



ENVIRONMENT PROTECTION AUTHORITY



PCU029197

Mr Howard Reed
NSW Department of Planning and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Attention: George Mobayed

Department of Planning
Received
19 DEC 2011
Scanning Room

Dear Mr Reed,

I refer to the Project Application, Environmental Assessment (EA) and accompanying information provided for the proposed Hera Gold Project (ref 10_0191) received by the Environment Protection Authority (EPA) on 11 November 2011.

Please note the regulatory responsibilities of the Office of Environment and Heritage (OEH) are now carried out by the Environment Protection Authority (EPA).

The EPA has reviewed the information in the EA and has determined that it is able to support the proposal subject to the Department of Planning and Infrastructure (DoP) seeking the important amendments to the draft Statement of Commitments, identified in **Attachment A** and subject to the proponent addressing the information requirements outlined below and in **Attachment B**. **Attachment B** also contains the EPA's assessment of the proposal, including justification for the amendments and request for additional information.

Following its review of the information in the EA, the EPA notes additional information is required for the EPA to adequately assess impacts of the project on biodiversity, groundwater, surface water and the environment in general from the use of hazardous materials. The additional information requirements are summarised below and are discussed in detail in **Attachment B**.

Biodiversity

Further information/clarification is required regarding impacts on vegetation and the proposed Compensatory Habitat Strategy.

Groundwater

Further information/clarification is required regarding the proposed measures to protect groundwater from pollution.

Hazardous Materials Management

Further information/clarification is required regarding the proposed measures to protect fauna and the environment in general from the use of cyanide onsite.

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Surface Water

Further information/clarification is required regarding the proposed measures to protect surface water from pollution.

It should be noted adoption of the recommendations regarding the need for additional information are integral to the EPA's ongoing support for the proposal. Further, the EPA notes the EA with the exception of the Air Assessment, has not addressed the issues of concern raised by the EPA during the adequacy assessment of the draft EA. These issues are raised again in **Attachment B**. The EPA considers that DoP needs to ensure that these important matters are addressed in its overall assessment of the application.

The EPA recommends that the proponent be required to provide the additional information specified above and that the EPA is provided with a further opportunity to review this new information before the project proceeds to the determination stage.

It is also expected that the EPA will be given an opportunity to review the draft Director-General's Environmental Assessment report for this proposal prior to finalisation. If the amendments to the draft Statement of Commitments are not included to the satisfaction of the EPA, we will be recommending that they are included as Conditions of Approval, if approval is recommended by DoP. It should be noted that the amendments, are important for the EPA's ongoing support of the proposal.

If DoP determines the project application by granting consent, the EPA recommends that the conditions of approval provided at **Attachment C** are incorporated into the consent.

The EPA would also appreciate receiving a copy of the submissions received by DoP (or a report summarising these submissions) in response to the exhibition of the Environmental Assessment. This is to assist the EPA to review the draft Director-General's Report and to recommend additional conditions of approval, if required.

The EPA notes that the proposal will require an environment protection licence pursuant to the *Protection of the Environment Operations Act 1997* to commence construction activities and to operate. The proponent will need to make a separate application to the EPA to obtain this licence once development project approval is granted.

Should you have any queries regarding the EPA's submission, please contact myself at the Dubbo Office of the EPA on (02) 6883 5367.

Yours sincerely

 15/12/11

BRAD TANSWELL

A/Head Pesticides, Operations and Planning
Environment Protection Authority NSW

Attachment A - Proposed Amendments to Draft Statement of Commitments
Attachment B - Assessment and Justification
Attachment C - Recommended Conditions of Consent

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ATTACHMENT A

Proposed Amendments to the Draft Statement of Commitments

HAZARDOUS CHEMICAL AND WASTE MANAGEMENT

Item 15 – The EPA recommends an additional commitment be added to this section to read:

“Sodium Cyanide and other Toxic Chemicals will be stored in accordance with the requirements of AS/NZS 4452- The Storage and Handling of Toxic Substances.”

The EPA notes storage requirements for sodium cyanide and other toxic chemicals may not have been satisfied by the measures outlined in the EA.

Item 15 – The EPA recommends an additional commitment be added to this section to read:

“Dangerous Goods will be transported in accordance with the requirements of the “Australian Code for the Transport of Dangerous Goods by Road and Rail- Current Edition.”

GROUNDWATER

Item 5.7 – The EPA recommends Statement of Commitment 5.7 be amended to include an additional commitment to:

“Undertake monitoring of groundwater underlying and in vicinity of potentially polluting surface infrastructure (Tailings Storage Facility for example) to ensure groundwater is not polluted. This will be detailed in the Groundwater Monitoring and Response Plan.”

