New Road from Tom Price to Karratha

Main Roads Western Australia

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 1159
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Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
9 October 1998	**Level of Assessment set (following any appeals upheld)**	**0**
6 January 2003	**Proponent Document Released for Public Comment**	**220**
3 March 2003	**Public Comment Period Closed**	**8**
4 November 2004	**Final Proponent response to the issues raised**	**84**
3 January 2005	**EPA report to the Minister for the Environment**	**8**

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Summary and recommendations

Main Roads Western Australia (MRWA) proposes to construct and maintain a new road from Northwest Coastal Highway (near Karratha), through the Millstream-Chichester National Park (NP), to the Nanutarra-Munjina Road intersection (north of Tom Price). This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for the Environment on the environmental factors relevant to the proposal.

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

Relevant environmental factors

It is the EPA's opinion that the following environmental factors relevant to the proposal require detailed evaluation in this report:

a) Biodiversity;

   There are four key issues that require discussion under the factor of Biodiversity. These are as follows:

   - key impacts and issues identified within the Millstream-Chichester National Park;
   - impacts on the threatened ecological community;
   - impacts and management outside the Millstream-Chichester National Park; and
   - rehabilitation,

b) Surface Drainage.

There were a number of other factors which were very relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

Conclusion

The EPA has considered the proposal by MRWA to construct and maintain a road from North West Coastal Highway, near Karratha to the Nanutarra-Munjina Road, north of Tom Price and has concluded that it can be managed to meet the EPA's objectives for the relevant environmental factors.

In developing this proposal, MRWA has taken into account the need to avoid creating new corridors and to locate the road as close as possible to existing infrastructure. This is particularly important where the road occurs within the Millstream-Chichester National Park (NP) to avoid adverse impacts on the Park's values.

Within the constraints imposed by the topography of the Chichester Ranges and the location of existing and proposed infrastructure, MRWA has identified a road alignment within the NP that is almost entirely within a 1 kilometre corridor from the existing railway and associated infrastructure. While there are two minor deviations (outside the 1 kilometre corridor) these are to avoid topographical and infrastructure constraints and are not considered to be significant deviations. In addition to locating the road in close proximity to existing infrastructure, MRWA has committed to restricting the width of disturbance during construction and also aligned some sections of the road to cover existing tracks and disturbed areas to effect further reductions in clearing.

In relation to the impacts of the road on the *Themeda* grassland threatened ecological community (TEC), the EPA notes that a relatively small proportion of the remaining extent of this TEC will be permanently impacted by the proposal and that MRWA has committed to restrict the width of disturbance through this sensitive area to less than 20 metres. The EPA has therefore recommended conditions to restrict disturbance widths through the NP and the TEC (Condition 7-1). CALM has advised that MRWA's commitment to fence a 200 metre road reserve through the TEC will be a positive outcome for biodiversity conservation as the major threat to this community appears to be overgrazing by livestock.

MRWA has developed an environmental offset package to mitigate the impacts of the proposal. The offset package consists of the rehabilitation of redundant access tracks and material pits both within and outside the NP (approximately 205 hectares), and contributions towards the management of the NP, including the re-construction of the fence along the northern boundary of the NP and the control of weeds in focus areas within the NP, such as Millstream.

MRWA recognises the significance of areas containing mulga associations and watercourses as important fauna habitats. For areas supporting mulga, MRWA has committed to undertake detailed drainage surveys to design the road to maintain sheet flows and this will be included in the Surface Drainage Management Plan (Commitment 2). While the road would necessarily affect watercourses in that a small proportion of riverine vegetation would need to be cleared, the function of watercourses should not be significantly affected, provided that MRWA undertakes a process of flow investigations, hydrological modelling, and subsequent bridge, culvert and floodway design. This process is aimed at preventing unnecessary flow constriction or alteration, loss of riparian vegetation, sedimentation and the effects of backwaters and scouring associated with poorly designed bridges, floodways and culverts. This process of addressing watercourse crossings will be set out in MRWA's Surface Drainage Management Plan (Commitment 2).

There are also operational risks associated with the location of the road through two Priority 1 water source protection areas, the Harding Dam catchment area and the Millstream Water Reserve. MRWA has consulted with the Water and Rivers Commission (WRC, now Department of Environment) during the earlier planning stages of the proposed road and has concluded the risk of the road contributing to the contamination of the water catchments to be low.

Based on the above, the EPA has concluded that it is unlikely that the EPA's objectives would be compromised provided there is satisfactory implementation by the proponent of the their commitments and the recommended conditions set out in Appendix 4 and summarised in Section 4.

Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister notes that the proposal being assessed is for MRWA to construct and maintain a road from North West Coastal Highway, near Karratha to the Nanutarra-Munjina Road, north of Tom Price.
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3.
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4, and summarised in Section 4, including the proponent's commitments.
4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

Proponent's commitments

The proponent's commitments as set in the CER and subsequently modified, as shown in Appendix 4, should be made enforceable. These include:

(a) employing a dedicated environmental co-ordinator to provide advice and supervise the environmental aspects of the construction phase of the proposal (Commitment 1);

(b) preparation and implementation of a Surface Drainage Management Plan (Commitments 2 & 3);

(c) preparation and implementation of a Vegetation Protection and Rehabilitation Plan (Commitments 4 & 5);

(d) preparation and implementation of a TEC Protection and Management Plan (Commitments 6 & 7);

(e) commitment to undertake rehabilitation trials in consultation with CALM (Commitments 8 & 9);

(f) preparation and implementation of a National Park Plan (Commitments 10 & 11);

(g) preparation and implementation of an Aboriginal Heritage Management Plan (Commitments 12 & 13);

(h) preparation and implementation of a Construction Management Plan (Commitments 14 & 15);

(i) construction of approximately 30 kilometres of fencing along the northern boundary of the National Park (Commitment 16); and

(j) contribution of $25000 a year for five years towards a weed control program in the National Park (Commitment 17).

Conditions

Having considered the proponent's commitments, as set out above, and the information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by MRWA to construct and maintain a road from North West Coastal Highway, near Karratha to the Nanutarra-Munjina Road, north of Tom Price is approved for implementation. These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

(a) that the proponent shall fulfil the environmental management commitments as set out in Schedule 2 to the recommended conditions in Appendix 4;

(b) the control of weeds along the road alignment both during and following construction (Condition 6);

(c) restricting the width and area of disturbance in the TEC and the NP during construction (Condition 7-1 and 7-2);

(d) the rehabilitation of areas disturbed during construction and as environmental offsets (Condition 7-3); and

(e) the development of completion criteria for areas to be rehabilitated (Condition 7-4).

Contents

1. Introduction and background

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the environmental factors relevant to the proposal by Main Roads Western Australia (MRWA) to construct and maintain a new road from Northwest Coastal Highway (near Karratha), through the Millstream-Chichester National Park, to the Nanutarra-Munjina Road intersection (north of Tom Price).

The proposal, which is described within the MRWA's Consultative Environmental Review (CER) document (GHD, 2003), was referred to the EPA in September 1998 by MRWA, the proponent. The EPA determined that the likely environmental impacts are sufficient to warrant formal assessment of the proposal under the *Environmental Protection Act 1986.* In October 1998 the EPA determined the level of assessment for the proposal at CER and the CER document was released on 6 January 2003 and the closing date for submissions was 3 March 2003.

In relation to previously assessed proposals within the Millstream-Chichester National Park (NP), it should be noted that the EPA's report and recommendations for the West Angela Iron Ore (EPA Bulletin 924, 1999) has relevance to this assessment. The EPA advised in Bulletin 924 that *'the construction of a new railway line through the Millstream-Chichester National Park cannot be managed to meet the EPA's environmental objectives for national parks and A-Class conservation reserves'* (EPA, 1999). The EPA further advised that *'Should the Government decide to approve a new railway line within the Millstream-Chichester National Park, it should be within one kilometre of the existing line to lessen the adverse impacts on the purpose and use of the park'.* It is noted that the subsequent environmental approval issued for the West Angelas project by the then Minister for the Environment included an Implementation Condition which specified that the new railway line should not lie more that one kilometre from the existing railway.

In summary, Bulletin 924 sets out a general position of the EPA that future road, rail and other corridors in the NP should be rationalised and that they should be developed within one kilometre of the existing infrastructure corridor.

Further details of the proposal are presented in Section 2 of this report. Section 3 discusses the environmental factors relevant to the proposal. The Conditions and Commitments to which the proposal should be subject, if the Minister determines that it may be implemented, are set out in Section 4. Section 5 presents the EPA's conclusions and Section 6, the EPA's Recommendations.

Appendix 5 contains a summary of submissions and the proponent's response to submissions and is included as a matter of information only and does not form part of the EPA's report and recommendations. Issues arising from this process, and which have been taken into account by the EPA, appear in the report itself.

