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MAIN ROADS DEPARTMENT WESTERN AUSTRALIA
PERTH TO DARWIN NATIONAL HIGHWAY
NEWMAN TO WHITE SPRINGS

REPORT AND RECOMMENDATIONS
BY THE
ENVIRONMENTAL PROTECTION AUTHORITY

Department of Conservation and Environment
Western Australia
Bulletin 175 July 1984

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SUMMARY

The Main Roads Department of Western Australia has proposed the construction and operation of a 271 km 2-laned sealed highway between Newman and White Springs in the East Pilbara region. This is designed to link in with the northern part of the Newman to Port Hedland Highway between White Springs and the North West Coastal Highway.

Twelve government submissions and five from members of the public to the ERMP/Draft EIS were received and the proponent submitted a Supplement (to meet Federal requirements): all these were taken into consideration during the Environmental Protection Authority's assessment. Issues of concern raised in submissions related to the Hamersley Range National Park, alternative routes, mulga vegetation, fire, tourist pressure, rehabilitation, road network requirements and Aboriginal sites.

The EPA believes that the proposed highway would not be environmentally acceptable unless

(i) the MRD adopts the environmental safeguards and management measures proposed in the ERMP/Draft EIS, the Supplement to the ERMP/Draft EIS and in the EPA report and,

(ii) finance is forthcoming for the National Parks Authority to undertake the necessary additional management requirements for Hamersley Range National Park.

1. BACKGROUND

Following joint studies by the Main Roads Department of Western Australia (MRD) and the Commonwealth Department of Transport and Construction, a National Highway corridor was recommended that would fulfil the objectives both of providing a dust free, relatively flood free road link between Newman and Port Hedland and of best serving potential iron ore mines west of Newman. The declared route trended west from Newman then north across the Hamersley Plateau. The recommendation was accepted by the Commonwealth Minister for Transport and Construction and the State Minister for Transport and the route was declared in July 1982.

Declaration of the route was conditional on the consideration, by relevant Government Departments (including the Department of Conservation and Environment) of environmental and planning reports for each section of the highway prior to construction. As a result of this procedure, construction of part of the Newman to Port Hedland link, between White Springs and the North West Coastal Highway, commenced in early 1983. Preparation of an ERMP was not requested.

Following the voicing of public concerns about environmental implications of the route, the Environmental Protection Authority (EPA) resolved in September 1983 that the Newman to White Springs section of the highway should be subject to an ERMP. In November 1983 the Commonwealth Minister for Home Affairs and Environment directed that an EIS also be prepared for this section. Consequently the report prepared by MRD and its consultants was written in order to satisfy both Commonwealth and State requirements. The report was based on guidelines prepared by the EPA and the Department of Home Affairs and Environment. The ERMP, particularly in terms of alternatives addressed, was constrained because the highway had to link with the White Springs to Hedland section under construction. The ERMP/Draft EIS was made available for public review for six weeks from January 10, 1984. In May 1984 MRD submitted a Supplement which together with together with the ERMP/Draft EIS constituted the Final EIS. This addressed the issues raised in public submissions.

2. THE PROPOSAL

The proposal consists of the construction and operation of 271km of 2 laned sealed highway between Newman and White Springs in the East Pilbara region. Construction is expected to take approximately 3.5 years, commencing during 1984. A number of bridges would be required for river crossings including those over Weeli Wolli, Marillana, Munjina and Bea Bea Creeks.

The project would have a distinct construction phase and an on-going operations phase. Principle construction activities would involve provision of earthworks, compaction and sealing of the highway. Other construction aspects would include culvert and bridge construction and the establishment of quarries, borrow areas, access tracks and construction camps. Operation of the highway would be largely concerned with long-term maintenance programmes.

