Jimblebar rationalisation and planned expansion, (formerly McCamey's Monster Iron Ore mining proposal)

BHP Iron Ore (Jimblebar) Pty Ltd

Proposed changes to environmental conditions

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 769
March, 1995

THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposal.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's report.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposal may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

APPEALS

If you disagree with any of the contents of the assessment report or recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of $10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

ADDRESS

Hon Minister for the Environment
12th Floor, Dumas House
2 Havelock Street
WEST PERTH WA 6005

CLOSING DATE

Your appeal (with the $10 fee) must reach the Minister's office no later than 5.00 pm on 24 March 1995

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Summary

The Environmental Protection Authority has been requested by the Minister for the Environment, under Section 46 of the Environmental Protection Act 1986, to report on the proposed expansion of the Jimblebar iron ore mine (formerly known as McCamey's Monster). The proposal by BHP Iron Ore (Jimblebar) Pty Ltd (the proponent) involves an increase in the mining rate from five to eight million tonnes per annum, and the expansion of both the scree and bedrock mining areas.

The original proposal to mine five million tonnes of scree ore a year was assessed by the Environmental Protection Authority in 1987 at the level of Consultative Environmental Review, and the Minister for the Environment released a statement that the proposal could be implemented on 8 March 1988. The environmental conditions placed on the project at that time, limited the total quantity of ore that could be extracted from the site and restricted the scree mining boundary.

Following the original assessment a number of modifications have been made to the operation which were informally assessed by the Environmental Protection Authority. These changes included the development of a railway, the addition of bedrock mining within the mining lease, and the expansion of the areas approved for mining. The proponent for the project has also changed following the original assessment. The current assessment is an opportune time to update the environmental conditions to reflect both the past and proposed changes to the operation and to include standard conditions applied by the Minister for the Environment.

The Environmental Protection Authority has jurisdiction over the protection of both the natural and social environments, and the control of pollution. The major environmental issues associated with the proposed changes to the Jimblebar operation which have been identified through the environmental assessment process include:

1. The management of protected flora and fauna;
2. Overburden dumping and landscape restructuring; and
3. Rehabilitation.

As part of this assessment Department of Environmental Protection officers, on behalf of the Environmental Protection Authority, and in consultation with BHP Iron Ore, reviewed the conditions and commitments on the project. This was to achieve one environmental statement and one list of proponent's commitments that provides for protection of the environment and for efficient and effective environmental auditing of compliance criteria. This will assist the public, the proponent and relevant agencies to more easily identify environmental management requirements associated with the development of the Wheelarra Hill iron ore deposit at Jimblebar.

The Environmental Protection Authority has concluded that the proposed expansion of the Jimblebar mine is environmentally acceptable and recommends that it could proceed subject to the recommendations contained in this report.

The following table summarises the recommendations made by the Environmental Protection Authority for this proposal; these appear in full in the main text of this report.

	Summary of Recommendations
1	The proponent should prepare an environmental management programme for the site, to minimise the impacts of overburden disposal on the project area.
2	The proponent should prepare a plan for the rehabilitation of the site.
3	At least six months prior to decommissioning the proponent should prepare and implement a decommissioning plan for the site.
4	The project is acceptable subject to the recommendations contained in this report and the proponent's commitments.

1. Introduction and background

BHP Iron Ore (Jimblebar) Pty Ltd (the proponent) proposes to rationalise and expand its existing operations at Jimblebar. This operation, originally known as the McCamey's Monster Iron Ore Mining Proposal, was referred to the Environmental Protection Authority (EPA) by the previous proponent (Hancock Mining Ltd) in September 1987 (EPA 1987). The original proposal was subject to a Consultative Environmental Review (CER) level of assessment, and approval for the implementation of the project was granted by the Minister for the Environment on 8 March 1988 (see Appendix 1).

The original proposal involved mining from Wheelarra Hill, located in the Pilbara region of the north west of Western Australia, approximately 40 kilometres east of the town of Newman (see Figure 1). The development involved the mining of scree ore only at a rate of up to five million tonnes per annum (mtpa), and the construction of a haul road for the transport of that material to Newman by truck.

The potentially significant environmental impacts identified during the original assessment were:

- landscape restructuring;
- soil erosion;
- vegetation and fauna losses; and
- rehabilitation.

The design of the original proposal is reflected in the environmental conditions placed on it and still contained in the current statement. The original statement addressed the construction of the haul road and its subsequent rehabilitation, the management of topsoil removed during the construction of the process site, and restricted the proponent to mining five million tonnes of iron ore from the site each year.

Since the original assessment, a number of changes have been made to the project which have been informally assessed by the EPA; these include the substitution of a rail spur in place of the haul road, the development of bedrock mining within the mining lease, and the expansion of the area being mined. The proponent responsible for the project has also changed during this period. The original environmental conditions have not been modified to reflect changes in the operational procedures and implementation of the project.

The proponent wishes to increase the mining rate from five to eight mtpa and under environmental condition 5 of the current Ministerial Statement any proposal to increase the mining rate beyond five mtpa must be referred to the EPA. The expansion proposal was referred to the EPA by the Department of Resources Development (DRD) on 18 November 1994. The current assessment was seen as an opportune time to revise the remainder of the environmental conditions to reflect current operations, and to include standard conditions generally imposed by the Minister for the Environment. The proponent has also recognised the need to consolidate and rationalise their operations, commitments, and environmental conditions to reflect the changing nature of the operation, the new ownership, and BHP Iron Ore's responsibility to conduct their operations in an environmentally sensitive manner.

2. Summary description of proposal

The proposal presented by BHP Iron Ore (Jimblebar) Pty Ltd involves the expansion of its current operations at Jimblebar, including further development of the Wheelarra Hill iron ore deposit.

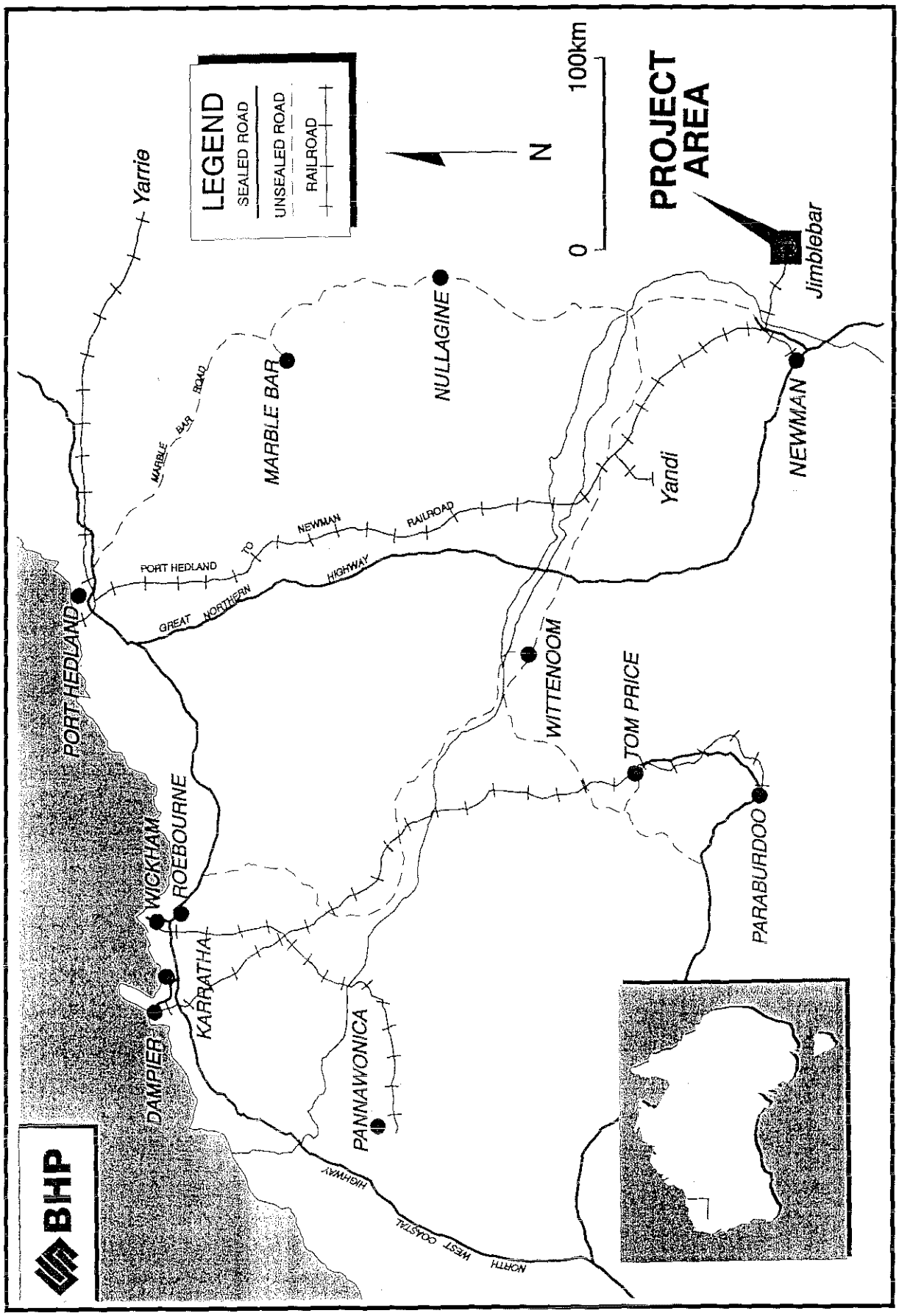

Figure 1: ***Location of the Jimblebar Iron Ore Mine, east of Newman*** (Figure 2.1 of Proposal for the Development of Wheelarra Hill Iron Ore; BHP Iron Ore 1994a)

