



Your reference: PA 07\_0018 MOD 3  
Our reference: EF13/4102; DOC14/279713-05  
Contact: Jason Price 02 6969 0700

The Planner  
Mining Projects  
Department of Planning and Environment  
GPO Box 39  
SYDNEY NSW 2001

Dear Ms Donnelly

**Re Rasp silver, lead and zinc mine – proposed modification No 3**

I refer to your electronic mail dated 17 November 2014 to the Environment Protection Authority (EPA) about the application received by the Department of Planning and Environment (DPE) to modify the underground mining location of Project Approval No 07\_0018 issued for the Rasp silver, lead and zinc (Rasp) mine in Broken Hill.

We have reviewed the Environmental Assessment (EA) provided to support the application to extend underground mining to the Zinc lodes in Block 7 and based on the information provided the EPA has no objection to the anticipated cumulative air quality and noise impacts from the proposal on the basis that all the mitigation measures are implemented.

However, the EPA considers there is significant uncertainty about the potential impacts on sensitive surface receptors from blasting vibration from the proposed modification. We note the proposed mining areas are significantly closer to infrastructure and residential premises than previous blasting at the Rasp mine. Modelling conducted by Prism Mining Pty Ltd in the document titled *Estimation of Blast Vibration at Eyre Street Locations from Blasting at Rasp mine* (the BVR) provided at Appendix B of the EA demonstrates that nearby infrastructure and residences may be subject to significant blast vibration impacts well beyond the current Project Approval criteria depending upon a number of variable blasting configurations controlled by the proponent.

Despite the blasting variables (such as drill hole diameter and charge mass) being configured to reduce sensitive receptor blast vibration impacts the BVR states "*...it must be noted that proposed blasting will be outside the areas in which previous blasting has been carried out, resulting in a high degree of uncertainty*" and "*Additional data from both development and production blasts monitored at close distances would be helpful to validate the estimates made (in the modelling presented)*".

Based on the previous performance of the proponent, and the uncertainty of the blast modelling presented, the EPA cannot ensure the amenity of residential premises near the Zinc lode will not be adversely impacted by blasting should this modification be approved. Whilst it is not the responsibility of the EPA to regulate damage from blast vibration impacts, we do however note that the BVR proposes limits on blast vibration impacts to avoid likely damage to residences or critical infrastructure (Silver City Highway – South

Road). This demonstrates how crucial blast vibration modelling is to the proposal yet the estimated impacts in the EA are highly uncertain.

If approval is granted by the DPE we recommend the conditions relating to air quality impacts provided at Attachment 'A' are incorporated into the modified Project Approval. We expect that all other existing conditions relating to environmental issues will be retained in any modified approval.

Attachment 'B' contains our assessment of the EA, including justification for our concerns about the blasting vibration impacts and recommended Project Approval conditions relating to blast vibration for DPE to consider.

As discussed with your Elle Donnelley, given the lack of demonstrated clarity about the potential impacts from blasting from this proposed modification these conditions provide protection to the residents of South Broken Hill beyond the blast vibration limit conditions that are currently in the Environment Protection Licence for the premises.

Also, given the limited confidence and uncertainty of predictions in the information provided to support the modification the EPA is unable to determine if the modification will impact unreasonably on the amenity of the residents of South Broken Hill. This is because the estimated vibration impacts are subject to potentially unreliable data and unknown geological structures that may be encountered. Such currently unknown structures that may be in the Zinc lode (dolerite dykes and shear zones) have had a strong amplifying influence on vibration outcomes in recent mining in the Western Mineralisation.

Identifying an amenity based vibration level that is acceptable to the community is difficult. Given the history of complaints about blasting at Broken Hill since the mine recommencement in 2011 and based on our experience over that time this level may be below those levels attached to the Environment Protection Licence which are based on the Australian and New Zealand Conservation Council guidelines. It is worth noting that complaints to the EPA about amenity impacts from blasting vibration have occurred at blasting vibration levels upwards from 3 millimetres per second.

Please note that inclusion of our recommended conditions in any modified Project Approval granted by the DPE is important for our ongoing support of the proposal. It is expected that the EPA will be given an opportunity to review and comment on any DPE draft conditions of approval for this proposal.

Where a modified Project Approval for the project is granted, an application for a variation to Environment Protection Licence No 12559 held by Broken Hill Operations Pty Ltd for the mine will be required to be submitted to the EPA prior to any construction work or activities associated with the proposal.

If you have any further enquiries about this matter please contact Jason Price by telephoning 02 6969 0700.

Yours sincerely



**DARREN WALLETT**  
Head, Griffith Unit  
Environment Protection Authority



## ATTACHMENT 'A'

Broken Hill Operations Pty Ltd (BHOP) have made application to the Department of Planning and Environment to modify the location of underground mining at their Rasp silver, lead and zinc (Rasp) mine in Broken Hill which is subject to conditions of Project Approval No 07\_0018 (PA).