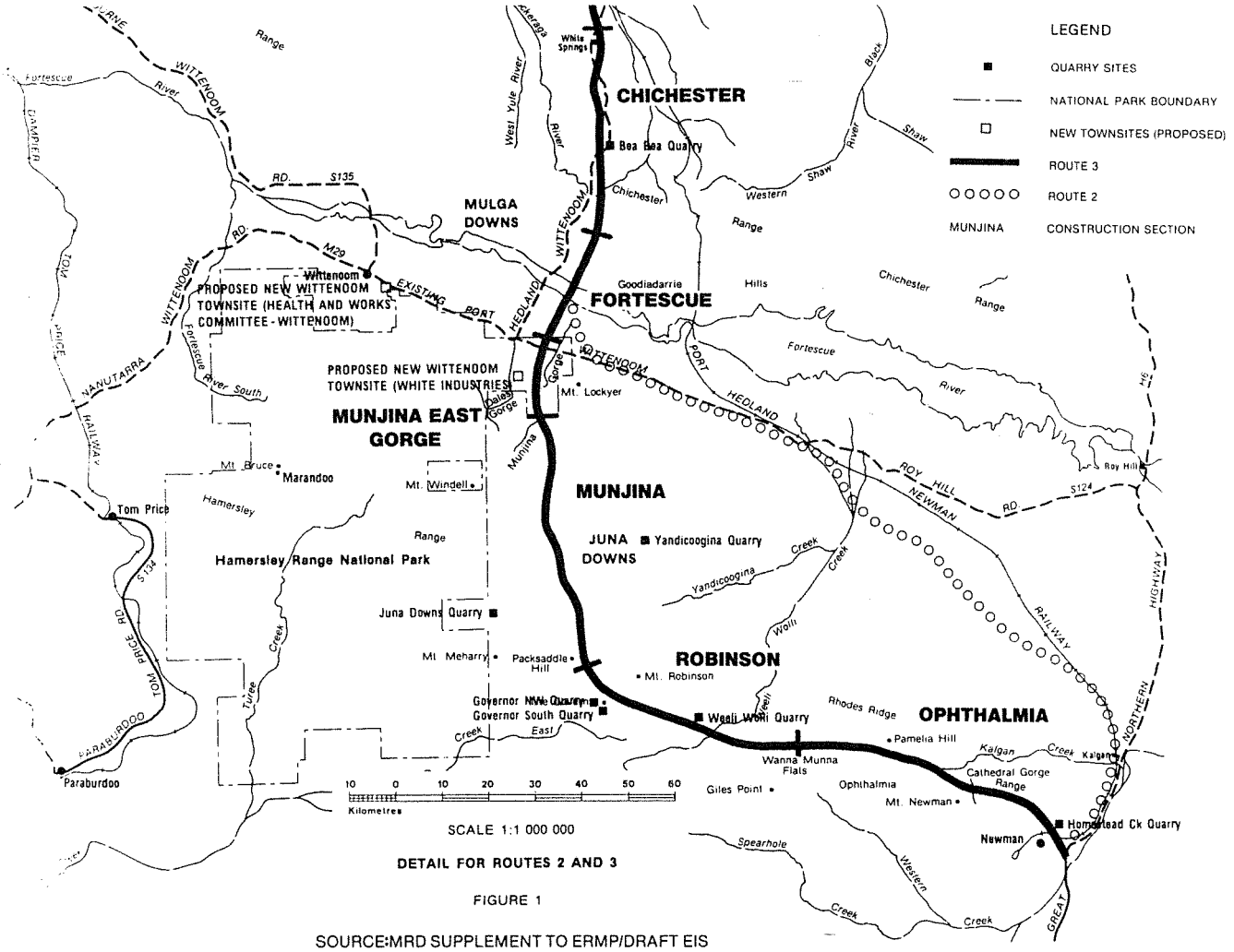
Figure 1 shows the proposed highway route and proposed quarry locations.

Commitments to environmental management made by MRD in the ERMP/Draft EIS and the Supplement are summarised in Appendix 1.

3. EXISTING ENVIRONMENT

3.1 Climate

The Newman to White Springs highway route is located in an area characterised by low average rainfall, high daily temperature variations and high evaporation rates. Cyclones can contribute heavy rainfall resulting in wide total monthly rainfall ranges e.g. from 0 to 500mm at Wittenoom in December.



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DETAIL FOR ROUTES 2 AND 3

FIGURE 1

SOURCE:MRD SUPPLEMENT TO ERMP/DRAFT EIS

3.2 Geology, Land Form and Soils

The route traverses granitic Archaean rocks of the Pilbara Block to the North and Lower Proterozoic sediments and volcanics of the Hamersley Basin to the south. Between the Chichester Range and the escarpment of the Hamersley Plateau, developed on Hamersley Basin sediments, is the Fortescue Plain composed of broad outwash fans enclosing an alluvial plain.

Plains within the Hamersley Plateau often act as internal drainage basins containing large volumes of water after cyclonic rains.

A wide range of soils have been defined, the major ones being hard alkaline redsoils on the granite plains, friable loamy soils on the Chichester Range and Hamersley Plateau and earthy clay soils on the Fortescue Plain. The majority of soils are highly erodible. Areas of low erosion potential tend to be on steep hill slopes where rock crops out and talus predominates.

3.3 Vegetation

The report describes eight vegetation associations grouped into Abydos Plain, Chichester Plateau, Fortescue Valley and Hamersley Plateau systems. The most widespread associations in the project area are as follows:

Kanji (Acacia inaequilatera) shrub steppe Abydos Plain, Chichester Plateau.

Snappy Gum (Eucalyptus leucophloia) woodland Hamersley Plateau, Chichester Plateau

Mulga (Acacia Aneura) low woodland Fortescue Valley, valleys of the Chichester Plateau & Hamersley Plateau

Of these associations mulga communities are the most sensitive to disturbance, particularly by fire and changes in surface drainage. The East Pilbara mulga is important,

differing from that encountered elsewhere in that it lies within the tropics in a semi arid area with strongly seasonal summer rainfall. As well as forming woodlands on the desert loams of flats and valley floors this mulga also occurs in fringing woodlands near creeks and on sheltered rocky hillsides and ridges with a spinifex ground layer.

The report highlighted the uncertain conservation status of a Mallee shrubland on a calcrete hill and a ghost gum fringing woodland in Munjina East Gorge. Also six rare (or poorly collected) or geographically restricted plant species were collected in the vicinity of the route with three being mentioned as of special significance. However, WA Herbarium information and further MRD surveys indicate that they are reasonably widespread, as is the ghost gum fringing woodland. MRD have now changed the highway route to avoid the mallee shrubland.

Past and current management practices (eg fire) associated with the pastoral industry have resulted in or are causing large-scale impacts on the vegetation.

3.4 Fauna

As a result of the variety of habitats present in the project area the diversity of faunal communities is high and probably characteristic of the Pilbara region. The pebble mound mouse (Pseudomys chapmani) is found adjacent to the highway and is currently listed as rare. The conservation status of much of the fauna along the route is unknown because of very limited collecting.

An important component of the fauna near the route is made up of feral cats, donkeys, camels, sheep and cattle.

