

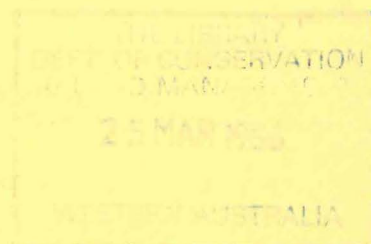
P. 3  
Armway Mining Pty. Ltd.

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## Gold Project

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# Hamersley Range National Park



Report and Recommendations  
by the  
Environmental Protection Authority



Department of Conservation and Environment  
Perth, Western Australia.

Bulletin 143    February 1984

REPORT AND RECOMMENDATIONS  
BY THE  
ENVIRONMENTAL PROTECTION AUTHORITY

ARMWAY MINING PTY LTD  
GOLD PROJECT  
HAMERSLEY RANGE NATIONAL PARK

DEPARTMENT OF CONSERVATION & ENVIRONMENT  
WESTERN AUSTRALIA

BULLETIN NO 143  
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The shallow strip mining project proposed by Armway would normally be acceptable on environmental grounds as the intended management broadly suits the conditions prevailing in the area. Rehabilitation would be a long term aspect of this management.

However the Environmental Protection Authority concludes that as a matter of principle, the Armway Mining Pty Ltd alluvial gold mining proposal in Hamersley Range National Park should not be approved unless it can be demonstrated that its value to the State justifies the negation of the fundamental principle that mining should not normally be allowed in National Parks unless the following criteria are met:

- (a) there is a strategic need for the mineral
- or (b) the mineral resource is rare and of high value, and its exploitation would be of significant material benefit to the State, or the nation.

Furthermore, the Government should appreciate that approval of this project would be seen as a precedent by holders of other mining tenements that cover over 38 000 ha of the park.

Finally the Authority recommends that areas disturbed by Armway during exploration should be rehabilitated and that a management plan should be prepared for the park.

1. BACKGROUND

Following the discovery of gold near Halls Creek in 1885 widespread prospecting resulted in many new discoveries culminating in 1893 with the discovery of gold at Kalgoorlie. This field has yielded more gold than the combined output of all other areas in the State.

Gold mining has been through a series of resurgences and declines with many mines being forced to close through low prices only to be re-opened later when the price rose or the mining and milling technology improved. Recent gold price rises have led to an increase in gold mining activity throughout the State.

1982 gold production was 21 000kg with about 1 500kg from small scale producers, usually winning less than 1 to 2 kg/year each. Currently there are three major gold producers with a combined annual production exceeding 10 000kg. These are Mt Charlotte at Kalgoorlie, Central Norseman at Norseman and Telfer, east of Nullagine.

Some 30 projects are now at an early stage of development. These small to medium sized projects are generally based on old gold mines or tailings dumps. Also there are extensive re-development projects at all existing large mines to increase production rates and prolong mine life. Alluvial deposits are relatively unimportant compared with lode occurrences in Western Australia. However the shallow alluvial deposits are now being exploited by small scale operators using graders or bulldozers.

## 2. THE PROPOSAL

The Joint Venturers (Langton Holdings Pty Ltd and Futuris Corporation Ltd through their operating Company Armway Mining Pty Ltd) are planning to develop two alluvial gold mining operations with associated screening and wet separation plants. The operations are situated some 30 km (Milli Milli) and 40km (Turee Creek) east of Tom Price on tributaries of Turee Creek within the Hamersley Range National Park in the Pilbara region of Western Australia (see Figure 1 for details). Approximately 2 ha have been disturbed during exploration and trial mining at the Milli Milli site.

In addition to the mining and treatment facilities the mines will require infrastructure including a power supply, water supply, on site worker accommodation and upgraded road access.