Both bedrock and scree ores are presently mined, and would continue to be recovered, at Jimblebar. Figure 2 shows the location of the two sources of ore within the mine. Scree and bedrock ores are mined concurrently to maximise opportunities for blending. The ore is processed by a primary crusher on site, and transported to Port Hedland via an existing rail spur which is connected to the main line between Newman and Port Hedland.

The project is operated by a contract workforce which is housed in the town of Newman, and all support facilities required for the expansion are already established on site.

No mining will occur below the water table, however groundwater is abstracted to service facilities and for fugitive dust suppression. All water for dust suppression in the mine site, processing plant usage and all domestic purposes is obtained from four existing bores which access the Wittenoom Formation south of the minesite. Groundwater levels around active bores are monitored on a monthly basis as are piezometers located near the mine; mining has not intercepted any groundwater on the lease. The water quality of non potable groundwater extracted for dust suppression and ancillary uses is generally good, having a pH of 7.8, and a conductivity of 0.34 mS/cm (BHP Iron Ore 1993).

Scree Mining

The mining of scree ore would occur progressively over several scree ore fans, as shown in Figure 2. The scree is relatively shallow and occurs above the water table in all areas. The average depth of the scree deposit is 40 metres; the deepest scree is found in the area currently being mined, where it extends to a depth of 70 metres (shown as area 1 in Figure 2).

Topsoil would first be removed and stored for later rehabilitation prior to scree mining in any new area. Conventional open cut mining methods would be used to recover scree ore, which can generally be free dug. Occasionally, drilling and blasting may be required to loosen the material. The ore would then be loaded on to haul trucks and transported to the crushing and loading facility. No overburden material is mined with scree ore. Production of scree ore at the Jimblebar site is estimated at between two and four million tonnes per year.

Bedrock mining

Future bedrock mining would continue in the same pit currently being mined, using similar mining techniques. The timing of this operation will be on-going in conjunction with the scree mining, so that material from the bedrock pit would be available for blending. Future mining will deepen the pit and extend it to the west and east as shown in Figure 3. An additional haul road will be required from the pit to the crushing facility.

Topsoil would be removed wherever possible prior to bedrock mining. Overburden from the bedrock pit would be backfilled into mined out scree or bedrock areas where practicable. If no mined out areas are available for backfilling, the overburden will be hauled to nominated storage areas where it will be formed to blend with the surroundings and rehabilitated. The proponent has estimated that in addition to backfilling all mined out scree areas, approximately 20 million tonnes of overburden material would require out of pit dumping.

3. Environmental impact assessment process

The proposed expansion and rationalisation of the Jimblebar operation is described in the 'Proposal for the Development of the Wheelarra Hill Iron Ore' prepared by BHP Iron Ore (Jimblebar) Pty Ltd (BHP 1994a). Environmental issues involved with the expansion are outlined in that document. The development proposal was submitted to DRD as a requirement of the Iron Ore (McCamey's Monster) Agreement Authorisation Act 1972.

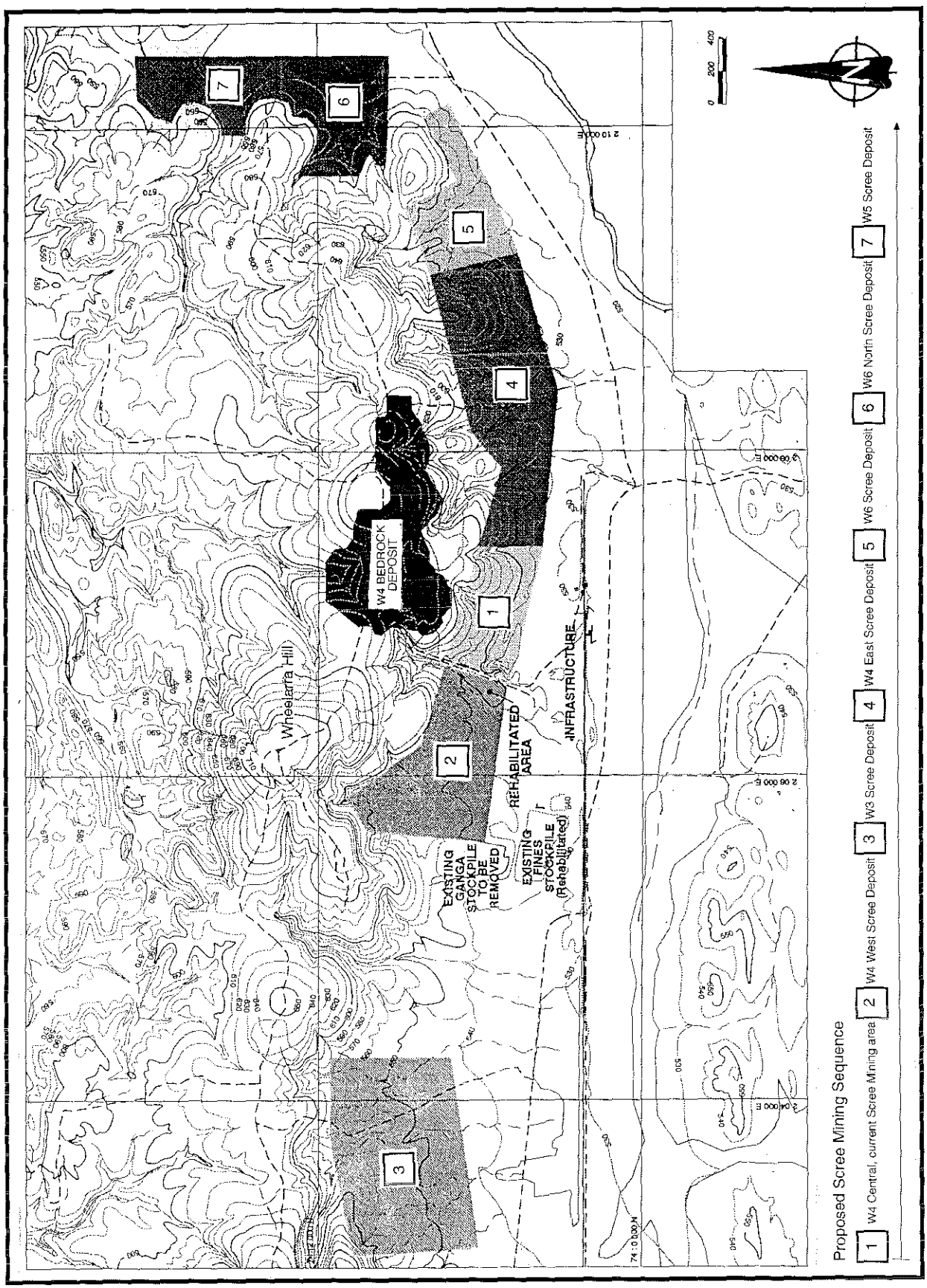

Figure 2: ***Location of bedrock and scree mining areas within the Jimblebar mining lease*** (Figure 3.2 of 'Proposal for the Development of Wheelarra Hill Iron Ore; BHP Iron Ore 1994a)

