistent with those previously approved. The Department is satisfied that the proposed modification falls within the scope of Section 75W of the EP&A Act and may be determined.

Consultation

Under Section 75W of the EP&A Act, the Department is not required to exhibit the modification application or undertake consultation. Notwithstanding, the Department referred the modification application to the Office of Environment and Heritage; NSW Office of Water; NSW Department of Trade and Investment, Regional Infrastructure and Services (Division of Resources and Energy); Population Health Services for the Far West Local Health District; Roads and Maritime Services and Broken Hill City Council. None of the agencies objected to or raised any concerns over the proposal.

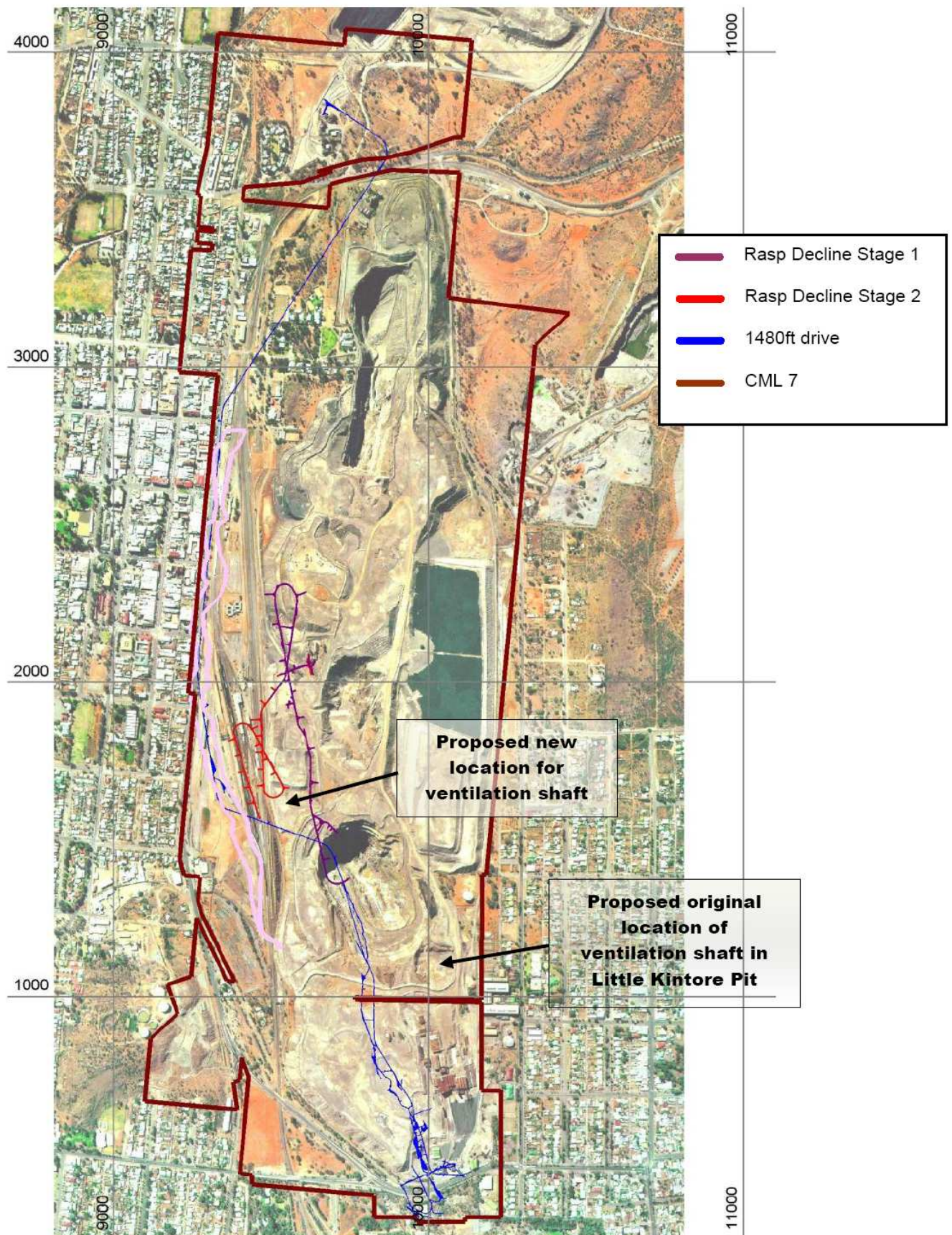


Figure 2: Location of approved and proposed ventilation shaft



Figure 3: Detail of approved and proposed ventilation shaft



Figure 4: Proposed waste rock management



Figure 5: Proposed stormwater management

4 ASSESSMENT

The Department has assessed the potential impacts of the proposed modification. Table 1 details this assessment.

