Orebody 25 Extension, 8km North East of Newman

BHP Billiton Iron Ore Pty Ltd

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 1210
Nov, 2005

Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
	Referral received	**22/11/2004**
	Intention to set EPS Level of Assessment advertised (no appeals)	**01/08/2005**
	EPA accepts scoping document (if one provided)	**N/A**
	Proponent's Final EPS document received by EPA	**8/11/2005**
	EPA report to the Minister for the Environment; Science	**28/11/2005**

ISBN. 0 7307 6851 1
ISSN. 1030 - 0120
Assessment No. 1609

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1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the environmental factors relevant to a proposal by BHP Billiton Iron Ore Pty Ltd (BHPBIO) to expand existing mining operations at Orebody 25 Mine (OB25), within mining lease (ML) 244SA. The project is located 8 kilometres north east of Newman, in the Pilbara Region of Western Australia (Figure 1).

The EPA was initially advised of the proposal in November 2004. Based on the information provided, the EPA considered that while the proposal had the potential to have an effect on the environment, the proposal could be readily managed to meet the EPA's environmental objectives. Consequently it was notified in the *West Australian* newspaper on 1 August 2005 that, subject to preparation of a suitable Environmental Protection Statement (EPS) document, the EPA intended to set the level of assessment at EPS.

The proponent has prepared the EPS, which accompanies this report (BHPBIO, 2005b). The EPA considers that the proposal described can be managed in an acceptable manner subject to the commitments to the proposal being legally binding.

The EPA therefore has determined under Section 40 (1) that the level of assessment for the proposal is EPS, and this report provides the EPA advice and recommendations in accordance with Section 44 (1).

2. The proposal

The proposal is described in detail in Section 2 of the proponent's "Orebody 25 Extension Project" document (EPS). The proposal involves expanding existing mining operations at Orebody 25 Mine.

Mining activities at Orebody 25 have involved development of hard rock Pits 1, 2 and 3 (Figure 2). Pit 2 was mined below the watertable in the late 1990s and was subsequently backfilled and rehabilitated. Pits 1 and 3 are still active.

The proposed Orebody 25 Extension Project involves increasing the ore production rate from 7 Mtpa to approximately 8 Mtpa, and mining the remaining ore from Pits 1 and 3. Under this proposal, Pit 3 is scheduled to be expanded below the watertable in early 2006, and mining of the additional ore in Pit 1 is scheduled to start in mid 2006. At the proposed production rate, it is estimated that the known reserves in Pit 1 and Pit 3 would be mined out in 2009 and 2012 respectively.

Approximately 60 million tonnes (Mt) of additional ore has been identified at Orebody 25, of which approximately 25 Mt is located within Pit 1 and approximately 34 Mt is within Pit 3. The additional ore occurs in narrow and steeply dipping lodes and is typical of the bedrock material previously mined at Orebody 25. A description of the geology and mineralisation of the area is provided in BHPBIO's EPS Document.

The main components of BHPBIO's proposal are:

- increasing the ore production rate from approximately 7 to 8 Mtpa;
- continued hard rock mining of resources in the existing approved Pits 1 and 3;
- extension of mining at Pit 1 outside existing approved areas;
- extension of mining at Pit 3 below the watertable and outside existing approved areas;
- extensions to existing approved Overburden Storage Areas (OSA's) and low grade ore stockpiles, progressive development of new OSA's, and placement of overburden in existing and new mined out pits (ie. in-fill dumping);
- progressive construction of haul roads and light vehicle access roads to the open pits, OSAs and mine infrastructure; and
- increasing ore transport from 11 trains per week to approximately 13 trains per week.

Significant features of the proposal are:

- progressive mining and rehabilitation of the site;
- backfilling of pit 3 to above the original groundwater level; and
- permanent changes to the final landforms, including hill-like features of the out-of-pit OSAs.

A tabled summary of the key components of the proposal follows.

Table 1 Summary of key proposal characteristics

Aspect	Proposed Orebody 25 Extension Project
Proponent	BHP Billiton Iron Ore Pty Ltd, 225 St Georges Terrace, Perth, Western Australia 6000.
Life of Extensions	Approximately 7-8 years (i.e. from 2006 to 2013).
Land Disturbance Area	The existing Orebody 25 Mine has disturbed some 415 hectares (ha) as at June 2005, the proposed extensions would disturb approximately 230 ha.
Hard Rock Mining	Hard rock mining would continue in the existing approved Pits 1 and 3. The proposed operations would require extensions to Pit 1 above the watertable and extensions to Pit 3 below the watertable.
Ore Crushing and Screening	Continued on-site primary and secondary crushing and screening to produce a nominal <100 millimetre (mm) product.
Overburden Storage Areas	Continued placement in existing OSAs and lowgrade ore stockpiles, plus new OSAs located adjacent to or as extension of existing OSAs. In-fill dumping in mined-out pits.
Power Demand and Supply	Power demand would increase by approximately 5000 mega watt hours (MWh) per annum and would continue to be supplied via a 66 kilovolt (kV) overhead transmission power line from the Newman gas-fired power station. The existing power supply system has design capacity to supply up to 20,000 kVA.
Ore Transport	Rail loading using front-end loaders and a Top-up Rail Loading Facility. Ore is transported from the mine to Port Hedland for tertiary crushing and blending prior to shipping. Transport of ore to Port Hedland would increase from 11 to approximately 13 trains per week.
Water Supply	Water demand for the Project would increase to approximately 2900 m^3/day. Process water would be supplied from the dewatering operations. It would continue to be used for dust suppression and ore processing. The potable demand would be similar to current levels (ie. 1.5 mega litres [ML] per annum) and would be sourced from the H-line bores of the Ophthalmia Dam Wellfield.
Greenhouse Gases	The current greenhouse gas emission from Orebody 25 is 27,500 $tCO_{2\text{-}e}$/annum and the proposed extension will increase the greenhouse gas emissions to 31,500 $tCO_{2\text{-}e}$/annum. A total of around 255,000 $tCO_{2\text{-}e}$ will be emitted over the life of the project.
Employment	Current employment is 100 persons. This would increase to 130 throughout the extension period.