3.5 Socio-Economic Environment

3.5.1 Land tenure

The project area includes Hamersley Range National

Park, Vacant Crown Land (VCL), pastoral leases and the Mt Newman Mining Company Pty Limited mining lease. Much of the land is under mining tenements and the Fortescue Valley is covered by a petroleum exploration permit.

A number of changes to land tenure are expected. The WA National Parks Authority has indicated its intention to proceed with a proposal to extend the National Park southwards from Munjina East Gorge through VCL to join the northern boundary of Juna Downs Station. The stations are also interested in taking up some of the VCL for pastoral activity.

In addition, Area C, West Angelas, Yandicoogina and Marandoo are possible contenders for a new iron ore mine in the vicinity of the proposed highway.

3.5.2 Economy

The economy of the area between Newman and White Springs is based on income derived from mining, tourist and pastoral industries. The improvements in transport and accommodation facilities during development of the iron ore mining industry have led to tourism becoming the second most important industry in the region. Access to tourist features in the area would be increased with sealing of the National Highway and the upgrading and sealing of major intra-regional link roads. The New Wittenoom tourist development proposal is located to take advantage of the proposed new highway.

3.5.3 Aboriginal Sites

The project area encompasses a number of sociolinguistic tribal areas. A series of archaeological and ethnographic surveys have indicated the occurrence of four

ethnographic sites adjacent to the southern part of the Munjina section of the route. Archaeological surveys are planned for the Fortescue section. However, finds over the rest of the route include rock shelters of particular interest in a ridge to the east of Packsaddle Hill. Excavations provided archaeological material demonstrating intermittent use by Aboriginal people from at least 8100 years ago to 100 years ago. One shelter would be destroyed during highway construction and permission for this to occur has been given by the WA Minister with special responsibility for Aboriginal Affairs.

4. ENVIRONMENTAL ASSESSMENT

4.1 Issues Raised in Submissions

A total of 12 State and Commonwealth Government submissions and 5 public submissions have been taken into consideration in the assessment of the Newman to White Springs National Highway proposal.

Table 1 summarises the topics of concern or interest raised in the various submissions. The location of a major highway through a National Park contrary to National Parks Authority policy was of greatest concern. The problem of subsequent east-west road access through the Park was also of concern as was the potential for construction vehicles to use existing Park roads. Issues were raised in relation to fencing, maintenance and management of the highway through the Park. It was also indicated that MRD should monitor the effects of the highway on the physical park environment.

Concern for the route being located within the National Park could be correlated with the level of concern relating to the assessment of alternatives. In general terms, submissions were critical of the alternatives section of the report.

The broad area of rehabilitation was addressed by a number of respondents.

Mulga vegetation in particular and route vegetation generally was of concern or interest to a number of respondents. Particular comments related to the presence of rare or endangered plant species along the route and the effect of the highway proposal on mulga communities. Re-routing the highway to avoid all mulga communities and to avoid passing through the gorges was suggested. Associated with these aspects was a demand to see monitoring programmes initiated to test the effectiveness of management approaches.

4.2 Adequacy of the ERMP/Draft EIS Report and Supplement

The EPA considered that although the ERMP/Draft EIS had some shortcomings, it contained sufficient information for the public and Government agencies to make an assessment of the proposal. Despite the shortcomings MRD decided to distribute the document for public review.

Some of the shortcomings arose from a lack of environmental and engineering information in the Ophthalmia, Fortescue, Chichester and Robinson Sections of the route. However, MRD followed the EPA guidelines suggesting that aspects of the proposal which currently only had a small degree of available detail should be discussed in a broad fashion with an undertaking to provide necessary information at a later stage.

The environmental impact assessment section of the report suffered from insufficient use of the environment descriptions. For example discussions of rainfall intensity and soil erodibility were not utilised at all when discussing borrow pit rehabilitation.

The Supplement was able to supply some of the information lacking from the ERMP/Draft EIS, however there could still have been more use of the report's environmental descriptions.