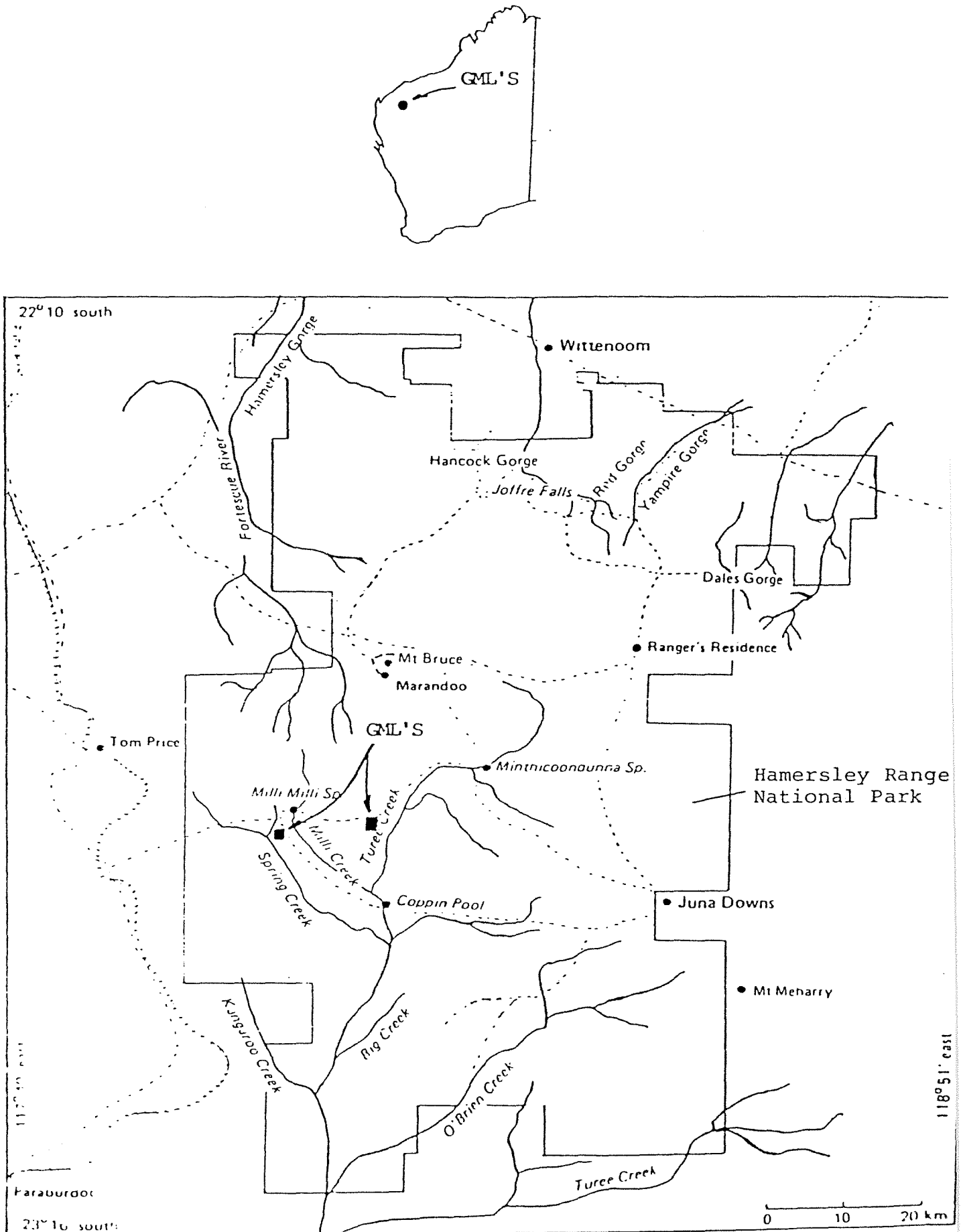
The gold is present in alluvial deposits derived from Archaean rocks exposed in the eroded core of the Milli Milli anticline. The Rocklea Dome exposes similar rocks west of Tom Price, outside the park. Gold mineralisation may be anticipated here also.

The Armway mining proposal is on Gold Mining Leases (GMLs) pegged after establishment of the Park. These tenements cover only 0.03% of the park area and somewhat less than this would actually be mined. Only areas of economic grade within the leases would be exploited. There is potential for further gold mining applications over a wider area within the park.

The Milli Milli proposal has an area of 48 ha while that of Turee Creek is 120 ha. Mining would be to an average depth of 80 cm using bulldozers, front-end loaders and trucks and would be confined to the vulture floors and lower hill slopes. Half a million m<sup>3</sup> of alluvium would be mined and treated at Milli Milli over about 5 years. At Turee Creek a million m<sup>3</sup> would be mined over 3.5 years. An estimated 70% loss on screening of Turee Creek ore compared with a 25% screening loss at Milli Milli would result in a longer life for the Milli Milli deposit. Screening and wet separation plants would be established at both sites. Screened material (exceeding 25 mm) would be backloaded to the mines.