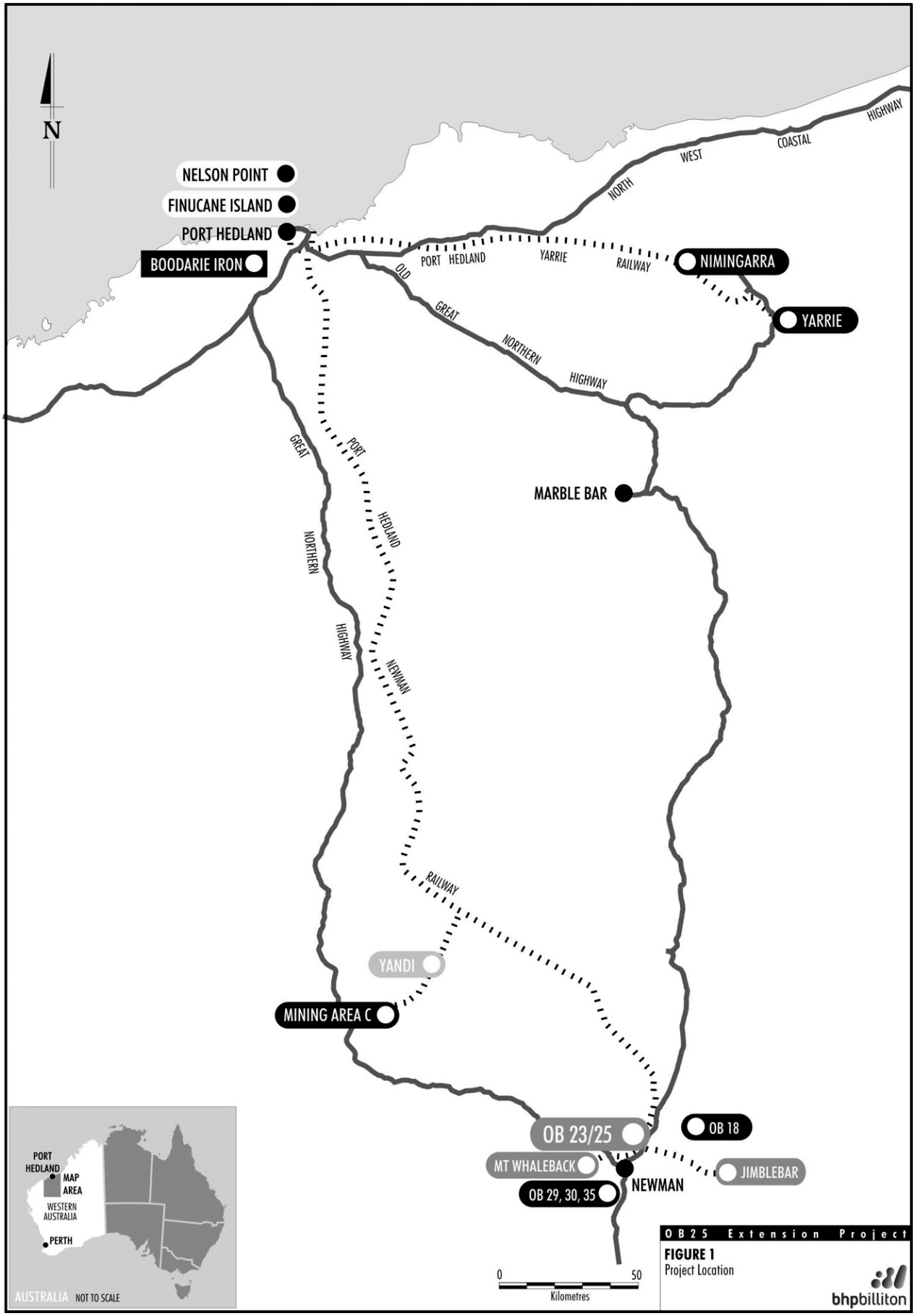

Figure 1: Regional Location

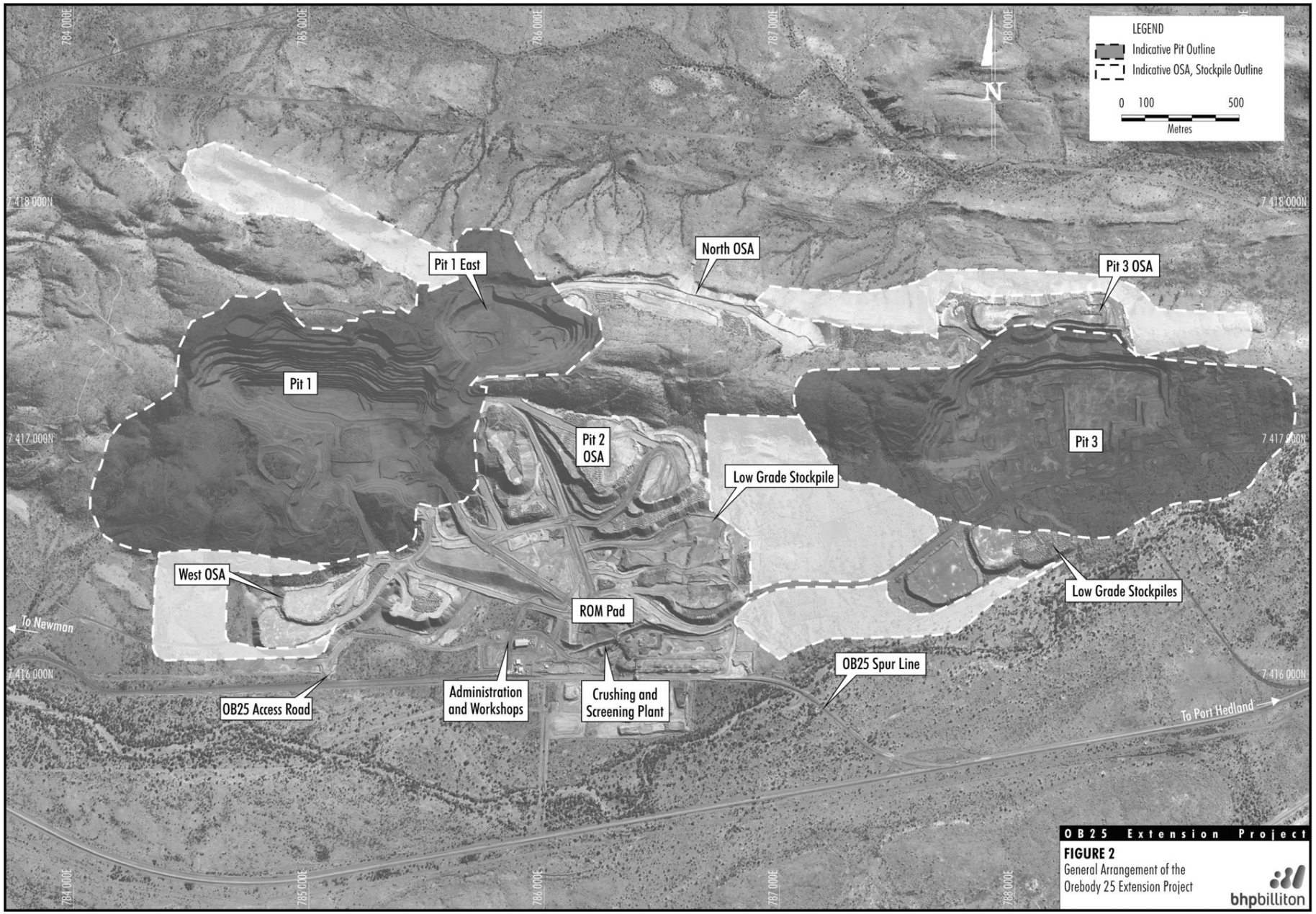

Figure 2: Project Location

Existing Mines

There are several existing mines in the region around Newman; they include Orebody 23, Mt Whaleback, Jimblebar and Orebodies 29, 30 and 35.
None of the pits is expected to encounter pyritic shales, which are recognised from this stratigraphic level as being the source of acid-forming solutions. Consequently acid rock drainage is not expected. Nevertheless, BHPBIO's management includes monitoring of blast holes for sulphides and, in the event of pyrites being intersected; a containment plan would be developed and implemented in consultation with decision-making authorities.

3. Consultation

The proponent has advised that consultation has occurred with the following government agencies and stakeholders during preparation of the EPS document:

- Department of Environment (DoE) Perth and Karratha, including representatives from Water and Rivers Commission (WRC);
- Environmental Protection Authority (EPA);
- Department of Conservation and Land Management (CALM) Perth and Karratha;
- Department of Industry and Resources (DOIR);
- East Pilbara Shire Council;
- Nyiyaparli Aboriginal Group;
- Newman Community Consultative Interaction Forum; and
- Pilbara Native Title Service.

The organisations consulted, the comments received and the proponent's responses are included in Section 1.6 and Tables 1-2 and 1-3 of the EPS (BHPBIO, 2005b). Many of the above-listed agencies and stakeholders have had follow-up meetings.

4. Relevant Environmental Factors

A summary of all the environmental factors, potential impacts and their management is outlined in Table ES-2 of the EPS document (BHPBIO, 2005b). In the EPA's opinion the following are the environmental factors relevant to the proposal:

1. Vegetation, flora and fauna;
2. Groundwater and subterranean fauna;
3. Surface water quality and mine discharges;
4. Aboriginal culture and heritage;
5. Dust, noise and vibration; and
6. Landforms, mine closure planning and rehabilitation.

Details on each of the relevant factors follow.

4.1 Vegetation, Flora and Fauna

Description

VEGETATION AND FLORA

Orebody 25 is situated near the southern boundary of the Fortescue Botanical District within the Eremaean Botanical Province. The Fortescue Botanical District is characterised by tree and shrub steppes with some short grass savannahs on the coast.

Flora surveys that have been conducted in the general vicinity of Orebody 25 include studies by *ecologia* at Wheelarra Hill (Jimblebar), Orebody 24, the Eastern Ophthalmia Range, and Orebodies 18, 23 and 25. All of these surveys covered similar types of landforms (i.e. ridges and hill slopes, scree slopes, outwash plains and gullies/gorge) and were in areas that are less than 35 km from Orebody 25.

A flora survey of the Orebody 25 area was conducted by *ecologia* in 1995 as a component of the *Orebody 25 Biological Assessment Survey*. The survey was conducted across 26 survey sites. A follow-up flora survey was conducted in 2000, specifically targeting Priority flora species. The survey identified five new populations of *Eremophila magnifica ms* area and five new populations of the Priority 3 species, *Triumfetta leptacantha*, which had not been previously recorded at Orebody 25. In 2004 a flora and fauna review was conducted to update the existing biological information available for Orebody 25 and nearby Orebody 23 and Orebody 18 project areas. Field surveys targeting Priority flora species were conducted to confirm the presence of absence of the following flora species of conservation significance previously recorded at Orebody 25:

(i) *T. lepthacantha* (Priority 3);

(ii) *E. magnifica ms*

- *E. magnifica* subsp. *magnifica ms* (Priority 4); and
- *E. magnifica* subsp. *velutina ms* (Priority 3).

The Priority flora search was unsuccessful in identifying any previously reported or new populations of *T. lepthacantha* within the Orebody 25 area, although relatively large numbers of *E. magnifica ms* were found. In order to consolidate the available flora and fauna survey information and assess the potential impacts of the Project, *ecologia* prepared a biological assessment report for the Orebody 25 Extension Project. The complete biological assessment report can be found in Appendix D of the EPS report.

The review of previous vegetation mapping conducted in 1995 indicated that while the coverage was good for a large portion of the Eastern Ridge (in particular around the main Pit 1 and Pit 3 areas), some of the proposed Project disturbance areas were outside of the mapped area. In order to address this aspect, the areas that had not been mapped previously were mapped and an updated vegetation map for Orebody 25 was prepared. The mapping was conducted in Spring 2005 (28th September 2005 to 2nd October 2005) and the methodology used is described in Appendix D of the EPS report. Specific references to the reports mentioned are included in the Bibliography section of the EPS.

Weeds

No 'declared' weeds listed under the *Agriculture and Related Resources Protection Act, 1976* have been recorded in the Project area. However, two environmental or otherwise recognised weed species have been recorded previously in the Project area. They are *Sonchus oleraceus* and *Acetosa vesicaria* (Ruby Dock).

Measures to minimise the potential for weeds to spread include:

- Areas of known weed infestation would be shown on mine plans and marked on the ground in order to minimise the potential for inadvertent access and spread of weeds.
- Weed hygiene procedures would be implemented throughout the life of the Project to prevent further spread of known weed species.
- All machinery and vehicles would be appropriately cleaned down prior to entering the Project area, and where necessary prior to leaving the Project area.
- Topsoil that is stripped from areas known to be infested with weeds would be treated before use.
- Regular inspections for the presence of weeds within areas of disturbance would be conducted.
- Treatment programmes for weed infested areas would be developed and implemented in consultation with CALM. These programmes may include, but are not restricted to, the application of herbicides and pre-emergent treatments.
- Information circulars called 'Enviro Matters' would continue to be used to provide information to employees and contractors regarding management of specific weed species at the Project.

BHPBIO has committed to preparing a Weed Management Plan for the Project that would provide specific details of how it would minimise the spread of weeds. The Weed Management Plan would be prepared to the satisfaction of the relevant advisory agencies.

FAUNA

The Project area falls within the Pilbara region, which is further subdivided into the Hamersley, Fortescue Plains, Chichester and Roebourne sub-regions. Orebody 25 is within the Hamersley sub-region. A description of the characteristics of the sub-region, *Hamersley,* is: mountainous area of Proterozoic sedimentary ranges and plateaus with Mulga low woodland over bunch grasses on fine textured soils and Snappy Gum over *Triodia brizoides* on skeletal sandy soils of the ranges.