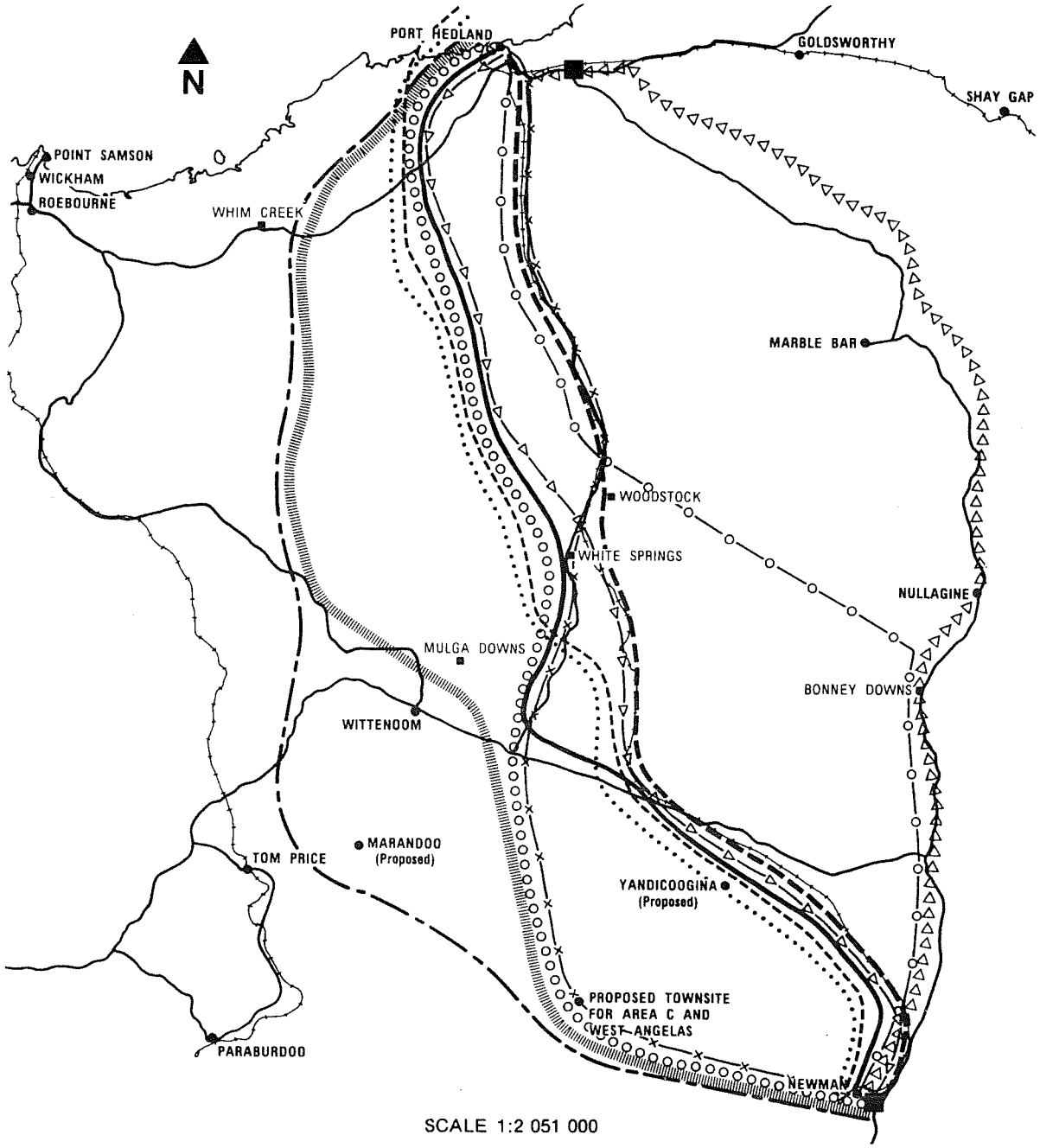
4.3 Alternatives

The predominant issues raised by the various submissions related to impacts by the highway proposal on the Hamersley Range National Park. As a result, consideration of alternatives to the proposal featured in many of these submissions.

Following Government consideration of the Corridor Report (Commonwealth Department of Transport and Construction and MRD, 1983), the various alternative routes being shown in Figure 2, route 3 was selected as the preferred route. In its guidelines, the EPA suggested that as a consequence of this Government decision, only alternatives within Corridor 3 should be discussed in any detail. However representations from the Department of Home Affairs and Environment resulted in a broader discussion of alternative corridors.

MRD discussed both variants to route 3 (namely the use of Junction, Campana City and Newman Gorges rather than Munjina East and Cathedral Gorges) and alternatives to route 3 (routes 1 and 2). Route 1 on the existing Great Northern Highway alignment was the least preferred as it had the highest construction cost and lowest benefit - cost ratio for all iron ore mining development scenarios. The corridor analysis showed that little difference existed between routes 2 and 3 in terms of route length, National Highway capital cost and benefit-cost ratio. Further, either route was favoured depending on the particular mining development scenarios.

Route 2 was recommended as a more reasonable alternative by a number of respondents. There is little difference between routes 2 and 3 in terms of total disturbance (the length of heavy and major earthworks would be 144km and 139km respectively). Both have the potential for visual impact



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LEGEND

ROUTE NUMBER		ROUTE LENGTH Km	ROUTE NUMBER		ROUTE LENGTH Km
1	◁◁◁◁◁◁◁◁◁	442	7	— — — —	414
2	———	453	8	◁——◁——◁	442
3	○○○○○○○○○	474	9	- - - - - - - - -	444
4	○——○——○	429	10	.....	446
5	|||||||||||	531	11	×——×——×	446
6	- ——— - ——— -	562			

■ ROUTE LENGTH TERMINI

SOURCE:MRD SUPPLEMENT TO ERMP/DRAFT EIS

NATIONAL HIGHWAY ALTERNATIVE CORRIDORS

FIGURE 2

in the Hamersley Ranges. However the alignment of Route 2 along the ecotone between the Hamersley Range and the Fortescue Plain would suggest that Route 3 would be preferable as it would be less likely to act as an ecological barrier.

With respect to Route 3, two alternative gorges were considered as alternatives to Munjina East Gorge which is situated in the North Eastern corner of Hamersley Range National Park. The relocation of the route through either of these would result in massive earthworks and severe disruption of these aesthetically attractive gorges. To the south the routes from these alternative gorges would involve crossing the Marillana Flats causing major drainage problems and potential damage to mulga communities through disruption to overland waterflow. In contrast to these difficulties, Munjina East Gorge is wide enough to accommodate the highway and the existing drainage line. Further the extent and depth of cuttings are considerably less than those required for the two alternatives.

The MRD has indicated in the Supplement that no firm decision on either Cathedral or Newman Gorges has been made, although the former is favoured. The EPA will require an environmental report on this section once the route is finalised.

4.4 Hamersley Range National Park

A distance of 18km of the proposed route is located within the north eastern corner of Hamersley Range National Park where the highway would descend from the Hamersley Plateau to the Fortescue Valley via Munjina East Gorge and Munjina Gorge.