The proposed modification will vary the potential air quality and blast vibration impacts at sensitive surface receptors. If the modified PA is granted approval additional monitoring of those impacts will be required and we expect to be consulted within three months of any modified PA about the review of the 'Air Quality Management Plan', 'Blast Management Plan' and 'Noise Management Plan' as required by condition 4 of Schedule 4 in the current PA.

We recommend that the following varied conditions are included in any modified Project Approval.

### Schedule 3 Environmental Performance Conditions

#### Air Quality Criteria

4. The Proponent shall ensure that the project is operated in a manner that does not exceed the criteria in Tables 4 and 5.

Table 4: Discharge Criteria for **all operational ventilation exhaust shafts**

Pollutant	Unit of Measure	Concentration Limit
Oxides of nitrogen (as NO <sub>2</sub> )	Milligrams per cubic metre	350
Total solid particles (TSP)	Milligrams per cubic metre	20
Type 1 and Type 2 substances <sup>a</sup>	Milligrams per cubic metre	1
Volatile organic compounds (as n-propane)	Milligrams per cubic metre	40

Table 5: Discharge Criteria for Point 2 – Process Enclosure / Baghouse Stack

Pollutant	Unit of Measure	Concentration Limit
Total solid particles (TSP)	Milligrams per cubic metre	20
Type 1 and Type 2 substances <sup>a</sup>	Milligrams per cubic metre	1

Notes to Tables 4–5:

- a Total of Sb, As, Cd, Pb, Hg, Be, Cr, Co, Mn, Ni, Se, Sn and V;
- reference conditions for the limits in Tables 4 and 5 are: dry, 273K and 101.3 kPa.

#### Air Quality Management Plan

11. The Proponent shall prepare and implement a detailed Air Quality Management Plan for the project to the satisfaction of the Secretary. This plan must:

- (a) be prepared in consultation with EPA and submitted to the Secretary for approval prior to the commencement of construction on the site;
- (b) identify all major sources of particulates and other air pollutants that may be emitted from the project, being both point source and diffuse emissions, including identification of the potential for lead contamination to be carried by these particulates;

(c) include an air quality monitoring program that:

- provides for periodic point source monitoring at **all operational ventilation exhaust shafts** and Point 2 (Process Enclosure/ Baghouse Stack);
- provides for continuous ambient monitoring across an ambient air quality and dust monitoring network comprising no fewer than ten monitoring locations (Points 3 to 12) for total suspended particulates,  $PM_{10}$ , lead and dust deposition. Monitoring locations shall be informed by the outcomes of the air quality assessments presented in the EA and PPR and identified in consultation with EPA; and
- provides for continuous meteorological monitoring using a meteorological monitoring station located on the site;
- is consistent with the requirements of *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DECC, 2007), the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment (Clean Air) Regulation 2010*.

(d) pro-active and reactive management and response mechanisms for particulates with specific reference to measures to be implemented and actions to be taken to minimise and prevent potential elevated air quality impacts (including ambient air and deposited dust impacts) on surrounding land uses as a consequence of meteorological conditions, upsets within the project, or the mode of operation of the project at any time;

(e) procedures and processes for monitoring ambient dust and deposited dust impacts;

(f) provision for regular review of dust monitoring data, with comparison of monitoring data with that assumed and predicted in the documents referred to under Condition 2 of Schedule 2;

(g) details of measures to be implemented to address any situation in which monitored dust impacts exceed those assumed and predicted in the documents referred to under Condition 2 of Schedule 2;

(h) specific complaints management procedures in the event that dust monitoring indicates elevated off-site impacts;

(i) procedures for the minimisation of dust generation on the site;

(j) protocols for regular maintenance of plant and equipment to minimise the potential for elevated dust generation, leaks and fugitive emissions; and

(k) a contingency plan should an incident, upset or other initiating factor lead to elevated dust impacts, whether above normal operating conditions or above environmental performance goals/ limits.



## ATTACHMENT 'B'

### Blasting vibration

Prism Mining Pty Ltd prepared a document titled *Estimation of Blast Vibration at Eyre Street Locations from Blasting at Rasp mine* (the BVR) for the proposed modification. This report was prepared with all the information available (blast data provided by the proponent) and using the industry accepted equation to generate expected Peak Particle Velocity impacts (vibration) in millimetres per second at the nearest sensitive receptors.

We note the proposed mining areas are significantly closer to infrastructure and residential premises than previous blasting at the Rasp mine. Development (smaller) and production (larger) blasting for this proposal will occur within the following distances of the following receptors.

