Rasp Mine

Zinc–Lead–Silver Project

Response to Submissions Report

Project Application No. 07_0018

September 2010

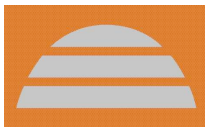




Broken Hill Operations Pty Ltd

a wholly owned subsidiary of CBH Resources Ltd

Broken Hill Operations Pty Ltd



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1 INTRODUCTION

Broken Hill Operations Pty Ltd (BHOP) is proposing to expand operations at its Rasp Mine (the Project), located in Broken Hill in New South Wales (NSW). The Project proposes to:

- extend the areas for underground mining to include the Western Mineralisation, Centenary Mineralisation and additional Main Lode Pillars;
- increase mining production to 750,000 tonnes per annum (tpa); and
- construct and operate a processing plant to produce lead and zinc concentrate.

The Project is declared a Major Project by the State Environment Planning Policy (SEPP) (Major Development) 2005, and therefore requires the approval of the NSW Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act*, *1979* (EP&A Act). BHOP lodged a Major Project Application (07_0018) with the Department of Planning (DoP) on 10 March 2007.

An Environmental Assessment Report (EAR) (BHOP, July 2010) supporting this application was exhibited from 2nd July to 6th August 2010. Following exhibition of the EAR, the DoP received 14 public and government agencies submissions on the Project, including 11 submissions in support, 2 submissions objecting and 1 submission that did not state its position.

BHOP engaged GWP Environmental Planning Pty Ltd (GWP) to assist in compiling this Response to Submissions (RTS) report. Chapter 2 provides a formal response to submissions made by government agencies, interest groups and the community in accordance with Section 75H(6) of the EP&A Act.

Since exhibiting the EAR, BHOP has modified the layout and design of the Project in order to further minimise environmental impacts and streamline operations. The modifications involve:

- locating the processing plant to the north-eastern end of the lease (away from densely populated residential areas);
- removal of secondary and tertiary crushers and screens from the crushing circuit; and
- loading concentrate into containers on trucks and transporting them to a newly constructed rail siding located at the north-eastern end of the lease.

The DoP has requested that BHOP provide a description of these changes and any additional environmental assessments in a Preferred Project Report. BHOP engaged GWP to compile this report, titled *Rasp Mine Preferred Project Report* (PPR) (BHOP, September 2010), which provides a detailed description of these modifications, as well as revised air quality, noise and surface water assessments. The DoP has indicated its intention to exhibit the PPR. It is recommended that the PPR be read in conjunction with this RTS report.

BHOP has revised its Statement of Commitments for the Project to reflect changes in the modified layout and design of the Project and to address the issues raised in the submissions (Chapter 3). This replaces the Draft Statement of Commitments provided in Section18 of the EAR. The changes made to the Statement of Commitments in response to submissions are highlighted in yellow.

2 RESPONSE TO SUBMISSIONS

This chapter has been prepared in response to a request from the Director-General in accordance with section 75H(6) of the EP&A Act, that BHOP prepare a response to the issues raised during the public exhibition of the EAR for the Project. The chapter has been prepared by GWP on behalf of BHOP, with assistance from the specialist consultants where applicable.

Specifically, the chapter addresses the items raised by:

- Department of Environment, Climate Change and Water (DECCW);
- NSW Office of Water (NOW);
- Greater Western Area Health Service & NSW Health (GWAHS & NSW Health);
- Department of Industry & Investment (I&I)
- Roads and Traffic Authority (RTA);
- Broken Hill City Council (BHCC);
- Corporate (3 submissions);
- Special interest community group (1 submission); and
- General public (4 submissions).

BHOP would like to acknowledge and thank all stakeholders for taking the time to review the EA and for submitting a response.

All submissions were comprehensively reviewed and considered. Matters raised by each submission are addressed by category of issue, with additional information and or clarification (if required) provided. For each issue, the theme of the issue raised is noted in bold, followed by a response in normal type. Issues that could not be grouped under an appropriate category were addressed under the ”Other” category.

2.1 SUMMARY OF ISSUES RAISED IN SUBMISSIONS

The DoP advised that a total of 14 submissions were received during the EA exhibition period. As illustrated in ***Figure 2-1***, the vast majority of the submissions (11 submissions or 79%) support the project, 2 (14%) objected to the project and 1 (7%) did not state its position.

All of the Corporate (3) and the majority of the General Public (3) submissions supported the Project. These included submissions from:

- CFMEU Mining & Energy;
- Southern Cross Care;
- Macquarie Drilling;
- Paul Brady;
- Thomas Stanley Dineen; and
- Bronwyn Plimer.

All of the submissions in support of the Project cited employment opportunities as the key benefit of the Project to the community. Many of the submissions also commended BHOP on the community forums held prior to the exhibition process and the high standard of the environmental studies and documentation produced as part of the EAR.

A summary of the matters raised by the submissions by category is provided in ***Table 2-1***.

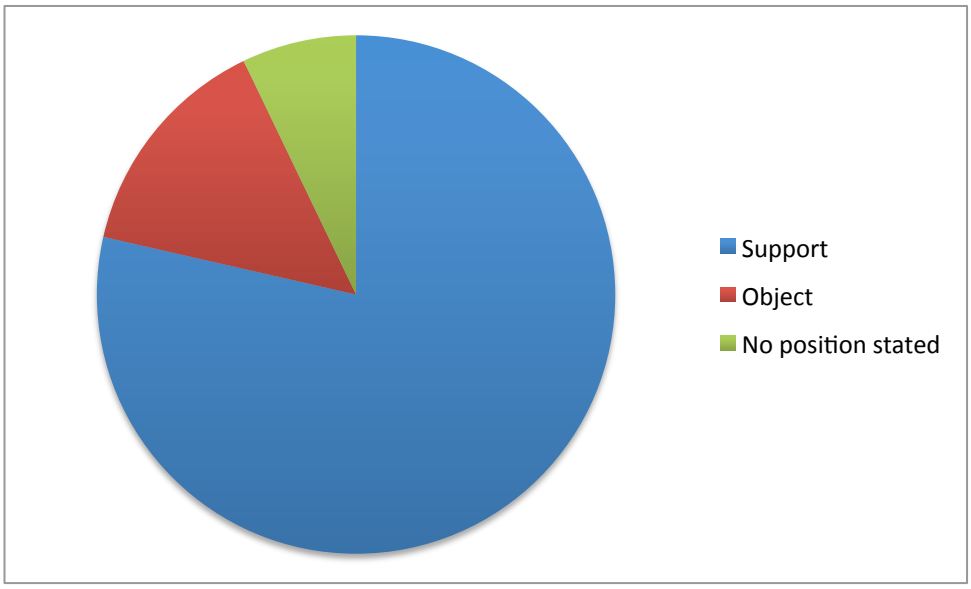


Figure 2-1: Summary of Submissions

Table 2-1: Summary of Matters Raised by Category

Submissions Received	Category of Matters Raised									
	Air Quality (Section 3.2)	Noise & Vibration (Section 3.3)	Community Health (Section 3.4)	Traffic & Transport (Section 3.5)	Aboriginal Heritage (Section 3.6)	European Heritage (Section 3.7)	Water Resources (Section 3.8)	Environmental Risk (Section 3.11)	Rehabilitation (Section 3.12)	Other (Section 3.13)
Government Agency										
Department of Environment, Climate Change and Water (DECCW)	•	•	•		•			•		•
NSW Office of Water (NOW)							•			
Greater Western Area Health Service & NSW Health (GWAHS & NSW Health)	•	•	•							•
Department of Industry & Investment (I&I)									•	
Roads and Traffic Authority (RTA)				•						
Broken Hill City Council (BHCC)	•			•		•				
Special Interest Group										
Residents Against Contaminated Environments (RACE)	•		•							•
General Public										
Glen Ravenscroft	•	•	•							•

2.2 AIR QUALITY

2.2.1 Air Quality Modelling

DECCW –

Recommended new Commitment:

- **Conduct additional air modelling which must include inputs of higher particulate emissions from the active component of the tailings dam.**

In accordance with this recommendation, and subsequent discussions and requests from DECCW, BHOP engaged ENVIRON to undertaken additional modelling of the dust emissions from Tailings Storage Facility 1 (TSF1) under "upset" conditions. ENVIRON sought clarification from DECCW as to what was required by way of additional modelling. The following was provided by via an email dated 17th May 2010 from Mr A Savage, DECCW:

> *"At the meeting I agreed to provide further advice regarding the requirement of additional modelling assessment of the tailings storage facility. Based on the information provided, DECCW requests:*
>
> *additional modelling assessment of 'upset conditions' whereby the active cell is assumed to be saturated, with zero emissions, but 100% of the total area of the inactive cell is assumed to be emitting with 90% control efficiency (base the polymer controlling emissions at near capacity effectiveness). This would represent ~10% of total uncontrolled emissions from the inactive TSF cell (100 × 0.1 = 10%)"*

ENVIRON conducted the additional modelling on this basis. The modeling inputs and results are included in the *Air Quality Assessment Addendum* (ENVIRON, 2010) attached to the PPR*,* and are shown spatially as contours on ***Figure 2-2***.

Significant contingency and redundancy has been built into the design of TSF1 to ensure adequate dust mitigation is available both during normal operations and under 'upset' conditions. Upset conditions at TSF1 were predicted for the 24-hour averaging period only, as this time period is considered to be highly conservative for upset conditions to occur without implementation of any of the Mine's dust control contingencies.

Modelling indicates that only those receptors in close proximity to the TSF1, specifically R1 and R21-R24 along the southeast boundary, show a noticeable influence due to the variation between normal and upset operations of the TSF1.

In all instances, and under the highly conservative assumption that any 'Upset' persists for up to 24-hours, DECCW air quality criteria are anticipated to be satisfied, even at receptors closest to the proposed TSF1. Maximum incremental predictions occur at Receptor R21, as a Project-related 24-hour increment of 11.8µg/m³.

This commitment is now superseded by the additional modelling included in the PPR.

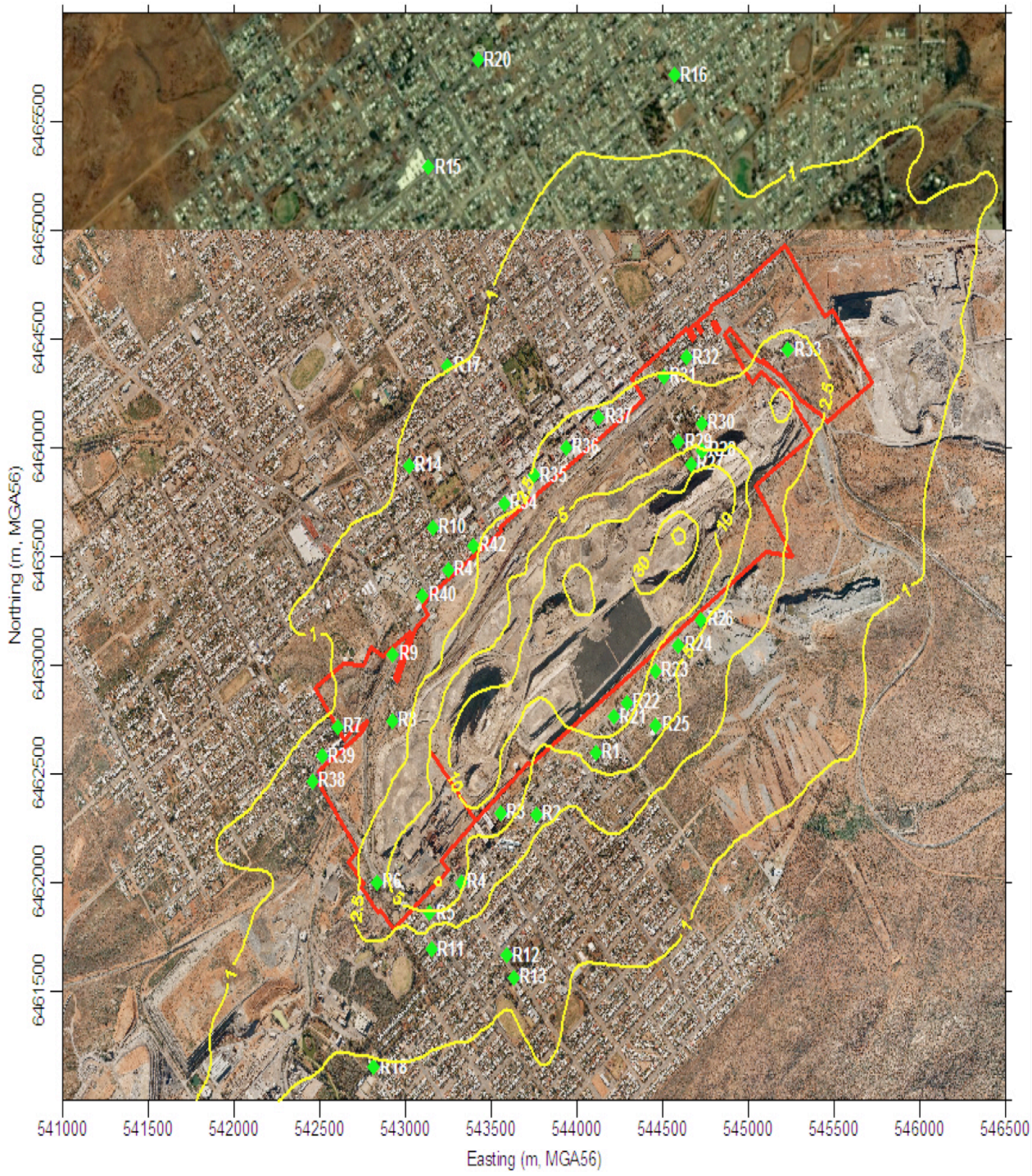


Figure 2-2: Operation Scenario 4 (Project Increment) – Maximum Predicted 24 Hour Average PM_{10} Concentrations (µg/m^3) Criterion = 50µg/m^3

2.2.2 Dust Monitoring

DECCW –

Recommended new Commitment:

- **Undertake sampling to quantify road surface silt loadings on an ongoing basis.**

BHOP will undertake sampling of silt loadings on an ongoing basis. Details of the location and frequency of this sampling will be included in the AQMP. A new commitment reflecting this sampling has been included in Section 3.