Item 5.7 – The EPA also recommends the timing in Statement of Commitment 5.7 which relates to the preparation of a *Groundwater Monitoring and Response Plan* be amended to:

*“Following Project Approval and **prior to commencement of Works.**”*

AIR QUALITY AND ENERGY

Item 10.26 – The EPA also recommends the timing in Statement of Commitment 10.26 which relates to the preparation of an *Air Quality Monitoring Program* be amended to:

*“Following Project Approval and **prior to commencement of Works.**”*

ECOLOGY

Item 4.13 – The EPA recommends Statement of Commitment 4.13 be amended to include a commitment to:

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*"Management of cyanide process solutions and waste streams to protect biota health and the environment by ensuring the concentration of tailings pumped to the Tailings Storage Facility will be **less than** 10mg/L WAD cyanide."*

GENERAL AMENDMENTS

The draft Statement of Commitments should be updated to reflect commitments identified following provision of additional information outlined in **Attachment B**.

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ATTACHMENT B

Assessment of the Proposal and Justification of Proposed Amendments to the Draft Statement of Commitments and Request for Additional Information

BIODIVERSITY IMPACTS

The EA requirements of the Environment Protection Authority (EPA)) and the Department of Planning and Infrastructure (DoP) require proponents to present justification of their preferred option based on four key thresholds – including *'whether or not the proposal, together with actions to avoid or mitigate impacts or compensate to prevent unavoidable impacts will maintain or improve biodiversity values'*.

The EPA also evaluates offset proposals against the *'Principles for the use of biodiversity offsets in NSW'* and, where applicable, our *'Interim Policy on assessing and offsetting biodiversity impacts of Part 3A developments'*.

In summary, based on review of the extent the proponent has avoided, mitigated, and offset predicted impacts, we advise that:

- a) **Avoid** - No further comments at this time.
- b) **Mitigate** - No further comments at this time.
- c) **Offset** - We note the willingness of the proponent to use the BioBanking Assessment Methodology (BBAM), their commitment to provide, at a minimum, a 'No Net Loss' outcome, and the apparent scope available within 'The Peak' and/or 'Chelsea' properties to achieve a suitable offset. However issues remain regarding tenure, design and security.

Further details and recommendations are provided below.

Issue 1:

The issue of 'additionality' has not yet been resolved.

Background:

We note that:

- a) the EA has, at a basic level, considered the 'like for like' principle in terms of vegetation communities on 'The Peak' and to a lesser extent, the communities within 'Chelsea';
- b) the proponent will apply the BBAM and will aim to provide a Tier 1 'Improve or Maintain' outcome, or if not possible will provide no less than a Tier 2 'No Net Loss' outcome; and

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- c) from the information presented in the EA it appears that there may be scope for the offset to be accommodated on 'The Peak' and/or 'Chelsea'.

However, it is incorrect for the proponent to state in the EA that the EPA had no fundamental issues with the proposed BOS. The EPA again advises that offsets must be 'supplementary' or 'additional', and this issue has not yet been resolved for the current proposal.

An offset is obtained by changing the management and security of a site to improve the status of biodiversity. Hence the likely change in the condition of the site that results from the proposed future management (in contrast to the current management actions and management restrictions) is important in determining the adequacy of an offset.

The EA summarises the conditions relating to the subject Western Lands Leases and states that the Travelling Stock Reserves imposes no additional land management or conservation requirements on the lessee, other than to permit the lawful use of the reserve for moving stock.

Nevertheless, Western Lands Leases and Travelling Stock Reserves are subject to some additional management restrictions/requirements in comparison to freehold land and confer on the land manager greater responsibilities than would otherwise be required. It is the additional management actions and security beyond that already applying to the land, and the associated condition improvement, that will constitute the offset. Therefore it will be important for this issue to be considered when applying the BBAM to determine the credits generated per hectare within the offset site.

In addition, the Offset Principles require offsets to be managed under effective and long term management arrangements. The EPA's interim Offset Policy also contains five criteria for determining the suitability of offset site in relation to security including:

- a) The unambiguous principal objective of ongoing site management is biodiversity conservation;
- b) Management is undertaken in accordance with a Plan of Management;
- c) There is reasonable likelihood that sufficient resourcing will be available to implement the Plan of Management over time;
- d) The arrangements are in-perpetuity, and conservation obligations are transparently transferred and disclosed to any new owners of the land through appropriate administrative procedures; and
- e) There are appropriate accountability mechanisms to secure the outcomes and these mechanisms cannot be altered without alternative and comparable offsetting arrangements being put in place.

These criteria must be met in order for the proposed offset to be consistent with the interim Offset Policy.

The EPA notes that the proponent plans to secure the offset via a change to the conditions of the Western Lands Lease(s) to specify 'conservation' as the only permitted land use within the final offset area. This option has not yet been demonstrated to meet the above criteria and the EPA would prefer an on-title in-perpetuity conservation mechanism to be applied.