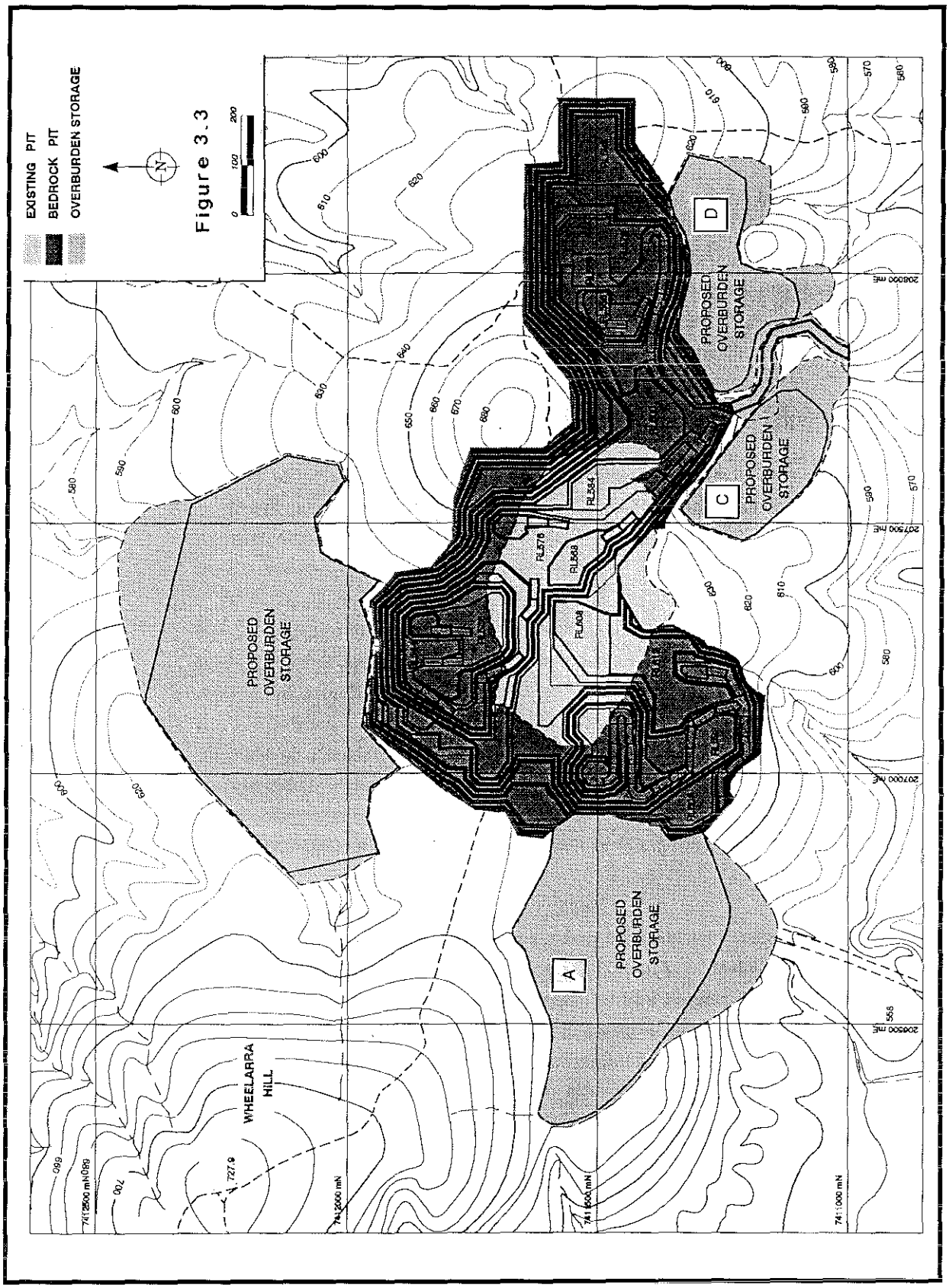

Figure 3: ***Proposed expansion of the bedrock mining area and locations of the proposed overburden storage areas (Areas A, B, C and D)***
(Figure 3.3 of 'Proposal for the Development of Wheelarra Hill Iron Ore; BHP Iron Ore 1994a)

DRD referred the project to the Minister for the Environment who requested the EPA to initiate a review of the environmental conditions applying to the proposal and to report to him under Section 46 of the Environmental Protection Act. The Department of Environmental Protection (DEP) conducted this review on behalf of the EPA.

The proponent's report was also distributed to the Departments of Minerals and Energy (DME), Conservation and Land Management (CALM), and Aboriginal Affairs, and to the Water Authority of Western Australia (WAWA), for their comments on the environmental issues associated with the proposal.

The key environmental issues identified in the review by involved agencies are:

- the management of flora and fauna;
- landscape restructuring / overburden management; and
- final rehabilitation of the project area.

The proponent has made additional environmental management commitments for the proposed expansion, which have been rationalised with the original commitments as part of this assessment. A consolidated list of all the environmental commitments made by BHP Iron Ore is included in Appendix 2; under environmental condition 1 of the Minister's Statement, the proponent remains bound by all of these commitments. A schedule of those commitments that the DEP will regularly audit is included in Section 7.

Previous conditions have been reviewed to consolidate the conditions that remain applicable into one comprehensive statement. One complete statement of current conditions and relevant commitments facilitates efficient compliance auditing and reporting of environmental performance by the proponent. It consolidates the environmental obligations of the proponent under Part IV of the Environmental Protection Act.

Limitation

This evaluation has been performed using information currently available. The information has been provided by the proponent through preparation of the development proposal, by DEP officers utilising their own expertise and reference material, by utilising expertise and information from other State government agencies, and by contributions from EPA members.

4. Evaluation

Those environmental aspects of the Jimblebar expansion which require evaluation include:

(1) Flora and fauna management (Section 4.1);

(2) Landscape restructuring / overburden management (Section 4.2); and

(3) Final rehabilitation and decommissioning (Section 4.3).

These issues are discussed below. Sections 4.1, 4.2, and 4.3 provide the context for Section 4.4 of this report which evaluates the existing environmental conditions and the proponent's environmental management commitments. Other issues associated with the proposal are adequately addressed in the proponent's documentation, previous commitments, and the conditions applied to the operation through the DEP's pollution control licence.

4.1 Flora and fauna management

4.1.1 Objective

To ensure that gazetted flora and fauna species occurring throughout the project area will be adequately protected for the life of the operation.

4.1.2 Evaluation framework

Technical information

A biological survey of the Jimblebar area was conducted by the proponent in June 1994 (BHP Iron Ore 1994b); BHP Iron Ore has also reported on the results of surveys conducted in the project area during 1987 as part of earlier approvals.

Flora

The 1994 vegetation survey of the project area identified five broad vegetation units, containing a total of 134 species. No Declared Rare Flora species were identified in the project area at the time the survey was conducted, however, two Priority Three taxa have been recorded in the Jimblebar area; *Ptilotus aphyllus* in 1987 and *Cryptandra* sp. "Mt Meharry" in 1994 (BHP Iron Ore 1994b). Priority Three taxa are defined as those taxa which have several poorly known populations, some of which are known to occur on conservation lands (that is, some of which are on lands not under immediate threat) (CALM 1990).

P. aphyllus has not been reported in the area since the 1987 survey. *Cryptandra* sp. was recorded in most of the gorges surveyed in 1994, however the species has been reported in several other localities (BHP Iron Ore 1994b).

The five broad vegetation communities recognised in the project area include tall shrubland, sparse tree steppe, shrub steppe, open mixed shrubland, and mixed communities (BHP Iron Ore 1994a). This latter group occurs throughout the gorge areas of the mining lease. The gorges contain most of the other communities present, and also include a number of species unique to this landform. These areas support the vegetation association with the highest species richness.

Fauna

The fauna of the area is considered typical of the Pilbara region, and four major fauna habitats have been identified within the Jimblebar area, including gorges, hills and ridges, drainage lines and spinifex steppe/scree slopes (BHP Iron Ore 1994b). Of these habitats, distinct drainage lines are the only ones that will not be directly affected by the proposal. Six species of native mammal were recorded in the Jimblebar area during the biological survey, however, the total number of species supported by these habitat types may be substantially greater (BHP Iron Ore 1994b).

The greatest number of vertebrate species has been recorded in the spinifex steppe habitat type, where 43 species were recorded. Although only 24 species were recorded from the gorge habitat type, these habitats supported large populations of two native mammal species, the Fat-tailed Antechinus and the Common Rock-rat, which specifically utilise the small rock caves and deep rock fissures for shelter and nesting (BHP Iron Ore 1994b). The specialised habitat of the gorge areas, in conjunction with their vegetative species richness has implications for the selection of sites for out of pit dumping.

One Schedule One species, the Pebble-mound Mouse (*Pseudomys chapmani*), was recorded in the area. Schedule One species are defined as fauna that is likely to become extinct, or is rare. Of the pebble mounds reported within the area of the mining lease, 61 were identified as active, and it is estimated that 17 of these are likely to be destroyed by mining (BHP Iron Ore 1994a).

BHP have undertaken discussions with officers of CALM regarding the ongoing management of both the Priority Three taxa and the Schedule One fauna species.