Recommended amended Commitment:

- **The commitment for the *"continuation and expansion of the existing air quality management program to include, in additional to two high volume samplers and five dust deposition jars, a real time monitor to identify real time impacts and delineate short term concentrations"* should be amended to read: *"continuation and expansion of the existing air quality management program to include high volume samplers, dust deposition jars and real time monitors"*.**

This commitment has been amended in accordance with DECCW's recommended wording and included in Section 3.

Greater Western AHS and NSW Health –

- **The assessment indicates that the real-time dust monitoring will inform dust management in real-time. There are no contingency plans for situations where the dust management controls may not work. Restriction of certain operations to reduce emissions during those situations must be considered.**

BHOP currently operates under an approved *Air Quality Management Plan* (BHOP, 18 May 2009) (AQMP). The existing AQMP includes a requirement to shut-down operations under certain meteorological conditions. BHOP will reflect this requirement, or a similar requirement as agreed with DECCW, in the revised AQMP prior to the commencement of operations on-site.

RACE –

- **We believe independent dust monitoring should be an absolute must in this situation. Without someone independent to monitor dust levels CBH will have no credibility or transparency.**

BHOP currently has an extensive air quality monitoring program in place to monitor the air quality impacts of the existing operations. This program will be revised and updated in consultation with DECCW prior to the commencement of the extended operations. The new program will be designed in accordance with the development consent conditions, the updated Environment Protection Licence (EPL) conditions and to meet the high air quality management standards of the site.

The current monitoring program requires that all air quality monitoring samples are collected by site personnel and sent to an independent NATA certified laboratory for analysis. This requirement will continue for the updated air quality monitoring program. The air quality monitoring results are currently reported to DECCW via BHOP's Annual Return and the Annual Environmental Management Report (AMER). Air monitoring results are also provided to the BHCC each month. Public access to air quality monitoring information as well as mitigation measures will be provided in an annual community environment report.

2.2.3 Soil Assessments

DECCW –

Recommended new Commitment:

- **Conduct a six monthly assessment of soil contamination on vacant land in Eyre Street and designated residences adjacent to the tailings dam (identified as the initial tailings disposal area) until dam is decommissioned and rehabilitated.**

BHOP will undertake assessments of soil contamination on land in Eyre Street including lands adjacent to TSF1. The precise location of soil sampling points will be decided in consultation with DECCW and incorporated into the AQMP to be prepared prior to the commencement of construction.

BHOP has therefore included the following SoC in Section 3:

Conduct bi-annual assessment of soil contamination on land in Eyre Street and land adjacent to TSF1 until TSF1 is decommissioned and rehabilitated.

2.2.4 Dust Emissions from TSF1

DECCW –

Recommended new Commitment:

- **Installation of video recording equipment to assist in the active management of emissions for the tailings dam.**

Greater Western AHS and NSW Health –

- **Active surveillance and reactive management of emissions from the tailing dam must be instituted.**

BHOP understand that DECCW and the health agencies are concerned about the potential for dust emissions from TSF1. Accordingly, BHOP will commit to installing real-time video equipment at the TSF1 to record the area and confirm that the tailings are not generating dust. This system will allow active management of the area and timely implementation of additional mitigation measures, if required.

DECCW –

Recommended Condition:

- **Visible dust emissions from any tailings storage facility are not permitted at any time.**

BHOP will take all reasonable and feasible measures to ensure that dust emissions from tailings storage facilities are negligible during construction, operation and closure of the facilities. As indicated in Sections 2.6.4 and 8 of the EAR, the dust prevention strategy for the TSF comprises the use of waste rock as embankment material, the use of temporary water sprays during construction, the installation of a spray system around the perimeter of each cell and the application of chemical dust suppressant after a cycle of tailings deposition ceases. Furthermore, as described above, the operation of real-time video surveillance will ensure continual reactive management of the facilities to negate dust emissions.

The air modelling results presented in the *Air Quality Assessment Addendum* (ENVIRON, 2010) demonstrate that these measures are adequate to control dust from the TSF. As requested by DECCW, the modelling was also undertaken under 'upset' conditions (refer to Section 2.2.1). These results also indicated even under the highly conservative assumption that any 'upset' persists for up to 24-hours, the DECCW air quality criteria can be satisfied. However BHOP is committed to ensuring minimal dust is generated at TSF1 and that control measures are undertaken immediately it becomes apparent that TSF1, or parts thereof, have dried out sufficiently to generate dust.

BHOP considers that the wording of this commitment should reflect this modelling and its commitment and has therefore included the following new Commitment:

Visible dust emissions from any tailings storage facility will be negligible.

2.2.5 Dust Emissions from Processing Buildings and Crushing Circuit

DECCW –

Recommended Conditions:

- **Crushing, grinding, screening and separating of extracted material must only occur inside the processing building.**
- **The processing building must be maintained under negative pressure at all times.**
- **The processing building and emission controls must be constructed and operated in such a manner, as to ensure there are no fugitive emissions from the processing building.**

Due to modifications to the processing plant and crushing circuit, these statements are now not applicable. A detailed description of the new processing plant and crushing circuit is provided in the PPR. The report clearly demonstrates that the modified plant, building design and locations would result in reduced air quality impacts, when compared to the original proposal.

This has been achieved by modification to processing operations, as well as additional dust control measures, including:

- Removal of dust generating secondary and tertiary crushers and screens (material from the jaw crusher now passes directly into the SAG mill, which is a wet process);
- Enclosing the crusher area with cladding and capturing of particulate emissions through hooded extraction to a bag house;
- Fully enclosing all conveyors prior to the grinding circuit and dust controlled via insertable bag dust collection units; and
- Strategically placed misting sprays to further assist in the control of fugitive dust emissions.

The *Air Quality Assessment Addendum* (ENVIRON, 2010) presented in the PPR demonstrates that the selection of dust control for the crushing circuit (full enclosure under negative pressure with all emissions vented to a baghouse versus acoustic cladding with hooded extraction) is not a critical factor in predicted concentrations from the Project.

The Addendum concluded that, even under highly conservative assumptions, the Project would meet the DECCW air quality criteria. It is therefore not considered necessary to fully enclose the crushing circuit venting under negative pressure to a baghouse.

It should also be noted that the original proposal as outlined in the EAR did not enclose grinding and separating activities within a building.

DECCW –

Recommended Commitment amendment:

- **Enclosure of all above ground conveyors and transfer points prior to the grinding circuit (ball mills).**

The original commitment in Section 3 has been amended to add the words "prior to the grinding circuit (SAG and ball mills).

2.2.6 Chemical Dust Suppressants and "Free Areas"

DECCW –

Recommended Commitment amendment:

- **The commitment to *"*maintaining a surface crust to minimise potential wind erosion". This should be revised to *"chemical dust suppressants as per the manufacturer's specifications, or more often as required, are to be used on all areas of the site potentially impacted by wind erosion".***

Recommended new Commitments:

- **Provision of a map of mine "free areas".**
- **Specify dust control measures for mine "free areas".**

The modelling undertaken as part of the *Air Quality Assessment Report* (ENVIRON, 2010) (Appendix H of EAR) was based on application of dust suppressants to all "free areas". "Free areas" are defined as existing on-site areas which are exposed and which will not be impacted by the day-to-day operation of the mine. The location of all Project-related "free areas" are shown on ***Figure 2-3***. To avoid confusion, BHOP proposes to add a reference to this figure in the SoC.

The commitment in relation to the use of dust suppressants has therefore been revised to state:

> *Chemical dust suppressants as per the manufacturer's specifications, or more often as required, will be used on all areas of the site potentially impacted by wind erosion as per the 'free areas' marked on the following Figure.*

2.2.7 Sealing of Haul Roads

DECCW –

Recommended Commitment amendment:

- **The commitment to *"extensive sealing of haul roads and other primary roadways"*. This should be revised to <u>specify all roadways that will be sealed</u>, eg. the 1.25km section of the haul road from the Kintore pit to ROM (Run of Mine) pad as detailed in section 3.1.1 of the Air Quality Impact Assessment.**

Table 2-2 provides a listing of all the existing and proposed sealed roads within the Rasp Mine area. This information has been incorporated into the revised air quality and noise assessments for the preferred project (which are provided in full in the PPR). The total length of sealed roads within the complex will be 4,514 metres.

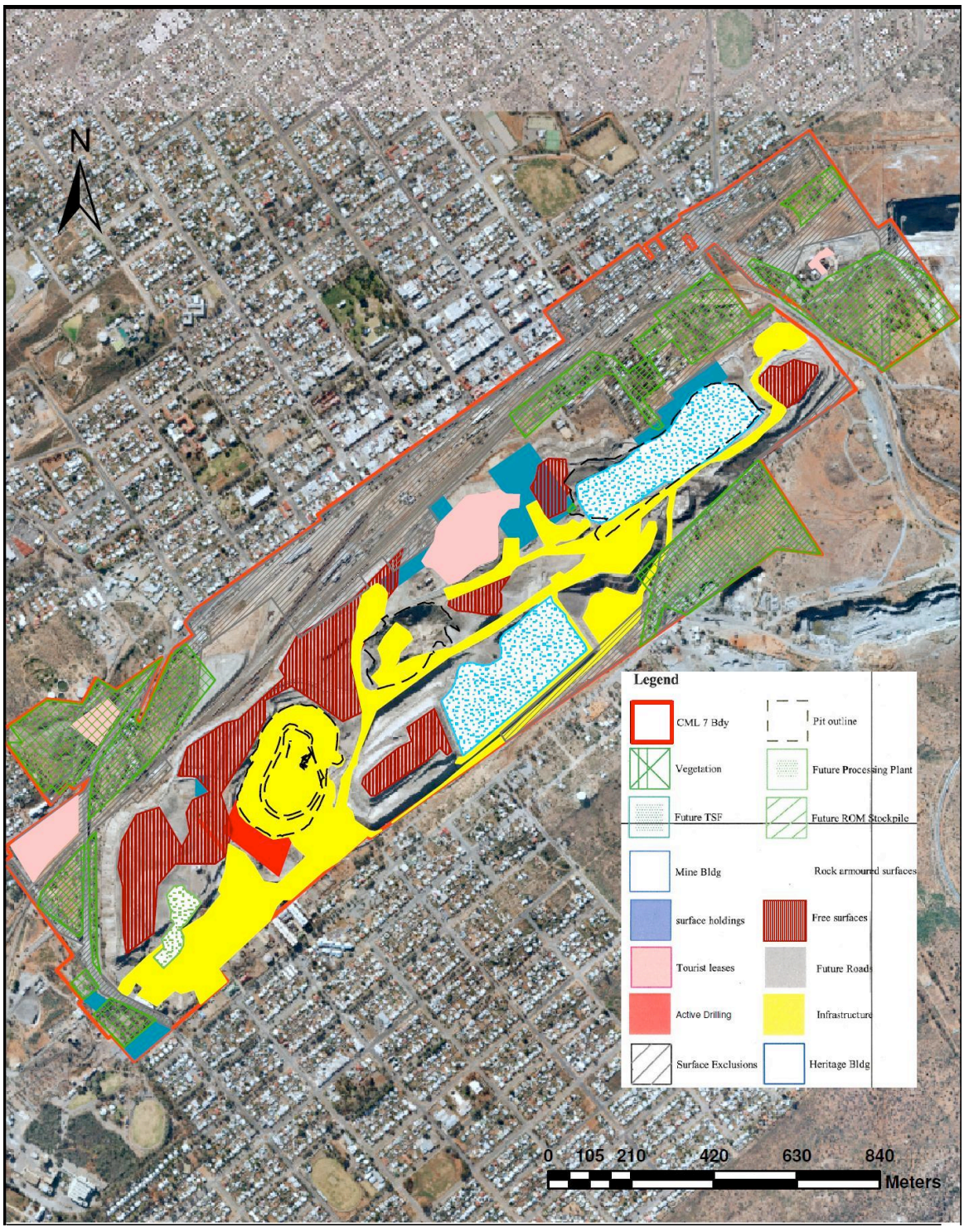


Figure 2-3: Project-related "Free Areas"

The commitment in relation to sealing of haul roads and other primary roads has been amended to include ***Table 2-2***.

Table 2-2: Existing and Proposed Sealed Roads

Road		Length (m)
Existing	Front gate to truck wash	292
	'Diamond' intersection to core shed	360
	Front gate road to car park	132
Proposed	Truck wash to haul road connection from Kintore Pit	690
	Kintore Pit intersection (truck wash and haul roads) to ROM pad (haul road for ore mine trucks)	1186
	ROM pad to and through mill	354
	Mill to rail load out (concentrate trucks)	910
	Truck wash road to workshop	190
	Haul road to backfill plant	400

2.2.8 Traffic-related Dust

Greater Western AHS and NSW Health –

- **There is concern that vehicle traffic along Eyre Street will generate increased dust levels in this area. This dust will have potentially high lead levels and will settle on roofs, houses and in yards, potentially increasing soil lead levels and may entre private water tanks if present following rainfall.**

In order to prevent surface material from being transported from the site onto local roads, BHOP has installed a fully automated vehicle wash facility at the main exit road, prior to the boom gate access point. All vehicles that have entered passed the boom gate access point will be required to be washed down prior to leaving site. This is to remove any potential lead contamination that may be on the vehicle. This includes ore transport vehicles, delivery vehicles, contractor and BHOP vehicles. The main features of this facility are:

- fully automated wash system;
- deluge designed to wash wheels and undercarriage of cars and trucks;
- waste water treatment and recycling systems; and
- sediment collection and removal system.

Therefore, vehicles exiting the site will not carry dust and there would be no impact on resident's houses, yards or water tanks from this source.

2.2.9 Dust Impacts

DECCW –

Recommended Condition of Consent

- **The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.**

BHOP will maintain the site in a condition that minimises or prevents the emission of dust from the premises. A commitment reflecting this condition has been added to the SoC at Section 3.

General Public

- **Dust and airborne pollutants are a common problem and as much as the applicant proposes using spray suppressants, will not completely negate this problem.**

BHOP agrees that dust and airborne pollutants are a common problem in the Broken Hill area and that the Project is unlikely to completely negate this problem. This is because the air quality issues in the region are not solely related to the existing or proposed mining operations.