- 60 metres under the South Road (Silver City Highway SH22) and includes other service infrastructure such as power lines and pylons, communication cables, sewerage and water pipes.
- 191 metres of the recreational services - the Italo International (Bocce) Club and unused tennis courts.
- 78 metres of the Line of Lode Reserve Trust houses 1 (which is occupied by a tenant) and 2.
- 184 (development) and 281 (production) metres of residential houses (14) in Eyre St and Eyre St west.
- 40 metres of the Perilya Southern Operations decline.

Modelling conducted in the BVR demonstrates that infrastructure and residences near the Zinc lode can be subject to significant blast vibration impacts well beyond the Project Approval blast criteria of 5 millimetres per second (95 percent of blasts) and 10 millimetres per second (strict limit) depending upon a number of variable blasting configurations controlled by the proponent.

Blast vibration impacts at the occupied Trust house are estimated at up to 65 millimetres per second and the EA advises that the proponent is negotiating an agreement to relocate the tenant during mining. Blast vibration impacts on South Road are estimated up to 75 millimetres per second. The mitigation measures proposed are to change the blast design to an estimated vibration impact of 56 millimetres per second, or block pedestrian access during blasting using the initial estimated blast of 75 millimetres per second.

The proponent later commits to a 65 millimetre per second blast vibration limit and indicates a vibration impact of up to 100 millimetres is acceptable to road infrastructure based on a report commissioned by the coal industry in 2008.

The mitigation measures proposed to minimise blast vibration impacts rely heavily on implementing controls during the process of mining the Zinc lode after gathering and reviewing data obtained from future blasting. This is because the estimated vibration impacts are subject to potentially unreliable data and unknown geological structures that may be encountered. Such currently unknown structures that may be in the Zinc lode (dolerite dykes and shear zones) have had a strong amplifying influence on vibration outcomes in recent mining in the Western Mineralisation.

Despite the blasting variables being configured to reduce sensitive receptor blast vibration impacts (such as drill hole diameter and charge mass) the BVR states "*...it must be noted that proposed blasting will be outside the areas in which previous blasting has been carried out, resulting in a high degree of uncertainty.*" and "*Additional data from both development and production blasts monitored at close distances would be helpful to validate the estimates made (in the modelling presented).*"



Based on the previous performance of the proponent and the uncertainty of the blast modelling presented the EPA is not in a position to be confident that the amenity of residential premises near the Zinc lode will not be unreasonably impacted. The EPA has received 15 complaints about blasting at the Rasp mine since June 2013 and issued 4 penalty notices to the proponent for exceeding the blast vibration criteria in their Environment Protection Licence (which aligns with the criteria in the current Project Approval). We can advise that complaints to the EPA about amenity impacts from blasting vibration have occurred at blasting vibration levels upwards from 3 millimetres per second.

The EPA has had a long standing concern about blast vibration management at the Rasp mine since the proponent recommenced mining at Rasp in 2011. In September 2013 due to the proponent's inability to consistently control blast vibration impacts at residential premises off lease, the EPA placed a Pollution Reduction and Studies Program (PRP) condition on the Rasp mine's Environment Protection Licence titled "Comprehensive Audit of Production Rock Blasting Activities". The aim of the PRP is to determine deficiencies in the proponent's blast vibration management, identify vibration levels acceptable to community amenity and develop a "blast management plan", and avoid ongoing adverse impacts by implementing robust blast management controls. The final audit report is due to be submitted to the EPA on 31 January 2015.

Also, in October 2013 due to concerns about blasting vibration levels from several nearby residents the EPA installed 3 blast vibration monitors in areas at North Broken Hill where complaints had been consistently reported. Results of this monitoring by the EPA have highlighted inconsistencies with actual blast vibration levels over short geographical areas. This demonstrated that at Broken Hill vibration levels are not uniform and can be exacerbated in localised areas presumably as a result of the highly disturbed geology of the area. It also highlights further uncertainties with the predicted modelling and understanding the potential impacts on the community's amenity from this modification.

Blasting vibration from the proposed modification is likely to have the most significant impact on South Broken Hill residents (as opposed to recent mining impacting on North Broken Hill residents) so the community's tolerance to blasting vibration in South Broken Hill is unknown. Therefore, given the close proximity of these residents to where blasting will occur identifying a vibration level that is acceptable to the community's amenity is difficult and may be below those levels attached to the Environment Protection Licence obtained from the Australian and New Zealand Conservation Council guidelines.

Should DPE approve the modification, given the uncertainty about blasting impacts on the community, the EPA believes that when blasting commences in any new "Blast Location" and any new "Sensitive Location" as identified in the BVR the most conservative blast parameters as identified in the BVR are to be used until such time as it can be demonstrated that there are no adverse impacts on sensitive receptors and an estimate of blast vibration levels that are acceptable to community amenity can be determined.