The Park is listed on the National Heritage list.

4.4.1 Management Plan

The highway would have a major influence on the Park in a number of ways. The most significant would be an unplanned influx of visitors to the Park due to the improved access provided by a sealed highway when compared with the existing gravel roads. Associated with increased visitor numbers would be a greater usage of park facilities and pressure on popular sites such as the northern gorges.

Financial strains would be imposed on the National Parks Authority of WA (NPA) because of visitor expectations related to roads, park facilities and ranger staff. Without additional finance park degradation would probably be pronounced.

Recommendation

Additional funding for Hamersley Range National Park maintenance and ranger staff should be provided before any highway construction occurs in the Park.

In order that these pressures can be planned for and accommodated there is an urgent need for the NPA to develop a park management plan that takes into account the land's capability for sustaining uses such as various types of recreation, while protecting the aesthetics, flora and fauna of the Park. This need is re-inforced when the pressures due to other proposals such as mining in the Park and the New Wittenoom Development are considered.

Recommendation

Funding for a management plan for Hamersley Range National Park should be provided as a matter or urgency.

4.4.2 Munjina East Gorge

Construction of the highway through Munjina East Gorge

would require a cutting in excess of a kilometre long with a maximun depth of 30m. In addition, at the northern end of the cut, a fill section would be needed to carry the highway across a section of the gorge. The MRD has proposed that the walls of the cut and the form of the fill would result in land forms that reflect those of the nearby gorges. The EPA considers that following vegetation regeneration the proposal would be aesthetically acceptable in relation to the gorge topography. Care would, however, be needed during construction to ensure that disturbance to the gorge was restricted to the route alignment and areas involved in necessary test work. In particular hillside mulga on the eastern slopes of the gorge would need to be avoided.

If construction of the highway did take place in the gorge, its dramatic scenery and interesting geology exposed by the cut could be explained using signs at strategically placed parking bays/rest areas. Discussions with the NPA would assist in both locating these parking and viewing areas and the form of information presentation.

Recommendation

Parking bays/rest areas and viewing areas adjacent to the highway within Hamersley Range National Park should be planned in conjunction with the National Parks Authority.

The EPA concurs with the proposal in the Supplement that a passing lane in Munjina East Gorge would be constructed as part of the project. To minimise disturbance it would be better to build the lane as part of the main project rather than returning at a later stage.

4.4.3 Offroad Vehicles

Offroad vehicles are having serious effects in the park, resulting in erosion as well as flora and fauna degradation.

Means of controlling access to the Park from the proposed highway requires further discussion between MRD and NPA. If fencing is decided upon as the most realistic approach, erection and maintenance should be the responsibility of the MRD.

Recommendation

MRD should discuss with NPA means of controlling off-road vehicle access from the highway into Hamersley Range National Park.

4.4.4 Exotic weeds and grasses

Exotic weeds and grasses could be introduced to the park via earthmoving and construction equipment as well as by users of the proposed highway. Such plants could outcompete sections of the native flora and thus these occurrences may have serious implications for conservation of the park vegetation. Consequently all earthmoving and construction equipment should be washed down prior to despatch to the Park. Particular attention should be given to the wheels, wheel arches and undercarriage of vehicles.

It is believed that if the highway is constructed through the park, regular monitoring for exotic weed and grass introduction should be carried out adjacent to parking bays/rest areas within the park. Agricultural Protection Board inspection would not be sufficient as exotic weeds are not necessarily declared noxious species.

Recommendations

. *All earthmoving and construction equipment should be washed down prior to despatch to the Hamersley Range National Park.*

- *Parking bays/rest areas on the highway within Hamersley Range National Park should be regularly monitored for exotic weeds and grasses by MRD with any control action in accordance with NPA practice.*

4.4.5 Construction traffic

Any highway construction in the Park would need to include consideration of Park users. To avoid the danger of heavy construction vehicles they should be excluded from the Yampire Gorge Road. MRD have recognised this need and have undertaken to include it as a contract requirement.

In addition it would be necessary to rehabilitate any temporary construction access roads and survey traces not required for on-going park use. This matter should be discussed with the NPA prior to siting of such access roads.

The rehabilitation techniques for tracks and survey traces as outlined by MRD are acceptable to the EPA.

Recommendation

Temporary access roads should be sited following discussions with NPA.

4.4.6 Highway Facilities Maintenance

The EPA notes that the MRD have accepted responsibility for the maintenance of parking bays, rest areas and road verges associated with the proposed highway. MRD have further undertaken to provide fencing at rest areas/ parking bays and lookouts adjacent to the proposed highway in the park following consultation with NPA. In the section of highway through the park, regular rubbish collection would be particularly important.

4.4.7 Noise

MRD have estimated that in the year of completion of the project, approximately 150 vehicles a day would use the

highway of which 30 would be heavy vehicles producing noise levels up to 70dB(A). By the year 2001, 200 to 280 vehicles a day could be using the highway. Background noise levels along the length of the route are probably of the order of 25dB(A). The report has estimated that traffic noise will be audible up to 10km from the highway, particularly at night. However, the main annoyance could be for people within 1km of the route. This would have implications in National Parks planning when considering such aspects as the location of camping areas, definition of wilderness zones and the location of the New Wittenoom townsite.