The *Air Quality Assessment Report* (ENVIRON, 2010) undertaken as part of the EAR (Annexure H) clearly indicates that the background air quality within the region is elevated when compared with other locations in NSW, and currently on occasions exceeds the NSW DECCW guidelines for both 24-hour PM_{10} and dust deposition. Such exceedances are anticipated to be largely due to natural processes, such as dust storms and the arid desert climate.

Similarly, the *Human Health Risk Assessment Report* (HHRA) (Toxikos Pty Ltd, 2010) undertaken as part of the EAR [Annexure I(A)] indicates that Broken Hill residents exhibit higher than average blood-lead levels and that these are attributed to a range of sources, and not just from mine-related activities. Sources include the naturally high lead levels in the soils, aridity and dust storms, lead petrol and lead paint dust from house renovations. This point is discussed in greater detail in Section 2.4.

Therefore, dust and airborne pollutants such as lead are likely to remain an issue in Broken Hill, irrespective of whether the Project proceeds.

It should be noted that both the *Air Quality Assessment Report* and HHRA undertaken as part of the EAR indicate that the Project is unlikely to exacerbate air quality issues in the region. The strict air quality controls, including the use of chemical dust suppressants, would ensure that the incremental 24-hour and annual average concentrations of TSP, PM_{10} and $PM_{2.5}$ would be below the applicable NSW DECCW assessment criteria for both construction and operational phases of the Project.

The HHRA concluded that lead exposure resulting from the proposed mine presents little risk to the health of nearby residents. In fact, the predicted increase in blood-lead levels as a result of the project are *less* than if the site is left in its present condition, primarily due to the use of chemical dust suppressants.

Therefore, although the Project will not totally negate air quality issues in the Broken Hill region, it will not result in an increase in dust and airborne pollutants. In fact, the Project is predicted to improve air quality in the area by implementing additional dust control measures.

2.2.10 Odour

RACE –

- **The location of TSF1 is approximately 300 metres from residential properties. The tailings will be pumped straight from the mill to the dam and will contain odour producing chemicals which will affect nearby residents during the pumping and dry process and beyond.**

- **The floatation mill and treatment plant will also produce offensive odours due to chemical additives, which without any special odour reducing measures in place will impact greatly on nearby residents.**

The organic chemicals used in the processing plant for separation of the lead and zinc minerals are surface active and, as a concentrated solution, are odorous. However, these chemicals are

preferentially removed in the concentrate that is separated from the main ore stream and sent to filtration.

The dry concentrate and residual chemicals are then exported from site in sealed containers. The tailing from the concentrator is the ore stream after the concentrates of lead and zinc are removed. This tailing goes through a thickening process to remove the majority of the water, which contains residual chemicals not removed in the concentrate. The tailing is then sent to the TSF for settling and decantation. This process results in limited odours being produced from the TSF. Therefore, no odour reducing measures are required to be applied to the plant tailing stream.

2.2.11 Air Quality Reporting

DECCW –

Recommended Condition:

- **The Air Quality Management Plan must include dust management practices that effectively minimise dust emissions at all times, including all mitigation measures discussed in the EAR.**

BHOP will ensure that the Air Quality Management Plan committed to in the EAR contains all the dust mitigation, management and monitoring measures specified in the EAR, as well as the PPR and this RTS report.

DECCW –

Recommended Commitment amendment:

- **The completion and implementation of the Tailing Construction and Operation Manual prior to the commencement of any construction activities at the site;**

The original commitment in Section 3 has been amended to add the words “prior to the commencement of any construction activities at the site”.

2.3 NOISE & VIBRATION

2.3.1 New Noise & Blasting Commitments

DECCW –

Recommended new Commitments:

- **Ensure operational noise is within limits of the NSW Industrial Noise Policy.**
- **Ensure rock blast vibration levels are within guidelines issued by the Australian and New Zealand Environmental and Conservation Council.**
- **Ensure rock blast overpressure limits are within guidelines issued by the Australian and New Zealand Environmental and Conservation Council.**
- **Crushing and screening only to be carried out during dayshift (7:00am to 7:00pm) seven days a week.**
- **Shunting of concentrate wagons will only occur between 7:00am and 6:00pm seven days a week.**

- **Production rock blasting will not occur between 7:15pm and 6:45am seven days a week.**

BHOP is satisfied with these recommendations and has updated the draft SoC to reflect the new commitments.

2.3.2 Construction hours

DECCW –

Recommended new Commitment:

- **Submit a construction noise report that demonstrates and justifies the need to carryout construction activities outside the standard hours of the Interim Construction Noise Guideline.**

The Construction Noise Guideline (CNG) (DECCW, 2009) recommends that construction works are restricted to:

- Monday to Friday, 7am to 6pm;
- Saturday, 8am to 1pm; and
- No construction work on Sunday or public holidays.

Broken Hill is a remote location in New South Wales. During construction BHOP will require some degree of contract labour from intra- and inter-state. To accommodate contractor travel arrangements and to limit the time contractors may be away from their families, BHOP proposes to undertake construction work from 7am to 7pm, seven days a week. This will also have the benefit of reducing the duration of the construction activities.

An updated *Noise & Vibration Assessment* (EMGA Mitchell McLennan, September 2010), including an assessment of construction noise levels predicted to be generated by the preferred project, is included in the PPR. The results are summarised in ***Table 2-3*** and presented graphically as noise contours in ***Figure 2-4*** below. It should be noted that no privately owned dwellings are within the 35 dB(A) contour for construction activities.

The results demonstrate that typical construction activities are expected to satisfy the adopted CNG criteria at all representative residential locations. To that end, predicted noise levels are generally below background noise levels at corresponding residential locations and well below *Industrial Noise Policy* (DECCW, 2000) (INP) based operational noise targets for both the daytime and evening periods.

It is generally accepted that, if construction noise can be shown to satisfy the stricter operational noise targets at residence, then construction activities can occur at anytime. Hence, the extension of construction hours to between 7am and 7pm seven days per week is considered reasonable.

During a recent meeting with the DoP it was noted that construction noise criteria does not generally apply to construction activities at “Brownfield” mine sites (due to the typically long construction times and the fact that construction activities are often indistinguishable from mining type operations). However, the area proposed for the process plant is significantly removed and isolated from any current sources of noise on the site. This, combined with the location of potentially impacted receivers suggests proposed construction noise is likely to be clearly distinguishable from any operations. Notwithstanding, the information presented above indicates that the Project noise levels predicted to be generated during construction works would still comply with the operational noise criteria.

Table 2-3: Predicted Construction Noise Levels

Location		Predicted Leq,15min Construction Noise Level, dB(A)		ICNG Daytime Criteria (background +10dB)	INP Operational Criteria, dB(A)	
		Civil Works	Structural Works		Day	Evening
A1	Piper St North	24	20	43	38	37
A2	Piper St Central	22	17	43	38	37
A3	Eyre St North	19	15	49	44	41
A4	Eyre St Central	18	14	49	44	41
A5	Eyre St South	18	13	49	44	41
A6	Bonanza & Gypsum Sts	19	15	53	48	41
A7	Carbon St	16	13	40	35	35
A8	South Rd	19	14	53	48	39
A9	Crystal St	18	14	51	46	39
A10	Garnet & Blende Sts	18	15	47	42	41
A11	Crystal St	29	26	51	46	39
A12	Crystal St	34	30	51	46	39
A13	Eyre St North 2	31	28	43	38	35
A14	Piper St North	27	24	40	35	35

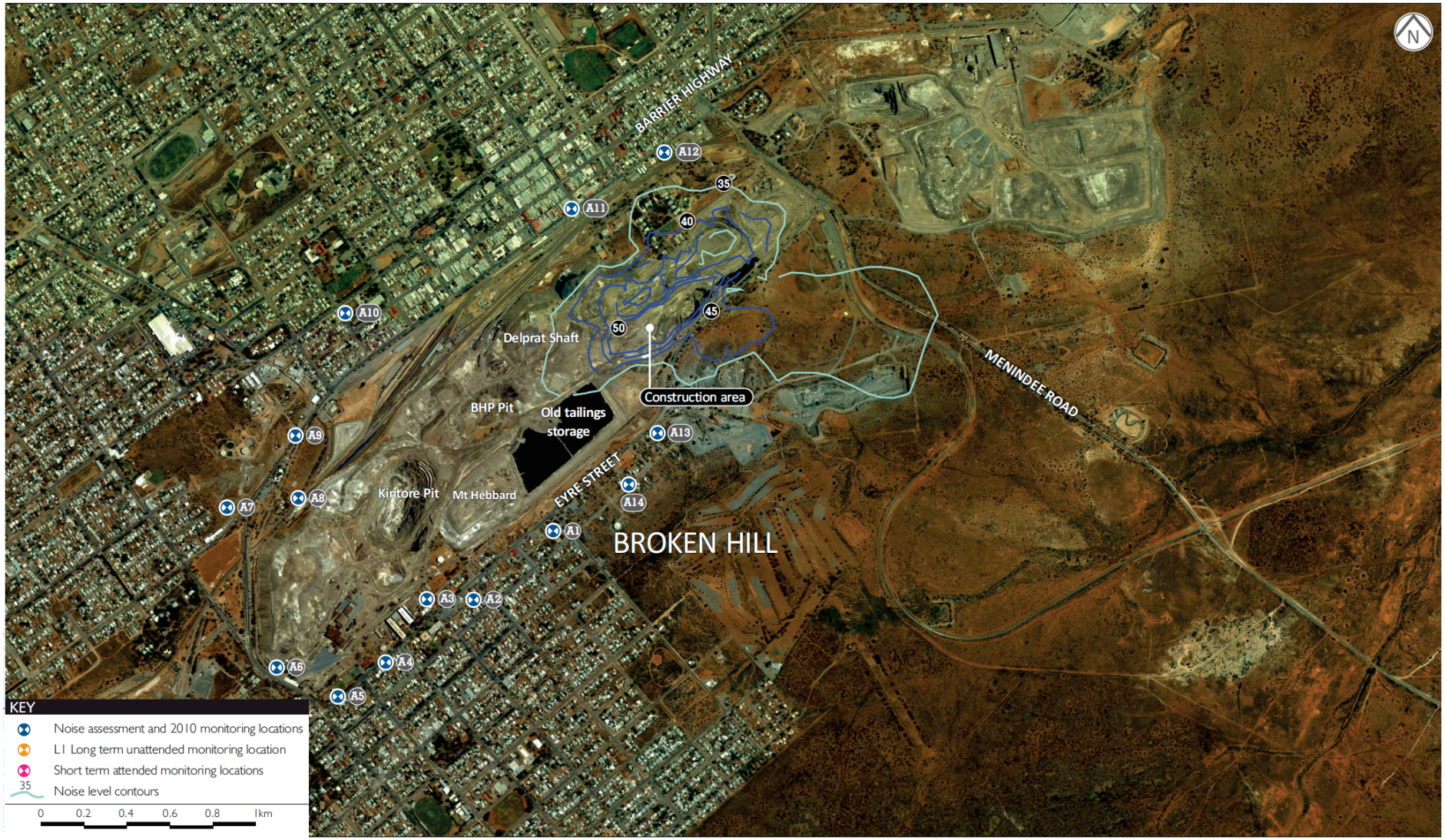


Figure 2-4: Daytime construction $L_{eq,15min}$ noise level contours, dB(A)

2.3.3 Traffic Noise

Greater Western AHS & NSW Health –

- **Concern that heavy vehicles using Eyre Street will increase noise levels.**

BHOP engaged Environmental Resources Management (ERM) and Environmental Management Group Australia (EMGA) to undertake *Noise and Vibration Assessments* (ERM, 2007 and EMGA, 2009) for the Project [Annexure G(A) and G(B) of the EAR]. The assessments included analysis of the traffic noise generated during the construction and operational phases of the Project. A summary of the results of the traffic noise assessment are included in Section 7.4.4 of the EAR and are reiterated in ***Table 2-4*** below.

The expected traffic noise levels calculated for a representative residence located in Eyre Street (i.e. façade 20 m from the road) indicate that during the busiest hour of the day or night, the environmental criteria for road traffic noise will be met at the potentially most affected residence. No significant road traffic noise impacts are therefore anticipated.

Table 2-4: Predicted Traffic Noise – Eyre Street (20 m from road)

Modeled scenario	Peak 1hr traffic volumes			Leq,1hr dB(A)	Criteria, dB(A)
	Light	Heavy	Total		
Existing (day)	132	21	153	65	NA
Project only (day)	57	12	69	62	NA
Cumulative (existing & Project) (day)	189	33	222	67	67
Project only (night i.e. 6.30am – 7.30am for 7am shift change)	67	0	57	51	55

1. Modelled speed is 50 km/hr as per street signpost.
2. Criteria are ERCTN (DECCW, 1994) criteria for land use developments with potential to create additional traffic on collector roads.
3. The night-time shift change 55dB(A) criteria assumes existing traffic noise levels are relatively low at below 45dB(A).

2.3.4 Noise Management Plan

Greater Western AHS & NSW Health –

- **A Noise Management Plan should be developed and implemented by the applicant to the satisfaction of DECCW.**

As indicated in Section 7.5.4 and committed to in Section 18.3 of the EAR, BHOP will update the existing site Noise, Vibration and Overpressure Management Plan to reflect the new operations and controls. The Plan will include:

- trigger limits for noise levels with response actions plans;
- details of major emission sources and their mitigation measures;
- details of inspection and monitoring programmes;
- details and requirements for a noise awareness programme for employees and contractors;
- details of the community complaints procedure; and
- internal and external reporting requirements.

BHOP will ensure that the Plan is prepared to the satisfaction of DECCW prior to the commencement of construction operations on-site.

2.3.5 Noise Predictions and Impacts

General Public

- **Although the applicant has shown attempts to reduce noise pollution as much as possible, there will still be affects from noise.**

As previously indicated, a revised *Noise and Vibration Assessment* (EMGA, 2010) has been prepared for the preferred project and is included in the PPR. The assessment indicates that the construction and operational activities proposed to be undertaken at the site would generate noise levels that are within noise criteria recommended by DECCW's INP at all residential locations surrounding the site. The assessment also indicates that predicted night-time noise levels satisfy the strictest sleep disturbance criteria specified in DECCW's *Environmental Noise Control Manual* (EPA, 1994) at most residential locations. The exception is a minor (1dB) exceedance of strict criteria at two locations in the northern parts of the town. This is considered to be a very minor level of exceedance that will not be noticeable in practice.