Comments from key government agencies

Flora

The flora taxon *Cryptandra* sp. "Mt Meharry" is expected to be removed from the Priority Three list in 1995 as it has been found to be more widely distributed than initially thought (S. van Leeuwen, pers. comm., 15 December 1994). *Ptilotus aphyllus* has historically been

identified in the Jimblebar region but is unlikely to occur in the areas to be affected by mining. This species generally favours sandplain/red sand dune country, and consequently may occur along the watercourse to the south of the mine area (S. van Leeuwen, pers. comm., 15 December 1994).

Although the annual species were missed due to the timing of the flora survey, there are very few annual species in the project area that are likely to be rare or endangered (S. van Leeuwen, pers. comm., 15 December 1994).

Fauna

In a letter of 14 December 1994, CALM verified that the management activities proposed by BHP Iron Ore for the Pebble-mound mouse are consistent with advice given by CALM officers to BHP staff. CALM have also suggested that there may be merit in BHP liaising with other land users/mining operators in the vicinity of Jimblebar, particularly CRA/Hamersley Iron, as the fauna management issues faced by both companies may, for some situations, be similar.

4.1.3 Evaluation

The most significant potential impact of the proposal on protected flora in the Jimblebar area is the removal of plants through direct disturbance. The magnitude of this impact requires determination through adequate surveying of the area to be affected prior to the disturbance and the mitigation of those impacts. Impacts might be minimised through avoidance of sites where specimens occur, or through the implementation of other management strategies developed in consultation with CALM. The surveys conducted by BHP Iron Ore have not identified any specimens of either of the Priority Three species in the areas that will be directly affected by the expanded operations.

The major potential impact on fauna is the direct destruction of fauna habitats through clearing for mining and the placement of overburden.

The proponent's biological survey at Jimblebar has given detailed attention to the management of impacts on Pebble-mound mice. The management strategy that BHP Iron Ore has proposed involves relocating and monitoring Pebble-mound mice from the area to be affected prior to those activities occurring. The strategy has been developed in consultation with CALM.

Ultimately, the statutory responsibility for the protection of flora and fauna rests with CALM. It is important that the proponent liaise with CALM to ensure the protection of species that require careful management, and obtains Ministerial approval to "take" rare specimens where this is unavoidable. The response from CALM to date indicates that they are satisfied with the management strategies proposed by BHP Iron Ore for both flora and fauna.

In the response to issues raised during the review period, the proponent confirmed that several discussions regarding Pebble-mound mouse monitoring have been held with Hamersley Iron. It is the proponent's intention that any work carried out in the future will be done in consultation with Hamersley Iron and CALM to avoid duplication of research.

BHP Iron Ore has also made a number of new commitments specific to the management of priority fauna and scheduled flora. These are listed below:

Flora and Fauna Protection (Numbers 5 and 7 in schedule of auditable commitments)

The distribution of the Priority Three taxa, Ptilotus aphyllus, *which has been recorded in the general mining area, will be further assessed in consultation with the Department of Conservation and Land Management.*

Active Pebble-mound mouse mounds which are likely to be destroyed by the mining activities will have their occupants relocated to suitable habitat outside the proposed mining area and the success of this translocation will be monitored. This program will be undertaken with, and to the satisfaction of, the Department of Conservation and Land Management.

The removal of protected flora and fauna without consent is illegal. Given the potential for impacts on flora and fauna as a result of the expansion as discussed above, it is considered that

the proponent's commitments regarding this issue are sufficient to protect gazetted flora and fauna on the site. These commitments are legally binding on the proponent through environmental condition 1 of the Minister for the Environment's statement as contained in Section 7.

4.2 Landscape restructuring/overburden disposal

4.2.1 Objective

To ensure that out of pit dumps minimise environmental disturbance, blend with the surrounding landscape, and can be successfully rehabilitated.

4.2.2 Evaluation framework

Technical information

Waste material is generated by both scree and bedrock mining. Although no overburden is removed during scree mining, approximately 45 - 50 per cent of the material dug from the scree pits is unsuitable fines, which require disposal. The proponent has estimated that approximately 10 million tonnes of saleable scree ore remains to be extracted from the Jimblebar operation (BHP Iron Ore 1994a).

Within the bedrock pit, an estimated 27.5 million tonnes of ore remains to be extracted, having a stripping ratio of 1.7:1 (BHP Iron Ore 1994a). On the basis of this stripping ratio, an estimated 47.65 million tonnes of overburden might be generated from the operation.

Since the current proponent has assumed responsibility for the project, they have followed a directive to avoid creating isolated surface dumps that do not blend with the surrounding landscape. The primary disposal options proposed for overburden and waste fines, are the partial backfilling of mined out scree and bedrock areas in conjunction with disposal to nominated overburden storage sites. As mining in the bedrock pit extends to the east, an additional haul road will be required from the pit to the crusher facility, which will be constructed using overburden material. It is also possible that intermediate grades of ore from the current waste fraction could be utilised in blending which might potentially reduce the waste to ore ratio of the bedrock pit.

Waste fines from the scree operation, and overburden material cleared from the bedrock pit would be returned to mined out areas where possible within the mine plan, or placed in storage areas which will be formed to blend with the surroundings and rehabilitated. The proposed storage areas, after maximisation of backfilling, are anticipated to contain a maximum of one million tonnes of fines and 20 million tonnes of overburden (BHP Iron Ore 1994a).

Any overburden material deposited above the original landforms will be shaped to blend in with the natural surroundings. All surfaces would be battered to an angle of around 20° or less. Overburden would be positioned in such a way that the naturally occurring water courses would not be obstructed. All exposed areas would then be rehabilitated (BHP Iron Ore 1994a).

The proponent has nominated four areas for overburden disposal, these are labelled areas A, B, C and D in Figure 3. The selection of these sites was based on several criteria including:

(i) The proximity of the dump site to the overburden source.

(ii) The ease of blending the resultant materials into the surrounding landform.

(iii) Minimisation of the area disturbed by dumping (minimum surface to volume ratio).

(iv) The ecological significance of the dump area on a local and regional scale.

4.2.3 Evaluation

Following the completion of all proposed scree mining, the mined out areas would have a capacity of approximately 10 million tonnes available for backfilling, if the pre-mining topography of the scree slopes is to be maintained following rehabilitation. The documentation submitted for this assessment has not included specific plans for the final use of the 47.65 million tonnes of overburden that could potentially be generated by the bedrock operation. In the absence of detailed mine planning this is understandable, however, the limited capacity of the scree areas, and the timing constraints to achieve blending requirements, indicate that out of pit dumping would be required.

Evaluation of the nominated overburden storage sites against each of the site selection criteria listed above has not been detailed in documentation submitted by the proponent. They are briefly assessed below.

(i) The proximity of the dump site to the overburden source:

As illustrated in Figure 3, all of the sites nominated by the proponent for overburden disposal abut the proposed final boundaries of the bedrock pit. While the close proximity of the source of the material to the dump site reduces costs and minimises timing constraints for the proponent, it can also serve to localise the area disturbed by the operation, providing there are no other previously disturbed areas also available for out of pit dumping.

(ii) The ease of blending the resultant materials into the surrounding landform:

The selection of sites for dumping requires consideration of the local topography, and the relative ease of preserving that topography after dumping. The use of valleys could enable material to be more easily blended with the surroundings. Isolated surface dumps would be more conspicuous, and could not be easily blended with the surrounding landscape while achieving the disposal of a large volume of material.

(iii) Minimisation of the area disturbed by dumping (minimum surface to volume ratio):

One of the key environmental aims of any dumping regime should be to minimise the scale of the disturbance to the greatest extent practicable. This could involve the preferential use of areas that have already been subject to some disturbance, in conjunction with constraining the size of any undisturbed areas proposed for overburden placement. The selection of valley and gorge areas for the dumping of overburden, maximises the volume of material that can be stored while minimising the surface area affected.

The decision to utilise gorge areas for the placement of overburden when there is insufficient backfill space for its disposal, requires a value judgement to be made. Avoiding gorge areas would minimise impacts on the areas having the greatest species diversity, however, preserving the gorge areas may in turn affect a greater surface area if the same volume of material is to be disposed of, on flatter parts of the landscape.

(iv) The ecological significance of the dump area on a local and regional scale:

The plant and animal communities of the gorge areas likely to be disturbed are represented locally in the Jimblebar area and regionally throughout the Ophthalmia Range. Some of the areas selected for dumping have already been subject to some degree of disturbance.

The ecological significance of proposed overburden storage areas also depends on the occurrence of gazetted flora and fauna species. Studies conducted by the proponent indicate that there are no gazetted or priority species present on the proposed overburden dump sites.