Table 1: Assessment of environmental impacts

Issue	Consideration and Conclusion
Air quality	<p>Constructing and operating the ventilation shaft at a new location has the potential to cause air quality impacts at different receptor locations compared with the originally approved project. The relocation would shift the potential impacts of the shaft's construction and operation from the eastern boundary of the project site to receptors along the northwest boundary (see Figure 2). This area includes a mix of commercial, residential and other land uses including schools, pre-schools and hospitals. However, the proposed new location is further from the project's site boundary than under the approved project and therefore further away from the nearest residences.</p> <p>The EA includes an air quality impact assessment (AQIA) by PAE Holmes of the proposal, including a review of the air quality impact assessment undertaken for the approved project.</p> <p>The AQIA notes that certain key air quality parameters (ie nitrogen dioxide (NO₂), volatile organic compounds, sulphur dioxide, carbon monoxide and polycyclic aromatic hydrocarbons) associated with the project are solely derived from the ventilation shaft (wherever it may be located). These emissions are associated with underground mining activities such as vehicle use and blasting. No change to the existing ventilation shaft emissions criteria in the project approval has been sought by the Proponent.</p> <p>Overall, the modification would lead to different locations for maximum predicted emissions, but no increase in actual emissions. For example, the maximum predicted 1-hour NO₂ emissions proposed for the most affected receptor (commercial property) is 197 µg/m³, which is 100 µg/m³ greater than predicted for this receptor under the approved project, although still within the site's environment protection licence (EPL) criterion of 246 µg/m³. However, at another receiver, where the existing maximum predicted 1-hour emission was 195 µg/m³, emissions are predicted to reduce to 109 µg/m³. Predicted annual average NO₂ concentrations are also comparable with the approved project and less than 3% of the EPL criterion of 62 µg/m³.</p> <p>For most hospital and schools receivers, the 1-hour NO₂ emissions are predicted to be the same or lower as for the approved project. The maximum predicted emissions at such sensitive receivers are 104 µg/m³, which is less than for the approved project (117 µg/m³).</p> <p>However, at two sensitive receivers (Broken Hill Primary School and Morgan Street Primary School), 1-hour NO₂ emissions under the modified project are predicted to be higher than for those individual sites under the approved project. Of these two, The Department notes that the predicted maximum 1-hour NO₂ emission for the Morgan Street Primary School (located approximately 2 km</p>

	<p>from the mine boundary) increases from 24 $\mu\text{g}/\text{m}^3$ to 96 $\mu\text{g}/\text{m}^3$ – a 4-fold increase in maximum predicted emissions. However, further analysis of this prediction by PAE Holmes (Appendix C) indicates that of the 8,760 model runs, the second and third highest predictions for this location are just 18 $\mu\text{g}/\text{m}^3$ and 10 $\mu\text{g}/\text{m}^3$, and that 99.7% of predictions fall below 5 $\mu\text{g}/\text{m}^3$. The Department is therefore satisfied that the highest prediction can be considered to be a statistical outlier, and that such a modelled outcome is very unlikely to be experienced in practice. 1-hour NO_2 emissions at the Broken Hill Hospital are predicted to be almost half those of the approved project.</p> <p>The predicted <i>annual</i> average NO_2 emissions are also all comparable with the approved project at all schools and hospital receivers, with the maximum predicted emission of 0.6 $\mu\text{g}/\text{m}^3$ being approximately 1% of the EPL criterion.</p> <p>The AQIA predicts that the magnitude of impact for the other key pollutants follows this same pattern of a varied location for predicted maximum impacts, but no great change in the magnitude itself, which remain well within the relevant criteria in the mine's EPL.</p> <p>Particulate (PM_{10}, $\text{PM}_{2.5}$ and total suspended particulates) and lead emissions from the ventilation shaft are predicted to make only a minor contribution to total site impacts, ie most dust (and lead contained within dust particles) is derived from wind pick-up from the surface, rather than from ventilation air emissions from the shaft. The majority of school and hospital receivers are also likely to experience lower dust deposition from the modification. The AQIA predicts that the project's overall 24 hour PM_{10} emissions at the most potentially affected receiver would incrementally increase by 3.1 $\mu\text{g}/\text{m}^3$, to 3.5 $\mu\text{g}/\text{m}^3$, or 7% of the project criterion (50 $\mu\text{g}/\text{m}^3$), which is generally consistent with the predicted emissions for the approved project. As with the approved project, the predicted contribution of the ventilation shaft towards <i>annual</i> average PM_{10} is very low (0.2 $\mu\text{g}/\text{m}^3$ or 0.7% of the project criterion of 30 $\mu\text{g}/\text{m}^3$).</p> <p>Surface construction activities and the handling of waste rock (discussed below) would be managed through dust management measures established in the Air Quality Management Plan required under the mine's project approval. The existing project approval requires that the Proponent must review and revise its Air Quality Management Plan following the approval of any modification. Given that surface activities are of short duration (4 weeks) and subject to the implementation of appropriate dust mitigation measures during and following the transfer of excavated material, the EA concluded that construction-related air quality impacts are negligible and consistent with those previously approved.</p> <p>With these measures in place, the Department is satisfied that the predicted air quality impacts would be minimal and consistent with those of the approved project.</p>
Noise	<p>Constructing and operating the ventilation shaft at a new location has the potential to cause noise impacts at different receptor locations compared with the approved project. The EA includes an assessment of the potential noise impacts of the proposal, including an update of the noise impact assessment undertaken for the approved project.</p> <p>Whilst in a new location, the ventilation shaft would be located more centrally on the project site and therefore further away from the nearest residences. The ventilation fans would be located underground and an 8 m high embankment would surround the duct/diffuser, which would further reduce potential noise impacts on nearby receivers.</p> <p>The noise impact assessment found that the predicted operational noise from the exhaust fans would be below the noise criteria listed in the project approval and that noise impacts from the relocated ventilation shaft and associated fans would be consistent with the original assessment.</p> <p>The majority of construction works would be conducted underground and within previously approved standard construction hours, with approximately 2 weeks of earthworks and installation of surface ventilation infrastructure. The assessment found that construction noise impacts are generally consistent with the original assessment and would comply with the existing noise criteria.</p> <p>The Proponent is required to review and revise its Noise Management Plan to incorporate the proposed modification. With these measures in place, the Department is satisfied that any potential noise impacts as a result of the modification would be minimal and manageable.</p>
Water Management	<p>The construction of a new 400 m deep ventilation shaft has the potential to intercept the groundwater table. The revised location of the ventilation shaft would also require minor changes to approved surface stormwater management measures.</p> <p>As part of its investigations for the new ventilation shaft site, the Proponent undertook geotechnical drilling to a depth of 399 m. The drilling did not encounter groundwater to this depth and, based on previous exploration around the project site, the EA indicates that groundwater is more likely to be intercepted a further 200 m deeper than the base of the ventilation shaft.</p> <p>The EA includes a revised Site Water Management Plan which incorporates changes to the site water management system to accommodate the proposed modification, as shown in Figure 5.</p> <p>With these measures in place, the Department is satisfied that any potential additional surface and groundwater impacts associated with the modification would be negligible.</p>
Waste	<p>Earthworks associated with the modification would result in the handling of an additional 46,500 tonnes of waste rock compared with the approved project.</p> <p>Approximately 30,000 tonnes of waste rock would be relocated by surface excavation works</p>