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Recommendations:

It is recommended that:

- a) The proponent clearly demonstrates how the proposed offset is supplementary and that this issue is considered when implementing the BBAM. The proponent should be required to submit the BBAM assessment to the EPA for review, along with justification for conclusions reached regarding the 'additionality' of the proposed management actions and outcomes.
- b) That the proponent be required to explore all possible on-title in-perpetuity conservation arrangements for the final offset in consultation with the EPA and the Western Lands Commissioner.

The Statement of Commitments should be updated to reflect commitments to implementing the BOS as discussed above.

Issue 2:

The issue of avoiding impacts associated with new fencing has not yet been included in the design of the offset options.

Background:

It is preferable for offsets to be designed such that they include linkages where possible and avoid the need to clear native vegetation for new fence lines. From our meeting with the proponent on 8 August 2011 the proponent's willingness to consider these issues in the offset design were noted. However, the proposed offset area options do not appear to have considered this issue. It appears that the offset proposal for 'The Peak' would require a substantial amount of new fencing between the project site and the offset and between the offset and the Nymagee-Condobolin Road to retain the eastern most 100 metres of the TSR. Similarly, there is no reasoning provided within the EA to support the proposed offset boundaries on 'Chelsea' where it also appears that substantial new fencing, and therefore new clearing, would be required.

Recommendation:

The design of the offset(s) should allow for appropriate placement of goat exclusion fencing avoiding the need for vegetation clearing. Should this not be achieved, the clearing required to establish new fence lines should be considered as part of the development and included in the assessment of the quantum of the offset required.

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GROUNDWATER

1) Further information/clarification is required regarding the proposed measures to protect groundwater from pollution.

The EA makes reference to lining several contaminated or dirty water/waste storage structures (including but not limited to the Acid Forming Encapsulation Area and associated leachate management pond, the Tailings Storage Facility and collection pond and drain, and the Process Water Dam and Raw Water Dam) with compacted clay to achieve an appropriate permeability.

Regarding the proposed clay liner for the Tailings Storage Facility (TSF) it is proposed to construct the embankment of the TSF using the clayey materials from within the TSF footprint. It is also proposed that the *in-situ* clay material underlying the TSF would be used to line the floor of the TSF. Permeability testing indicates permeability in the order of 2×10^{-9} to 3×10^{-9} metres per second (m/s) for the *in-situ* clayey material underlying the TSF.

Importantly the EPA notes that the *in-situ* permeability of the clayey material underlying the TSF does not meet the EPA's requirement in terms of permeability.

Recommendations:

Further information regarding the construction of the clay liners for all structures mentioned above is required. This includes the location of liners (e.g. floor and walls), overall thickness of liners, thickness of successive layers, gradients of sides of structures of clay liners etc for all structures referred to above.

Importantly for the TSF liner further information is required to demonstrate how the EPA's requirements (outlined below) will be met to ensure impacts do not occur.

The EPA's standard requirement for these types of liners is to achieve a permeability of 1×10^{-9} m/s or less with a re-compacted clay liner of at least 90 centimetres (cm) in thickness (or alternative geosynthetic liner of equivalence). Where the proposed liner will not meet this thickness and the natural geology of the site in conjunction with constructed clay liners is considered sufficient in meeting this requirement, sufficient evidence must be provided in support of this to demonstrate the construction will be adequate to prevent pollution of groundwater (e.g. geological evidence, appropriate groundwater modelling etc).

Details of the proposed QA/QC program must also be provided to ensure earthworks (compaction etc) are undertaken in the appropriate manner and the design criteria are achieved.

Even where the EPA's requirements outlined above are met, the contaminants in the tailings still have potential to permeate from the TSF albeit over a long period of time. Hence an assessment also needs to be provided including:

- i) an assessment of the long term fate of contaminants in the TSF;
- ii) an assessment of potential impacts on groundwater quality in the longer term, against ANZECC 2000 criteria for any beneficial uses likely to be impacted; and

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- iii) longer term arrangements for management, monitoring and response to any such impacts beyond the operational life of the proposed mine.

Further information is required regarding the proposed groundwater monitoring network particularly around the TSF, but also any other groundwater monitoring across the site. This includes the number and locations of piezometers, as well as parameters to be monitored.

Noting it is the EPA's expectation that piezometers are located in strategic locations, depending on the location of structures with the greatest risk to groundwater and other factors such as groundwater flow direction etc. This would include locating piezometers up gradient and down gradient of structures with the greatest risk to groundwater.

Information must also be provided regarding the reasoning behind the proposed groundwater monitoring network (locations of monitoring points, depth of groundwater monitoring bores, parameters monitored etc).

Groundwater Monitoring is discussed further under the heading "Water" in Attachment C.

- 2) The EA notes potentially acid forming waste rock placed on the surface would not be encapsulated because it would be stockpiled on the surface for a short period only.