It should be noted that the noise modelling undertaken as part of the assessment is based on worst-case meteorological conditions. The daytime predictions were based on calm weather conditions and the night-time predictions are for calm and temperature inversion conditions, even though inversions were found not to be a 'feature' of the area as defined by the INP.

Therefore, noise generated from the project will be within applicable strict noise criteria specified by DECCW, even during calm weather conditions.

BHOP is also cognisant of the potential impacts to its neighbours from its operations. This was the driving force in relocating the processing plant from its original location to the north east of the lease. The distance to the closest residence from the crushing and grinding activities, acknowledged as the major noise sources, has increased from 200 m to 425 m and the benefits in reduced noise impacts are demonstrated by the noise modelling.

General Public

- **Noise pollution levels and accepted levels of noise differ from previous submissions (re submission 2009 stage 1 CBH), which indicate conflicting measurements quoted. I request a re-evaluation assessing previous measurements with present quoted figures.**

The background noise levels used in the noise assessment prepared as part of the current EAR [Annexure G(A) and G(B)] and the levels used in BHOP's 2009 development application (DA 264/2009) were both sourced from monitoring undertaken as part of a *Noise and Vibration Assessment* undertaken by ERM in 2007. The background noise levels used for the current and the 2009 applications are therefore the same.

However, the noise criteria imposed by DECCW as part of the 2009 EPL differ from the Project specific operational noise criteria adopted for the current assessment. BHOP cannot explain why DECCW imposed different criteria in the 2009 EPL, the assessments were base on the same background noise levels. The Project specific noise criteria for the current assessment have been derived in accordance with DECCW's INP.

2.4 COMMUNITY HEALTH

2.4.1 Health risks associated with chemical dust suppressant

DECCW –

Recommended new Commitment:

- **Revise the health risk assessment for the dust suppressant chemicals once the choice of chemicals has been finalised.**

Greater Western AHS and NSW Health –

- **A satisfactory update and approval of the health risk assessment around the dust control agents to be used on site before operations commence.**

RACE –

- **CBH still hasn't decided on a particular brand of dust suppressant, therefore we do not know what the chemical make-up of this suppressant will be.**

Annexure I(b) of the EAR provides a *Screening Assessment of Health Risk Potentials due to Chemical Dust Suppression Agent Applications* undertaken by ENVIRON Australia Pty Ltd (2010). The Screening Assessment provides a comprehensive analysis of the potential for health risks occurring as a result of the off-site transport of a range of dust suppression chemicals.

The Assessment concluded:

> *"The chemical components of the dust suppressants which have been identified as being of concern are generally of high vitality and environmental fate properties indicate that these chemicals will be relatively short lived, both in the soil as a result of degradation processes, and in the atmosphere. Absorption to soil particles is also unlikely due to the low organic matter content of the sandy soils typically found in the vicinity of the mining site. Nevertheless, the migration of contaminants off-site via vapour, dust and spray was modelled.*
>
> *The exposure of the nearest residents was estimated using worst case scenarios. Maximum concentrations were compared with toxicity values according to enHealth guidelines. The risk and hazard were calculated and these indicated that the potential for human health impacts from the use of dust suppressants on the mining site were negligible".*

Based on the results of this assessment, BHOP does not consider it necessary to re-assess potential health risks associated with a dust suppressant that has already been assessed as having negligible impact. However, BHOP will commit to undertaking an additional assessment if the suppressant chosen was not analysed as part of the EAR Screening Assessment.

Accordingly, the following commitment in relation to health risk assessment for the dust suppressant has been included in the SoC:

> *"If the dust suppressant chosen to be used at the site is not included in the Screening Assessment undertaken as part of the EA (Annexure I(b)), then a new health risk assessment of the dust suppressant will be undertaken and forwarded to Greater Western AHS and NSW Health for review prior to its use on-site."*

2.4.2 Blood-lead Level Monitoring

DECCW –

Recommended new Commitment:

- **Development of a Community Health Assessment Plan acceptable to the Department of Planning, Department of Health and DECCW. The plan will detail the proposed health assessment of residents adjacent to the mine likely to be at risk as a result of background lead levels and possible lead emissions from the mine. The plan must include monitoring of blood lead levels of resident children and where necessary an assessment of the cause and recommended remedial action where these levels are above acceptable levels.**

Greater Western AHS –

- **Current blood lead monitoring should go beyond the employees and contractors identified in the report and include monitoring of community members with a particular focus on children 0 to 5 years.**
- **Given the current knowledge on blood lead levels and their effects on health, the uncertainties in the health risk assessment and the close proximity of the mine to a large population already affected by lead contamination, Greater Western AHS would be seeking blood level monitoring / surveillance of the population and targeted specifically at the impact the mine was having on the population.**
- **Given the assumption of community awareness around existing lead risk, Greater Western AHS would be seeking to institute an appropriate community awareness and education program around lead risk.**

BHOP does not consider that it is appropriate for a mining company to have the responsibility for blood-lead level monitoring of the Broken Hill general population. This view is based on a number of key reasons, including:

- Extensive human health risk assessment reporting has concluded that lead exposure resulting from the proposed mine presents little risk to the health of nearby residents. In fact, the predicted increase in blood-lead levels as a result of the project are *less* than if the site is left in its present condition;
- Health risk assessment results have been based on *very* conservative assumptions, which have been subject to a sensitivity analysis;
- Previous studies in Broken Hill have shown that higher than average blood-lead levels in the area are attributed to a *range of sources*, not just from mine-related activities;
- Lead contamination in Broken Hill is a *community wide* issue that should be dealt with on a community wide level; and
- Blood-lead level monitoring of the general Broken Hill population is already being undertaken by the Greater Western AHS.

Human Health Risk Assessment

The EAR contains a comprehensive HHRA that was undertaken by Toxikos Pty Ltd (Toxikos) (2010). The HHRA included extensive analysis of background environmental lead concentrations in Broken Hill, analysis of a range of exposure scenarios, modelling of blood-lead levels and characterisation of incremental risks to human health due to the Project.

The HHRA indicated that at the most affected receptors the total lead intake was predicted to be 60% of the Tolerable Daily Intake (TDI) set by the World Health Organisation. These predictions were based on very conservative estimates of background lead intake from existing soil and diet. The HHRA concluded that lead exposure resulting from the proposed mine presents little risk to the health of nearby residents.

Furthermore, the HHRA noted that the predicted increase in blood-lead levels as a result of the Project are *less* than if the site is left in its present condition. The difference is due to the additional dust controls that the mine has committed to implement as part of the Project.

Toxikos is aware that limited data and assumptions used in the HHRA may influence the accuracy of the results. However, it should be noted that the assumptions used to cope with unknowns in data for specific parameters err on the side of safety and therefore bias the evaluation to an over-estimation of health risk. The results of the assessment are therefore considered worst-case. This approach is considered appropriate for an assessment of possible impacts on human health. It should be noted that uncertainties identified in the assessment were subject to a sensitivity analysis, which further demonstrated the conservative nature of several of the assumptions used in the assessment.

Lead Sources

The HHRA provides a review of available data and studies on blood-lead levels in residential areas of Broken Hill. Although it is acknowledged that lead in soil and house dust is dominated by ore body sources, studies have shown that a significant proportion of lead was from different sources such as leaded petrol and paint (Gulson et al., 1995). Comments from members of the Broken Hill Lead Reference Group meeting held on 12th May 2010 indicated that lead paint sources are of particular concern given that more and more people in the Broken Hill area are renovating houses.

Blood-lead levels can also be influenced by environmental factors such as drought. This is due to the naturally high lead levels occurring in soils adjacent to the Line of Lode orebody, which runs through the centre of Broken Hill. As indicated in a newspaper article published in the Barrier Daily Truth on 3rd May 2007, the blood-lead levels in children living in Broken Hill increased in 2007 and this is thought to be attributed to dry conditions brought on by the drought. The article describes how water was becoming more and more expensive and people were not watering gardens in which children were playing. Drought causes more dusty environments at home and in public areas in which children were playing.

There are also a number other mining and quarrying operations in the immediate vicinity of the Broken Hill township that would be responsible for contributing to dust in the region.

It is therefore not reasonable or feasible to determine that changes in blood-lead levels within the Broken Hill population are attributed to mining operations associated with the Rasp Project.

Community Wide Issue

The lack of a single source of lead, and its widespread distribution in and around the City, highlight the fact that higher than average blood-lead levels in the area is a community wide issue. This point has been acknowledged by BHCC and health agencies through the establishment of the Broken Hill Lead Reference Group. This Group was recently reinstated to facilitate a whole of government and community approach to the management of lead in Broken Hill.

Due to the predicted low level of incremental risk to human health attributable to the Project and the lack of a single source of lead in the community, BHOP considers that it is not reasonable or feasible to be solely responsible for undertaking blood-lead level monitoring of the general Broken Hill population. Rather, BHOP believe that it is a community issue that needs to be addressed on a community level, and facilitated through local and State health agencies.

Nevertheless, BHOP is willing to continue to support the Greater Western AHS and NSW Health in their endeavours to monitor and reduce blood-lead levels in the Broken Hill area.

As indicated in Section 2.2.4, BHOP have included a new commitment to undertake assessments of soil contamination of land in Eyre Street and land adjacent to the tailings dam on a six monthly basis. This monitoring will provide valuable long-term information on lead levels in areas adjacent to the Mine. BHOP is also committed to an extensive air quality monitoring program which will identify the potential for any increases in blood lead levels long before they can be realised. BHOP consider this is a better indicator allowing preventive measures to be undertaken before any Broken Hill resident can be affected by lead bearing dust attributable to the Rasp Mine.

As indicated in the EAR, BHOP is also committed to implementing dust mitigation and suppression measures (refer to Chapter 8 and Section 18.6 of the EAR) to manage emissions and prevent adverse impacts from its operations contributing to increased blood-lead levels in the local community. In addition, BHOP has committed to preparing and implementing a comprehensive Lead Management Plan, which will include:

- requirements for employee and contractor hygiene;
- requirements for washing lead soiled articles, for example laundering of work clothes;
- requirements for washing vehicles prior to leaving the site;
- requirements for monitoring of employee lead blood levels with actions to be taken when designated trigger levels are reached; and
- requirements for inspections and housekeeping for each operational area to minimise dust build-up and the potential for subsequent off-site movement.

BHOP will also continue to work with the local community groups and health agencies and support them in their goals and initiatives to manage lead levels in the area. This may include:

- Attending Broken Hill Lead Reference Group meetings;
- Contributing to lead awareness education programmes in order to maintain a high level of lead awareness within the local community;
- Assisting in encouraging public participation rates in existing blood lead monitoring programs; and
- Other initiatives as determined, for example, supporting a university student theses through the use of a XRF lead monitor to identify lead levels in soils in the City of Broken Hill .

Finally, BHOP notes that approximately $41 million in royalties will be paid to State and Federal Governments over the life of the mine. It is presumed that a portion of these payments would be distributed to the agencies responsible for health and would contribute to a range of services and programs, including funding for monitoring programs such as blood lead monitoring in Broken Hill.

2.4.3 Lead Modelling

Greater Western AHS and NSW Health –

- **There is the potential of increased dust containing lead in the immediate vicinity of the mining operation and in areas in the path of winds with potential for lead to be washed into private raintanks. The bioaccessibility of lead from this source has not been included in modelling. Community members must be made aware of this potential through community education programs.**

As indicated in Section 9.2.1 and Annexure I(a) of the EAR, the bioaccessibility of lead from rainwater tanks was not included in the HHRA. Ingestion of tank water in Broken Hill was not considered an exposure pathway. Broken Hill residents are supplied reticulated water and the Greater Western AHS, BHCC and Country Water have undertaken extensive education campaigns alerting residents to the risks of consuming tank water, and advising residents not be drink tank water or used tank water in food preparation. Given this no data was available to enable this source to be included in the HHRA

Given the well-known health risks associated with ingestion of tank water in Broken Hill, it is considered unlikely that it is used for drinking water purposes. It is therefore not considered appropriate to include ingestion of tank water as an exposure pathway in the HHRA.

2.4.4 Existing Health Concerns

General Public

- **The closest residents to the mine lease already have highly contaminated soils and are subject to adverse health effects.**

The HHRA undertaken as part of the EAR included a review of available data on soil lead concentrations in residential areas of Broken Hill. The background soil lead concentrations used in the assessment were sourced from Greater Western AHS (Boreland, 2010) and include measurements of soil lead levels sampled during the period 2004 to 2008, which is the most recent soil data available. This data was derived as part of the management response to children with high blood lead levels. It is therefore more reflective of high-end or "worst-case" concentrations.

The soil lead concentrations calculated to be present after 15 years of mine operation assumed no loss of the deposited lead as a result of the Project plus the assumed background soil lead concentrations. This data, plus high-end background lead intake from diet, intake from the Broken Hill articulated water supply and intake by inhaling airborne PM_{10} lead, was included in the health risk assessment model.

Despite the "worst-case" inputs used in the human risk assessment, the model indicated that at closest residents to the mine, the total lead intake was predicted to be 60% of the TDI, which presents little risk to the health of nearby residents. As previously indicated, the predicted increase in blood-lead levels as a result of the project are *less* than if the site is left in its present condition. This is due to the additional dust controls that would be implemented at the mine.

2.5 TRAFFIC & TRANSPORT

2.5.1 Site Access

BHCC –

- **The access to the site from Eyre Street should be assessed to determine the capability of the existing road pavement to withstand the intended road and traffic movements.**

BHOP has included a commitment in Section 3 to assess the capability of the existing road pavement along Eyre Street to withstand the intended road and traffic movement associated with the Project. This assessment would be undertaken prior to the commencement of construction. If it is found that the road pavement is inadequate, then BHOP will consult with BHCC to agree on any feasible contributions for road pavement improvement and/or maintenance works.