The gold would be extracted from the screened ore in a washing plant and the resultant slurry of spent alluvium would be directed to tailings dams. Because the gold makes up a very low percentage of the alluvium the tailings produced would total the amount of ore mined. Each tailings dam would be 0.75 ha in area and would be divided into a series of bays with walls 1 m high. The aim is to progressively dewater the tailings and when sufficiently dry back-load them to the mined areas. The tailings dams would be sited to avoid the risk of flooding during storms.

FIGURE 1: LOCATION OF THE ARMWAY GOLD MINING LEASES (GML'S)



Source: Armway Mining Pty Ltd ERMP

Each separation plant would require 450 m<sup>3</sup> of water per day, much of this being recovered from the tailings dam. A bore at each site producing 2m<sup>3</sup> water/hr would be sufficient to supply the project requirements. This supply is yet to be defined but indications are that it should not be difficult to develop such a groundwater resource.

Each plant would also need a 125 KVA diesel generator while the accommodation camp would require a 12 KVA diesel generator.

The workforce would consist of six permanent and up to six casual workers. The camp, sited near the Turee Creek deposit would consist of transportable units with an ablution block, kitchen, dining room and small recreation area. Sewerage disposal would be by septic tank and rubbish would be disposed of in a fenced pit. Waste oil would be taken to Tom Price for disposal. Access to the areas would be provided by some upgrading of the old Roebourne to Nullagine mailroad from the sealed Tom Price to Paraburdoo road. Tracks have already been upgraded to link the old mail road to each mining area.

The proposed rehabilitation programme is based on mixing the screenings and tailings and spreading this over the mined-out areas. Following mining the disturbed sites would be contoured to re-establish shallow drainage lines and ephemeral pools in areas previously having such features. Seedlings of local species would be planted adjacent to these drainage lines and in clumps throughout the rest of the area and watered by trickle irrigation. Local seed would be broadcast according to expected germination success and seedling survival rates. The local access tracks would be ripped to promote vegetation establishment. Despite the comprehensive nature of the rehabilitation programme it would be many years before full revegetation was achieved.

### 3. THE PROPOSED MINING AREA

Hamersley Range National Park with an area of 617 606 ha was proclaimed in 1969. It is an A Class Reserve for the conservation of the environment and for enjoyment of its attractions by the public. The Park is listed on the Register of the National Estate because of aesthetic value, recreational and tourist attraction, the diversity of species and/or communities represented, the "naturalness" and "representativeness" of the area and rarity and position in ecological geographic units. The scenic grandeur and wildflowers are also significant attractions.

The proposed mining areas are within a remote and harsh wilderness area \* of the park, far removed from the main tourist attractions of the northern gorges.

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\* see note on page 4

#### 4. THE ERMP AND PUBLIC COMMENTS

As a result of guidelines provided by the EPA, the proponents produced a brief but reasonably comprehensive report. The proposal was clearly described and a reasonable description was given of rehabilitation following mining. A detailed topographic map showing the proposed mining areas would have been a useful addition to the document. The environment section was derived from published and other sources with only a short period of field inspection. As a result only a generalised outline of the area's flora and fauna was provided. The inter-relationships between organisms and their environment was only considered in broad terms.

There was a failure to discuss the extent of current mining tenements within Hamersley Range National Park. This is an important factor when considering the precedence of allowing any individual mining operation in the park.

Other mining tenements, apparently related to gold exploration and prospecting, and granted after creation of the park, occupy approximately 38 000 ha which is 6.2% of the park (pers. comm. National Parks Authority).

The discussion of environmental impacts was brief and it contended that the effects of the operation would be localised to the small mine sites and to access roads.

The management programme was reasonably comprehensive, discussing in particular the need for effective rehabilitation. The rehabilitation discussion could have been improved by including a detailed mining and rehabilitation plan.

The six public and ten Government Department comments submitted during review of this project are summarised in Table 1 and the Appendix. The major issues raised were the incompatibility of mining in a National Park and the concern that allowing this mining project would be setting a precedent for potential miners in the Hamersley Range and other National Parks in Western Australia.