	<p>around the duct/diffuser area, and would be reused to construct bunds around this area as shown in Figure 4. The remaining 16,500 tonnes of waste rock would be generated by the raise bore excavation of the shaft, and would be reused as road base within the underground mine.</p> <p>The Department notes that the handling and management of waste rock on the surface of the project site would be undertaken over a short time period and is a relocation of waste rock already on the project site. No additional waste rock would be delivered to the surface, nor would waste rock be transported off-site.</p> <p>The existing project approval requires the Proponent to review and revise its Waste Management Plan to incorporate the modification. With the implementation of a revised plan, the Department is satisfied that any waste impacts as a result of the proposed modification would be minimal and consistent with the approved project.</p>
<i>Other Issues</i>	The Department is satisfied that all other issues would have negligible environmental impacts and do not warrant further assessment.

5 RECOMMENDED CONDITIONS

The Department has recommended modified conditions of approval for the Rasp Mine Project that require the modification to be constructed and operated as proposed in the EA submitted in support of the modification application. The Proponent has reviewed and accepted the proposed conditions.

6 CONCLUSION


The Department has assessed the modification application, EA (Appendix A), submissions (Appendix B) and additional information provided by the Proponent in accordance with the relevant requirements of the EP&A Act, including the objects of the Act and the principles of ecologically sustainable development.

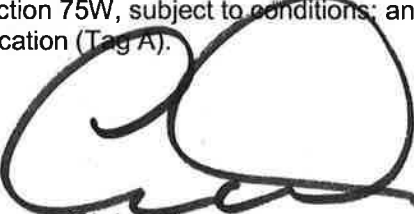
Based on this assessment, the Department considers the proposed modification to be consistent with the approved project. The assessment has found that the proposed changes to the approval would not generate any adverse environmental impacts. Consequently, the Department is satisfied that the proposed modification should be approved, subject to conditions.

7 RECOMMENDATION

It is **RECOMMENDED** that the Executive Director Major Projects Assessment, as delegate of the Minister:

- **consider** the findings and recommendations of this report;
- **determine** that the proposed modification falls within the scope of section 75W of the EP&A Act;
- **approve** the application under section 75W, subject to conditions; and
- **sign** the attached notice of modification (Tag A).


 Howard Reed
 A/Director
 Mining and Industry Projects
 16.3.12


 Chris Wilson
 Executive Director
 Major Projects Assessment
 16.3.12

Appendix A – Environmental Assessment

Appendix B – Submissions

Appendix C – PAE Holmes letter dated 16 March 2012 regarding receptor R20 modelling results