Given the magnitude and type of operation involved, it is recognised that the requirement for out of pit dumping may well be unavoidable. In attempting to constrain the area directly affected by overburden placement, the proponent has nominated valley areas for dumping to maximise the volume dumped, in comparison with the surface area disturbed. As discussed in Section 4.1 above, these areas also contain the greatest diversity of vegetation communities, and provide habitat on which a number of mammals depend. The sites selected comprise habitats which are well represented in the Ophthalmia Range and contain no rare or priority species. The use of these areas, however, requires particular consideration of the likely

environmental impact, in conjunction with the other criteria applied to select sites for overburden disposal.

Of the proposed overburden storage areas identified in Figure 3, sites A, C and D have been subject to some disturbance as a result of the current operation. Sites C and D are also likely to link disturbance caused by expansion of the bedrock pit with the scree areas immediately to the south. On this basis, and having consideration of the criteria discussed above, it could be expected that placement of overburden in areas A, C and D would confine disturbance to the south of the pit and would be more environmentally acceptable. Expansion of overburden dumping into area B is the least desirable.

The proponent has committed to design the overburden dumps with low profiles and to blend them with the surrounding land forms. The sites will be designed to be stable and to resist erosion, and will be progressively rehabilitated (BHP Iron Ore 1994a). The proponent's commitment to blend overburden dumps with the surrounding topography is to be commended, however, application of the criteria applied to the selection of sites for out of pit dumps has not yet been clearly demonstrated by the proponent, nor the integration of overburden dumping plans and rehabilitation procedures with the overall mine plan. Accordingly, the proponent should consider the rationalisation of out of pit dumping, and the restructuring of the landscape in a manner integrated with the mine plan. The justification for selection of sites for overburden disposal should also consider the relative ecological value of alternative sites.

Recommendation 1

Prior to expanding the boundary of mining operations within the bedrock pit, as assessed in this report, BHP should prepare an Environmental Management Programme for the site. The Environmental Management Programme should plan for, and manage, the impacts of overburden disposal on the landscape, and should demonstrate:

- **minimisation of out of pit dumping;**
- **provisions for topsoil retention and reuse;**
- **consideration of the location of overburden dumps to maximise the use of disturbed areas, and to minimise environmental disturbance; and**
- **integration of overburden dumping locations and operations with the requirements for mine planning and long term rehabilitation.**

The EMP should also identify conceptual profiles for the rehabilitated landscape.

The detailed plans for the rehabilitation of overburden areas could be incorporated within the broader rehabilitation plan required by recommended environmental condition 4 stated in Section 7, and discussed in Section 4.3 below.

4.3 Final rehabilitation and decommissioning

4.3.1 Objective

To ensure that the project area is rehabilitated to a sustainable stable form.

4.3.2 Evaluation framework

Technical information

The proponent's stated objective for the rehabilitation programme at Jimblebar is to ensure that upon completion of the project, disturbed surfaces, with the exception of the bedrock pit, are

returned to a stable condition with flora approaching that which occurred in the area prior to mining (BHP Iron Ore 1994a).

Topsoil and vegetation on most areas would be stripped and stored for later use in rehabilitation. At the end of mining activities, all areas will be contoured, topsoiled and contour ripped or scalloped. Where necessary, the proponent plans to seed areas with a mix of local species. Provenance species will be used in all rehabilitation (BHP Iron Ore 1994a).

Following the completion of mining, all buildings and other infrastructure no longer required for other ongoing mining activities will be removed. Concrete slabs will be broken up and buried and the rehabilitation of all disturbed areas will be completed using techniques standard at the time of decommissioning (BHP Iron Ore 1994a).

BHP Iron Ore has stated that it is premature to propose completion criteria (also known as rehabilitation or environmental performance criteria) for rehabilitation areas now. The company is presently undertaking assessments of major rehabilitation programmes developed at other company operations to determine the success of a number of different slope stabilisation techniques, so that those implemented at Jimblebar are the most appropriate (BHP Iron Ore 1994a).

Comments from key government agencies

It is considered important to identify an end land use for the area so that the minesite can be returned to the subsequent owner in an acceptable condition and does not impose unacceptable short or long term costs. The Department of Environmental Protection considers that BHP should develop 'interim' or 'working' rehabilitation performance criteria that can be further refined with time as their ongoing monitoring and management programmes refines and improves potential rehabilitation procedures.

Proponent's response

The proponent responded to this issue as follows:

"As mentioned in Section 8.7 of the proposal document, BHP Iron Ore still feels that prescriptive site specific rehabilitation completion criteria cannot be proposed at this time even if these are interim or of a working nature only. As a result we are unable to make any further commitments regarding this issue.

We reiterate that BHP Iron Ore is committed to on-going rehabilitation research and we will apply successful techniques as they emerge. Additionally, BHP Iron Ore will return to areas requiring further remedial work to establish a stable and vegetated landform to the satisfaction of the appropriate regulatory authority."

4.3.3 Evaluation

Estimates provided by operational staff at BHP suggest there is only another 30 million tonnes of ore to be recovered from the Jimblebar operation (J. Jacobson, pers. comm., 1 December 1994). The proposed increase in extraction from five to eight mtpa, indicates that the remaining mine life is approximately five years. Since the total tonnage mined remains the same over the project life, the increased mining rate is not expected to result in significantly increased impacts.

On this basis, the proponent should plan for the final rehabilitation and decommissioning of the site in the near future. Given the difficulties in establishing rehabilitation in the region as a result of the unpredictability of rainfall, it is important that there be some 'goal' for the desirable final outcome of the rehabilitation prescriptions applied. The identification of the desired rehabilitation outcome and the strategy proposed to achieve it does not have to be prescriptive at this time. The biological survey work undertaken by the proponent correlating vegetation types with topographic elements may provide a working basis for the development of such a goal.

Additionally, community expectations for the rehabilitation of mined lands have increased significantly during the last decade. It is recognised that for rehabilitation to be most effective it must be integrated into the mining plans, rather than being left to the conclusion of mining

(EPA 1991). The rehabilitation plan required by recommendation 2 below, provides a mechanism for demonstrating the integration of rehabilitation operations and plans with the progression of the mining operation. The integration of the plan for rehabilitation of the site and that for overburden disposal discussed in Section 4.2.3 above, with the mine plan, would maximise the effectiveness of the ongoing and final rehabilitation prescriptions applied by the proponent.

For the current assessment, the proponent has made the following additional commitment regarding rehabilitation techniques:

Rehabilitation (Number 11 in schedule of auditable commitments)

BHP Iron Ore will continue research to improve rehabilitation techniques and apply successful procedures as they emerge. BHP Iron Ore will also return to areas that require further remedial work to establish a stable and vegetated landform to the satisfaction of the appropriate regulatory authority.

The commitment and responsibility of BHP Iron Ore to achieve the successful rehabilitation of the site is to be commended. It is believed that it is important to commence the development of working rehabilitation performance criteria for the Jimblebar operation. These criteria can be based on the broad objectives for rehabilitation and progressively refined through adaptive management processes.

Recommendation 2

Prior to the completion of mining, and within 12 months of approval being granted for the operation to expand, BHP should prepare a conceptual rehabilitation plan for the site, to the requirements of the Environmental Protection Authority on the advice of the Department of Environmental Protection. The plan should include draft rehabilitation performance criteria and a mechanism for monitoring, reporting on, and revising those criteria.

Recommendation 3

At least 6 months prior to decommissioning, the proponent should prepare and subsequently implement a decommissioning and final rehabilitation plan for the site, to the requirements of the Environmental Protection Authority on the advice of the Department of Environmental Protection.

4.4 Assessment of existing environmental conditions and commitments

The operation by BHP at Jimblebar is currently subject to environmental conditions and commitments set as a result of the environmental impact assessment of the original McCamey's Monster iron ore mining proposal.

4.4.1 Objective

The objective of reviewing existing conditions and commitments is to achieve one environmental statement and one list of proponent commitments that provides for adequate protection of the environment and for efficient and effective environmental auditing of compliance criteria. It is also considered that this objective will assist the public, the proponent and relevant agencies to easily identify the environmental requirements associated with the Jimblebar iron ore mine.

4.4.2 Changes to environmental conditions

Existing environmental conditions have been reviewed, revised and consolidated. The removal of conditions that are no longer relevant is summarised in Table 1. Table 1 should be examined in conjunction with the original statement of environmental conditions contained in Appendix 1. The revised statement containing the recommended environmental conditions arising from this assessment is included in Section 7.