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- \* Starling (1980), in discussing the concept of wilderness, stated that ideally wilderness is undeveloped land retaining its primaevial character and influence without permanent improvements or human habitation.

Grandage (1980) considered that a wilderness area is one which is potentially dangerous, made safe only because of one's own skill and experience.



TABLE 1 SUMMARY OF COMMENTS

TOPICS RAISED	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Mining incompatible with National Park	+	+		+		+	+		+							
Precedent		+	+	+		+	+			+				+		
Water supply		+		+				+								
Wilderness values		+			+	+										
Archaeology, ethnography		+		+							+	+				
Rubbish disposal		+														
Rehabilitation		+	+	+	+				+	+			+		+	+
Extent of mineralisation, tenements		+	+													
Management and responsibilities		+	+			+				+						
Tailings disposal and water course sedimentation			+													+
Biological survey	+	+	+	+	+											
Tourism														+		+

Other matters raised were:

- (i) The approaches to rehabilitation which drew considerable comment, generally of a favourable nature. Refinements were suggested such as the conducting of trials. Two submissions recommended bonds to ensure rehabilitation was carried out satisfactorily. The company recognises rehabilitation as the major environmental issue following mining. It has stated that it would engage environmental consultants as supervisors of the environmental management programme. The company has also undertaken to develop rehabilitation investigations in consultation with relevant government departments.
- (ii) The actual extent of gold mineralisation both in the proposal area and elsewhere in the park. The extensive gold tenements outside the proposed mining area suggest that there is potential for other gold occurrences.
- (iii) The availability and use of water was queried. Questions of tailings dam management and groundwater effects were raised.  
  
 Armway has said that tailings dams would be kept out of drainage lines and recirculated water would be monitored to avoid excessive salt build-ups in the tailings. The Public Works Department does not believe that there would be problems caused by groundwater extraction but the bores would need to be licenced.
- (iv) Aboriginal site surveys which were raised by two respondents. They felt that these should have been undertaken prior to writing the ERMP. However the Aboriginal Sites Department is agreeable to the Company discussing needs for a survey following the EPA decision.
- (v) The need to retain wilderness values in the park, an issue discussed by three private submissions. They were concerned that mining and upgrading of roads could downgrade the wilderness value both during and following the mining operation.
- (vi) Criticisms and suggestions on the biological survey aspects of the report. Concerns were raised about both feral animals and the practice of continuing to muster cattle in the park. Criticism was made of the summary nature of the biological descriptions.
- (vii) Ongoing management by both Government and the Company to ensure that mining did not downgrade the area, which was seen as important by a number of private respondents. It was stated that in order to reasonably assess the impact of development proposals in the park there was an urgent need for a Park Management Plan. It was also indicated that there would be concern if any proposed activity prejudiced future tourist development opportunities.

## 5. DISCUSSION

### 5.1 MINING IN NATIONAL PARKS : THE PRINCIPLE INVOLVED

#### 5.1.1 Application of the principle outside Western Australia.

The New South Wales National Parks and Wildlife Service and Department of Mineral Resources have proposed a policy to resolve the land-use conflicts between mining valuable coal resources and retaining National Parks (Department of Environment and Planning NSW, 1980). It was considered that underground mining could be accommodated using a park zoning plan. However it was believed that coal extraction by open cut means would inevitably mean gross disruption to the land surface and was therefore unacceptable.

Lucas (1981) discussed mining in National Parks in the USA and UK. In the USA, with few minor exceptions, all National Parks are closed to mining. However in the UK, which has only a fraction of the USA land area and depends almost entirely on imports for its primary supplies of minerals, mining may be approved if a compelling national or regional, economic or strategic need exceeds the need to conserve the park environment. As a result large underground mines employing a large workforce have been approved in UK National Parks where it was shown that impacts would be minimised by environmental management. However similar operations or those in more environmentally sensitive areas have been refused.