The 1995 survey conducted by *ecologia* used a variety of sampling techniques including systematic sampling, inventory sampling and opportunistic sampling. The main habitat types identified and surveyed within the Orebody 25 area are described below.

1. *Spinifex Steppe* – Consists of dense thickets of *Acacia* species with scattered eucalypts over predominantly sandy soils. The habitat supports a high number of bird and reptile species, particularly those species that utilise the dense vegetation;
2. *Mesic Gully* – This habitat provides the most structural diversity, with dense thickets of *Acacia aneura*. The high heterogeneity provides a rich array of ecological niches for exploitation by fauna. The litter layer is rich in ground dwelling insects which in turn support a diverse assemblage of insectivorous bird and reptile species; and
3. *Cliff Face* – A specialised habitat utilised by relatively few species. Small caves and weathered holes provide shelter and roosting spots for small mammal species and the small crevices are utilised by reptiles.

The fauna survey conducted by *ecologia* identified a total of 69 terrestrial fauna species, comprising of 47 bird species, six native and one introduced mammal, and 15 reptile species. No amphibian species were recorded during the survey. One introduced mammal species, the European Cow (*Bos taurus*), was also recorded within the Orebody 25 area.

No fauna species listed under the EPBC Act have been recorded in the Project area but one 'Scheduled' species listed under the *Wildlife Conservation Act, 1950* has been previously recorded in the Project area, the Peregrine Falcon (*Falco peregrinus*). One CALM listed 'Priority species' was previously recorded during surveying, the Western Pebble-mound Mouse (*Pseudomys chapmani*). No fauna species listed under international agreements (i.e. JAMBA and CAMBA) or the IUCN (International Union for Conservation of Nature and Natural Resources) were recorded in the Project area.

Short Range Endemic Invertebrates

The EPA's Guidance Statement No. 56, *Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia* (EPA, 2004) requires that the EIA of proposals consider the potential impacts on the conservation of short-range endemic (SRE) invertebrates. In particular, the principles and objectives for the protection of biodiversity as outlined in *The National Strategy for the Conservation of Australia's Biological Diversity* (Department of the Environment, Sport and Territories, 1996).

There is a potential risk that the proposed mining and development activities associated with the proposed Orebody 25 Extension Project may have an influence on local populations of short-range endemic fauna species, with any possible influence on locally endemic species resulting in the consequential loss of biodiversity

An environmental risk assessment was conducted on SRE's to evaluate the potential risks associated with the Project and, if necessary, allow BHPBIO to formulate additional management actions to reduce the potential risks. It was conducted using the same methodology used by BHPBIO for its expansion plans for the Marillanna Creek (Yandi) Mine, Jimblebar Mine, and Goldsworthy Operations. This methodology was developed in conjunction with the Museum of Western Australia. The risk assessment concluded that the combination of existing environmental control measures to limit impacts on flora and fauna, BHPBIO's mine planning processes to minimise disturbance areas and the absence of records of short range endemic species within the Project area or immediate surrounds combined to reduce the risk to an acceptable level.

Assessment

The area considered for assessment of these factors is contained by the mining envelope, of which an extra 230 hectares is expected to be disturbed for this proposal. To date the total disturbance for the Orebody 25 area is approximately 350ha, of which 38ha is rehabilitated.

The EPA's environmental objective for this factor is to maintain the abundance, diversity, geographic distribution and productivity of flora and fauna at species, community and ecosystem levels through the avoidance or management of adverse impacts and improvements in knowledge. Under the provisions of the *Wildlife Conservation Act 1950*, DRF and priority flora are to be protected, as well as other species of conservation significance.

VEGETATION AND FLORA

No DRF have been identified within the project area. Potential impacts to rare flora species or significant fauna habitat need to be identified and recorded on mine plans so that they can be managed appropriately. Where necessary, BHPBIO would undertake additional pre-clearance survey work to identify or improve knowledge of the distribution of the species of conservation significance and where possible, adjust clearing boundaries to avoid disturbance. CALM staff would be consulted to develop management strategies to CALM's satisfaction where significant flora or fauna, vegetation associations or habitat areas cannot practically be avoided. Monitoring of clearing to check whether only the intended areas are cleared is a part of the process. If subsequent surveys identify any DRF that cannot be avoided by adjusting the clearing boundaries BHPBIO would prepare and submit an application to take DRF pursuant to the *Wildlife Conservation Act 1950,* making any land disturbance in these areas subject to Ministerial approval.

In its EPS, BHPBIO has listed general management strategies for managing potential impacts on flora and fauna which require baseline surveys at the mining operation prior to land disturbance and involve minimising clearing through mine sequencing across the lease. In this way, mined-out pits can sometimes be used for overburden disposal, which reduces the need for clearing of new areas.

BHPBIO is committed to continuing the Tree Monitoring Programme developed and implemented for the Orebody 23 Mine to monitor any effects of dewatering drawdown on vegetation communities along Homestead Creek and the Fortescue River. Water stress criteria would be developed as part of the ongoing Tree Monitoring Programme at the Project to determine/ trigger when appropriate remedial actions are required. The EPA considers that the Tree Monitoring Programme should include conservative triggers for action, developed in consultation with CALM. The proponent has assured that the effect of groundwater drawdown on phreatophytic vegetation will be monitored by continually analysing data and comparing the drawdown to background data to identify any significant differences. The results of the monitoring programme would continue to be summarised in the Annual Environmental Report (AER).

FAUNA

Several species of varying conservation significance have been outlined in fauna surveys. BHPBIO has consulted closely with CALM staff to determine appropriate management procedures for adequate levels of protection, which are tailored to the status of the species as well as their recorded proximity to mining operations. CALM has advised BHPBIO that it is satisfied that the management of impacts to fauna (and flora) species of significance are covered adequately as described in the EPS.

BHPBIO's overall guiding principles for managing the potential impacts of its Pilbara operations on fauna are documented in its Land Management Manual and include the following:

- baseline fauna assessments should be undertaken at each mining operation prior to land disturbance;
- land clearing should be minimised;
- fauna monitoring sites should be established during operations; and

- the return of fauna to rehabilitated areas should be promoted through introduction of fauna habitats (i.e. rock piles, etc).

A Significant Species Management Plan would be prepared and implemented for flora/fauna species of conservation significance. The Plan would be prepared in consultation with, and to the satisfaction of the relevant government agencies prior to the commencement of clearing activities in areas where fauna and flora species of conservation significance are known to occur. The EPA recommends that a condition be set to require the above-mentioned management plan be prepared and implemented.

Conclusion

Having particular regard to the:

(a) advice by CALM on the acceptability of the proposed management of conservation significant flora and fauna; and
(b) the EPA's conditions requiring a Significant Species Management Plan;

it is the EPA's opinion that the proposal can be managed to meet the EPA's objective for this factor provided conditions are imposed as noted.

4.2 Groundwater and Subterranean Fauna

Description

Groundwater

The Ethel Gorge – Newman area has been the subject of numerous groundwater investigations associated with the feasibility, design, operation and potential impacts of Ophthalmia Dam, the Newman Water Supply Scheme and development of the Orebody 23 and Orebody 25 mines.

The two main aquifer types identified by these previous investigations in the Orebody 25 area are Basement Aquifers and Valley Fill Aquifers. The Fortescue River and its main tributaries (i.e. Homestead, Shovelanna, Whaleback and Warrawanda Creeks) join prior to cutting through the Ophthalmia Range in the 400 m wide Ethel Gorge (some 6 km to the northeast of Orebody 25). The alluvial aquifers associated with these creek systems combine and flow in a generally northerly direction through Ethel Gorge and, ultimately, to the Fortescue Marshes.

Groundwater level monitoring is conducted by BHPBIO on a monthly and bimonthly basis within the Ophthalmia Dam Wellfield and surrounds. Groundwater quality sampling is conducted on a quarterly basis at Orebody 25 and Orebody 23.

Groundwater quality sampling was conducted in 2004 by Aquaterra as part of the Orebody 25 Extension Project hydrogeological study. The study involved assessment of the long-term and short-term impacts of the proposed mining below the water table at Pit 3, using a combination of field investigations and hydrological modelling. As part of the investigation, water quality sampling was conducted to determine existing salinity, the presence of pyritic shale and where groundwater quality exceeded drinking and aesthetic water quality guidelines. The complete hydrological investigation report prepared by Aquaterra is attached to the EPS document as Appendix C.

Field investigations and hydrological modelling were carried out to assess the impacts associated with mining below the water table at Orebody 25 (Pit 3). The modelling also included simultaneous mine dewatering taking place at the Orebody 23 Mine, and ongoing abstraction from the post-mining pit lakes to supply raw water to Newman and BHPBIO's other satellite mines.

Stygofauna

Dewatering of pits and water abstraction from wellfields are harmful to stygofauna due to the loss of stygofauna habitat. The duration of mining for the proposed pit to be mined below the water table is about 7 years, after which the pit would be backfilled to 5 meters above the pre-mining water table.

Stygofauna survey results from previous studies at Orebody 23 are relevant to the Orebody 25 Extension Project, due to the close proximity of the Orebody 23 and 25 mines, and their common connection to the alluvial aquifers associated with Homestead Creek and Ethel Gorge.

In July 1997, 22 groundwater bores were sampled by the Museum of WA within a 2 km radius of Orebody 23. In November 1998, a follow-up survey of an additional 63 groundwater bores, located in the vicinity of Ophthalmia Dam and surrounding catchments was conducted. Subsequent morphological evaluation of the Amphipod component of the recorded populations indicated the presence of a new genus, which was named *Chydaekata*, and 15 species belonging to the new genus being only recorded in the region.