Recommendation:

Further information is required regarding the management of potentially acid forming waste rock to be temporarily stored in the Acid Forming Encapsulation Area to ensure it does not become acid generating prior to returning underground.

This should include inclusion of contingency measures in the event the potentially acid forming waste rock placed on the surface become acidic prior to placement underground.

Recommendation:

The Statement of Commitments should be updated to reflect commitments to implement measures to protect groundwater as discussed above.

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HAZARDOUS MATERIAL MANAGEMENT

In 2010 the Department of Health and Aging National Industrial Chemical Notification and Assessment Scheme (NICNAS) finalised their assessment report on the use of sodium cyanide at gold mines. The report was entitled "Priority Existing Chemical Assessment Report No 31- Sodium Cyanide" (the NICNAS report).

This document makes recommendations regarding concentration limit controls in conjunction with other wildlife exposure minimisation strategies to protect wildlife.

This in conjunction with existing EPA policy on sodium cyanide use in mines sets the basis for licensing cyanide use at mines in NSW.

To ensure consistency with the policy documents mentioned above cyanide limits set by the EPA at new mine sites are developed to ensure zero fauna deaths at Tailing Storage Facilities (TSFs).

Licence limits for Weak Acid Dissociable (WAD) cyanide are to be applied to the tailings as they are freshly discharged to the TSF. A sample taken at the edge of the TSF is not an acceptable sampling location.

The NICNAS report mentioned above makes recommendations regarding concentration limit controls in conjunction with other wildlife exposure minimisation strategies to protect wildlife. This is contained in *Table 5a: Framework for Management of Risks to Wildlife from Sodium Cyanide Use in Gold Mining* in the NICNAS report mentioned above.

The EPA's policy on setting licence limits for cyanide at TSFs is to set limits in line with the categories of protection afforded to wildlife as referred to in Table 5a of the NICNAS report to ensure an adequate level of protection is provided to wildlife. In accordance with the requirements of NICNAS, **measures to protect wildlife must be provided upfront and cannot be provided in retrospect.**

It is noted that the NICNAS report indicates all categories of cyanide facilities (outlined in Table 5a of NICNAS) must employ wildlife exclusion actions (such as fencing around the base of TSF's and floating balls on ponded areas for example) upfront and not in retrospect. This requirement is regardless of the concentration limit.

The EPA does not agree with the statement provided in the EA that Category 1 facilities (as indicated in NICNAS) do not require additional cyanide specific management measures to protect fauna.

Despite the proponent providing a commitment of maintaining a concentration of less than 10 milligrams per litre (mg/L) of WAD cyanide at the discharge point to the TSF, there is no information provided in the EIS regarding management strategies and contingencies that will be employed to reduce potential for exposure of fauna to cyanide. As indicated above, in accordance with the requirements of NICNAS, measures to protect wildlife must be provided upfront and cannot be provided in retrospect.

If it is intended to manage the site in accordance with Category 1 of NICNAS further information needs to be provided regarding management strategies and contingency plans that will be employed to reduce potential for exposure of fauna to cyanide in order to demonstrate the site meets the requirements of this category.

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Recommendations:

Clarification is required regarding:

- 1) Confirmation that the proponent is able and is willing to commit to a discharge limit of less than 10 mg/L of WAD cyanide at the discharge point to the proposed TSF.**
- 2) Clearly identify the management strategies that will be employed to reduce potential for exposure of fauna to cyanide including details of control measures and monitoring programs and timing for implementation of these strategies.**
- 3) Confirmation that the measures referred to in point 2) above will be provided upfront and not in retrospect.**
- 4) The Statement of Commitments should be updated to reflect commitments to implement measures to protect fauna and the environment in general as outlined above.**

This information will assist the EPA in determining suitable concentration limits for discharge to the proposed TSF and what monitoring and controls details need to be included on the licence.

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WATER

The EPA's review of the EA in terms of surface water management has identified the need for additional information where this information is fundamental to assessing the likely impacts of the proposal and cannot therefore be provided as an approval condition. The primary issues of concern are:

- minimum freeboards to be maintained in the Tailings Storage Facility (TSF) and the process and raw water dams and an assessment of water quality impacts in the event of overtopping;
- the potential longer term impacts from, fate of, management and monitoring of contaminants placed in the TSF;
- flocculants to be used to treat water captured in sediment basins;
- management of groundwater pumped from the open cut voids;
- post closure water management; and
- the need for consolidated surface and groundwater monitoring programs.

These issues are discussed individually below.

Tailings Storage Facility, Process and Raw Water Dam Freeboards

It is noted that the Tailings Storage Facility (TSF) will be designed to store 1.6 million m³ of material over the mine life. It is also noted that the TSF will be constructed in stages and as such it is unclear what freeboard depth will be maintained at any point in time to prevent overtopping during a rainfall event. Similarly, it is unclear what freeboard will be maintained in the process water and raw water dams.