BHCC –

- **The access to the site should be assessed to determine the need for traffic management devices to be installed to ensure that all traffic movements can be carried out safely to ensure that all vehicles can satisfactorily queue and carry out turning movements without crossing the centreline of the road or without causing other traffic management issues. Particular attention should be directed to heavy vehicle turning movements from Eyre Street in a westerly direction and any impacts on the Comstock Street intersection.**

RTA –

- **The Eyre Street access modification should be in accordance with the recently approved DA264/2009. Turning paths are to be provided to demonstrate that the proposed haulage/delivery/construction vehicles will be able to turn left into or out of the Eyre Street access without crossing the centreline of Eyre Street.**

- **All work associated with access modification is to be completed prior to commencement of operations.**

BHOP engaged Halcrow Pty Ltd to further assess the Eyre Street site access arrangements and any affects on the Comstock Street intersection. The results of this assessment are presented in ***Figure 2-5*** and ***Figure 2-6***.

Figure 2-5 provides turning paths for 26 metre B-double trucks turning left into and out of the Eyre Street site access. The plan clearly demonstrates that these vehicles can enter and exit the site without crossing the centreline of Eyre Street. However, some minor modifications to the footpaths on both sides of the access will be required. BHOP will consult with BHCC and the RTA with regard to the detailed designs of the proposed footpath modifications. All modification works will be completed prior to the commencement of operations. A new commitment reflecting these requirements has been included in Section 3.

In order to avoid any trucks queuing on Eyre Street, a truck waiting area will be constructed inside the site entrance. The truck waiting bay area has the capacity to hold two B-double trucks at any one time. These waiting arrangements are considered adequate given the limited number and frequency of anticipated B-double trucks entering the site.

It should also be noted that the areas adjacent and along the Eyre Street access point are “No Parking” areas.

Figure 2-6**Error! Reference source not found.** shows the current turning paths for B-double trucks at the Comstock Street and Eyre Street intersection. Given the internal site truck waiting area and the “No Parking” requirements, the existing Comstock/Eyre Street intersection turning arrangements will not be impacted by the Project.

A recent development application approved by BHCC (DA264/2009) required BHOP to comply with the following traffic-related conditions:

- *The existing access on Eyre Street should be widened to provide adequate width to allow turning movements for the largest vehicle anticipated to use the site.*
- *Two-way traffic flows to be separated at the property boundary through provision of a suitable physical barrier;*
- *Traffic turning left into or out of the development is not to cross the centreline of Eyre Street.*

BHOP will consult with BHCC and the RTA to ensure that any modifications to the Eyre Street access point are agreed.

Figure 2-5: Sweep paths for 26m B-double trucks entering / leaving the site

NOTE: Blue lines indicate sweep paths for trucks entering the site from the south. Red lines indicate sweep paths for trucks leaving the site and travelling north-east.

Figure 2-6: Current sweep paths for 26m B-double trucks at the Comstock Street / Eyre Street intersection

NOTE: Blue lines indicate sweep paths for trucks travelling south along Eyre Street and turning left into Comstock Street. Red lines indicate sweep paths for trucks travelling west along Comstock Street and turning right onto Eyre Street.

RTA –

- **The South Road access is to be used only by oversize trucks which can not negotiate the internal road system from the Eyre Street access. It is noted that a safe entry/exit procedure will be implemented and will form part of the overall traffic management plan for the site. A copy of the management plan is to be submitted to the RTA for approval.**

The traffic management plan will include a safe entry/exit procedure for oversized trucks that use the South Road access point. This procedure will be prepared in consultation with the RTA and the traffic management will be submitted to the RTA for approval prior to construction.

2.5.2 Car Parking

RTA –

- **To discourage on street parking in Eyre Street (on street parking has been a problem in the past) the visitor's car park must be easily accessible and clearly signposted. Further it is considered that the car parking requirements should be based on, as a minimum, one space per two employees. This rate is based on the unique circumstance of the mining development being located within the centre of the city where employees drive to work with little or no car pooling history.**

As indicated in Section 14.4.1 of the EAR, the predicted number of employees and contractors for full-scale underground mining is 165.

BHCC's *Development Control Plan for Industrial Development* (BHCC, 2005) requires that "'*car parking space shall be provided on-site for employees, visitors and company vehicles and shall be calculated at the rate of one space per three employees'*. Therefore, 55 on-site car parking spaces would be required to meet Council requirements.

In its submission, the RTA has indicated that car parking requirements should be based on one space per two employees. This equates to 83 spaces.

The site currently has 66 sealed car parking spaces. These are located immediately inside the Eyre Street entrance, adjacent to the site offices (16 spaces around the main site office and 10 spaces around Radford House) and to the west of the main site office (40 spaces).

In order to meet RTA's requirements, an additional 17 car parking spaces would be needed. However, given that the majority of employees will be working in shifts and that not all shift workers will be on-site at anyone time, BHOP is confident that the existing 66 car parking spaces would be adequate to accommodate employees.

If it is found that car parking is an issue during operations, then BHOP will commit to providing additional on-site car parking spaces. Suitable locations exist for additional car parking immediately to the north of the existing employee car park.

2.5.3 Lighting

RTA –

- **Should crushed ore during the construction stage need to be transported other than during daylight hours the RTA will require lighting of the intersections in accordance with AS 1158 where the transportation route turns left or right at intersections. Costs involved in maintenance and power for this lighting is the responsibility of the proponent.**

The most frequent occasion when B-double trucks would be used is during the first 12 months of construction when crushed ore will be transported to the Endeavour Mine. The transport route proposed for crushed ore is the designated trucking route through Broken Hill. Trucks currently use this route 24 hours per day 7 days per week.

A traffic assessment undertaken for the 2009 identified traffic flow east of Eyre Street at 2232 vehicles. B-Double truck movements associated with the transport of crushed ore are planned at an average of 11 round trips per day or 22 truck movements. This represents less than 1% increase of the current traffic volumes.

Nevertheless, BHOP has committed to restricting trucking movements for ore transport to between 7 am and 6 pm, which are daylight hours. The above requirement is therefore not applicable to this Project.

2.5.4 Road upgrade and maintenance costs

BHCC –

- **Any upgrading of the road should be at the cost of the developer. Any ongoing road maintenance issues in relation to this development should also be the responsibility of the developer.**

RTA –

- **All works associated with the development are to be at no cost to the RTA.**

As discussed in Section 2.5.1 of this report, the capability of the existing road pavement along Eyre Street to withstand the intended road and traffic movement associated with the Project will be undertaken in prior to the commencement of construction. If it is found that the road pavement is inadequate, then BHOP will consult with BHCC to agree on any feasible contributions for road pavement improvement works.

It is proposed that any contributions associated with road pavement or ongoing maintenance works on Eyre Street will be in-line with the Project-related traffic generated by BHOP as a proportion of the total traffic on the road.

BHOP accepted that any modifications to be implemented at the site entrance/exit would be undertaken at the costs of BHOP.

2.6 ABORIGINAL HERITAGE

DECCW –

Recommended new Commitment:

- **A procedure in relation to the identification of an Aboriginal object on the site.**

While it is unlikely there are any Aboriginal heritage items on the Project area, BHOP have stated their commitment to the implementation of a procedure for the preservation of opportune finds. This includes Aboriginal objects. All relevant staff and contractors will be required to undertake Aboriginal heritage awareness training as part of the site induction program. In addition, the following procedure will be implemented if an Aboriginal object is found:

- All work in the area must immediately cease and the on-site Mine Manager and Environment and Community Relations Manager must be notified;

- The area must be fenced off and no further work is to take place in that area;
- A qualified archaeologist must be engaged to make an assessment of the discovery and relevant Aboriginal stakeholders, including the Broken Hill Local Aboriginal Land Council, must be invited to inspect the find;
- An incident report must be prepared and submitted to DoP and DECCW;
- Under Section 91 of the *National Parks & Wildlife Act 1974*, this reporting must include a completed Aboriginal Heritage Information Management System (AHIMS) Aboriginal Site Card if a new Aboriginal site or Object is identified.

This procedure will be included in the site Conservation Management Plan (refer to Section 18.7 of the EAR and Section 2.7 below).

The following amendment to the Commitment reflecting the above management measures has been included in the SoC:

> "Procedures for the preservation of opportunistic finds, including Aboriginal and European objects".

2.7 EUROPEAN HERITAGE

BHCC –

- **It is suggested that the proposed Heritage Management Plan be developed as a Conservation Management Plan providing a strategic framework for all heritage items located on the Lease based on the principles of the Burra Charter.**

The commitment that was included in Section 18.7 of the EAR to prepare a Heritage Management Plan has been amended in Section 3 of this report. The Heritage Management Plan will be prepared as a Conservation Management Plan and will provide the strategic framework for all heritage items located on the Lease based on the principles of the Burra Charter.

2.8 WATER RESOURCES

2.8.1 Water Quality Monitoring

NOW –

Recommended new Commitment:

- **To monitor the quality and quantity of water captured by the toe drains on the Tailings Storage Facility (TSF).**
- **To monitor the movement of seepage sourced from the TSF and to monitor the quality of the local groundwater system.**

BHOP is satisfied with these recommendations and has updated the draft SoC to reflect the new commitments. The details of the location, frequency and quality parameters for TSF seepage and groundwater monitoring will be included in the Tailings Construction and Operations Manual (refer to Section 2.6.4 of the EAR) and the Groundwater Management Plan (see below), respectively.

2.8.2 Groundwater Management Plan

NOW –

- **The proponent must prepare a Groundwater Management Plan to monitor seepage movement within and adjacent to the TSF in consultation with and to the satisfaction of NOW prior to commencement of activities.**

BHOP will prepare a Groundwater Management Plan to monitor seepage movement within and adjacent to the TSF. The GMP will be prepared in consultation with NOW. A commitment to prepare a GMP has been included in the SoC at Section 3.

2.8.3 Water Availability

NOW –

- **The proponent must ensure that it has sufficient water for all stages of the project to the satisfaction of NOW, and if necessary, adjust the scale of operations to match its licensed water entitlements.**

A new commitment has added to the SoC in Section 3 stating that if sufficient water is not available, BHOP will adjust the scale of their operations to match their licensed water entitlements.

2.8.4 Licensing

NOW –

- **The proponent must obtain relevant licences to the satisfaction of the NOW under the *Water Act 1912* for all groundwater works (including bores and piezometers) within the proposed site prior to the commencement of activities.**

- **The proponent must obtain relevant licences to the satisfaction of the NOW under the *Water Act 1912* for all activities which intercept of extract groundwater prior to commencement of these activities.**

BHOP will obtain all necessary licences under the *Water Act 1912* prior to the commencement of activities on site. A commitment to reflect this requirement has been added to the SoC.

2.9 ENVIRONMENTAL RISK

Agency Comments

DECCW –

- **The Environmental Risk Assessment summarised in Chapter 6 of Volume 1 of the EA does not provide a full list of environmental issues that were assessed. It only provides a list of those found to be key issues for management in the project. DECCW requested that this information is supplied specifically to allow identification of all the issues considered as possible risks and the likelihood and consequence estimates that were assigned to each risk. This would clarify how the issues listed as "key issues" in Table 6-5 of the EA were determined.**

The environmental risk assessment providing a full list of environmental issues that were assessed in the EAR is included in ***Appendix A*** of this report.

2.10 REHABILITATION

Greater Western AHS and NSW Health –

- **Recommend an effective long-term stabilisation and rehabilitation plan to reduce dust impact off the lease once the mining operations ceased.**

I&I –

- **The proponent must prepare and implement a Rehabilitation Environmental Management Plan (REMP) to the satisfaction of the Director General of I&I NSW. The REMP must:**
  - **a) be prepared in accordance with I&I NSW guidelines and in consultation with relevant agencies and stakeholders;**
  - **b) be submitted and approved by the Director General of I&I NSW prior to the commencement of the activity; and**
  - **c) address all aspects of rehabilitation and mine closure, including final land use assessment and evaluation, rehabilitation objectives, domain objectives, completion criteria and rehabilitation monitoring.**

BHOP will prepare and implement a Rehabilitation Environmental Management Plan (or any such plan as required by the Project approval), which addresses all aspects of rehabilitation and mine closure.

2.11 OTHER

2.11.1 Location of Mine

General Public

- **The proposed mine is right in the heart of an established residential community, for this reason alone, should be rejected.**

Broken Hill has been one of the most significant world production centres of silver, lead and zinc since the late 19th century. Mining and associated operations at the Rasp site have been conducted for over 125 years. The Broken Hill population has built-up around the mine and adjacent mining operations as a direct response to the acceleration of mining activities over many years.

BHOP has seriously considered environmental and health comments and concerns from Broken Hill residences and local interest groups over a long period of time and has strived to conduct operations at the Rasp site in an environmental acceptable manner.

BHOP has considered a number of site layout and operational alternatives in order to reduce environmental impacts to Broken Hill residents. To this end, as discussed in the PPR, BHOP is proposing to move the location of the processing plant and the rail load-out facilities to the north-eastern end of the lease. The new location is removed from densely populated residential areas.

The proposed modifications will result in significant reductions in air quality and noise impacts when compared to the original layout. BHOP has committed to a wide range of mitigation and management measures to ensure that the project can operate within stringent air quality, water quality and noise criteria.

It has been demonstrated that, despite being situated in the centrally within Broken Hill, the Project can operate in a manner that will not significantly impact local residents.

2.11.2 Maintenance of plant and equipment

DECCW –

Recommended Condition:

- **All plant and equipment installed at the premises or used in connection with the licensed activity:**

  (a) must be maintained in a proper and efficient condition; and

  (b) must be operated in a proper and efficient manner.

The following new commitment has been included in the SoC:

All plant and equipment installed or used at the site will be maintained and operated in a proper and efficient condition and manner.

2.11.3 Meteorological Monitoring Station

DECCW –

Recommended Condition:

- **The Proponent shall install and continuously operate a meteorological monitoring station on the project site. The station shall be installed and operating prior to construction works commencing at the project site.**

An existing meteorological station operates at the site and any requirements for upgrading the stations monitoring parameters will be agreed with DECCW.