In March 2001, groundwater bore sampling was undertaken at Orebody 23 to determine whether the morphological basis for the 15 new species identified in the 1997 and 1998 surveys could be corroborated by other genetic methods, and whether the distribution of the species was greater than recorded from the initial survey. Sampling was conducted in the same bores used in the 1997 and 1998 surveys, plus several other groundwater bores in the Newman area that had not been previously sampled.

Stygofauna recorded within the vicinity of the drawdown zone during the 2004 Biota survey included species of Amphipod, Isopod and Copepod. Earlier results from the 1998 Biota survey also recorded the presence of Ostracoda species in the far north-eastern reaches of the predicted drawdown zone. However, from all the surveys conducted, the species recorded within the impact zone are not exclusive to that particular zone. From the 1998 survey results it is evident that species of Amphipod, Copepod and Isopod are present outside the predicted drawdown zone. The Pilbara Regional Biological Survey further indicated the presence of Ostracoda populations more than 4 km from the drawdown zone boundary.

Assessment

The area considered for assessment of these factors is Orebody 25 and Orebody 23. The EPA's environmental objective for this factor is to maintain the quality and quantity of groundwater so that existing and potential environmental values, including ecosystem maintenance, are protected.

BHPBIO uses pit water for dust suppression and ore processing in preference to supplies from wellfields.

The EPA notes that BHPBIO would continue to conduct annual and triennial aquifer reviews of observation and production dewatering bores during the life of the Project. The reviews would discuss the results of water quality and water level monitoring within each of the bores and, if required, describe changes to production bore extraction rates and management measures. Where relevant to its operations BHPBIO would consider participating in research programmes by Government, research institutes and/or other mining companies, into the assessment and management of changes to regional hydrology caused by mining below watertables.

A reticulation system would be installed so that dewatering discharge can be used to supply process water requirements at the Orebody 25 Mine. Excess water from the dewatering operations would be fed to Newman (via the E and H-Lines), Mt Whaleback (via the E-Line) and Ophthalmia Dam (new pipeline). Any unusable excess water would be discharged into the Ophthalmia Dam, however this is predicted to be less than 5 ML/day and only in the early stages of the proposed Pit 3 extensions.

The EPA also notes that in collaboration with the Museum of WA and specialist subterranean fauna taxonomists, BHPBIO would continue to identify and assess the conservation significance of stygofauna species collected in the vicinity of Orebody 25 via a Stygofauna Sampling programme. The distribution of species retrieved within the Orebody 25 area would be mapped in conjunction with subterranean fauna data collected from Orebody 23 and Ethel Gorge for determination of species significance. Further stygofauna sampling will be undertaken in the Ophthalmia region if required to clarify possible uncertainties in species distribution.

In the event that groundwater bore monitoring indicates adverse impacts on stygofauna species and/or communities of conservation significance due to pit dewatering activities, BHPBIO would implement appropriate management measures (Stygofauna Management Plan), in consultation with CALM, to minimise the potential impacts on stygofauna species and/or communities of conservation significance occurring within the drawdown impact zone. The EPA recommends that a condition be set to require that the above-mentioned sampling programme and management plan be prepared and implemented.

Conclusion

Having particular regard to the:

(a) high standard of the proponent's hydrogeological modelling of impacts and proposed management;
(b) advice by the DoE on the technical feasibility of the proposed management;
(c) water licensing requirements of the DoE; and
(d) EPA's recommended condition requiring the Subterranean Fauna Survey Programme be prepared and implemented and, if the results of the surveys indicate that there is a risk of loss of subterranean species or communities as a result of project operations, management measures in accordance with a Subterranean Fauna Management shall be prepared and implemented.

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor provided that conditions are imposed as noted.

4.3 Surface Water Quality and Mine Discharges

Description

Orebody 25 is located within Water Reserve 6 (DoE) and Special Lease 3116/3684 (BHPBIO). The ephemeral creeks and gullies that drain from the Eastern Ridge flow into Homestead Creek, which is a tributary of the Fortescue River. The amount of surface water quality data that is available is limited due to the small number of days during which surface water flow occurs. Flow events are usually the result of heavy, sustained rainfall over a period of days associated with cyclones that have crossed the Pilbara coast.

Samples are currently collected at four established rising stage samplers and opportunistically via field grab samplers up-stream and down-stream of mining activities. Three of the rising stage samplers are situated on Homestead Creek (Homestead Creek at Nullagine Road Causeway [EGW010], Homestead Creek upstream [EGSW001], and at one location along a minor tributary of Homestead Creek, OB 25 Pit 3 West [EGSW006]).

Mining operations at the Orebody 25 Extension Project have the potential to impact surface water resources by changing local surface water flow patterns (through the construction of new open pits, OSAs and service infrastructure), or by affecting surface water quality as a result of erosion from disturbed areas or contamination from chemicals/hydrocarbons.

Water Discharges

Currently at Orebody 25, up to 2.5 mega litres per day (ML/day) is abstracted from the Ophthalmia Dam Wellfield primarily for dust suppression/ore processing. The total water demand for 2004-2005 was 680 ML. The potable water demand is approximately 1.5 ML per annum. The maximum daily water demand for the Expansion Project would increase to approximately 2.9 ML/day, approximately 790ML per year. Dewatering of Pit 3 would supply the majority of this demand. Potable water demand would remain similar to current levels and would continue to be sourced from the Ophthalmia Wellfield.

Approximately three in-pit dewatering bores and up to four shallow ex-pit dewatering bores would be required during operations at Pit 3. The in-pit bores are predicted to be high yielding, abstracting approximately 4 ML/day. The effectiveness of the in-pit bores would be expected to reduce as water levels decrease. In-pit sumps would be installed to replace in-pit bores as necessary during the final stages of mining. The maximum drawdown at Pit 3 is predicted to be 130 m, with water levels predicted to recover to pre-mining levels approximately 45 years after dewatering ceases.

CALM raised with BHPBIO the issue of mine water discharges to the environment with a view to seeking an assurance that the volumes would not be used for irrigation but would be either recharged into the aquifer or suitably reused. This matter has been addressed in Appendix A in the EMP (BHPBIO, 2005b) under Groundwater Management and the proponent has addressed this issue under management action No. 5.

A reticulation system would be installed so that dewatering discharge can be used to supply process water requirements at the Orebody 25 Mine. Excess water from the dewatering operations would be fed to Newman (via the E and H-Lines) and Mt Whaleback (via the E-Line). Any unusable excess water would be discharged into the Ophthalmia Dam, however this is predicted to be less than 5 ML/day and only in the early stages of the proposed Pit 3 extensions.

The proposed installation of a reticulation system would enable the re-use of water pumped from the dewatering bores for process water at Orebody 25. Any excess water would be fed into the H-line or E-Line for use at Mt Whaleback or Newman.

Discharge into Ophthalmia Dam would occur only when abstraction exceeded demand at the Project, Mt Whaleback and Newman. Water balance modelling of dewatering discharge into the Ophthalmia Dam, has indicated that excess water from Orebody 25 and/or Orebody 23 would not result in dam overflow.

Assessment

The area for assessment is the entire mining area, but more specifically all ground disturbed by mining activities, and areas downstream. The EPA's objectives for watercourses and surface water quality are:

(a) for watercourses- maintain their integrity, functions and environmental values; and,
(b) for surface water quality- maintain or improve the quality of surface water to ensure that existing and potential uses, including ecosystem maintenance, are protected, consistent with the draft *WA Guidelines for Fresh and Marine Waters* (EPA, 1993) and the NHMRC /ARMCANZ *Australian Drinking Water Guidelines - National Water Quality Management Strategy*.

The management of water resources at all of BHPBIO's Pilbara operations is governed by a Mining Operations Water Management Programme, which is aligned with the BHP Billiton's Sustainable Development Policy and Charter. The Programme consists of two parts:

1. Water Management Manual - purpose of which is to outline objectives and strategies for water management and conservation all of BHPBIO's mining operations.
2. Site-specific Water Management Plans - developed as separate site-specific plans that provide details of the site's water supply scheme, current water management practices, water reduction initiatives and performance indicators.

Conclusion

Having regard to BHPBIO's Water Management Programme which describes site sediment control, data from water quality monitoring stations, the maximisation of water for use in suppressing dust and in the ore processing facilities (and hence the minimisation of water discharges), the discharge of excess water into Ophthalmia Dam and in recognition of the Department's advice, it is the EPA's opinion that the proposal can be managed to meet the EPA's objectives for this factor.

4.4 Aboriginal Culture and Heritage

Description

The Nyiyaparli Aboriginal People are the cultural heritage custodians of the Orebody 25 area and surrounds. Several archaeological and ethnographic surveys over the period from 1979 to 2004 have been carried out in the area and BHPBIO has consulted with the Nyiyaparli Aboriginal People.

As part of the EPS consultation, in September 2005 BHPBIO met with representatives of the Nyiyaparli Native Title claimants, and their heritage consultant (E. McDonald of

Ethnosciences Pty Ltd) on-site to discuss the Orebody 25 Extension Project and inspect the existing mine and proposed development areas. There were some concerns about the potential for the proposed pit dewatering to negatively affect the quality of drinking water in the area by causing a mixing of ground and surface water. Some attendees stated that they believed the groundwater at Yandi had been contaminated (based on the warning signs that had been placed around the mine site) and that a similar thing could occur at Orebody 25. BHPBIO explained that the proposed Project dewatering would not cause contamination of either surface or groundwater, and that the water would be used for process water at the mine and Newman, with the excess to be discharged into the Ophthalmia Dam. The attendees were assured that the water quality at Yandi was not contaminated, and that the signs they had observed were an insurance requirement rather than an indicator of the water quality.

The Nyiyaparli representatives expressed their satisfaction with the proposed pit extensions and rehabilitation plans, including the proposed dewatering activities. Their only request was that a Nyiyaparli name be given to a hill that is currently called 'Indjibandi', a Yinyjiparnti name for the dingo. The group suggested that the Nyiyaparli name, 'Yukurra' be applied to the hill and the Orebody 25 mine as a whole. BHPBIO will consider the appropriateness and practicality of the suggested name change.