Should these dams overtop it is noted from Figure 2.4 that there will be catch banks and channels that will direct this flow to sediment basins. However, given the nature of the water in these dams, such an overtopping event would compromise the primary purpose of erosion and sediment control measures.

Recommendation:

It is recommended that the proponent be requested to provide further information about:

- **the minimum freeboard that will be maintained in each of these dams/facilities at any time;**
- **the probability of the proposed minimum freeboard being overtopped; and**
- **an assessment of the water quality impacts from these dams in the event they are overtopped against relevant ANZECC 2000 benchmarks, taking into account dilution from expected flow volumes in rainfall events that cause the overtopping.**

Erosion and Sediment Control

Sediment Basin Discharge

The proposal indicates that a discharge quality of less than 50mg/L TSS will be achieved, which is consistent with licensing requirements across most other mining operations. The achievement of this discharge quality within 5 day management periods may require the use of flocculants. Selection of a flocculating agent, if required, should aim for a low impact product. **The EPA**

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recommends that the proponent use flocculants that have a LC50 of >100 mg/L. This ecotoxicology should be assessed against a waterflea (eg cladoceran), a relevant fish species for the area and a freshwater alga to provide confidence that the flocculant is suitable, noting that cationic flocculants are often the most toxic and that some anionic flocculants can have low toxicity to fish but high toxicity to waterfleas.

Recommendation:

It is recommended that the proponent provide information about the type, toxicity and management of any flocculants proposed to treat water captured in sediment basins. In the absence of further information the EPA will use a licence limit for polyelectrolyte flocculants used in sediment basins of LC50 less than 100mg/L.

Void De-Watering and Onsite Groundwater Reuse

The proposed underground voids will intercept groundwater-bearing layers with subsequent inflows. The proposal indicates this groundwater will be pumped to the surface for use in mining related activities.

The EA indicates that groundwater from certain areas underlying the site would not be suitable for irrigation and exceeds ANZECC water quality triggers for certain parameters and is therefore not suitable for discharge to surface waters.

The use of groundwater from the voids for dust suppression or site rehabilitation has potential to result in surface impacts such as soil sodicity, and increased soil salinity amongst other things and will therefore require close management to avoid these soil impacts.

Careful management may therefore be necessary such as shandyng with fresher water sources, and assessment and management of sodicity impacts, impacts on soils and vegetation that may be irrigated, increased erosion due to sodicity impacts on soils, impacts on reduced soil quality and associated reduction in viability of post-mining land use.

Recommendation:

Given the nature of the groundwater and its potential impacts on soil and vegetation, it is recommended that the proponent prepare Groundwater Reuse Procedures as part of a broader Groundwater Management and Monitoring Plan. This recommendation forms part of the proposed approval conditions provided in Attachment C.

Note that the groundwater reuse management plan may require shandyng or additional treatment of groundwater, or alternative groundwater disposal options. Any reduction in the amount of groundwater able to be used on-site as a consequence of this groundwater reuse management plan will require the proponent to review the water balance provided in the environmental assessment.

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Process water dam

Process wastewater is reused during the mining process. However, it is not clear how the remaining process water will be managed after mining operations are completed.

Recommendation:

It is recommended that the proponent be requested to advise how all residual water will be managed at the end of the mining operations.

The material used to construct process water dams may also be contaminated during the mine life and should be considered as part of waste management in the decommissioning of the dam and rehabilitation of the site.

Bunding of the Carbon in leach Process Area and Chemical Storage Areas

The proponent should consider any reduction in effective volume of banded areas due to the cumulative volume of all the containers stored and whether there is any likelihood that more than one container could fail at a time. For example, if damage to one container is likely to damage another then the size of the containment area may need to be increased.

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ATTACHMENT C

Recommended Conditions of Consent

NOISE

Recommended Noise Limits

L6 Noise limits

L6.1 Noise generated at the premises must not exceed the noise limits presented in the table below. (Note that the noise limits apply to the noise contribution from the Hera Project only. Locations R1 to R4 in the table below are those described in the Noise and Vibration Assessment, September 2011, prepared by Spectrum Acoustics Pty Ltd for the Hera Project, via Nymagee, Environmental Assessment.

Noise Limits (dB(A))

Location	Day	Evening	Night	
	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _A (max)
R1, R2, R3, R4 Burthong Rd Nymagee	35	35	35	45

L6.2 For the purpose of Condition 6.1:

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays.
- Evening is defined as the period from 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays.

L6.3 The noise limits set out in condition L6.1 apply under all meteorological conditions except for any one of the following:

- a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
- b) Stability category G conditions and wind speeds greater than 2 metres/second at 10 metres above ground level;

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L6.4 For the purposes of condition L6.3:

- a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station at (Cobar MO AWS).
- b) Temperature inversion will be assessed by use of the sigma-theta process as outlined in Appendix E4 of the NSW Industrial Noise Policy (INP).