Table 1. Summary and evaluation of changes to environmental conditions set by the Minister for the Environment

Original Condition No.	Issue	Evaluation	New Condition No.
1	Adhere to proposal.	This is a standard condition - now updated.	1
2	Advice from MRD re. construction of haul road, floodways and location of borrow pits. Construction of crossing at Great Northern Highway.	Haul road in original proposal replaced by rail spur. No additional haul road construction outside the mine site is proposed; condition can be removed.	removed
3	Rehabilitation of the haul road; preparation of rehabilitation programme for haul road.	Haul road not constructed. No additional haul road is proposed within the expansion; condition can be removed.	removed
4	Prior to construction, reuse topsoil from the process site in the rehabilitation of the lease area.	All construction originally proposed has been completed. No further construction for process facilities is proposed; condition can be removed.	removed
5	Refer to EPA any proposals to hard rock mine or to increase mining rate beyond 5 mtpa.	Changes to the proposal as assessed should be referred to the EPA. This condition is a statement of statutory process; condition can be removed.	removed

A number of standard environmental conditions regarding project management have been included in the revised statement described in Section 7. These include:

Management of non substantial changes—condition 2

During the detailed implementation of proposals, it is often necessary or desirable to make minor and non-substantial changes to the designs and specifications which have been examined as part of the Environmental Protection Authority's assessment. Subsequent statutory approvals for this proposal should make provision for such changes, where it can be shown that the changes are not likely to have significant effect on the environment.

Decommissioning—condition 5

Community expectations for the rehabilitation of mined lands have increased significantly over the last decade. It is important that rehabilitation management does not impose short or long term costs on the community of Western Australia. This is particularly relevant when the success of the rehabilitation strategy cannot be evaluated in the short to medium term. It is therefore important at the time of mine closure that measures for decommissioning and final rehabilitation of the mine site are considered to be satisfactory.

Management of transfer of the proposal—condition 6

The Statement should include a "transfer" clause which has been used in all recent statements issued by the Minister for the Environment and which allows for a continuity of environmental responsibility by any new proponent.

Time limit on environmental approval—condition 7

Where a project has not substantially commenced within a specified time then environmental approval may lapse.

Audit—condition 8

In order to ensure that environmental conditions and commitments are met, an audit system is required.

4.4.3 Changes to proponent commitments

In the proposal documentation submitted by BHP Iron Ore, a revised list of environmental management commitments was included. These have been rationalised with the initial commitments attached to the current Ministerial statement of approval. Previous commitments have been amalgamated, and commitments which duplicate existing statutory requirements or have already been satisfied have been removed. The proposed new consolidated and updated list of environmental commitments, which will be included as part of the DEP's compliance auditing programme, is included as a schedule of the recommended environmental conditions in Section 7. Table 2 summarises the changes to the proponent's environmental commitments.

Table 2. Summary and evaluation of changes to proponent's environmental commitments as attached to the original Statement of Approval

Original proponent commitment No.	Issue	Evaluation	No. in audit schedule of proponent's commitment
1	Landscape - preserve the existing landscape within operational constraints.	Not subject to audit.	Not subject to audit
2	Vegetation protection - prevent unnecessary vegetation removal.	Repeated in 1994 environmental commitment 9.1.	1
3	Waste stockpiles - design to reduce obtrusiveness.	Repeated in 1994 environmental commitment 9.5.	2
4	Decommissioning.	Now addressed in Environmental Condition 5.	Audited as a condition
5, 6, 7	Erosion and sedimentation - minimise.	Repeated in 1994 environmental commitment 9.4.	3
8:1	Erosion - maintain existing access road.	Not reflected in 1994 environmental commitments, addressed in #5, 6 & 7 above.	Not subject to audit
8:2	Erosion - design haul road appropriately.	Project development did not involve haul road construction; no future haul road proposed.	Not subject to audit

Original proponent commitment No.	Issue	Evaluation	No. in audit schedule of proponent's commitment
9	Erosion - before haul road construction - on floodway crossing.	Project development did not involve haul road construction; no future haul road proposed.	Not subject to audit
10	Vegetation protection - see #2 above.	Amalgamated with #2 into a single commitment. Reflected in 1994 commitment 9.1.	1
11	Vegetation - preserve on areas not for immediate mining.	Not included in 1994 commitments. Retain.	4
12	Vegetation - obtain material to maintain access road from existing borrow pits.	Not subject to audit.	Not subject to audit
13	Vegetation - design borrow pits for installation and maintenance of haul road.	Project development did not involve haul road construction; no future haul road proposed.	Not subject to audit
14	Fauna - haul road will not disturb key habitats.	Project development did not involve haul road construction; no future haul road proposed.	Not subject to audit
15	Protect Fauna - Restrict off-road activities.	Not subject to audit.	Not subject to audit
16	Protect fauna - No Pets on mine site.	Not subject to audit.	Not subject to audit
17	Protect Fauna - boreholes & costeans capped and filled when no longer required.	Repeated in 1994 environmental commitment 9.3.	5
18:1	Avoid sites where artefact scatters have been identified.	Regulated through other statutory mechanisms.	Not subject to audit by DEP
18:2	Aboriginal artefacts - lodge application with Minister for Aboriginal Affairs.	Regulated through other statutory mechanisms.	Not subject to audit by DEP
19	Discuss with relevant Aboriginal groups before operations commence.	Regulated through other statutory mechanisms.	Not subject to audit by DEP
20	Draw water from bores in the Wittenoom Dolomite.	Not subject to audit by DEP.	6
21	Manage sewage.	Regulated through existing licences or other statutory mechanisms.	Not subject to audit
22	Burn all combustible rubbish and bury the remainder.	Burning of rubbish is not encouraged; all rubbish should be buried.	Not subject to audit
23	Prevent pollution from oil and fuel spills.	Regulated through existing licences or other statutory mechanisms.	Not subject to audit

Original proponent commitment No.	Issue	Evaluation	No. in audit schedule of proponent's commitment
24	Manage dust from the project.	Regulated through existing licences or other statutory mechanisms.	Not subject to audit
25	Rehabilitation - transfer topsoil and vegetation stripped during operations to areas to be rehabilitated.	Not subject to audit.	Not subject to audit
26	Landscape - batter mine faces, borrow pits.	Not subject to audit.	Not subject to audit
27	Shape waste dumps irregularly.	Replicates original commitment 3 above. Replaced by 1994 commitment 9.5.	2
28	Rip and batter all borrow pits.	The rehabilitation of all borrow pits has been completed. No future borrow pits are proposed.	Not subject to audit.
29	Rip all compacted surfaces.	Not subject to audit.	7
30	Landscape restoration - apply fertiliser and use seeding on rehabilitation areas.	Not subject to audit.	8
31	Remove all equipment.	Repeated in 1994 commitment 9.13. Now addressed in environmental condition 5.	Audited as a condition
32	Fill/cap all sewage holes, pits, trenches, boreholes.	Repeated in 1994 commitment 9.13. Now addressed in environmental condition 5.	Audited as a condition
33	Clean and tidy the site	Repeated in 1994 commitment 9.13. Now addressed in environmental condition 5.	Audited as a condition

New commitments to be introduced (see Appendix 2)

A number of the proponent's additional commitments (BHP Iron Ore 1994a) repeat the intent of existing commitments summarised in the table above. Where this is the case, the wording of the most recent commitment has been retained. Additional new commitments that are important to environmental protection, and are regulated within the Environmental Protection Act, have been reviewed during the assessment process, and have already been discussed in Sections 4.1 and 4.3 above. The proponent's full list of 1994 commitments is included in Appendix 2. Although the proponent is legally bound by all commitments made for the project, and reported in the Minister's Statement, not all of these will be subject to audit by the Environmental Protection Authority or the Department of Environmental Protection.

5. Discussion and synthesis

The documentation prepared by BHP Iron Ore has generally given comprehensive coverage to the potential impacts arising from the proposed expansion. Issues such as dust impacts, and

ground and surface water issues which have not been discussed in Section 4, are addressed within the DEP licence conditions applying to the operation.

Following the assessment of this proposed expansion, and with specific consideration of the environmental issues discussed in Section 4 of this report and the proponent's response to them, the modifications to the proposal presented by BHP are regarded as being environmentally acceptable, subject to the further recommendations in this report.

The rationalisation conducted of proponent commitments has resulted in a schedule of auditable commitments that is attached to the recommended environmental conditions contained in Section 7.

6. Conclusion and recommendations

The modifications to the proposal as presented by BHP Iron Ore, including expansion of the extraction rate to eight mtpa, are environmentally acceptable, and the proposal could proceed, subject to the recommendations contained in this report.

In the next section, the recommended changes to the Minister for the Environment's Statement as a result of this assessment are detailed. If agreed to by the Minister for the Environment, this statement would replace the previous Statement of approval, and will be legally binding on the proponent.