4.8.8 National Park Authority Conditions

If the highway is constructed within the park, specific conditions required for mineral exploration should be followed that are outlined in recommendation 3 of the NPA submission (given in full in the Supplement) including consideration of auxiliary tracks and survey lines, pollutants, camp or worksites, use of soap, detergent, wetting agents or emulsifiers, fire control, water bores, firearms and domestic animals.

Recommendation

The conditions usually applied to mineral exploration in Hamersley Range National Park should be applied to any highway construction activity within the park.

4.4.9 Development Guidelines in National Parks

The EPA has suggested that the following guidelines should be used to assess the suitability of a mining project in a National Park. Factors indicating suitability would be either

(i) a strategic need for the mineral or
(ii) a demonstrable significant material benefit to the State or Nation provided that alternative economically viable reserves were not available elsewhere in the State.

Despite NPA management policies which propose that National or Shire highways are not acceptable in National Parks the route down Munjina East Gorge is in engineering and economic terms the most desirable of the alternatives considered. Further the highway would serve to reduce the isolation of Pilbara residents by providing an important link for inter-regional traffic between Perth, the Pilbara and the Kimberley. In general terms therefore, the second of the general guidelines could be favourably applied to the highway proposal.

4.4.10 Conclusions regarding highway routing through the park.

The EPA considers that route 3, using Munjina East Gorge is the most prudent of the alternatives considered. In general the proposed highway design in the park should result in landforms that reflect those of the nearby gorges. The EPA believes that the route through the National Park would be environmentally acceptable if recommendations in 4.4.1 to 4.4.8 are adopted.

4.5 Other Considerations

4.5.1 Mulga vegetation

Biological studies for the project highlighted the importance of mulga communities associated with the proposed highway. These communities are sensitive to changes in surface drainage and fire. MRD has adjusted the proposed route to avoid the Marillana Flats community as well as more restricted areas. However, between Munjina Clay Pan and Newman and across the Fortescue valley there will be a need for a range of engineering structures to minimise interruption of surface runoff supplying particular mulga communities. Specialised structures have been described in the report and MRD have undertaken to monitor their effectiveness. This monitoring will need to include both the adjacent vegetation and the engineering structures.

Recommendation

MRD should monitor the effectiveness of the Special drainage redistribution systems by studying both the engineering structures and adjacent mulga communities. The results of these studies and any proposed remedial action should be reported to the EPA.

During the course of the mulga studies, Juna Downs Station was extended to include the Munjina and part of the Robinson section of the proposed highway. In order to create suitable pastoral land, the mulga of this region has since been subjected to widespread fire and will experience ongoing grazing pressure. Because of the importance of mulga in this area the EPA has recommended to the Pastoral Board that prior to any further VCL releases in the Mt Robinson to Newman area, boundaries for a mulga conservation reserve should be defined.

4.5.2 Fire

Fire is common in the Pilbara resulting from both lightning strikes and man's activities which may be either accidental or as part of land management. Concerns have been raised about the likely increase in accidental fires within Hamersley Range National Park following highway construction. Suggestions were made that MRD should conduct studies to determine the change in fire frequency following highway construction. However the EPA considers that a broad scale fire management study is required for the Pilbara region. This study should involve consideration for National Parks, Conservation Reserves, VCL and land alienated for pastoral or mining use. Such a study has commenced co-ordinated by NPA, concentrating on the management of Hamersley Range National Park.

Recommendation

The EPA considers that a broad scale fire management plan is required for the Pilbara Region. The Hamersley Range National Park fire management study presently being carried out should be incorporated in the broad study.

The incidence of accidental fires caused by highway users could be reduced by use of educational signs

Recommendation

The MRD should consider a system of educational road signs to make roadusers aware of fire risks.

4.5.3 Tourist sites outside the National Park

Construction of the highway will probably lead to higher tourist numbers in the Pilbara region. These people, together with the Pilbara residents will be provided with improved access to pools and other attractive areas particularly within the Chichester and Hamersley Ranges. The East Pilbara and West Pilbara Shire Councils need to be informed that popular tourist sites outside National parks could require management to prevent their deterioration if visitor numbers increase following highway construction.

Recommendation

It should be drawn to the attention of the East Pilbara and West Pilbara Shire Councils that construction of the highway could lead to greater tourist usage of recreational sites in their Shires. As a result they should define and monitor popular tourist sites in their Shires outside of national parks. Further they should develop management approaches to prevent site deterioration as necessary.

4.5.4 Borrow pits and gravel pits

The proposed siting and management of pits is in general terms acceptable to the EPA. However no consideration was given to the inclusion of in-pit vegetation buffer

strips on the contour to avoid excessive soil erosion. Further, no mention was made of the need to work parallel to the contour, particularly with rehabilitation activity such as ripping or spreading of topsoil and cut vegetation.

Recommendation

To avoid on-going soil erosion in borrow and gravel pits it will be necessary to work parallel to the contour and to retain in-pit vegetation buffer strips as necessary.

4.5.5. Road network requirements.

The need for an associated road network to link with the National Highway will develop following construction of the highway. These supporting roads would probably include a link to the west to both Paraburdoo and Tom Price, access to the National Park, to future townsites and to existing ones such as Marble Bar. MRD has undertaken to carry out a review of such roads in a report, following construction of the highway. However, it is believed that such a review should be conducted before completion of the highway so that an on-going road development plan can be developed with time to adequately take environmental constraints into account. Particularly important roads would be any crossing Hamersley Range National Park including links to Tom Price and Marandoo.