2.11.4 Location of Environmental Monitoring Sites

DECCW –

- **The location of the ambient air quality and meteorological monitoring stations must be informed by the modelling results from the EA and be to the satisfaction of DECCW.**

- **All ambient air monitoring sites shall be installed and operating prior to construction works commencing at the project site.**

BHCC –

- **Actual monitoring locations could be specified in any approval conditions.**

Greater Western AHS and NSW Health –

- **The number of real-time dust monitors and their location must be decided based on air modelling and their ability to accurately measure air quality and wind patterns in the region.**

- **As the high volume samplers will be used to quantify lead in the dust emissions, their location must also be decided using the contour plots identifying high risk zones and after consultation with DECCW.**

BHOP, in consultation with specialist consultants, will propose monitoring sites for air, noise and water as part of the relevant Environmental Management Plans. The location of the sites will be informed by the modelling undertaken as part of the EAR and the preferred project process. BHOP will ensure that the number and location of monitoring sites are to the satisfaction of DECCW and installed prior to the commencement of construction activities.

2.11.5 Effluent Reuse

Greater Western AHS and NSW Health –

- **In the event that the proposed development is connected to Country Water's recycled water supply network and uses recycled effluent on site in the future, a detailed health risk assessment on this process should be submitted to Greater Western AHS for evaluation prior to commencement of the effluent reuse. .**

BHOP does not have any existing plans to connect to Country Water's recycled water supply network. However, if connection is considered in future, BHOP will prepare and submit a detailed health risk assessment on this process to Greater Western AHS for evaluation prior to commencement.

2.11.6 Design of Ventilation Fans

RACE –

- **The design of the ventilation fan has still not been finalised in regards to the direction that the fan will be facing and the location of the water sprays.**

As indicated in Section 2.4 of the EAR, a ventilation fan will be located at the existing Little Kintore pit at a depth of approximately 20 metres. This site was selected as it is approximately central to the Project area and away from the mining lease boundaries and surrounding neighbours.

The ventilation fans will be suitably orientated with appropriate noise attenuation mechanisms and air quality control measures installed to minimise impacts to the local community. The fan outlets will be optimally positioned in regards to prevailing wind direction and the location of residences.

As indicated in Section 3.2.3 of the *Air Quality Assessment* (ENVIRON, 2010) (Annexure H of the EAR), if the ventilation shaft is not a "wet" shaft, as is expected, then water sprays will be installed and used during blasts to maximise suppression of dust in the underground mine.

The final design and fan orientation will be determined during the detailed design phase of the Project, which is scheduled to be completed by the end of 2010.

A commitment reflecting these requirements is included in the SoC.

2.11.7 Stakeholder Consultation

RACE –

- **We believe that because of the mines location in regards to nearby residents, more consultation and consideration should be afforded to all relevant stakeholders.**

BHOP believes the building of relationships with the community based on trust and mutual advantage is essential to business success and sustainability. To this end, a comprehensive stakeholder consultation program has been implemented for the Project prior to exhibition of the EAR, during the EAR exhibition period and during the development of the preferred project. A summary of the consultation actions undertaken for each phase of the project is provided below.

Consultation Prior to Exhibition of the EAR

The consultation program implemented prior to the consultation of the EAR included the following actions:

- BHOP formulates community newsletters to inform and seek comment from local residents in regards to changes at the Mine site that may generate environmental impacts.

- A community forum was held in July 2007 at a local centre in the town of Broken Hill. This was advertised in the two local newspapers. A display was presented providing an overview of the Project, the major potential environmental impacts and how these are planned to be managed. Directors and senior management from BHOP and CBH attended with environmental consultants to discuss the Project and answer any questions raised. This was an informal session over a four hour period where community members could learn more about the Project and freely discuss their concerns. A newsletter was prepared and distributed to the to the Eyre Street residents and published in an edition of the Barrier Mail in July 2007. This included an invitation to attend a community forum.

- A presentation was provided to the Broken Hill South Rotary Club by the General Manager and Mine Manager of the Rasp Mine.

- The General Manager of the Rasp Mine presented a forum organised by the OACC on Workforce & Business Development in the Broken Hill region.

- The Mine Manager attended and was available for questions at a local community meeting organised by the RACE (Residents Against Contaminated Environments) group.

- The General Manager and Mine Manager of the Rasp Mine were interviewed by a number of local newspapers regarding the Project.

- The General Manager and Mine Manager of the Rasp Mine conducted a number of interviews with ABC radio and television including the 7.30 Report, and the local Broken Hill radio station GTS BKN 7, regarding the Project.

- The local Regional Indigenous community Group met with the General Manager of the Rasp Mine who provided an update on the Project.

- A number of universities have taken the opportunity to visit the site and learn about the Project, mining at the original BHP mine.

- A communication forum was established with major stakeholders. The Consultative Group has met on several occasions since its inception in February 2007.

Consultation during the Exhibition Period

BHOP continued to maintain contact with stakeholders during the exhibition of the EAR. The programme has included the following actions:

- A community forum and presentation held on 20 July 2010. Senior management from BHOP as well as the specialist air, health and noise consultants involved in the preparation of the EAR conducted the presentation and answered questions from the community.

- Information sessions and follow-up consultation with those agencies who were consulted during the preparation of the EAR.

- A dedicated Consultation Group meeting to review and discuss the EAR.

- Provision of the Rasp Mine News Updates to local neighbours surrounding the mine to outline information on activities.
- Media releases to provide information on the EAR and its availability for review.
- Placing the EAR on the CBH website (www.cbh.com.au).
- Placing copies of the EAR at local libraries in Broken Hill.
- Provision of information to the BHCC.

In addition the Mine Manager has undertaken discussions and provided mine site tours to a number of local Broken Hill residents. This has included individual residents as well as members of the RACE group.

BHOP believes that the consultation implemented prior to and during the exhibition of the EAR is thorough and comprehensive.

In a newspaper article published in the Barrier Daily Truth on 22 July 2010, a local south resident, Mr Glen Ravenscroft, who is also a member of RACE, commended BHOP's community forum and presentation. In the article Mr Ravenscroft is quoted as saying "I was quite impressed with the (presentation)" and that it "showed to us that they were concerned about the social issues (involved in) running a mine in the middle of Broken Hill". Further, Mr Ravenscroft added, "it was actually quite an impressive presentation. They went out on a limb to get the community's support" and that he does "feel it was very commendable that CBH did address the community".

Consultation for the Preferred Project

A consultation program has commenced to inform the local community and relevant stakeholders about the preferred project. Details of the consultation program are included in the PPR and key actions undertaken to date are summarised below:

- A series of meetings with key government agencies to inform them about the preferred project and the results of additional noise and air modelling. Meetings have been held with representatives from the following agencies:
  - I&I NSW;
  - DECCW;
  - Greater Western AHC and NSW Health;
  - BHCC; and
  - DoP.
- A series of meetings and/or phone calls with service providers, to inform them about the preferred project and discuss the provision of the relevant services to the new processing plant locations. Meeting have been held with representative from the following service providers:
  - Australian Rail & Track Corporation (ARTC);
  - Country Energy; and
  - Country Water.
- A dedicated Consultation Group meeting to review and discuss the preferred project.
- Meeting with representative from Perilya Broken Hill Operations Pty Ltd, the owner and operator of the neighbouring Perilya Broken Hill Mine and the owner of 'Proprietary Square' which is a small building development located to the north-west of the site.

- The Mine Manger was interviewed on local ABC radio to provide a brief outline of the proposed changes.

Feedback from government agencies and stakeholders about the preferred project has been positive with all parties commending BHOP for efforts to further reduce environmental impacts associated with the Project.

In addition the consultation actions outlined above, it is understood that the DoP intend to exhibit the PPR for a period of two weeks. This will ensure that all community members are informed about the project and given the opportunity to comment.

BHOP believes that it has implemented and comprehensive consultation program throughout all stages of the approvals process.

3 REVISED STATEMENT OF COMMITTMENTS

3.1 INTRODUCTION

BHOP has made a number of commitments for managing potential environmental impacts of the Project. These commitments along with other management and mitigation measures were documented in the following sections of the EAR:

- Stakeholder Engagement, *Section 4.10;*
- Noise and Vibration, *Section 7.5;*
- Air Quality and Greenhouse Gas, *Section 8.3;*
- Water Resources, *Section 10.6 and 10.7;*
- Heritage, *Section 11.5;*
- Visual Amenity, *Section 13.5;*
- Traffic and Transport, *Section 14.5;*
- Waste Management, *Section 15.3;*
- Rehabilitation and Closure *Sections 17.3 and 17.4*.

The draft Statement of Commitments provided in Section 18 of the EAR has been revised to consider the issues raised in the response to submissions. The revised Statement of Commitments details the measures proposed by BHOP for environmental mitigation, management and monitoring of the Project. Amendments and additions to the draft Statement of Commitments have been marked in yellow.

If approval is granted under Part 3A of the EP&A Act, BHOP will commit to the following actions and controls.

3.2 STAKEHOLDER ENGAGEMENT

BHOP is committed to ongoing consultation with stakeholders and the local Broken Hill community. BHOP believes the building of relationships with the community based on trust and mutual advantage is essential to business success and sustainability. This is recognised by the commitment of BHOP to further developing the community consultation programme, which includes:

- continued support of the Community Consultation Group who will continue to meet on a regular basis;
- provision of the Rasp Mine News Updates to local neighbours surrounding the mine to outline information on activities;
- Rasp Mine information notice board to be located at the Café and Miner's Memorial;
- annual distribution of a Rasp Mine magazine providing a summary of environmental monitoring, initiatives and activities;
- targeted consultation involving presentations and briefings on specific issues as they arise;
- consultation with relevant stakeholders during the preparation of the final closure plan; and

- continued implementation of the complaints procedure to address individual issues as they arise.

3.3 NOISE AND VIBRATION

BHOP understands that intrusive noise, vibration and overpressure levels are a concern for community members and can affect their standard of living. In recognition of this concern BHOP have made a number of commitments to mitigate noise levels from the Project including:

- re-location of the processing plant to the north-eastern end of the site, away from residential dwellings to the south;
- re-location of mine ventilation fans to Little Kintore Pit and away from residential and commercial areas and installing noise suppression on the fan units;
- smaller stope designs to reduce blast vibrations, designing blasts and arranging firing times to minimise potential community impacts;
- construction of noise barriers with 4 m high bunding along the southern side of the haul road and the southern perimeter of the ROM pad mine truck haul route;
- silencers installed on haul trucks and noise suppression kits on the FEL(s) used on the ROM pad, container stockpile and rail loading areas;
- limiting crushing to dayshift (7:00am to 7:00pm) seven days a week;
- limiting shunting of concentrate wagons to between 7:00am and 6:00pm seven days a week;
- prohibiting production rock blasting between 7:15pm and 6:45am seven days a week;
- restricting construction activities to day shift;
- cladding of the primary crusher and installing noise abatement bunding to the north and south of the crusher;
- installing a building around the flotation facility providing shielding of the SAG and Ball mills;
- covered conveyors and transfer stations prior to the grinding circuit; and
- installation of two overlapping bunds at the northern side of the wagon stockpile area to shield Crystal Street residences.

In addition, BHOP will ensure that:

- operational noise is within limits of the NSW Industrial Noise Policy.
- rock blast vibration levels are within guidelines issued by the Australian and New Zealand Environmental and Conservation Council.
- rock blast overpressure limits are within guidelines issued by the Australian and New Zealand Environmental and Conservation Council.

The current noise, vibration and overpressure management plan will be updated to address potential impacts from new Project activities prior to the commencement of those activities. Without limiting the contents of this plan, the plan will include:

- trigger limits for noise levels with response actions plans;

- details of major emission sources and their mitigation measures;
- details of inspection and monitoring programmes;
- details and requirements for a noise awareness programme for employees and contractors;
- details of the community complaints procedure; and
- internal and external reporting requirements.

The construction environmental management plan will outline specific requirements for noise, vibration and overpressure mitigation and reduction during construction activities.

3.4 AIR QUALITY

BHOP recognises that of particular concern to the local community is the generation of dust and lead dust. BHOP is committed to implementing the following dust mitigation and suppression measures:

- use of water spray / chemical dust suppressant system at the tailings storage facilities;
- installation of vehicle wash facilities with a wash facility installed post concentrate loading to accommodate both the truck and concentrate container ;
- extensive sealing of haul roads and other primary roadways;

Roads to be Sealed

Road		Length (m)
Existing	Front gate to truck wash	292
	'Diamond' intersection to core shed	360
	Front gate road to car park	132
Proposed	Truck wash to haul road connection from Kintore Pit	690
	Kintore Pit intersection (truck wash and haul roads) to ROM pad (haul road for ore mine trucks)	1186
	ROM pad to and through mill	354
	Mill to rail load out (concentrate trucks)	910
	Truck wash road to workshop	190
	Haul road to backfill plant	400

- application of chemical dust suppression as per the manufacturer's specification, or more often as required, on all "free areas" of the site as per the following figure;
- enclosure of all above ground conveyors and transfer points prior to the grinding circuit (SAG and ball mills);
- restricted height of ROM stockpile and installation of static wind breaks (orientated perpendicular to the dominant wind direction) along with top-mounted water sprays;
- water sprays on all permanent stockpiles;
- maintaining a concentrate moisture level of around 9 percent;
- service roads and tip points around the stockpile will be laid with compacted road base (high moisture and low silt content);
- installation of real-time air quality monitoring to assist in the active management of emissions;
- limitation of vehicle or work access in exposed areas;

- maintaining of surface crust to minimise potential wind erosion;
- identification and remediation of areas where fines or silt has built up (typically after heavy rain storms);
- remediation of disturbed areas including but not limited to, removal and burial of fine material, capping with inert waste rock, or use of dust suppressants;
- undertaking sampling to quantify road surface silt loadings on an ongoing basis; and
- installation of video recording equipment to assist in the active management of emissions for the TSF.