Recommendation 4

The proposal by BHP Iron Ore (Jimblebar) Pty Ltd for the rationalisation and expansion of the Jimblebar Open Cut Iron Ore Mine is environmentally acceptable and could proceed subject to the following key points:

- **the Environmental Protection Authority's recommendations in this assessment report (Recommended Environmental Conditions are listed in Section 7); and**
- **compliance with the proponent's environmental management commitments (see Appendix 2).**

7. Recommended environmental conditions

The following Recommended Environmental Conditions would amend the Minister's original Statement (Appendix 1), and apply additional conditions to reflect the recommendations contained in this report, and to include appropriate standard conditions.

STATEMENT TO AMEND CONDITIONS APPLYING TO A PROPOSAL (PURSUANT TO THE PROVISIONS OF SECTION 46 OF THE ENVIRONMENTAL PROTECTION ACT 1986)

PROPOSAL:	JIMBLEBAR RATIONALISATION AND PLANNED EXPANSION (35/XX)
	FORMERLY McCAMEY'S MONSTER IRON ORE
CURRENT PROPONENT:	BHP IRON ORE (JIMBLEBAR) PTY LTD
CONDITIONS SET ON:	8 MARCH 1988

The implementation of this proposal is now subject to the following conditions which replace all previous conditions:

1 Proponent Commitments

The proponent has made a number of environmental management commitments in order to protect the environment.

1-1 In implementing the proposal, including the mining of up to eight mtpa in the expanded area of operations, as reported on in Environmental Protection Authority Bulletin 769, the proponent shall fulfil the commitments made in the Notice of Intent (1987), and in the "Proposal for the Development of Wheelarra Hill Iron Ore" (November 1994), reported on in Environmental Protection Authority Bulletin 769; provided that the commitments are not inconsistent with the conditions or procedures contained in this statement.

A schedule of environmental management commitments which will be audited by the Department of Environmental Protection is attached.

2 Implementation

Changes to the proposal which are not substantial, may be carried out with the approval of the Minister for the Environment.

2-1 Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal. Where, in the course of that detailed implementation, the proponent seeks to change those designs, specifications, plans or other technical material in any way that the Minister for the Environment determines, on the advice of the Environmental Protection Authority is not substantial, those changes may be effected.

3 Minimisation of Impacts of Overburden Disposal

3-1 The proponent shall minimise the environmental impacts of overburden disposal on the project area, including rationalisation of the volume of out of pit dumping required, and the selection of sites for placement of this material, in a manner integrated with the mine plan.

3-2 Prior to expanding operations in the bedrock pit, to achieve the objectives of condition 3-1, the proponent shall prepare an Environmental Management Programme in consultation with the Department of Environmental Protection.

3-3 The proponent shall implement the Environmental Management Programme required by condition 3-2, to achieve the objectives of condition 3-1.

4 Rehabilitation

4-1 The proponent shall rehabilitate the project area to a standard of rehabilitation that is consistent with the surrounding environment.

4-2 Within 12 months of the date of issue of this Statement, the proponent shall prepare a rehabilitation plan for the site, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection. This plan shall include draft completion criteria and a monitoring component to determine its effectiveness, and shall be reviewed and reported on annually, as part of the proponent's existing reporting requirements.

4-3 The proponent shall implement the rehabilitation plan required by condition 4-2.

5 Decommissioning

5-1 The proponent shall satisfactorily decommission the project, remove the plant and installations, and achieve the final rehabilitation of the site and its environs.

5-2 At least six months prior to decommissioning, the proponent shall prepare a decommissioning and final rehabilitation plan to achieve the objectives of condition 5-1.

5-3 The proponent shall implement the plan required by condition 5-2.

6 Proponent

These conditions legally apply to the nominated proponent.

6-1 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

7 Time Limit on Approval

The environmental approval for the proposal is limited.

7-1 If the proponent has not substantially commenced the expansion of the project within five years of the date of this statement, then the approval to implement the proposal as granted in the statement of 8 March 1988 shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced.

Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period, to the Minister for the Environment by way of a request for a change in the condition under Section 46 of the Environmental Protection Act. (On expiration of the five year period, further consideration of the proposal can only occur following a new referral to the Environmental Protection Authority.)

8 Compliance Auditing

To help determine environmental performance, periodic reports on progress in implementation of the proposal are required.

8-1 The proponent shall submit periodic Progress and Compliance Reports, in accordance with an audit programme prepared by the Department of Environmental Protection in consultation with the proponent.

Procedure

1 Unless otherwise specified, the Department of Environmental Protection is responsible for assessing compliance with the conditions contained in this statement and for issuing formal clearance of conditions.

2 Where compliance with any condition is in dispute, the matter will be determined by the Minister for the Environment.

Note

1 The attention of the proponent is drawn to Section 47 (1) of the Environmental Protection Act which states:
"A proponent on whom a statement has been served under section 45 (5) and who does not ensure that any implementation of the proposal to which the statement relates

is carried out in accordance with any conditions and procedures set out in the statement commits an offence."

2 The reporting requirements for these conditions may be effected through the reporting requirements of the State Agreement Act, subject to meeting the timing requirements of the conditions.

Schedule of Environmental Management Commitments to be audited by the Department of Environmental Protection

1. Only the minimum area required for operation of the project will be disturbed. Where practicable, topsoil to a depth of about 200 mm will be stripped and stockpiled prior to any earthmoving. All disturbed areas no longer required for the operation will be contoured (where necessary), topsoiled (where available), ripped and seeded where necessary.

Overburden Management

2. The overburden storage sites will be designed to be low profile and to blend with the surrounding land forms. The sites will be designed to be stable and to resist erosion. The surface of the overburden will be progressively rehabilitated as specific areas become inactive.

Erosion Control

3. Erosion around roads and building areas will be controlled by minimisation of clearing, rehabilitation, proper drainage and bunding where necessary. Monitoring will take place where disturbance occurs near creek drainage and appropriate silt traps installed where seen as necessary to minimise siltation.
4. Areas not intended for immediate mining will have the vegetation preserved until operations commence.

Flora and Fauna

5. The distribution of the Priority Three taxa, *Ptilotus aphyllus*, which has been recorded in the general mining area, will be further assessed in consultation with the Department of Conservation and Land Management.
6. All bore holes will be capped to prevent accidental entrapment of native fauna.
7. Active Pebble-mound mouse mounds which are likely to be destroyed by the mining activities will have their occupants relocated to suitable habitat outside the proposed mining area and the success of this translocation will be monitored. This program will be undertaken in consultation with, and to the satisfaction of, the Department of Conservation and Land Management.

Groundwater

8. Water supplies will be drawn from bores into the Wittenoom Dolomite. No dams will be constructed and no existing free water will be tapped.

Rehabilitation

9. All compacted surfaces will be ripped.
10. Fertiliser applications or seeding will be used on rehabilitation areas as required.

11. BHP Iron Ore will continue research to improve rehabilitation techniques and apply successful procedures as they emerge. BHP Iron Ore will also return to areas that require further remedial work to establish a stable and vegetated landform to the satisfaction of the appropriate regulatory authority.

8. References

BHP Iron Ore, 1993. Jimblebar — Annual Environmental Report. September 1993. BHP Iron Ore, Perth.

BHP Iron Ore, 1994a. Jimblebar — Proposal for the Development of Wheelarra Hill Iron Ore. November 1994. BHP Iron Ore, Perth.

BHP Iron Ore, 1994b. Jimblebar Mine Site — Biological Survey. August 1994. BHP Iron Ore, Newman.

Department of Conservation and Land Management, 1990. Western Australia's Endangered Flora. CALM, Perth.

Environmental Protection Authority, 1987. McCamey's Monster Iron Ore Mining Proposal, Report and Recommendations of the Environmental Protection Authority, Bulletin 317, Environmental Protection Authority, Perth.

Environmental Protection Authority, 1991. Proposed Mesa J Iron Ore Development - Pannawonica, Report and Recommendations of the Environmental Protection Authority, Bulletin 547, Environmental Protection Authority, Perth.

Appendix 1

Statement of Conditions of Approval, 8 March 1988

MINISTER FOR ENVIRONMENT

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

McCAMEY'S MONSTER IRON ORE PROPOSAL

HANCOCK MINING LTD

This proposal may be implemented subject to the following conditions:

1. The proponent adhering to the proposal as assessed by the Environmental Protection Authority and fulfilling the commitments made in the Notice of Intent (copy of commitments attached).

2. The proponent shall seek advice from the Main Roads Department over the construction of the haul road, floodways and location of borrow pits for road material and the proponent shall construct the crossing at the Great Northern Highway to the specification of the Main Roads Department.