Recommendation

Prior to completion of this section of the National Highway, MRD should complete a study of the road network that is likely to be developed to link in with the Newman to Port Hedland Highway. This study should examine roads which are the responsibility of Local Authorities as well as MRD roads and should be provided to EPA for comment.

4.5.6 Aboriginal Issues

Care will need to be taken in areas where ethnographic sites have been defined near the route.

4.6 Further Studies

4.6.1 Vegetation and fauna

At the time of writing the ERMP/Draft EIS a vegetation survey had been conducted as part of a mulga study between Newman and Munjina East Gorge. The general information available for the remainder of the route did not highlight any particular environmental concerns apart from the need to minimise mulga disruption in the Fortescue Valley. However, if the route is approved there will be a need to complete the vegetation survey by studying the Fortescue and Chichester Sections of the route.

Recommendation

Before the route alignment is finalised, MRD should conduct vegetation surveys on the Chichester and Fortescue sections of the route and provide the EPA with the reports.

4.6.2 Archaeological Sites

Archaeological surveys at the time of writing this report were yet to be completed on the Fortescue and Chichester section. The EPA would require a report concerning the outcome of these surveys.

Recommendation

MRD should provide EPA with a report concerning the outcome of archaeological surveys on the Fortescue and Chichester sections of the route prior to construction so that statutory requirements are met.

4.6.3 Detailed route information

Currently, details of the highway route have not been finalised. To provide the EPA with final information on the project, covering aspects such as route alignment, bridge details, quarry details, and construction camp location in relation to the environment, there will be a need to provide planning and environment reports for the sections that were lacking engineering and/or environmental detail at the time of writing the report. These are the Opthalmia, Robinson, Fortescue and Chichester sections. Sufficient information to form a basis for progressing environmental assessment has already been supplied for the Munjina East Gorge, Munjina and Newman sections.

Recommendation

MRD should provide the EPA with planning reports for the Opthalmia, Robinson, Fortescue and Chichester sections of the highway and consider its comments prior to construction.

4.6.4 Triennial report

In order that the EPA is kept informed of the environmental aspects of the highway once it is in operation, it considers that the MRD should provide triennial reports for the Newman to White Springs National Highway that include consideration of:

(i) rehabilitation success in pits, access roads and survey traces;

(ii) exotic weed and grass introduction to National Park highway rest areas and parking bays;

(iii) performance of specialised drainage structures in associated mulga country.

(iv) the incidence of active erosion;

(v) measures proposed to correct any environmental deterioration observed,

(vi) other issues as necessary.

Termination of this requirement would be dependent on the results of the monitoring and management activity. Because of the region's uncertain rainfall it is likely that at least 3 such reports would be necessary.

Recommendation

MRD should provide the EPA with a minimum of three triennial reports covering environmental issues relating to the on-going operation of the highway.

5. CONCLUSIONS

Following consideration of Government and public submissions and study of the ERMP/Draft EIS and Supplement, the EPA concludes that the proposed route via Munjina East Gorge in Hamersley Range National Park is an environmentally acceptable route for the Newman to White Springs Highway. Issues of concern raised in Submissions relate to the National Park, alternative routes, mulga vegetation, fire, tourist pressure, rehabilitation, road network requirements and Aboriginal sites. These have been addressed and recommendations made where necessary.

The EPA believes that the proposed highway would not be environmentally acceptable unless

(i) the MRD adopts the environmental safeguards and management measures proposed in the ERMP/draft EIS, Supplement and in this report and,

(ii) finance is forthcoming for the NPA so that it can carry out the additional management responsibilities likely to arise from an increase in visitors to the Hamersley Range National Park that would be a consequence of the access provided by highway construction.

6. RECOMMENDATIONS

The recommendations set out below are a summary of those mentioned through the text of this report. The relevant sections of this report are indicated.

6.1 RECOMMENDATIONS TO MRD

6.1.1 Parking bays/rest areas and viewing areas adjacent to the highway within Hamersley Range National Park should be planned in conjunction with the National Parks Authority (4.4.2).

6.1.2 MRD should discuss with NPA means of controlling off-road vehicle access from the highway into Hamersley Range National Park (4.4.3).

6.1.3 All earthmoving and construction equipment should be washed down prior to despatch to the Hamersley Range National Park (4.4.4).

6.1.4 Parking bays/rest areas on the highway within Hamersley Range National Park should be regularly monitored for exotic weeds and grasses by MRD with any control action in accordance with NPA practice. (4.4.4).

6.1.5 Site temporary access roads following discussions with NPA. (4.4.5)

6.1.6 The conditions usually applied to mineral exploration in Hamersley Range National Park should be applied to any highway construction activity within the Park (4.4.8).

6.1.7 MRD should monitor the effectiveness of the special drainage redistribution systems by studying both the engineering structures and adjacent mulga communities. The results of these studies and any proposed remedial action should be reported to the EPA (4.5.1).

6.1.8 The MRD should consider a system of educational road signs to make road users aware of fire risks. (4.5.2).

6.1.9 To avoid on-going soil erosion in borrow and gravel pits, it will be necessary to work parallel to the contour and to retain in-pit vegetation buffer strips as necessary (4.5.4).

6.1.10 Prior to completion of the National Highway, MRD should complete a study of the road network that is likely to be developed to link in with the Newman to Port Hedland Highway. This study should examine roads which are the responsibility of local authorities as well as MRD roads and should be provided to EPA for comment (4.5.5).

6.1.11 Before the route alignment is finalised, MRD should conduct vegetation surveys on the Chichester and Fortescue sections of the route and provide the EPA with the reports (4.6.1).

a report (4.6.1).