In addition to mitigation measures, best practice will be employed during the operations. This includes:

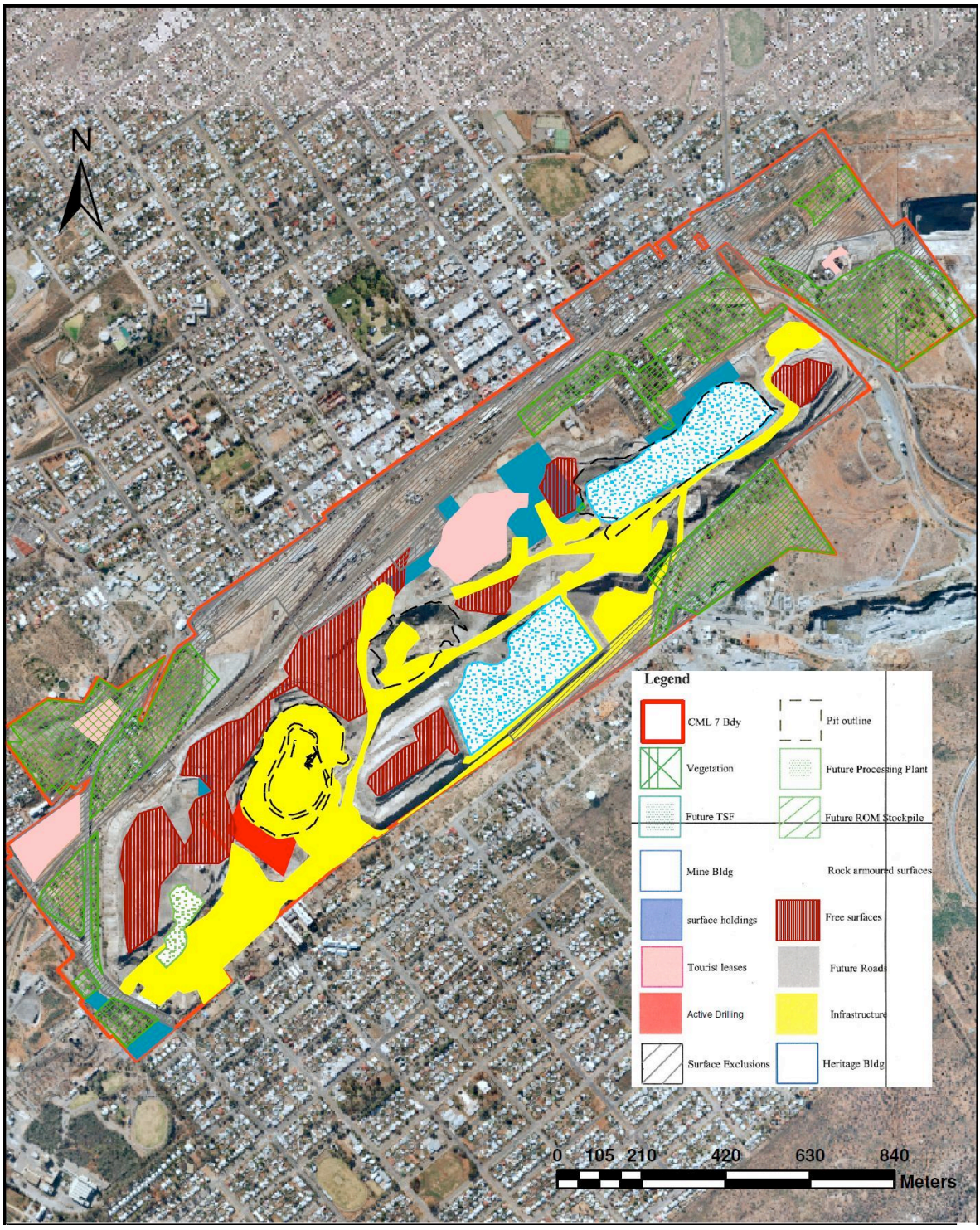
- adoption of a lead management plan to address specific issues dealing with personal hygiene of employees, blood lead action guidelines, sampling and environmental monitoring;
- continuation and expansion of the existing air quality management program to include high volume samplers, dust deposition jars and real time monitors;
- regular maintenance of pollution control equipment to ensure that it is functioning at optimal performance levels. A maintenance schedule will be documented and implemented for all pollution control equipment as part of an environmental management plan;
- maintain and operate all plant and equipment installed or used at the site in a proper and efficient manner;
- maintaining the premises in a condition which minimises or prevents the emission of dust from the premises; and
- ensuring visible dust emissions from any tailings storage facility are negligible.

A CEMP will also be developed prior to construction. The plan will include management and monitoring measures relating to air quality that will be implemented during all construction works.

A Tailing Construction and Operation Manual will be completed and implemented prior to the commencement of any construction activities at the site.

In addition the following measures will be undertaken to minimise and monitor greenhouse gases:

- efficiency of all new mobile and fixed equipment will be considered during procurement for both diesel and electric powered equipment;
- within 12 months of commencement of underground mining, an energy audit will be conducted to compare predicted and actual energy consumption;
- equipment will be maintained to retain high levels of energy efficiency;
- the inventory of emissions developed for this assessment will be regularly updated and maintained; and
- emissions and abatement strategies will be reported annually in the AEMR.



Chemical Dust Suppressants to be applied to "Free Areas"

3.5 COMMUNITY HEALTH

Community feedback has emphasised their concern with the potential of the Project to impact on blood lead levels. BHOP is committed to implementing dust mitigation and suppression measures (Section 18.4) to manage emissions and prevent adverse impacts from its operations contributing to increased blood lead levels in the local community through a lead management plan. In addition the lead management plan will include:

- requirements for employee and contractor hygiene;
- requirements for washing lead soiled articles, for example laundering of work clothes;
- requirements for washing vehicles prior to leaving the site;
- requirements for monitoring of lead blood levels with actions to be taken when designated trigger levels are reached; and
- requirements for inspections and housekeeping for each operational area to minimise dust build-up and the potential for subsequent off-site movement.

In addition, BHOP will conduct bi-annual assessment of soil contamination on land in Eyre Street and land adjacent to TSF1 until TSF1 is decommissioned and rehabilitated.

If the dust suppressant chosen to be used at the site is not included in the Screening Assessment undertaken as part of the EAR (Annexure I(b)), then a new health risk assessment of the dust suppressant will be undertaken and forwarded to Greater Western AHS and NSW Health for approval prior to its use on-site.

BHOP is also committed to maintaining a high level of lead awareness within the local community by contributing to lead awareness education programmes.

3.6 WATER RESOURCES

Conservation of water resources is increasing seen as a critical activity and BHOP is committed to the following water conservation measures:

- treatment of mine dewatering to enable usage in the processing plant;
- tailings water to be returned to the processing plant for reuse;
- water to be recycled from Horwood Dam to the processing plant;
- investigation of the use of the silver tank as water holding tank for water to be recycled to the processing plant, reducing the potential for evaporation from open type storages;
- investigate the use of grey water from domestic facilities for use in ground management; and
- installation of flow metres to monitor water usage.

If sufficient water is not available, the scale of their operations will be adjusted to match the licensed water entitlements.

Measures to manage water quality that will be included in BHOP's water management programme include:

- provision and location of spill kits and requirements for training;
- design and installation of chemical storage to include bunds with suitable sumps, and where appropriate roofed to prevent stormwater entry;
- bunding of the diesel refuelling station;
- oil / water separators to be installed at vehicle wash facilities and the diesel refuelling station;
- management of sediment and sludge from vehicle washing facilities;
- water quality monitoring including groundwater (represented by mine dewatering) and at locations to the east of TSF1, and surface water represented by Horwood Dam;
- monitor the quality and quantity of water captured by the toe drains on the Tailings Storage Facility (TSF); and
- monitor the movement of seepage sourced from the TSF and to monitor the quality of the local groundwater system.

In addition the recommendations from the Stormwater Management Plan as proposed by Golder Associates (Golder 2010, Annexure K) will be implemented and will address potential impacts from new Project activities prior to the commencement of those activities. This Plan includes:

- erosion and sediment control measures;
- design requirements for on-site retention evaporation basins;
- requirements for management of catchment areas, including drains, pipework, bunding and sumps; and
- quarterly inspections of the site storm water management structures to confirm that they are operational.

In addition, a Groundwater Management Plan will be prepared to provide details of the monitoring of seepage movement within and adjacent to the TSF.

Finally, all necessary licences under the *Water Act 1912* will be obtained prior to the commencement of activities on site.

3.7 HERITAGE

BHOP recognises the historical value of the site as the original BHP operations and representing mining from the 1880s and the importance this has to the local community. BHOP is committed to protecting the historical value of the site through the implementation of a Conservation Management Plan that will provide the strategic framework for all heritage items located on the Lease based on the principles of the Burra Charter. The Conservation Management Plan will include:

- photographic record of listed heritage buildings;

- programmes for each building for adaptive reuse outlining measures to maintain its structural stability and identify requirements for retention, renovations, permitted re-use and ongoing maintenance;
- preservation requirements for buildings not to be reused;
- inspection and monitoring programme;
- inventory of all mobile items remaining on site;
- agreement with a mining history organisation to preserve and care for relocated items; and
- procedures for the preservation of opportunistic finds, including Aboriginal and European objects.

The Conservation Management Plan will outline specific requirements for the management of historical heritage.

In addition, the Conservation Management Plan will include appropriate management measures to be implemented in the event that an Aboriginal object is identified on-site.

3.8 VISUAL AMENITY

Visual impacts will be minimised by implementation of the following management measures:

- material stockpiles, waste, plant, equipment and vehicle parking will be restricted to designated areas;
- where possible, avoid the use of highly reflective materials and colours on the site, unless necessary for safety reasons;
- lighting being kept to a minimum necessary to safely carry out operations;
- lighting being directed away from residences through the use of directional lighting equipment and shielding; and
- implementation of a rehabilitation and mine closure strategy post operations, aimed at retaining the mining character of the site.

3.9 TRAFFIC AND TRANSPORT

BHOP is committed to providing a safe road network for its employees, contractors and the surrounding community. The major measures to manage road safety include:

- sealing of all main traffic routes including the roads indicated in the table located at 3.4;
- placing compacted moisture conditioned road base on other internal roads and chemical dust suppressant as required to minimise off site dust levels;
- requiring heavy vehicles associated with deliveries to the mine to use approved B-Double routes;
- restrict trucking movements for off site ore transport to between 7 am and 6 pm.
- providing sufficient parking spaces on-site for employee and contractor vehicles;

- implementing safety procedures to be adhered to during temporary usage of the South Road access; and

- assessing the capability of the existing road pavement along Eyre Street to withstand the intended road and traffic movement associated with the Project. This assessment would be undertaken prior to the commencement of construction. If it is found that the road pavement is inadequate, then BHOP will consult with BHCC to agree on any feasible contributions for road pavement improvement and/or maintenance works.

The construction environmental management plan will outline specific requirements for the management of traffic and transport, and a traffic management plan will be developed for operations.

Additional works to be implemented at the Eyre Street site entrance/exit would be undertaken at the costs of BHOP.

3.10 WASTE MANAGEMENT

Prior to commencement of operations, the procedures for managing wastes will be detailed in the waste management programme. The waste management programme will describe the following:

- recycling of wastes, where practicable;

- storage of general waste, which cannot be recycled, in bins on-site prior to collection and off-site disposal by a licensed waste disposal contractor;

- burying of packaging from explosive products in a separated, designated site in the bottom of BHP Pit or disposed of as part of the back fill for stopes;

- storage of other regulated or hazardous waste in drums or designated bins on-site in a bunded area until collected by a licensed contractor for recycling or disposal off-site at a regulated facility;

- depositing mineralised waste rock in the BHP Pit or used as rock fill in underground stoping voids;

- using non-mineralised waste rock as road base, fill material for earth bunding, rehabilitative covering for disturbed areas or rock fill in underground stoping voids; and

- using tailings as part of the back fill mix for stopes underground.

The construction environmental management plan will outline specific requirements for the management of waste.

3.11 REHABILITATION AND CLOSURE

BHOP intend to return the Project Area to the community at the cessation of mining activities in a suitable condition to achieve agreed closure objectives. The rehabilitation and mine closure strategy will include:

- preparing and implementing a Rehabilitation Environmental Management Plan (or any such plan as required by the project approval), which addresses all aspects of rehabilitation and mine closure;
- development of a conceptual mine closure plan;

- objectives for landscape management and rehabilitation;
- methodology for decommissioning, landscape management and rehabilitation of the Project Area;
- post-mining care and maintenance, and ongoing monitoring and management requirements; and
- mine planning to consider and implement rehabilitation and closure strategy on an ongoing basis for the life of mine through progressive rehabilitation.