The potential impacts of the Project on Aboriginal heritage sites are related primarily to direct disturbance of sites and include:

- damaging sites during mining operations and construction of Project infrastructure;
- collecting or excavating artefacts from heritage sites;
- damaging artefacts by off-road use of vehicles; and
- trespassing on sites by unauthorised personnel and culturally inappropriate behaviour (including defacing artefacts or artworks).

No known Aboriginal heritage sites are located within the proposed Project disturbance areas.

Assessment

Under consideration are all areas likely to be disturbed by the range of activities associated with mining at this site. The EPA's objectives for this factor are to:

- ensure that the proposal complies with the requirements of the *Aboriginal Heritage Act*; and
- ensure that changes to the biological and physical environment resulting from the project do not adversely affect cultural associations with the area.

The proponent's guiding principles for managing and minimising impacts to Aboriginal heritage can be summarised as:

- undertaking Aboriginal heritage surveys in consultation with cultural heritage custodians and representatives;
- avoiding Aboriginal sites where possible and revising the mine plan if significant Aboriginal heritage sites are identified;
- obtaining appropriate approvals under the *Aboriginal Heritage Act* prior to disturbing any sites;
- providing compulsory inductions for employees and contractors with regard to their responsibilities under the *Aboriginal Heritage Act*, and maintaining appropriate protective management measures for recorded Aboriginal sites; and

- all employees promptly reporting any potential Aboriginal sites discovered in the vicinity of BHPBIO's operations.

The consultation process has not identified any potential for significant adverse impacts on cultural associations.

Conclusion

Having regard to BHPBIO's management strategies for minimising impacts and its observance of the requirements to obtain all approvals under the *Aboriginal Heritage Act* it is the EPA's opinion that the proposal can be managed to meet the EPA's objectives for this factor.

4.5 Dust, Noise and Vibration

Description

Dust

Mining, transporting and processing of ore generates dust, which may have adverse effects on flora, fauna and humans. BHPBIO recognises this and has dust management principles and strategies in its Land Management Manual, including:

- minimising areas of exposed soil; and
- wetting trafficked dirt roads and construction areas around minesites.

BHPBIO's mining operations at Orebody 23/25 has adopted the following trigger levels for dust control (BHPBIO, 2005a):

- Total Solid Particles (TSP) – a 24 hour dust concentration of 90 $\mu g/m^3$; and
- Particulate Matter (PM_{10}) - a 24 hour dust concentration of 50 $\mu g/m^3$.

The EPA notes from the EPS document (BHPBIO, 2005b) that the proposed increase in production rate would result in a marginal increase in the amount of ore that would be railed to and shipped from the Port Hedland Port Facility. At current throughput rates at the Port, the Orebody 25 Extension Project would increase tonnages at Port Hedland by less than 2%. The cumulative impacts of this production rate increase are not expected to significantly affect dust and noise levels in Port Hedland as existing control measures during crushing, screening and loading would continue to be used.

Also, the EPA notes that BHPBIO is currently modifying the crushing and screening circuit at Orebody 25 to allow for discrete production of lump and fines at Orebody 25. This will reduce the need for tertiary crushing and screening at Nelson Point, hence, reducing dust production at Port Hedland.

Noise and Vibration

Noise levels at the mine are created by blasting, machinery such as the crushers and screening equipment, trains, dump trucks and drill rigs. The minesite is not remote, with the nearest township (Newman) being about 8km from the Orebody 25 mine complex. Consequently, any potential impacts from noise and vibration may not be restricted to mine employees and visitors but may affect the local township. Noise levels are managed to comply with occupational health and safety conditions as outlined in the *Mine Safety and Inspection Regulations, 1995*.

Assessment

Dust

The area for assessment of the effects of dust is the area encompassed by mining, processing and transportation activities, plus surrounding areas immediately downwind. The EPA's objectives for this factor are to ensure that the dust levels generated do not adversely impact upon community welfare and amenity.

BHPBIO has advised that the blasting at the mine is managed so that it is timed for conditions when winds are not blowing towards Newman.

The mine uses significant amounts of water to control dust. The water comes from mine dewatering operations that would otherwise be discharged into creek systems. BHPBIO uses the following practices to minimise dust:

- keeping areas of exposed soil to a minimum and rehabilitating unused areas;
- watering haul roads and other areas which could generate dust;
- chemical suppressants are applied to haul roads;
- water sprays and dust collectors installed at the crushers;
- water sprays used on ore stackers;
- transfer points enclosed and/or fitted with water sprays where practicable;
- dust curtains installed around hoppers; and
- ore is moisture-conditioned prior to rail transport.

The background dust levels at Newman have been measured from a station with both TSP and PM_{10} monitors situated between Orebody 25 and the town of Newman. Between June 2004 and July 2005, there were ten 90 $\mu g/m^3$ exceedances (six in the month of January) that were all related to earthwork, land clearing, and construction activities. The monthly averages were all below the proponents trigger levels by 10 $\mu g/m^3$ or more except for the month of January where the average for both was higher (BHPBIO, 2005a). The EPA notes that action to suppress dust should be initiated before dust levels reach BHPBIO's trigger levels, to minimise the potential for these to be exceeded.

Considering the continuing dust suppression measures in place at Orebody 25, the EPA considers that BHPBIO's dust management strategies are acceptable.

Noise and Vibration

The area for assessment of noise and vibration is the mine area and wherever these effects may be perceived in the surrounding region. The EPA's objectives are to:

- protect the amenity of nearby residents from activities generating noise and vibration; and
- ensure that noise and vibration impacts emanating from the proposed mine comply with statutory requirements and acceptable standards.

Conclusion

Having regard to dust, noise and vibration, the EPA is satisfied that levels generated by the mining activities are largely contained within the mining envelope and that the associated occupational health and safety issues can be managed under the *Mine Safety and Inspection Regulations, 1995*.

Accordingly, it is the EPA's opinion that the proposal can be managed to meet the EPA's objectives for dust, noise and vibration.

4.6 Landforms, Mine Closure Planning and Rehabilitation

Description

The Project area is located in the central portion of the Ophthalmia Range, which forms part of the larger Hamersley Plateau. The main landscape features in the region are elongated rocky ridges and ranges composed of Proterozoic-aged Banded Ironstone Formation (BIF) material. The ridges are generally made up of a series of rounded hills and rocky escarpments, and are oriented in an east-west direction (parallel to the strike of the BIF). The ridges are typically in the order of 300 m higher than the surrounding valley floors, which are comprised of more recent Cenozoic-aged alluvial sediments.

Orebody 25 is located in a faulted extension of Ophthalmia Range known as the Eastern Ridge. The Eastern Ridge is approximately 8 km long and has been separated from the main part of the Ophthalmia Range by several faults.

Visual Aspects of the Landforms

Landforms within the Project area would be affected by the planned mining operations. The existing high walls of Pit 1 and Pit 3 are currently visible from the outskirts of Newman and sections of the Newman to Port Hedland Highway and the Newman to Nullagine Road. The proposal does not involve substantial changes to these high walls (i.e. the majority of the planned activities involve deepening the pits) and would therefore not substantially affect the existing views of the pits. The planned extensions to the existing OSAs on the southern side of the ridge and the proposed pit extension to the south of Pit 1 would be visible from the Newman direction. However, the new mine landforms would be very similar to the existing pit walls and dumps and would therefore not be expected to result in substantial additional visual impacts. The proposed OSA extensions on the northern side of Eastern Ridge would be largely screened from view.

Rehabilitation and Closure

BHPBIO's Decommissioning and Rehabilitation Plan (EPS document Appendix B) outlines the description of the rehabilitation and decommissioning standards that will be applied to the previous, current and proposed mining activities at Orebody 25, along with indicative timing of the rehabilitation works during the remaining life of the mine and a description of proposed

rehabilitation trials. It also includes ongoing research activities and the mine rehabilitation and mine closure monitoring programme.

Rehabilitation and mine closure requirements would be integrated with mine planning during the life of the Project. Landforms such as the proposed Project OSAs would be designed to satisfy the guiding closure principles, with due consideration of relevant legislation and closure guidelines. It is not proposed to modify the slopes of final voids. Progressive rehabilitation of mine landforms would be undertaken, where practicable, having regard to operational and safety requirements.

'Moonscaping'-a method of scalloping the slopes to enhance rainfall infiltration and create microclimates-and the overall face slopes have also been revised over time to ensure that erosion of the faces is minimised. A final angle of 15^0 is considered to be ideal and will be adopted wherever possible. However, where waste dumps are made of competent (ie non-erosive) rock steeper slopes may be used. Rip lines must be exactly on the contour or they can encourage erosion.

Management strategies to minimise impacts on landforms are summarised as follows:

- mine structures would be designed and placed to minimise environmental impacts;
- disturbed areas which are no longer required would be re-contoured to blend with the surrounding topography, topsoiled and contour-ripped prior to seeding with native species as required;
- erosion and sedimentation control measures, such as biodegradable jute mesh material and sediment fences, would be positioned as needed to minimise potentially erosive sheet flow, the development of gullies and sedimentation into watercourses.

The guiding closure principles for the design and revegetation of final mine landforms are outlined in the conceptual Decommissioning and Rehabilitation Plan and include:

- Minimising the number and size of out-of-pit OSAs.
- Residual pit voids would be left as run-of-mine (ROM) where geotechnically stable.
- Use of overburden material to in-fill final voids as void areas become available and/or as resources are mined out.
- Landform designs would be similar to regional landforms, within the constraints imposed by the physical nature of the materials.
- Revegetation of mine landforms would aim to establish local native vegetation suitable to the post-mining habitats.
- Ecosystem Function Analysis or an equivalent long-term systems-based monitoring approach would be used to track the trajectory of rehabilitated areas towards self-sustaining status.
- The end land use for the area would be determined in consultation with stakeholders, and approved by the administering authority during the life of the mine. At this stage the end land use for the area is considered most likely to revert to bushland.