6.1.12 MRD should provide EPA with a report concerning the outcome of archaeological surveys on the Fortescue and Chichester sections of the route prior to construction so that statutory requirements are met (4.6.2).

6.1.13 MRD should provide the EPA with planning reports for the Ophthalmia, Robinson, Fortescue and Chichester sections of the highway and consider its comments prior to construction (4.6.3).

6.1.14 MRD should provide the EPA with a minimum of three triennial reports covering environmental issues relating to the ongoing operation of the highway (4.6.4).

6.2 RECOMMENDATIONS TO GOVERNMENT

6.2.1 Additional funding for Hamersley Range National Park maintenance and ranger staff should be provided before any highway construction occurs in the Park (4.4.1).

6.2.2 Funding for a management plan for Hamersley Range National Park should be provided as a matter of urgency. (4.4.1).

6.2.3 The EPA considers that a broad scale fire management plan is required for the Pilbara region. The Hamersley Range National Park fire management study presently being carried out should be incorporated in the broad study (4.5.2).

6.3 RECOMMENDATIONS TO LOCAL AUTHORITIES

6.3.1 It should be drawn to the attention of the East Pilbara and West Pilbara Shire councils that construction of the highway -could lead to greater tourist usage of recreational sites in their Shires. As a result they should define and monitor popular tourist sites in their Shires outside of National Parks. Further, they should develop management approaches to prevent site deterioration as necessary (4.5.3).

REFERENCES

Commonwealth Department of Transport and Construction and Main Roads Department, Western Australia, 1982: Perth-Darwin National Highway. Newman-Port Hedland Study, Perth:MRD 185 pp.

Main Roads Department W.A., 1984: Perth to Darwin National Highway Newman to White Springs. Draft ERMP and EIS, January 1984.

Main Roads Department W.A., 1984: Perth to Darwin National Highway Newman to White Springs. Supplement to Draft ERMP and EIS, May 1984.

APPENDIX 1 ERMP/DRAFT EIS AND SUPPLEMENT MANAGEMENT COMMITMENTS

Surface Hydrology	Bridges and culverts will be designed to ensure minimal upstream flooding. Hydrological studies ongoing.
Soil erosion control	Involving minimisation of disturbance, ripping, topsoil replacement, drains and contour banks and discharge velocity design; regular inspection and maintenance.
Survey Traces	Soil erosion control measures will be constructed if required.
Construction Tracks	On completion they will be tyned and topsoil respread.
Construction Camps	No camp will be established in Hamersley Range National Park; removal of building on decommissioning; waste disposal, siting in relation to water bores and rehabilitation were considered.
Borrow Areas	Minimal disturbance; return of topsoil and cleared vegetation after completion.
Fencing	Will be undertaken as outlined; maintenance in the National Park will be a MRD responsibility.
Cut and Fill	No cuts on talus slopes; special management of Munjina East Gorge.

Water Supply	Where highway will prevent stock access, another water supply bore will be drilled; all bores by MRD will be available for pastoral or community use.
Dust Suppression	Near camp sites or communities dust suppression will be undertaken as necessary.
Declared Plants	Agricultural Protection Board would identify these and eradicate.
Bushfires	MRD will undertake action to prevent damage to MRD personnel and equipment if a bushfire occurs during operation. During construction fire outbreaks will be contained.
Parking Bays and Rest Areas	These will be regularly maintained.
Road Verges in National Park	These will be regularly cleared of rubbish.
Off-Road Vehicles	Fencing.
Aboriginal Sites	Will adhere to requirements of legislation.
Aesthetics	Aim is to have minimal adverse aesthetic impact.
Rehabilitated areas	Annual inspection and maintenance with results of the effectiveness of techniques to EPA.
Siting of temporary facilities	Sited so as to cause minimal disturbance; in typical vegetation out of flood plains.

Flora and fauna protection	Minimal disturbance; consultations with NPA; further studies regarding rare vegetation and water birds. Avoidance of mulga or drainage design to retain malga.
Pastoral areas	Access tracks, gates and requirements of landholder would be considered.
Urban Community	Consideration of dust, noise, obstruction, speeds and blasting.
Aboriginal sites	Minimising of impacts by discussion; completion of archaeological studies.
National Park	Negotiation with National Parks Authority on siting of facilities.
Environmental Reports	Route section assessment reports will be provided to EPA.
Pilbara Road Study	To be conducted following construction of highway.
Yampire Gorge	Contracts will prohibit use of the gorge by heavy construction vehicles unless NPA approval given.
Special drainage redistribution systems	Monitoring of performance.
Quarries	Fencing and signposting on completion if necessary.
Contracts	Will include sections on rehabilitation, waste disposal and clearing standards.

APPENDIX 2 LIST OF RESPONDENTS

Public submissions in response to the ERMP/Draft EIS were received received from the following:

1. National Parks Authority of Western Australia
2. Department of Lands and Surveys (WA)
3. Western Australian Museum
4. Department of Mines (WA)
5. Geological Survey of Western Australia
6. Western Australian Heritage Committee
7. Western Australian Herbarium
8. Conservation Council of Western Australia
9. WA National Parks and Reserves Association
10. Dr Ian Churchward
11. Confidential Author
12. Department of Resources Development (WA)
13. Australian Conservation Foundation
14. Department of Resources and Energy
15. Department of Aboriginal Affairs
16. Australian Heritage Commission
17. Public Works Department (WA)

Submission 11 was received from an author who wished to remain anonymous.