L6.5 For the purposes of determining the noise generated at the premises a Class 1 or 2 noise monitoring equipment as defined by AS IEC61672.1-2004 and AS IEC61672.2-2004, or other noise monitoring equipment accepted by the EPA in writing, must be used.

L6.6 To determine compliance:

- a) with the $L_{eq(15 \text{ minute})}$ noise limits in condition L6.1, the noise monitoring equipment must be located:
 - within 30 metres (m) of a dwelling façade where any dwelling on the property is situated more than 30 m from the property boundary that is closest to the premises;
 - approximately on the boundary where any dwelling is situated 30 m or less from the property boundary that is closest to the premises;
 - within approximately 50 m of the boundary of a National Park or a Nature Reserve.
- b) the noise monitoring equipment must be located in a position that is:
 - at the most affected point at a location where there is no dwelling at the location; or
 - at the most affected point within an area at a location prescribed by conditions L6.6(a).

L6.7 A breach of this Environment Protection Licence will still occur where noise generated from the premises in excess of the appropriate limit specified in the condition L6.1 is detected:

- in an area at a location other than an area prescribed by condition L6.6; and/or
- at a point other than the most affected point at a location.

L6.8 For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

L7. *Blasting*

(Note that the blasting conditions L7.1 to L7.5 respectively apply to all receiver locations).

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L7.1 Blasting-overpressure must not exceed at any time.

The overpressure level from blasting operations at the premises must not exceed 120dB (Lin Peak) at any time. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L7.2 Blasting-overpressure must not exceed.

The overpressure level from blasting operations at the premises must not exceed 115dB (Lin Peak) for more than five per cent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L7.3 Blasting-vibration must not ever exceed.

Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 10mm/sec at any time. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L7.4 Blasting-vibration must not exceed.

Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 5mm/sec for more than five per cent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L7.5 Blasting hours of operation.

Blasting operations at the premises may only take place between 9:00am-3:00pm Monday to Friday. (Where compelling safety reasons exist, the Authority may permit a blast to occur outside the abovementioned hours. Prior written (or facsimile) notification of any such blast must be made to the Authority).

M7 Requirement to monitor weather

M8.1 The meteorological weather station must be maintained so as to be capable of continuously monitoring the parameters specified in condition M8.2.

M8.2 For each monitoring point specified in the table below the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified opposite in the other columns.

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Point ##

Parameter	Units of Measure	Frequency	Averaging Period	Sampling Method
Air temperature	°C	Continuous	1 hour	AM-4
Wind direction	°	Continuous	15 minute	AM-2 & AM-4
Wind speed	m/s	Continuous	15 minute	AM-2 & AM-4
Sigma theta	°	Continuous	15 minute	AM-2 & AM-4
Rainfall	mm	Continuous	15 minute	AM-4
Relative humidity	%	Continuous	1 hour	AM-4

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AIR

The proposed Air Quality Management Plan (AQMP) must incorporate measures outlined in the revised Statement of Commitments (SoC)

Several measures for controlling particulate impacts are outlined in the recommended conditions of approval provided below which have been accounted for in the modelling. Requirements for managing significant particulate sources like the tailings storage facility, and others outlined in the SoC must be incorporated into the AQMP. The AQMP must also include ambient PM₁₀ monitoring at sensitive receptor(s), and Vent Rise Exhaust monitoring. Recommended conditions for the Vent Rise Exhaust are outlined under the "**Licence Conditions for Vent Stack**" heading below.

Maximum cumulative 24-hour average PM₁₀ concentration is predicted for Mine Camp (Receptor 6, located on-site), with project-increments varying between 1.1–20.9 micro grams per cubic metre (µg/m³). This outcome is dependent on assumptions in relation to particulate concentrations in the Vent Rise Exhaust which are conservative as applied in the assessment. Due to uncertainty in this source emission profile, in-stack particulate concentration should be monitored and logged to assess performance.

Recommended Conditions of Approval

Stockpile areas and unsealed roads

- Maintain ore handling areas (ROM pad/ stockpiles) in a moist condition by using water carts to water down areas affected by wind-blown and traffic generated dust.
- Limit disturbance to the minimum area necessary for mining and associated activities.
- Impose maximum speed limit of 40km/h on internal vehicle access roads within the Project Site.
- Spray unsealed access roads and other trafficked areas with water carts at a rate of 2 litres per square metre per hour (L/m²/hour), as required, when visible dust is generated.
- Use biodegradable dust suppressants with insignificant environmental impacts for controlling dust emissions from unsealed roads and disturbed areas.