Due to the proximity of Newman to Orebody 25, there may be a future problem with feral animals. The Environmental Management Plan will ensure waste disposal is carried out in such a way to prevent the attraction a feral animals. Feral animals will be dealt with on site if they become an issue.

Assessment

The area considered for assessment is the entire mining lease, plus the surrounding drainage systems. The EPA's environmental objectives for this factor is to ensure that:

- mine closure planning and rehabilitation are carried out in a coordinated, progressive manner and are treated as an integral part of mine development;
- there is no liability to the state as a result of the proposal;
- no contaminated sites are created as a result of the proposal;
- landforms remaining after closure are in a safe and stable condition with the erosion rates comparable to those of natural landforms in the area; and
- self-sustaining vegetation communities are established, composed of native plant species of local provenance.

The EPA notes that the proposed mine is not expected to have any significant visual amenity impacts and that there are no known regionally significant or unique landforms, landmarks or geo-conservation values in the areas to be mined.

The EPA recommends that a condition be imposed requiring that a closure and rehabilitation plan be prepared and implemented. The plan would be reviewed whenever significant changes occur at the mine (or at intervals of no more than five years). In addition, annual environmental reports would be prepared and provided to key stakeholders.

Conclusion

Having particular regard to the:

a) Plans developed by the proponent, including the Decommissioning and Rehabilitation Plan;
b) Rehabilitation trials have already begun and some have been completed; and
c) The EPA's recommended condition regarding the closure and rehabilitation plan.

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor provided that conditions are imposed as noted.

5. Conclusions

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

The relevant factors identified in this assessment are as follows:

- Vegetation, flora and fauna;
- Groundwater and subterranean fauna;
- Surface water quality and mine discharges;
- Aboriginal culture and heritage;
- Dust, noise and vibration; and
- Landforms, mine closure planning and rehabilitation.

The EPA has not recommended a separate condition to address the potential for impact on areas of Aboriginal heritage because no Aboriginal sites are located within the proposed disturbance areas and it considers that consultations, which have been effective and ongoing with relevant stakeholders, have not identified any potential for significant adverse impacts on cultural associations.

Dust, noise, vibration and greenhouse gas emissions are considered to be secondary factors that can be acceptably managed and do not require specific conditions under Part IV of the *Environmental Protection Act 1986*.

The proponent has consulted with stakeholders and agencies to address the various issues raised to a satisfactory degree. The EPA considers that the proposal could be carried out in an environmentally acceptable manner provided that the recommended conditions, together with the proponent's commitments, are implemented.

6. Recommendations

The EPA considers that the proponent has demonstrated, in the EPS document, that the proposal can be managed in an environmentally acceptable manner and provides the following recommendations to the Minister for the Environment:

1. That the Minister notes that the proposal being assessed is for Orebody 25 Extension 8km north east of Newman.
2. That the Minister considers the report on the relevant environmental factors as set out in Sections 4.1 – 4.6.
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions and proponent commitments as set out in Appendix 2, including the provision for implementation of an environmental management system.
4. That the Minister imposes the conditions and procedures recommended in Appendix 2 of this report.

Appendix 1

References

Annual Environmental Report (Mining Operations), BHP Billiton Iron Ore, June 2005 (2005a)

Australian Drinking Water Guidelines - National Water Quality Management Strategy, NHMRC /ARMCANZ, 1996

The National Strategy for the Conservation of Australia's Biological Diversity, Department of the Environment, Sport and Territories, 1996.

Orebody 25 Extension Project, Environmental Protection Statement. BHP Billiton Iron Ore, November 2005 (2005b)

Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia EPA's Guidance Statement No. 56, 2004

WA Guidelines for Fresh and Marine Waters, EPA, 1993

Mine Void Water Resource Issues in Western Australia, Water and Rivers Commission, Perth, Western Australia, 2003

Appendix 2

Recommended Environmental Conditions

and Proponent's Commitments

Statement No.

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED
(PURSUANT TO THE PROVISIONS OF THE
ENVIRONMENTAL PROTECTION ACT 1986)

OREBODY 25 EXTENSION PROJECT
8km NORTH-EAST OF NEWMAN

Proposal: Proposal for extensions to current mines, and new pits, to mine and crush iron ore at the Yarrie, Nimingarra and Cattle Gorge mine areas at a continuing rate of up to approximately 8.5 million tonnes per annum, for transportation by rail to Port Hedland; rehabilitation; and decommissioning of the site, as documented in Schedule 1 of this statement.

Proponent: BHP Billiton Iron Ore Pty Ltd

Proponent Address: 225 St George's Terrace PERTH WA 6000

Assessment Number: 1609

Report of the Environmental Protection Authority: Bulletin 1210

The proposal referred to in the report of the Environmental Protection Authority may be implemented. The implementation of that proposal is subject to the following conditions and procedures.

1 Proposal description

1-1 The proponent shall implement the proposal as documented and described in schedule 1 of this statement subject to the conditions and procedures of this statement.

2 Proponent environmental management commitments

2-1 The proponent shall fulfil the environmental management commitments contained in schedule 2 of this statement.

3 Proponent nomination and contact details

3-1 The proponent for the time being nominated by the Minister for the Environment under section 38(6) or (7) of the Environmental Protection Act 1986 is responsible for the implementation of the proposal until such time as the Minister for the Environment has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person as the proponent for the proposal.

3-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent under section 38(6a) and provide the name and address of the person who will assume responsibility for the proposal, together with a letter from that person which states that the proposal will be carried out in accordance with the conditions and procedures of this statement, and documentation on the capability of that person to implement the proposal and fulfil the conditions and procedures.

3-3 The nominated proponent shall provide written notice to the Department of Environment of any change of the name and address of the proponent within 30 days of such change.

4 Time limit of approval to commence

4-1 The proponent shall provide evidence to the Department of the Environment that the proposal has substantially commenced within five years from the date of this statement or the approval granted in this statement shall lapse and be void.

Note: The Minister for the Environment will determine any dispute as to whether the proposal has been substantially commenced.

4-2 The proponent shall make an application for any extension of approval for the substantial commencement of the proposal to the Minister for the Environment prior to the expiration date of this statement, which shall demonstrate that:

Note: The Minister for the Environment may consider the grant of an extension of the time limit of approval not exceeding five years for the substantial commencement of the proposal.

5 Compliance reporting

5-1 The proponent shall submit compliance reports in accordance with a schedule approved by the Department of Environment and with the compliance monitoring guidelines, and shall:

1. describe, or update, the state of implementation of the proposal;
2. provide verifiable evidence of compliance with the conditions, procedures and commitments; and
3. review the effectiveness of corrective and preventative actions contained in the environmental management plans and programs;
4. provide verifiable evidence of the fulfilment of requirements specified in the environmental management plans and programs;
5. identify all confirmed non-conformities and non-compliances and describe the related corrective and preventative actions taken; and
6. identify potential non-conformities and non-compliances and provide evidence of how these are being assessed for corrective action.

6 Performance review

6-1 The proponent shall submit a performance review report every five years following the formal authority issued to the decision-making authorities under section 45(7) of the

Environmental Protection Act 1986, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority, which addresses:

1. the major environmental issues associated with implementing the project; the environmental objectives for those issues; the methodologies used to achieve these; and the key indicators of environmental performance measured against those objectives;
2. the level of progress in the achievement of sound environmental performance, including industry benchmarking, and the use of best practicable measures available;
3. significant improvements gained in environmental management, including the use of external peer reviews;
4. stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and
5. the proposed environmental objectives over the next five years, including improvements in technology and management processes.

6-3 The proponent may submit a report prepared by an independent auditor to the Chief Executive Officer of the Department of Environment on each condition of this statement which requires the preparation of a management plan, programme, strategy or system, stating whether the requirements of each condition have been fulfilled within the timeframe stated within each condition.

7 Conservation of Significant Flora and Fauna

7-1 Prior to ground-disturbing activities, the proponent shall provide a summary report of the results of recent and adequate surveys for significant flora and fauna species in the areas to be disturbed by the Project, and provide documentary evidence from the Department of Conservation and Land Management on the requirement, if any, for a Significant Species Management Plan to be prepared for the conservation of significant flora or fauna species recorded in the Project area.

7-2 In the event that conservation-significant flora or fauna species are recorded in the Project area and on the Department of Conservation and Land Management's recommendation, in accordance with condition 7-1, the proponent shall prepare a Significant Species Management Plan, in consultation with the Department of Conservation and Land Management, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority, prior to ground disturbing activities.

The Significant Species Management Plan shall describe the significant, identified species of flora and fauna, and describe significant vegetation associations and habitat areas, and shall set out procedures to:

1. demarcate identified populations and/or individuals of conservation-significant, identified species of flora and fauna, vegetation associations and habitat areas;
2. modify land clearing plans and evaluate alternative mine plans, to minimise or avoid impacts on the conservation-significant, identified species of flora and fauna, vegetation associations and habitat areas;

3. minimise impacts where proposed mining activities are likely to impact on conservation-significant, identified species of flora and fauna, vegetation associations and habitat areas;
4. monitor and record impacts on conservation-significant, identified species of flora and fauna, vegetation associations and habitat areas; and
5. implement appropriate contingency measures where impacts on conservation-significant, identified species of flora and fauna, vegetation associations and habitat areas are identified.

7-3 The proponent shall review and revise the Significant Species Management Plan required by condition 7-2 at intervals not exceeding five years.

7-4 The proponent shall implement the Significant Species Management Plan required by condition 7-2.

7-5 The proponent shall make the Significant Species Management Plan required by condition 7-2 publicly available.