#### 5.1.2 Application of the principle in Western Australia.

The preamble to the National Parks Authority Act, 1976 specified a National Park as an area set aside:

*"for the conservation of the natural environment, the preservation and enhancement of natural beauty, and the provision of access and facilities for public recreation."*

Mining is generally seen as inappropriate in a National Park because of this stated purpose. However certain parks contain mining tenements approved prior to their creation. In these cases the EPA believes that the rights of the tenement holders must be respected. As a consequence mining proposals on these tenements could be approved with conditions to protect the park environment. Furthermore, the mining areas might be excised from the park or incorporated in its management plan. For example mining tenements for iron ore were granted before establishment of the Hamersley Range National Park. These occur throughout the

northern section of the Park between Marandoo and Wittenoom. They also lie in a belt from Mt Meharry to Paraburdoo. The Marandoo area holds the only significant deposit and because of current market conditions it is unlikely that there will be any new iron ore mining proposal in the park for many years.

The approach to mineral exploration in National Parks has been to allow most applications but only under conditions controlling the nature of the exploration activity and to require an ERMP prior to any decision to allow mining. It is important to define the mineral resources in these areas so that if strategic or economic conditions indicate mining is necessary then it need not be delayed. Any mining approvals should however be subject to detailed conditions agreed to by the Environmental Protection Authority and National Parks Authority.

The EPA believes that, as a matter of principle, mining on leases granted following the declaration of a National Park should only be allowed if the following criteria are met:

- (a) there is a strategic need for the mineral or
- (b) the mineral resource is rare and of high value, and its exploitation would be of significant material benefit to the State, or the nation.

## 5.2 APPLICATION OF THE PRINCIPLE TO THIS PROPOSAL

When considering a need for the project the strategic requirements and value to the State must be considered. At present there is no strategic need for gold production from the park. The gold proposal would add some 4.5% to the annual Western Australian gold production and meanwhile other gold projects outside the park are being developed. As a result it cannot be argued that the resource in the park is particularly rare. However the direct income and employment as well as multiplier effects may be of significant value to Western Australia. The proponent has not put forward any information to demonstrate this. Furthermore the EPA is not competent to assess this aspect of the proposal.

## 5.3 THE PRECEDENT INVOLVED

Approval of the Armway project would be seen as a precedent by holders of the other gold tenements in the park. If this proposal were to be approved it would be difficult to refuse other proposals on the 38 000 ha of the park covered by mining tenements, other than for iron ore. In such a situation the cumulative impact on the park would be considerable.

#### 5.4 POTENTIAL IMPACT OF THIS PROPOSAL

A shallow strip mining project as proposed by Armway would normally be acceptable on environmental grounds because the plans to recycle process water and to progressively rehabilitate the mined areas broadly suit the conditions prevailing in the area. Suggested refinements would include such aspects as details of tailings handling, retention of vegetation strips and conducting of rehabilitation trials.

Previous mining in Hamersley Range National Park has included a short period of small-scale alluvial mining in the 1890's and more recently "recreational" gold mining condoned by the National Parks Authority. These are all on a much smaller scale than the Armway proposal which has the potential to mine almost 170 ha. The Company has currently disturbed some 2 ha during exploration work at Milli Milli.

Rehabilitation will be a long-term aspect of this project. It would take many decades before a stable land surface with something approaching the original vegetation communities was established. As a result the area of disturbed ground would be noticeable for a considerable period. This, together with improved road access would tend to decrease the wilderness attributes of the region. Much of Western Australia can provide a similar experience but with time developments would tend to decrease such isolation. National Parks with wilderness areas in the future would then be of greater importance.

The upgrading of roads to service this operation together with the need to inspect Company operations would necessitate more management inputs by the National Parks Authority. This proposal, together with plans for a tourist town and a national highway in the park highlight the need for a management plan for Hamersley Range National Park.

#### 6. CONCLUSIONS

Exploitation of the alluvial gold deposits within Hamersley Range National Park by soil stripping would cause disruption that would persist for many years. As a result it is likely that the aesthetic value and recreational and tourist attraction of the Milli Milli section of the park would be seriously affected. Some 2 ha disturbed by Armway Mining is currently in need of rehabilitation.

It is concluded that, unless it can be shown that the project would provide significant assistance to the economy of Western Australia the Armway gold mining proposal should be refused, as a matter of principle,

since there is no strategic need for the mineral, nor is it particularly rare. The proponent has not put forward any information to show significant material benefit to the State or the nation. Furthermore, the EPA is not competent to assess such benefits.

In addition, the Government should appreciate that approval of this project would be seen as a precedent by holders of other mineral tenements that cover over 38 000 ha of the park.