3. The proponent shall, on completion of the project, rehabilitate the haul road and before completion of the project, the proponent shall provide, to the satisfaction of the Environmental Protection Authority, a programme for that rehabilitation.

4. The proponent shall remove, stockpile and use topsoil from the process site in the rehabilitation of the lease area to the satisfaction of the State Mining Engineer.

5. Any additional proposal to hard rock mine or to increase the mining rate beyond 5 million tonnes per annum (required to be submitted under Clause 9 of the Iron Ore (McCamey's Monster) Agreement) shall be referred to the Environmental Protection Authority by the Minister for the time being responsible for the administration of the Agreement.

B. Hodge.

Barry Hodge, MLA
MINISTER FOR ENVIRONMENT

8 MAR 1988

7th Floor, May Holman Centre,

Phone (09) 325 4133

Appendix 2

Environmental Management Commitments, as combined January 1995

Following are two lists of the environmental management commitments:

- those made by the original proponent and assumed by BHP Iron Ore for the original 1987 proposal; and
- the environmental management commitments initiated by BHP Iron Ore for the proposed expansion as assessed in this Bulletin.

The rationalised list of commitments that the Department of Environmental Protection will audit is contained in Section 7 of the main text of this Bulletin.

LANDSCAPE PROTECTION

- The existing landscape will be preserved as much as possible, within the constraints of the actual mining operation.
- Unnecessary removal of vegetation will be avoided.
- Waste stockpiles will be irregularly shaped and of low profile to reduce obtrusiveness.
- Upon decommissioning all equipment and buildings, etc, will be removed, rubbish burned or buried and the area left clean and tidy.

EROSION AND SEDIMENTATION

- Run-on will be controlled by bunding or drains which will lead water into sumps to allow sediment settling.
- Runoff from all roads, plant areas, the mine site, camp area, etc, will be directed, using bunds or drains, into appropriately designed sediment holding sumps from which overflow will be led into existing watercourse.
- Natural vegetation will be retained whenever possible to assist in trapping sediment from sheet run-off.
- Careful maintenance of the existing access road and design of the haul road will reduce erosion.
- The floodway crossing on the Fortescue River will be designed so as to minimise erosion or damage to the banks.

PROTECTION OF VEGETATION

- Unnecessary removal of vegetation will not be permitted.
- Areas not intended for immediate mining will have the vegetation preserved until operations commence.
- Only existing borrow pits will be used as source material to maintain the access road.
- Borrow pits required for the installation and maintenance of the haul road will be designed according to the standards set out in Walker (unpublished - Mt Newman Mining Co Pty Ltd).

PROTECTION OF FAUNA

- Following studies on the significant fauna of the area it has been found that the haul road will not disturb any key habitats.
- Cross-country recreational driving, hunting and other activities which may affect fauna will not be permitted.
- The keeping of pets at the mine site and camp will not be permitted.
- All boreholes and costeans will be capped or filled when no longer required.

PROTECTION OF ABORIGINAL INTERESTS

- An archaeological survey has indicated where artefact scatters, etc, are located. These sites will be avoided to the greatest possible extent. If site disturbance is unavoidable

application to allow work to proceed will be lodged with the Minister for Aboriginal Affairs.

- The proponent will hold discussions with relevant Aboriginal groups before commencing operations, but the Aboriginal people have known of the proposal for several years and have expressed no interest.

INCIDENTAL ITEMS TO PROTECT THE ENVIRONMENT

- Water supplies will be drawn from bores into the Wittenoom Dolomite. No dams will be constructed and no existing free water will be tapped.
- All sewage will be led into septic tanks and leach drains.
- All combustible rubbish will be burned and the remainder buried.
- Large fuel and oil tanks will be fitted with excess flow valves and be stored in bunded pits. Small amounts of fuel and oils will be stored where accidental spillage can be contained.
- Dust suppression will be exercised, mostly by damping down wherever necessary.

REHABILITATION

- Topsoil and vegetation stripped during operations will be replaced as soon as practicable onto areas to be rehabilitated.
- All faces on the mine, borrow pits, etc, will be battered if low and benched if high.
- Waste dumps will be irregularly shaped to be unobtrusive.
- Borrow pits will be ripped and battered.
- All compacted surfaces will be ripped.
- Fertiliser applications or seeding will be used on rehabilitation areas as required.

DECOMMISSIONING

- All equipment, machinery, rubbish, the camp, etc, will be removed upon completion of operations. Combustible debris will be burned and ash and non-combustible rubbish buried.
- All sewage holes, pits, trenches, boreholes, etc, will be filled or capped.
- The area will be left clean and tidy.

Environmental Management Commitments made by BHP Iron Ore for the planned expansion of the Jimblebar operation, and contained in:

> BHP Iron Ore, 1994. Jimblebar - Proposal for the Development of Wheelarra Hill Iron Ore. November 1994. BHP Iron Ore, Perth.

Commitment numbers below refer to the number assigned in the proponent's report.

Clearing of Vegetation

9.1 Only the minimum area required for operation of the project will be disturbed. Where practicable, topsoil to a depth of about 200 mm will be stripped and stockpiled prior to any earthmoving. All disturbed areas no longer required for the operation will be contoured (where necessary), topsoiled (where available), ripped and seeded where necessary.

Development Policy

9.2 BHP Iron Ore has a "minimum impact" development policy which will include minimum clearing and ground disturbance, careful monitoring and effective rehabilitation. Adherence to this policy will be a requirement written into the mining contracts.

Flora and Fauna Protection

9.3 The distribution of the Priority Three taxa, Ptilotus aphyllus, which has been recorded in the general mining area, will be further assessed in consultation with the Department of Conservation and Land Management.

All bore holes will be capped to prevent accidental entrapment of native fauna.

Active Pebble-mound mouse mounds which are likely to be destroyed by the mining activities will have their occupants relocated to suitable habitat outside the proposed mining area and the success of this translocation will be monitored. This program will be undertaken in consultation with, and to the satisfaction of, the Department of Conservation and Land Management.

Erosion Control

9.4 Erosion around roads and building areas will be controlled by minimisation of clearing, rehabilitation, proper drainage and bunding where necessary. Monitoring will take place where disturbance occurs near creek drainage and appropriate silt traps installed where seen as necessary to minimise siltation.

Overburden

9.5 The overburden storage sites will be designed to be low profile and to blend with the surrounding land forms. The sites will be designed to be stable and to resist erosion. The surface of the overburden will be progressively rehabilitated as specific areas become inactive.

Hazardous Materials Storage

9.6 The handling, use and disposal of hazardous materials will comply with all local and State regulations. Bulk fuel will be stored in above ground tanks held in impermeable, bunded enclosures, in accordance with Department of Minerals and Energy (DOME)

requirements. Explosives will be stored in a magazine remote from workshops, the mine site and any areas susceptible to flooding.

Noise

9.7 Blasting will be carried out at specified times during daylight hours to minimise noise impacts. Occupational noise levels will be monitored and managed as required under the Mines Regulations.

Dust Control

9.8 Normal means of dust suppression, including watering of roads, will be employed to minimise dust generation. Occupational dust levels will be monitored and managed as required under the Mines Act.

Water Supply

9.9 The water level in the groundwater bores used for all purposes on site will be measured monthly. Periodic quality measurements will also be taken.

Aboriginal Interests

9.10 Archaeological and ethnographic sites will be avoided to the greatest possible extent. If site disturbance is unavoidable no work will proceed until clearance has been obtained from Minister for Aboriginal Heritage.

Public Safety

9.11 Access to the project area will be prohibited to the public with signs, fences or gates installed as necessary.

Rehabilitation

9.12 Procedures developed by BHP Iron Ore in the Pilbara will be applied to rehabilitation. The object of the rehabilitation will be to ensure that, at the end of the project, all disturbed surfaces (with the exception of the mined bedrock pit) are returned to a stable condition with a flora which approaches the natural condition of the site.

BHP Iron Ore will continue research to improve rehabilitation techniques and apply successful procedures as they emerge. BHP Iron Ore will also return to areas that require further remedial work to establish a stable and vegetated landform to the satisfaction of the appropriate regulatory authority.

Rainfall measurements will be taken in the area to assist in the gauging of the success of rehabilitation.

Decommissioning

9.13 Following the completion of the project, buildings and other structures will be removed. Concrete slabs will be broken up and buried. The rehabilitation of the overburden will be completed. Remaining borrow pits will be rehabilitated. All unwanted bare or compacted areas will be contoured (where necessary), ripped and seeded. Monitoring of the rehabilitated areas will be undertaken to gauge success.