8 Weeds

8-1 The proponent shall not carry out land disturbing activities other than in accordance with a Weed Management Plan, prepared in consultation with the Department of Conservation and Land Management and the Department of Agriculture to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

This plan shall:

1. describe the location and area affected for each weed species which occurs in the proposal area;
2. identify any additional weed species which have the potential to occur in the proposal area;

and shall set out procedures and measures to:

3. monitor weed species;
4. control or eradicate weed species;
5. prevent the spread of weed species; and
6. prevent the introduction of any additional weed species.

8-2 The proponent shall implement the Weed Management Plan required by condition 8-1.

8-3 The proponent shall make the Weed Management Plan required by condition 8-1 publicly available.

9 Subterranean Fauna

9-1 Within six months following the formal authority issued to the decision-making authorities under section 45(7) of the *Environmental Protection Act 1986*, the proponent shall commence surveys for subterranean fauna in accordance with a Subterranean Fauna Survey Plan prepared to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.

The Subterranean Fauna Survey Plan shall set out procedures and measures to:

1. survey areas affected by project operations; and
2. survey areas with similar habitats outside the areas to be affected by project operations to establish the conservation significance of fauna within the areas to be affected.

9-2 In the event that the results of the surveys required by condition 9-1 indicate that there is a risk of loss of subterranean species or communities as a result of project operations, the proponent shall institute management measures in accordance with a Subterranean Fauna Management Plan, prepared in consultation with the Department of Conservation and Land Management to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

The Subterranean Fauna Management Plan shall set out procedures and measures to:

1. avoid and/or manage impacts on subterranean fauna species and/or communities and their habitats where the long-term survival of those species and/or communities may be at risk as a result of project operations;
2. monitor the distribution and abundance of species and/or communities of subterranean fauna, groundwater levels, groundwater quality and other relevant aspects of subterranean fauna habitat to ensure that the long-term survival of subterranean fauna species and communities is not compromised as a result of project operations; and
3. take timely remedial action in the event that monitoring indicates that project operations may compromise the long-term survival of subterranean fauna and / or communities.

9-3 Prior to the commencement of dewatering activities at Cattle Gorge or Nimingarra I, the proponent shall implement the Subterranean Fauna Management Plan required by condition 9-2.

9-4 The proponent shall make the Subterranean Fauna Management Plan required by condition 9-2 publicly available.

10 Decommissioning and Final Rehabilitation

10-1 The proponent shall rehabilitate and decommission the new project areas in accordance with the Decommissioning and Rehabilitation Plan provided in the Environmental Protection Statement (November 2005) document or subsequent revisions which meet the requirements of the Minister of the Environment on advice of the Environmental Protection Authority.

10-2 The proponent shall review and revise the Decommissioning and Rehabilitation Plan, in consultation with the Water and Rivers Commission, the Department of Industry and Resources and the Department of Conservation and Land Management, as required, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

The objective of this plan is to ensure that closure planning and rehabilitation are carried out in a coordinated, progressive manner and are integrated with development planning, consistent with the Australian and New Zealand Minerals and Energy Council / Minerals Council of Australia *Strategic Framework for Mine Closure (2000),* current best practice, and the agreed land uses.

Each revision of the Decommissioning and Rehabilitation Plan shall set out procedures and measures to:

1. manage over the long term ground and surface water systems affected by the open pits and waste rock dumps;

2. rehabilitate all disturbed areas to a standard suitable for the agreed end land use(s);

3. backfill Pit 3, to at least 5 metres above the pre – mining groundwater table so as to manage impacts to groundwater quality and subterranean fauna;

4. identify contaminated areas, including provision of evidence of notification and propose management measures to relevant statutory authorities; and

5. develop management strategies and/or contingency measures in the event that operational experience and/or monitoring indicate that a closure objective is unlikely to be achieved.

10-3 The proponent shall make revisions of the Decommissioning and Rehabilitation Plan required by condition 10-2 publicly available.

Procedures

1. Where a condition states “to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority”, the Environmental Protection Authority will provide that advice to the Department of Environment for the preparation of written notice to the proponent.

2. The Environmental Protection Authority may seek advice from other agencies or organisations, as required, in order to provide its advice to the Department of Environment.

3. Where a condition lists advisory bodies, it is expected that the proponent will obtain the advice of those listed as part of its compliance reporting to the Department of Environment.

Notes

1. The Minister for the Environment will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environment over the fulfilment of the requirements of the conditions.

2. The proponent may be required to apply for a Works Approval, Licence and Registration for this project under the provisions of Part V of the *Environmental Protection Act 1986*.

Schedule 1

The Proposal (Assessment No 1609)

The proposal involves expanding existing mining operations at Orebody 25 Mine. The project is located 8 kilometres north east of Newman, in the Pilbara Region of Western Australia (Figure 1). Mining activities at Orebody 25 have involved development of hard rock Pits 1, 2 and 3 (Figure 2). Pit 2 was mined below the watertable in the late 1990s and was subsequently backfilled and rehabilitated. Pits 1 and 3 are still active.

The proposed Orebody 25 Extension Project involves increasing the ore production rate from 7 Mtpa to approximately 8 Mtpa, and mining the remaining ore from Pits 1 and 3. Under this proposal, Pit 3 is scheduled to be expanded below the watertable in early 2006, and mining of the additional ore in Pit 1 is scheduled to start in mid 2006. At the proposed production rate, it is estimated that the known reserves in Pit 1 and Pit 3 would be mined out in 2009 and 2013 respectively.

The main components of BHPBIO's proposal are:

- increasing the ore production rate from approximately 7 to 8 Mtpa;
- continued hard rock mining of resources in the existing approved Pits 1 and 3;
- extension of mining at Pit 1 outside existing approved areas;
- extension of mining at Pit 3 below the watertable and outside existing approved areas;
- extensions to existing approved Overburden Storage Areas (OSA's) and low grade ore stockpiles, progressive development of new OSA's, and placement of overburden in existing and new mined out pits (ie. in-fill dumping);
- progressive construction of haul roads and light vehicle access roads to the open pits, OSAs and mine infrastructure; and
- increasing ore transport from 11 trains per week to approximately 13 trains per week.

Significant features of the proposal are:

- progressive mining and rehabilitation of the site;
- backfilling of pit 3 to above the original groundwater level; and
- permanent changes to the final landforms, including hill-like features of the out-of-pit OSAs.

A tabled summary of the key components of the proposal follows.

Table 1 Summary of key proposal characteristics

Aspect	Proposed Orebody 25 Extension Project
Proponent	BHP Billiton Iron Ore Pty Ltd, 225 St Georges Terrace, Perth, Western Australia 6000.
Life of Extensions	Approximately 7-8 years (i.e. from 2006 to 2013).
Land Disturbance Area	The existing Orebody 25 Mine has disturbed some 415 hectares (ha) as at June 2005, the proposed extensions would disturb approximately 230 ha.
Hard Rock Mining	Hard rock mining would continue in the existing approved Pits 1 and 3. The proposed operations would require extensions to Pit 1 above the watertable and extensions to Pit 3 below the watertable.
Ore Crushing and Screening	Continued on-site primary and secondary crushing and screening to produce a nominal <100 millimetre (mm) product.
Overburden Storage Areas	Continued placement in existing OSAs and lowgrade ore stockpiles, plus new OSAs located adjacent to or as extension of existing OSAs. In-fill dumping in mined-out pits.
Power Demand and Supply	Power demand would increase by approximately 5000 mega watt hours (MWh) per annum and would continue to be supplied via a 66 kilovolt (kV) overhead transmission power line from the Newman gas-fired power station. The existing power supply system has design capacity to supply up to 20,000 kVA.
Ore Transport	Rail loading using front-end loaders and a Top-up Rail Loading Facility. Ore is transported from the mine to Port Hedland for tertiary crushing and blending prior to shipping. Transport of ore to Port Hedland would increase from 11 to approximately 13 trains per week.
Water Supply	Water demand for the Project would increase to approximately 2900 m^3/day. Process water would be supplied from the dewatering operations. It would continue to be used for dust suppression and ore processing. The potable demand would be similar to current levels (ie. 1.5 mega litres [ML] per annum) and would be sourced from the H-line bores of the Ophthalmia Dam Wellfield.
Greenhouse Gases	The current greenhouse gas emission from Orebody 25 is 27,500 tCO_{2-e}/annum and the proposed extension will increase the greenhouse gas emissions to 31,500 tCO_{2-e}/annum. A total of around 255,000 tCO_{2-e} will be emitted over the life of the project.
Employment	Current employment is 100 persons. This would increase to 130 throughout the extension period.