This will enable blasting vibration impacts on the South Broken Hill community to be more thoroughly assessed and modelling validated or amended. The EPA also considers that if amenity levels are unreasonably impacted blasting in certain areas should cease. As such, we suggest it would be appropriate that the following be addressed through the project Approval conditions.

- Given the significant uncertainty about blasting impacts in this area we believe that consideration should also be given to requiring the proponent to submit a blast management plan for each "Sensitive Location" identified in the BVR.
- When blasting commences in any new "Blast Location" and any new "Sensitive Location" as identified in the BVR the most conservative blast parameters as identified in the BVR are to be used until such time as it can be demonstrated that there are no adverse impacts on sensitive receptors and an estimate of blast vibration levels that are acceptable to community amenity can be determined.



- The proponent must have a complaints protocol for the investigation of and responding to any complaints about blast vibration. The complaints protocol should include a requirement that should any complaint be received about blasting then blasting operations cease in the area and the proponent undertake an assessment of the blast parameters used and the vibration trends to identify the most appropriate blast parameters to avoid adverse impacts on sensitive receptors in that area in future blasts.
- When blasting in any area subject of this modification should complaints be made about vibrations from any member of the community the proponent must apply the complaints protocol.
- Where the proponent receives more than 10 complaints from 10 different residents about blasting at any "Sensitive Location" identified by the BVR the proponent must engage with the community (hold a Community Consultation meeting) prior to continuing blasting in that area.

Damage to property from blasting vibration is not regulated by the EPA. The New South Wales Department of Trade and Investment (Resources and Energy) have the responsibility to liaise with affected property owners and it is our understanding there is no legislative requirement for the mining company to initiate a process of investigation resulting from an alleged report. As the EPA is aware of several reports of alleged damage to properties from mining since recommencement in 2011 the proponent should be required through their modified approval to have a procedure in place to assess damage to buildings should complaints be received alleging same.

### **Air quality**

The key issue in relation air quality for this proposal is the cumulative impacts from the emission of pollutants through the ventilation exhaust shafts during blasting.

The methodology used in the air quality assessment undertaken by Pacific Environment Limited and dated 30 October 2014 has been completed generally in accordance with the EPA guideline the "Approved Methods for the Modelling and Assessment of Air Pollutants in NSW".

The proposed ventilation exhaust shaft to be utilised for the Zinc lode in this proposal is known as 'Shaft 6' which is located well within the Rasp mining lease boundary, has alternative stack parameters and is expected to have improved dispersion capabilities to the existing Point 1 ventilation exhaust shaft.

The assessment does not predict any additional air quality impacts and that relevant cumulative air quality criteria detailed in the Project Approval will be met. The proponent continues to meet the air quality criteria for existing activities at the Rasp mine.

The EPA has recommended that conditions 4 and 11 of Schedule 3 of the Project Approval are updated to reflect the new ventilation exhaust shaft emission point (Shaft 6) and to incorporate the data obtained from the proponent that establish pollutant limits for the Process Enclosure and Baghouse stack (Point 2).

### **Noise**

The EGMA Mitchell McLennan Pty Ltd report titled "Rasp Mine Zinc Lodes Project Approval Variation Noise Assessment" dated October 2014 was completed generally in accordance with the New South Wales Industrial Noise Policy (INP).

Additional potential noise emissions from the proposal are limited to ventilation fans in the intake and exhaust shafts. The EPA notes however the report assessed the noise impacts from Shaft 5 as a ventilation exhaust shaft and Shaft 6 as a ventilation intake shaft. The EPA understands from the report that the fans utilised in both shafts have similar/or the same sound power (noise) levels. We also note that additional representative residential receptors were included in the noise assessment.

The predicted noise impacts from modelling of the fans indicate that there will be no additional noise impacts from the cumulative introduction of the ventilation fans. The EPA expects no adverse impacts from the modification and post approval noise monitoring is proposed to confirm the modelled results.

### **Goundwater and surface water**

Groundwater is expected to be maintained several hundred metres below mining activities associated with this modification and post mining conditions are not expected to have an adverse impact on any rising groundwater. There are no expected surface water impacts from this proposal.

### **Waste**

Waste rock is proposed to be used to backfill mining voids to minimise subsidence and disposal of waste rock in this manner is consistent with the current Project Approval. Hydraulic fill (coarse de-slimes tailings) is proposed to be used in underground waste rock backfilling to assist in the stabilisation of underground structures. The EPA understands this activity has been assessed and is permitted in the current Project Approval.

No additional waste is expected to be generated by the proposed modification and ore processing rates through the mill remain unchanged by this proposal.