The various proposals within Hamersley Range National Park highlight the need for a management plan for this park.

## 8. RECOMMENDATIONS

8.1 The Armway gold mining proposal should be refused unless it can be demonstrated that its value to the State justifies the negation of the fundamental principle that mining should not normally be allowed in National Parks unless the following criteria are met:

(a) there is a strategic need for the mineral or

(b) the mineral resource is rare and of high value, and its exploitation would be of significant material benefit to the State or the nation.

8.2 The areas disturbed during the proponents' exploration should be rehabilitated at their expense to the satisfaction of the National Parks Authority and the Department of Conservation and Environment.

8.3 Any mining approvals in National Parks should be subject to detailed conditions approved by the Environmental Protection Authority.

8.4 A management plan should be prepared for Hamersley Range National Park.

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## APPENDIX

### SUMMARY OF SUBMISSIONS RECEIVED FROM THE PUBLIC AND GOVERNMENT DEPARTMENTS

Six public submissions on the ERMP were made to the EPA after considering the ERMP. Government Departments provided 10 submissions.

Those making submissions were as follows:

Dr A S Weston  
WA Conservation Council  
Dr J E D Fox  
National Parks and Reserves Association  
J N Dunlop  
A B Craig  
National Parks Authority  
Public Works Department  
Department of Agriculture, Western Australian Herbarium  
Western Australian Heritage Committee  
Aboriginal Affairs Planning Authority  
Western Australian Museum, Aboriginal Sites Department  
Department of Resources Development  
Department of Tourism  
Forests Department  
Department of Mines

The submissions are summarised below in terms of subject areas.

#### Mining in National Parks

Four public submissions, the National Parks Authority and the Department of Agriculture indicated that mining was incompatible with the purpose of National Parks. It was queried whether the long-term disturbance of the National Park could be justified by a short term mining operation.

#### Biological Survey

A number of submissions considered the survey work was of a summary nature. One submission particularly raised concern about the pebble-mount mouse and suggested baseline invertebrate sampling.

#### Management Plan

Two submissions commented on the absence of a park management plan. It was believed that it should be prepared prior to approval of any developments in the park.

#### Mining Tenements

A number commented that the presence of other mining tenements in the park raised the possibility of setting a precedent for other prospective miners in National Parks.



### Proposal Impacts

One submission stated that combined impacts of proposals in the park should be considered.

### Cost Benefit Analysis

Two submissions suggested that a cost benefit analysis would have been a useful aid to decision-making with this project.

### Rehabilitation

Submissions discussed the needs for rehabilitation of currently disturbed and future mined areas. One submission considered cutting of fruit-laden branches should not be permitted while another gave details of mulga regeneration techniques. Conducting of trials was also suggested. Five submissions considered the rehabilitation programme acceptable.

### Mining

Some submissions indicated that the ERMP did not give sufficient information on the actual extent of alluvial gold in the area. It was also felt that illegal mining should be controlled.

### Rubbish Disposal

One submission queried rubbish disposal in the Park.

### Maps

It was indicated in two comments that the ERMP would have benefited from further maps. For example it was suggested that maps showing a mining and rehabilitation plan would have been useful.

### Project Management

A number of submissions raised the question of management of the mining and rehabilitation programmes. Inspection by consultants or government and the use of bonds were suggested.

### Exotic Animals

Feral animals and pastoral industry in the park caused concern for members of the public.

### Tourism

Concerns about impact on tourism raised by the Department of Tourism. Another submission indicated the main tourist activity in this area was metal detecting for gold (Mines Department).

### Aboriginal Issues

The absence of archaeological and anthropological surveys was raised in two submissions but the Aboriginal Affairs Planning Authority and WA Museum are satisfied with the Company's approach.

### Water

Water supply was of concern to two with the suggestion being made that monitoring of the salinity of recycled water should be made to avoid increasing salinity in tailings to be used for rehabilitation (Mines Department). The PWD was not concerned about the rate of pumping proposed but stated that a licence was necessary to allow ground water abstraction.

### Wilderness

Concerns about the impacts on the wilderness area of the park were raised by three.

### Sedimentation

Sedimentation of creek lines was raised as a possibility by two and the Mines Department queried the location of tailings dams in relation to creek lines.