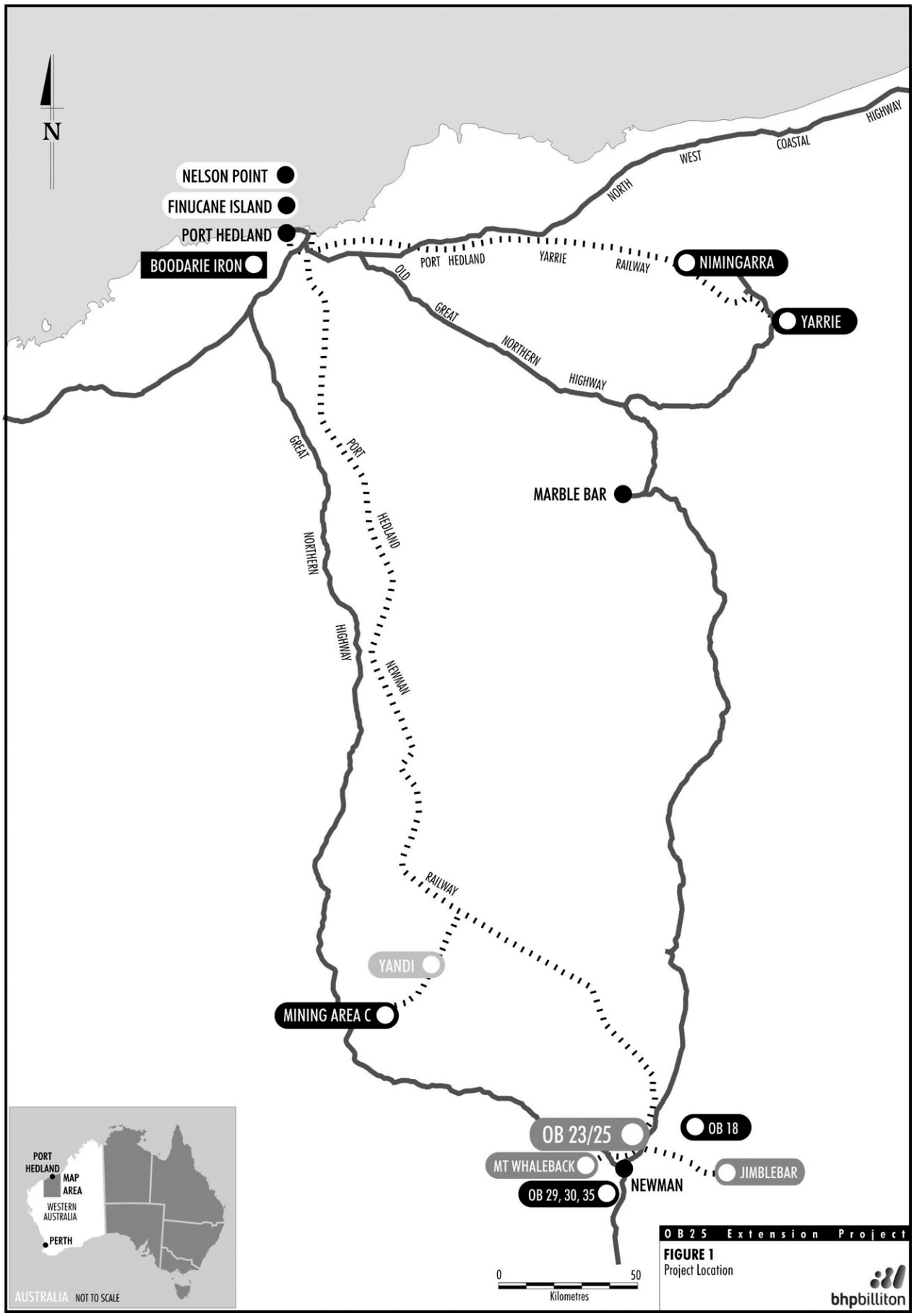

Figure 1: Regional Location

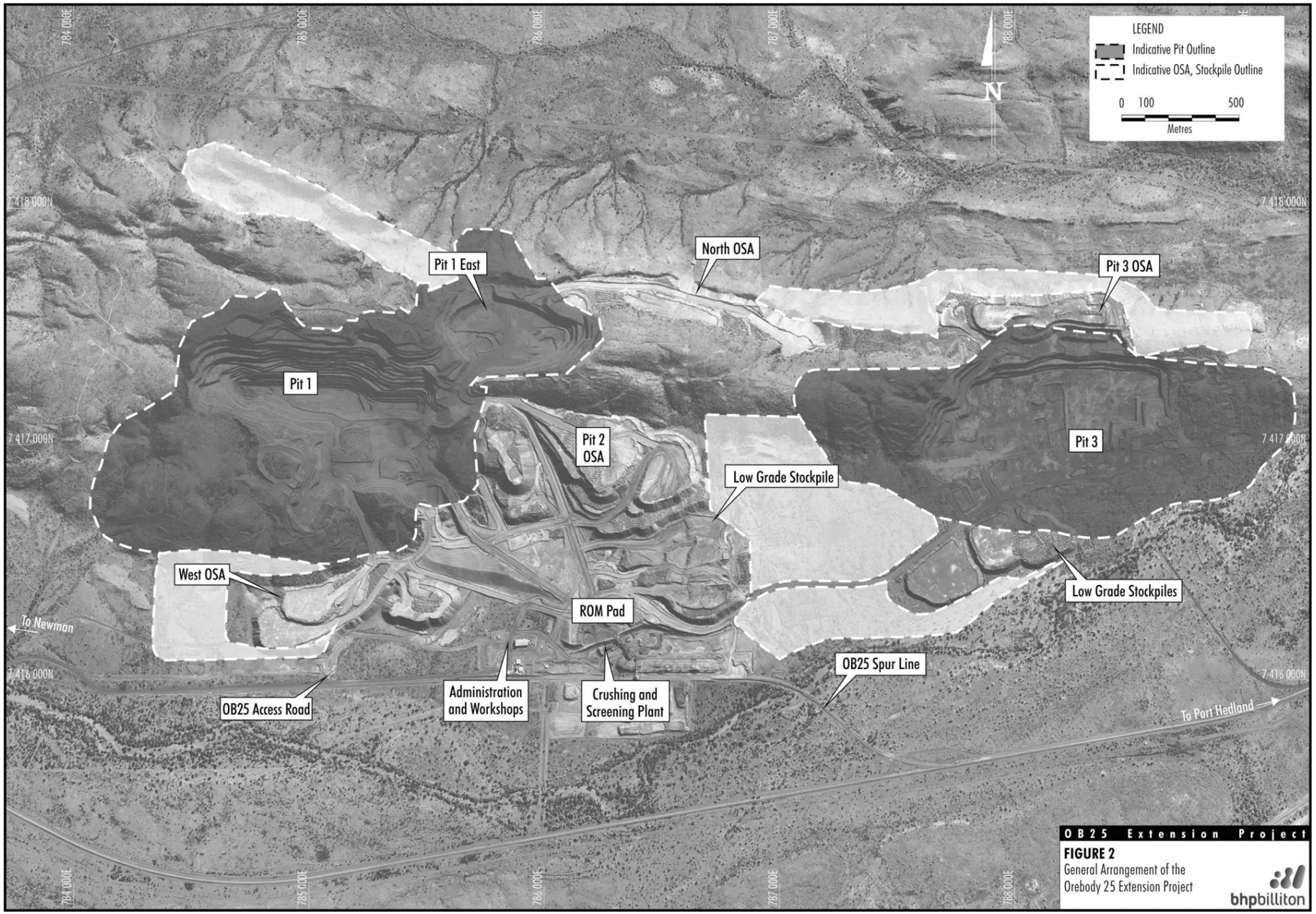

Figure 2: Project Location

Schedule 2

Proponent's Environmental Management Commitments

Orebody 25 Extension Project
8km North East of Newman

(Assessment No. 1609)

BHP Billiton Iron Ore Ltd

Proponent's Environmental Management Commitments

OREBODY 25 EXTENSION PROJECT - 8km North East of Newman (Assessment No. 1609)

Note: The term "commitment" as used in this schedule includes the entire row of the table and its six separate parts as follows:

- a commitment number;
- a commitment topic;
- the objective of the commitment;
- the 'action' to be undertaken by the proponent;
- the timing requirements of the commitment; and
- the body/agency to provide technical advice to the Department of Environment.

Commitments

Number	Topic	Objective	Action	Timing	Advice
1	Environmental Management Plan.	Implement an Environmental Management Plan that describes procedures and practices for protection of key environmental aspects during all phases of mining..	• Implement the Environmental Management Plan for the Project that is contained as Appendix A of the Environmental Protection Statement. • Review and revise the Environmental Management Plan at intervals of no more than five years, or when significant changes occur at the Mine. Each revision of the Environmental Management Plan will be prepared to the requirements of the EPA on advice from the DoE, DoIR and CALM and contain the following: o A description of key components of the Project (ie. mining method, overburden management, ore processing, ore loading and transportation, water and power supply, and service infrastructure). o A description of the Environmental Management System, and the Environmental Risk Assessment and Management systems which will be used at the Project. It will include a description of how best practicable environmental measures have been applied to risks which are identified (through the Risk Assessment Process) as requiring this level of management to reduce residual risk to an acceptable level. o A description of the environmental management procedures and practices to be used to minimise impacts on key environmental aspects. These aspects are to include: soil resources, landforms, surface water, groundwater, flora (including priority species and species of interest), fauna (including priority species and species of interest), air quality, noise, waste, dangerous goods and hazardous materials, and Aboriginal heritage. o For each environmental aspect, the Environmental Management Plan will describe the overall management objective, potential impacts, management measures, and monitoring programme to track performance. • A copy of each new revision of the Environmental Management Plan will be provided to key	Revised at intervals of no more than five years during operations.	DOIR DOCEP CALM DIA

			stakeholders, and to other interested parties if requested.		

Number	Topic	Objective	Action	Timing	Advice
2	Annual Environmental Report.	Annually prepare reports on environmental management, monitoring and rehabilitation.	• Prepare an Annual Environmental Report (AER) that discusses environmental management actions, summarise monitoring results and describes rehabilitation activities at the Orebody 25 Extension Project over the 12 month reporting period. • Distribute the AER to key stakeholders and provide copies to other interested parties if requested.	Annually during operations.	-
3	Mining Below the Watertable	To minimise the long term impacts of the open pits on groundwater following mine closure.	• Backfill all mine voids at Orebody 25 which progress below watertable to above the pre-mining watertable.	Prior to mine closure	-
4	Potentially Acid Forming Overburden	To minimise potential impacts of mining Potentially Acd Forming overburden in the event that it is encountered	• In the event that potentially acid forming overburden is to be mined, the proponent will develop and implement management measures that minimise the potential for the material to generate acid rock drainage. • If required, develop, in consultation with DoIR, management measures to be incorporated in the Project Environmental Management Plan.	During operations	DOIR
5	Monitoring of vegetation communities in Homestead Creek	Monitor the effect of dewatering drawdown on potentially affected vegetation communities	▪ Implement the Orebody 23 tree monitoring programme. ▪ Take remedial action as agreed with relevant Government decision making authorities if significant tree stress due to mine dewatering is recorded.	During operations	DoE, CALM

Key

CALM = Department of Conservation & Land Management
DoE = Department of Environment
DoIR = Department of Industry & Resources.
EPA = Environmental Protection Authority.