Ore processing plant

- Minimise drop-heights from the ROM bin to the primary crusher.
- Enclose crushing and dry screening plant components of the Processing Plant, with venting to a fabric filter or equivalent device for removal of particulate matter from the air stream prior to release. Alternatively, install suitable alternate dust control measures such as water sprays to ensure that the required level of dust suppression is achieved.
- Incorporate water spray facilities at all transfer points in the crushing and screening circuit within the Processing Plant.
- Maintain and inspect the crusher and dry screen circuit hood and filter systems and all other dust control technologies, in accordance with supplier recommendations.

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- Optimise the design of the Processing Plant to:
 - minimise the amount of conveyor operating hours with zero load;
 - maximise the use of gravity to move material through the Processing Plant reducing the need for pumping; and
 - maximise the use of energy efficient motors in major pieces of the Processing Plant.

Tailings Storage Facility

- Maintain approximately 75% of the Tailings Storage Facility area as wet, with emissions restricted to 25% of the surface area of the Tailings Storage Facility.
- Cap or otherwise treat the Tailings Storage Facility during rehabilitation activities following completion of operations.
- Install temporary wind breaks in the vicinity of the Tailings Storage Facility and implement chemical suppressant technology within the facility to minimise emissions.

Vegetative rehabilitation

- Establish vegetative cover, using endemic native grass species, over all long term topsoil stockpiles not regularly used and to all non-operational exposed surfaces, e.g. Tailings Storage Facility wall, ROM pad batters, as soon as practical after disturbance.
- Profile all surfaces to reduce velocity of overland winds. Contour the final landform shape to avoid strong wind flows and smooth gradients to reduce turbulence at surface.
- Reshape, topsoil and rehabilitate completed Waste Rock Emplacement areas as soon as practicable after they are no longer required for mining-related purposes.

General

- Progressively optimise the underground mine design to minimise travel distances for mining equipment and re-handling of waste and ore material.
- Use mining equipment which is regularly maintained and serviced to maximise efficiency.
- Limit disturbance to the minimum area necessary for mining and associated activities.
- Minimise all drop heights.
- Ensure site personnel understand fundamentals of air emissions, and have been trained to make timely reporting of any visible air emissions to allow for prompt and appropriate action to be undertaken for the management of the identified emissions.

Air Quality Monitoring Program

1. The Air Quality Monitoring Program (AQMP) should be developed to confirm on an on-going basis, the consistent and effective implementation of particulate management measures at the Project and to demonstrate compliance with the EPA's air quality criteria.
2. The in-stack particulate concentration in the Ventilation Rise Exhaust stream should be monitored and logged to assess the performance of the system and clarify the uncertainty in the emission estimation process. Recommended licence conditions are provided under the heading "**Licence Conditions for Vent Stack**".

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3. The AQMP must be prepared in consultation with the EPA and surrounding community as follows:
 - o PM₁₀ monitoring should be conducted at a minimum one (1) location in the vicinity of the Project Site (northwest corner receptor R3 or the Mine Camp R6 could provide suitable locations). An additional location, either to the east of the Project Site or near the residences at the southwest corner of the Project Site (adjacent to R1 and R2) could provide a useful indication of background concentrations for comparison against the monitoring conducted at the northwest corner location.
 - o Real-time meteorological monitoring should be conducted at the Project Site, in accordance with the recommendations of the NSW EPA Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (DEC, 2007). Real-time meteorological data, specifically wind measurements, can be used to inform dust management planning and impact potential minimisation at the Project Site.
 - o The selection of monitoring methods and locations should be conducted in consultation with the NSW EPA. The ongoing requirement for the program reviewed after a period of 12 months, in consultation with NSW EPA.

Licence Conditions for Vent Stack

P1 Location of monitoring/discharge points and areas

P1.1 The following point referred to in the table below is identified for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air.

EPA Identification no.	Type of monitoring point	Type of discharge point	Description of location
1	Air emissions monitoring	Discharge to air	Ventilation Rise Exhaust

LIMIT CONDITIONS

L1 Concentration limits

L1.1 For each monitoring/discharge point or utilisation area specified in the tables below (by point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

Point 1

Pollutant	Units of measure	100 percentile limit	Reference conditions	Averaging period
Solid particles	mg/m ³	10	273K, 101.3kPa	As per test method

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MONITORING AND RECORDING CONDITIONS

M1 Requirement to monitor concentration of pollutants discharged

M1.1 For the monitoring/discharge point specified below, the applicant must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The applicant must use the sampling method, units of measure and sample at the frequency, specified opposite in the other columns:

Point 1

Pollutant	Units of measure	Frequency ¹	Sampling Method ¹
Solid particles	mg/m ³	Post commissioning, annual	TM-15
Temperature	K	Post commissioning, annual	TM-2
Velocity	m/s	Post commissioning, annual	TM-2
Volumetric flow rate	m ³ /s	Post commissioning, annual	TM-2
Selection of sampling positions	NA	NA	TM-1

¹or as otherwise approved in writing by the EPA.