In addition the strategy will address the rehabilitation and mine closure requirements for the following key areas;

- final land form – confirm that the resulting landform will be similar to the current landform;
- drainage and erosion control – re-assessment and implementation of stormwater management plan for post-mining activities;
- safety – audit of Project Area to identify potential post-mining hazards and implement the appropriate controls;
- tailings – contain tailings to provide for long-term stability and prevention of dust generation; and
- heritage items – preserve the heritage value of the Project Area for future use by the community

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Rasp Mine

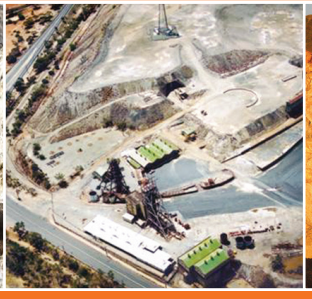
Zinc–Lead–Silver Project

Response to Submissions – Appendices

Project Application No. 07_0018

September 2010




Broken Hill Operations Pty Ltd

a wholly owned subsidiary of CBH Resources Ltd

APPENDIX A: ENVIRONMENTAL RISK REGISTER

TYPE	POTENTIAL IMPACT	POTENTIAL CONSEQUENCE	ACTIVITIES THAT MAY AFFECT ENVIRONMENTAL VALUE	MITIGATION	RESIDUAL RISK			KEY RISK
					C	L	R	
Noise	Noise from processing operations impacts neigbours.	Degradation of noise amenity. Community complaints. Exceedence of EP licence conditions. Restriction of operating hours. Fines and penalties.	Equipment not maintained. Movement of concentrate trucks. Operation of primary crusher, including rock breaker. Operation of SAG and Ball mills. Loading / unloading of concentrate containers. Rail shunting. Failure to manage.	Design a preventive maintenance program and audit its implementation. Install noise suppression kit on concentrate trucks. Locate crusher in a depression, install noise abatement cladding and restrict hours of operation from 7am to 7pm. Install noise abatement bunding to the north and south of the crusher. Install screening. Installation of noise suppression kit on the FEL and Container Handling Procedure. Restrict hours of operation from 7am to 6pm. Update the Noise, Vibration and Overpressure Management Plan. Employee and contractor noise awareness training program. Noise monitoring program. Update community complaints procedure.	Moderate	Likely	Medium	YES
	Noise from mining operations impacts neighbours.	Degradation to noise amenity. Community complaints. Exceedence of EP licence conditions. Restriction of operating hours.Fines.	Movement of haul trucks. Operation of ventilation fan. Dumping of ore at ROM stockpiles. Reversing beepers of haul trucks on ROM Pad. Loading of ore into crusher (forklift). Failure to manage.	Install noise suppression kit on haul trucks. Install noise abatement bunds along road way. Low level noise fans selected. Installation of noise suppression on the fan units. Installation of noise suppression kit on the FEL at the ROM pad. Earth bunding around southern side of ROM pad. Broadband reversing beepers installed on haul trucks. Restrict hours of operation to 7am - 7 pm. Noise abatement cladding on crusher. Update the Noise, Vibration and Overpressure Management Plan. Employee and contractor noise awareness program. Noise monitoring program. Update community complaints procedure.	Moderate	Likely	Medium	YES
	Vibration and/or over pressure impacts neighbours.	Damage to property. Community complaints. Exceedence of EP licence conditions. Restriction of operating hours. Fines and penalties.	Blasting underground. Failure to manage.	Smaller stope designs, blast designs, smaller diameter blast holes, use of electronic detonators and timing of firings. Blasting procedures. Update the Noise, Vibration and Overpressure Management Plan. Employee and contractor noise awareness program. Installation of monitors and monitoring program.	Moderate	Unlikely	Low	YES

	Noise and vibration from construction activities impacts neigbours.	Damage to property. Community complaints. Exceedence of EP licence conditions. Restriction of operating hours. Fines and penalties.	Operation of earthworks equipment. Surface blasting. Building works. Movement of trucks.	Timing and procedures for operation. Design and timing of blasts. Timing and procedures for construction. Installation noise suppression kit and broadband reversing beepers on site trucks. Timing of deliveries. Formulation and implementation of the Construction Environment Management Plan.	Significant	Likely	Medium	YES
Air Quality	Dust generated from processing operations impacts neighbours.	Degradation of air quality. Community health affects. Exceedence of EP Licence conditions. Restrictions to operations. Fines and penalties.	Crusher operations, including operation of rock breaker. Movement of concentrate container trucks. Crushed ore stockpile. Concentrate loading into containers. Operation of lime production plant. Tailings deposition. Movement of delivery trucks. Tailings spillage at backfill plant. Movement of light vehicles. Failure to manage.	Install cladding and baghouse. Removal of secondary and tertiary crushers and screens from the circuit. Installation of water / misting sprays. Sealed roads, road monitoring and street sweeper. Storage of crushed ore in a bin with an insertable bag dust collector installed in the roof. Operation to be conducted in a building with rubber curtains at entry and exit, moisture level of concentrate maintained at 9%, truck wash on exit. Enclosed storage silo vented to bag filters, automated filling from tanker, high levels alarms, arrestment plant and pressure release device. Enclosed mixing tank. Addition of tailings slurry, water sprays system, application of chemical dust suppressant, water truck. Sealed road, road monitoring and street sweeper. Truck wash facility. Routine inspections and housekeeping. Sealed roads, water sprays, application of dust suppressant on unsealed roads. Employee and contractor awareness programs. Update of Lead Management Plan. Update of Air Quality Monitoring Program. Update of Traffic Management plan.	Significant	Possible	Medium	YES
	Fumes and dust impacts neighbours.	Degradation of air quality. Community health affects. Community complaints.	Surface explosion from storage or handling of mining explosives. Electrical fires. Chemical fires (flammable reagents and diesel). Gas bottles & paint stores. Vehicle fires.	Explosives storage designed to Australian Standards. Explosives handling procedures and training. Emergency response procedures and training. Chemicals stored according to Australian Standards. Fire fighting training and resources	Moderate	Unlikely	Low	NO

	Dust generated from mining operations impacts neighbours.	Degradation of air quality. Community health affects. Community complaints. Exceedence of EP Licence conditions. Restrictions to operations. Fines and penalties.	Movement of haul trucks. Dumping of ore on ROM stockpile. Loading crusher (forklift). Movement of light vehicles. Failure to manage.	Water sprays and dust suppressant used on unsealed road in pit. Sealed haul road to ROM pad, road monitoring and operation of street sweeper. Truck wash facility at workshop. Restricted height of ore stockpile, installation of wind breaks and top-mounted water sprays. Dumping and ore take up areas to be compacted road base with application of dust suppressant. Installation of cladding on crusher. Sealed roads, water sprays, application of dust suppressant on unsealed roads and street sweeper. Employee and contractor awareness programs. Update of Lead Management Plan. Air quality monitoring program.	Significant	Possible	Medium	YES
	Community exposed to airborne contaminants (Other than dust or lead bearing dust) from operations.	Degradation of air quality. Community health affects. Community complaints. Exceedence of EP Licence conditions. Restrictions to operations. Fines and penalties.	Blasting activities.	Underground ventilation outlet located 20 m below surface in Little Kintore Pit. High moisture content on walls of vent shaft (or installation of water sprays). Distance from blasting to vent outlet - 1 km. Air quality control measures as per manufacturers design.	Moderate	Unlikely	Low	NO
	Community exposed to lead bearing (or other metals).	Degradation of air quality. Community health affects. Community complaints. Exceedence of EP Licence conditions. Restrictions to operations. Fines and penalties.	Processing and mining operations as listed above for dust. Wind lift off of dust from free areas. Work clothing. Vehicles from site. Failure to manage.	Mitigation measures as listed above for processing and mining. Maintenance of surface crust to inhibit wind erosion and dust take up. Use of dust suppressant. Identification and remediation of areas where fines or silt has built up. Potentially contaminated work clothes to be laundered on site. All vehicles that enter past the boom gate must go through were facility prior to leaving. Employee and contractor hygiene requirements. Workplace inspection and housekeeping procedures. Employee and contractor awareness programs. Update of Lead Management Plan. Air quality monitoring program.	Significant	Possible	Medium	YES
Water	Water demands impact water supply to Broken Hill residents and businesses.	Water restrictions imposed on residents and businesses. Additional costs. Restrictions to operations.	Water treatment system fails. Water extraction below expectations. Severe drought.	Water recycling from underground, processing and TSF. Water Conservation Management Plan.	Significant	Unlikely	Medium	NO

	Lowering of water table.	Groundwater not used by community as already exceeds criteria for human drinking or for livestock usage.	Mine dewatering.	Monitor water table level.	Moderate	Rare	Low	NO
	Tailings contaminate groundwater.	Groundwater not used by community as already exceeds criteria for human drinking or for livestock usage.	Tailings seepage to groundwater table. Groundwater is 200 m below TSF 1 and 100 m below TSF2.	Monitor seepage and seepage path below the TSF.	Moderate	Rare	Low	NO
Lighting	Lighting from operations impacts neighbours.	Community complaints.	Lighting at crusher. Lighting at mill. Lighting at processing plant. Lighting along roads. Lighting at rail load-out area. Lighting at container storage areas. Haul and concentrate trucks, and other site vehicles.	Processing facilities to be located in depressions or behind purpose built bunding. Bunding installed along roads. Use of directional lighting and shielding.	Minor	Possible	Low	YES
Visual amenity	Disturbance / interruption to current visual amenity of the mining landscape, including waste dumps.	Loss of site European heritage value. Community complaints. Loss of value for tourism at closure. Legal action. Restriction to operations.	Historically listed buildings deteriorate and collapse. Earthquake. Demolition of historically listed buildings or infrastructure. Modifications to historically listed buildings or infrastructure. Earth works.	Adaptive reuse of buildings will ensure they are maintained. Modifications to be sensitive to historical values. No demolition of buildings required. Formulation and implementation of a Conservation Management Plan.	Moderate	Rare	Low	YES
European heritage	Disturbance of site of European heritage significance.	Loss of site European heritage value. Community complaints. Loss of value for tourism at closure. Legal action. Restriction to operations.	Historically listed buildings deteriorate and collapse. Earthquake. Demolition of historically listed buildings or infrastructure. Modifications to historically listed buildings or infrastructure. New finds not reported.	Adaptive reuse of buildings will ensure buildings are maintained. No demolition of buildings required. Modifications to be sensitive to historical values. Formulation and implementation of a Conservation Management Plan. Training and procedures for opportunistic finds.	Moderate	Unlikely	Low	YES

Land	Land internal to surface lease areas is (further) contaminated. (CML7 is an historic mine site covered with tailings and waste dumps.)	Contaminated land restricts potential for tourist operations post closure.	Hydrocarbon and other chemical spillages. Spillage during delivery, unloading and storage of reagents. Failure of chemical supply lines. Failure of tailings pipeline.	Bunding and containment of processing areas where chemicals are used. Bunding of chemical storage areas. Chemical spillage procedures. Provision of spill kits and training in their use. Inspection and maintenance of pipelines. Tailings pipeline installed in a trench.	Moderate	Likely	Medium	NO
	Contaminated water from processing leaves lease and impacts neighbours.	Damage to land. Damage to property.	Failure to contain water from processing plant. Large rainfall event. Failure of water containment structures.	Surface water management plan designed by a competent water engineer (Golder Associates). Water containment structure designed to a 1 in 200 year rainfall event. Water containment structures inspections and maintenance program.	Significant	Rare	Medium	NO
	Land external to surface lease areas is contaminated from chemicals used on site.	Damage to public property. Damage to resident and business properties. Fines and penalties. Closure of TSF1. Prosecution.	Breach of TSF1 wall. Collapse of TSF1 wall. Overtopping of TSF1 wall. Seepage through TSF1 wall.	TSF1 containment structure designed by a competent engineer (Golder Associates). Design incorporates wall stability features: - raise in not constructed on fresh tailings - starter embankment keyed into exiting tailings and Mt Hebbard - installation of drains and emergency spillway - TSF designed to pond to the north-west of the facility - Routine pumping of supernatant and storm water to the decant dam - Installation of geomembrane to protect embankment - installation of a buttress at the tow of the slope Design approved by the Dam Safety Committee. Formulation and implementation of the Tailings Construction and Operations Manual.	Major	Rare	Medium	YES
	Growth of weeds inhibits the growth of natural vegetation.	Non compliance with LEP.	Natural occurrence, birds or wind.	Site inspections, currently annually. Weed eradication.	Minor	Possible	Low	NO
Power	Operations impact on community power needs.	Increase in power outages for community. Community complaints. Restrictions to operations.	Power demands.	Power is to be brought to the processing plant on a separate line than that used for the community. Past experiences with outages in Broken Hill indicate that operations will be restricted prior to affecting community demands for power.	Significant	Rare	Medium	NO

Vibration	Operations impact integrity of community houses and buildings.	Damage to residential houses, businesses and public buildings with resultant cracks and broken windows. Collapse / damage to Blackwoods pit wall. Community complaints. Fines and penalties.	Production blasting. Development blasting. Crusher and milling operations.	Blast designs and procedures. Assessment of processing plant location by competent engineer.	Moderate	Unlikely	Medium	YES
Subsidence	Mining operations impact integrity of rail, residential houses and public and commercial buildings.	Damage to rail infrastructure, residential and commercial buildings. Community complaints. Fines and penalties. Restrictions to operations.	Stope collapse. Self mining to Crystal Street and rail line.	Assessment undertaken by competent geotechnical engineer (Coffey Mining) predicted no significant subsidence above stopes. Selected mining method ie no block caving. Planned backfill operations. Depth of mining, below 200m. Risk assessments targeting excavation stability. Regular void monitoring using survey equipment. Design of extraction sequences to ensure ground stresses do not exceed the capabilities of the rock mass. Ground support.	Major	Rare	Medium	YES
Seismic	Earthquake leads to potential for off site contamination.	Restrictions to operations. Community complaints.	Collapse / damage to mine infrastructure and buildings. Collapse / damage to TSF embankment.	Seismic study undertaken and will underpin infrastructure and TSF designs.	Major	Rare	Medium	YES
Traffic	Increased transport on roads impact existing transport infrastructure.	Interruption to general traffic flow. Community complaints.	Access to site during construction and operations. Deliveries at Eyre Street impede trucks turning from Comstock Street. Interruption to traffic at South Rd when South Rd entry used.	Formulation and implementation of the traffic Management Plan Assessment of turning sweep and recommendations by a competent traffic engineer. Procedures for deliveries via South Road.	Moderate	Unlikely	Low	YES
Greenhouse gases	Increase in greenhouse gas emissions.	Impact on Australia's ability to meet greenhouse gas targets.	Electricity and diesel usage.	Greenhouse gas assessment indicates an insignificant impact on Australia's reported greenhouse emissions, 0.007% Conduct energy audit within 12 months of operation. Report emissions and abatement strategies. Plant and equipment maintenance program.	Minor	Rare	Low	YES

Aboriginal cultural heritage	Disturbance / destruction of Aboriginal items or places of cultural significance.	Community complaints. Legal action and penalties.	Earthworks.	The Project area has had continuous mining for over 125 years and is now made up of tailings and mine waste dumps. The site has been completely disturbed with little or no remaining original topography. No Aboriginal heritage items were identified in consultation with Aboriginal groups or studies undertaken by ERM in 2001. Procedure for opportunistic finds.	Minor	Rare	Low	NO
Social profile and community infrastructure	Mine demands reduces services to local community.	Restriction of community services. Community complaints.	Engagement of employees and contractors external to Broken Hill.	BHOP is committed to drawing its employees from the local community wherever possible and to support local contractors and businesses. Broken Hill is a city with reducing population and the socio economic assessment has concluded that there are sufficient existing local services to accommodate the Project. The Project is expected to have a positive effect on the City of Broken Hill through both direct and indirect employment opportunities, expansion of business with increased demand for goods and services, retention of working age population and an increase in business and community confidence in the continuing prosperity of the Broken Hill area.	Minor	Rare	Low	NO