M2 Testing methods - concentration limits

Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

- (a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
- (b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
- (c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The *POEO Clean Air Regulation 2010* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M3 Post Commissioning Testing

Once the facility is operational, stack testing must be conducted to ensure that the facility is maintained and operating such that emissions do not exceed the relevant Design Criteria

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specified in the *Air Quality and Greenhouse Gas Assessment (September 2011)*. The licensee must submit a written report to the EPA detailing the results of post-commissioning source emissions sampling and analysis undertaken in accordance with the requirements specified in this EPL. The monitoring and report must also assess compliance with the limit conditions specified in this EPL.

WATER

Surface Water Discharges

It is recommended that the following approval condition be incorporated into DoP's final approval:

The Proponent must ensure that all surface water discharges from the site comply with:

- (a) Section 120 of the POEO Act;***
- (b) a maximum of 50 milligrams per litre of suspended solids in any discharge of water from sediment basins, and any other discharge limits (both volume and quality) that may be specified by licensing instruments issued under environment protection legislation administered by the EPA.***

Water Management Plan

It is recommended that the following approval condition be incorporated into DoP's final approval:

The Proponent must prepare a Water Management Plan for the project to the satisfaction of the EPA. This plan must:

- (a) be prepared in consultation with the EPA and by suitably qualified and experienced person(s);***
- (b) address construction, operation and post closure monitoring, management and response arrangements; and***
- (d) include:***
 - a Site Water Balance;***
 - an Erosion and Sediment Control Plan;***
 - a Groundwater Management and Monitoring Plan;***
 - a Surface Water Monitoring Program; and***
 - a Surface and Ground Water Response Plan to respond to issues identified by the surface and groundwater monitoring programs.***
- The site water balance must include, as a minimum, a description of the conditions under which the capacity of the TSF, raw water or process water dam(s) may be exceeded and the likely water quality that could be discharged and its fate, plus contingencies for minimising impacts if these dams are close to exceeding capacity. The management of process mine water that remains following the completion of mining must be addressed in the water management plan.***

The Surface Water Monitoring Program must include, as a minimum, the following components:

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- (a) **detailed baseline data on current surface water flows and quality in creeks and other waterbodies that could be affected by the project;**
- (b) **surface water quality and stream health assessment that includes representative baseline survey of current aquatic life in drainage lines upstream and downstream of the mine site prior to commencement of construction;**
- (c) **an initial surface water quality characterisation assessment of water quality in sediment basins and other water storage structures on the mine site to ensure they are collecting water of a quality consistent with their design purpose, and must include but not necessarily be limited to monitoring for pH, electrical conductivity, a full scan of metals, and total and WAD cyanide. The water quality monitoring conducted for this characterisation assessment must continue until such time as the EPA is satisfied that water quality in each of the surface water management structures is consistent with their respective design purposes and that the surface water can be managed in accordance with EPL conditions;**
- (d) **an on-going monitoring program for operational and post closure stages of the mine, including specification of analytes, sampling frequency, sampling locations and triggers for management response, for:**
 - **sediment basins including salinity and toxicants;**
 - **reuse dams;**
 - **discharges from the mine site;**
 - **surface water flows, quality, and impacts on water users outside the mine site;**
 - **stream health and channel stability in downstream waterways.**

The Groundwater Management and Monitoring Plan must include, as a minimum, the following components:

- (a) **a Groundwater Reuse Management Procedures that ensures salinity, and other potentially polluting contaminant levels in groundwater used on-site is fit-for-purpose and managed to prevent:**
 - **cumulative impacts on soil and vegetative condition;**
 - **impacts on water quality in sediment basins; and**
 - **impacts on permeability of pond linings.**

The Groundwater Reuse Management Procedures must include a detailed monitoring program that specifies relevant parameters and sampling frequency for any groundwater to be used on the site. The program must be designed to the satisfaction of the EPA.

- (b) **an initial groundwater quality characterisation assessment of groundwater quality collected on the mine site. The groundwater quality monitoring conducted for this characterisation assessment must continue until such time as the EPA is satisfied that monitoring results have been adequately addressed by the Groundwater Reuse Management Procedures;**
- (c) **an on-going TSF groundwater monitoring program designed to assess the effectiveness of the TSF in containing contaminants. This monitoring program must operate at operational and post closure stages of the mine until such time as EPA approves the cessation of the**

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program. The on-going TSF facility monitoring program must include specification of analytes, sampling frequency, sampling location and depths and triggers for management responses.

Unless otherwise adequately justified by the proponent to the satisfaction of the EPA, the monitoring required by (b) and (c) above must include sample analysis for pH, EC, TDS, DO, redox potential, major cations and anions, acidity, alkalinity, TSS, a full scan of metals, bicarbonate, calcium, chloride and sulphate.

The monitoring required by (c) above must also include sample analysis for WAD cyanide.

Note: Relevant indicators and sampling frequencies may be revised over time.

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