2. The proposal

Currently access between Karratha, Roebourne and Tom Price on the public road system is via the Roebourne-Wittenoom Road and the Nanutarra-Munjina Road. MRWA has advised that vehicles commuting between these two centres use (subject to obtaining a permit from the rail operator) the shorter, private rail access road along the existing Dampier to Paraburdoo railway line rather than the public road.

The need for a more direct link between Karratha and adjoining towns to the inland communities of Tom Price, Paraburdoo and Newman was recognised in the *Regional Road Development Strategy* (Roads 2020) and the *Pilbara Regional Transport Strategy*. The *Central Pilbara Infrastructure Planning Study* (1999) also recognised the need for a sealed link between Karratha and Tom Price, servicing the expanding Pilbara tourism industry and providing social benefits to the inland towns of Tom Price and Paraburdoo.

Following a planning and consultation exercise in 1997/8, and the CER process, MRWA has identified a preferred alignment, which closely follows the Pilbara Rail Company (PRC) railway and access track from Paraburdoo to Dampier. While the CER report identified a preferred alignment, several other alternative road alignments were shown and described in the CER (Figures A and B, GHD, 2003) and compared in terms of their environmental impacts.

MRWA's preferred road alignment is shown in Figures 1 and 2. It is noted that in the event the proposal is approved for implementation by the Minister for the Environment, further consultation will be required with CALM during the detail design. Further refinements to the alignment and exact placement may be a result of this further consultation. MRWA will also be required to consult with the Conservation Commission (CC), as the vesting body for the NP, in relation to the creation of dedicated road reserve within the NP. MRWA has advised that the area of land required for excision from the NP would be approximately 240 hectares, which would allow for a nominal 60 metre wide road reserve to be established.

The proposed road has been designed as a single carriageway with a seven metre wide seal, and a nine metre wide formation for a design speed limit of 110 kilometres an hour. The road will be approximately 245 kilometres long with approximately 40 kilometres being constructed along the existing Roebourne-Wittenoom Road reserve. Construction of the proposal will also include construction of other infrastructure to support the road, such as:

- road drainage structures;
- material pits;
- cross drainage (culverts, floodways and bridges);
- new railway level crossings;
- stopping bays and rest areas;
- guard rails and fencing; and
- connections to existing public and private roads.

Approximately 474 hectares of native vegetation will be required to be cleared for the proposed road, of which 110 hectares of clearing would occur within the NP. Up to a further 100 hectares of native vegetation along the alignment would be required for the sourcing of fill and basecourse materials for construction.

The main characteristics of the proposal are summarised in Table 1 below. A detailed description of the proposal is provided in Section 1 of the CER (GHD, 2003).

Table 1: Summary of key proposal characteristics

Element	Quantities/Description
Length	Approximately 245 kilometres.
Connections to existing roads	North West Coastal Highway; Roebourne-Wittenoon Road; Millstream-Yaraloola Road; Mt Bruce Road; and Nanutarra-Munjina Road.
Approximate area of native vegetation disturbance • Road formation and associated infrastructure • Material sources	Approximately 474 hectares. Approximately 137 hectares will be rehabilitated during and following construction. Up to 100 hectares. The majority will be rehabilitated following construction.
Design Speed	110 kilometres per hour.
Formation Width	Approximately 9 metres.
Waterway crossings	Up to 9 bridges across major watercourses and railway lines. Culverts and low-level floodways will be used for all other waterway crossings.
Railway crossings	1 road over rail bridge. 4 new level crossings.
Fencing of road reserve	Approximately 200 kilometres of stock fencing will be erected along the road reserve outside the Millstream Chichester National Park.

Since release of the CER, the proponent has made a number of modifications to the proposal. These include:

- The provision of an environmental offset package as described in Section 3.1.
- Rejection of the 'Preferred (2)' alignment, near Camp Curlewis and north of Barawanna Hill within the NP, as shown in the CER, following advice from CALM that this alignment would result in unnecessary disturbance to a new area

that includes a poorly known and inadequately collected flora. Following further consultation with CALM, MRWA has located the road alignment on the western side of the existing railway north of Barawanna Hill.

- Minor realignments within the environmental study corridor to maximise the utilisation of cleared areas and access tracks to effect further reductions in the clearing of native vegetation.
- An additional flora survey was undertaken following more favourable climatic conditions.

The potential impacts of the proposal initially predicted by the proponent in the CER document (GHD, 2003) and their proposed management are summarised in Sections 6 and 7 of the CER.

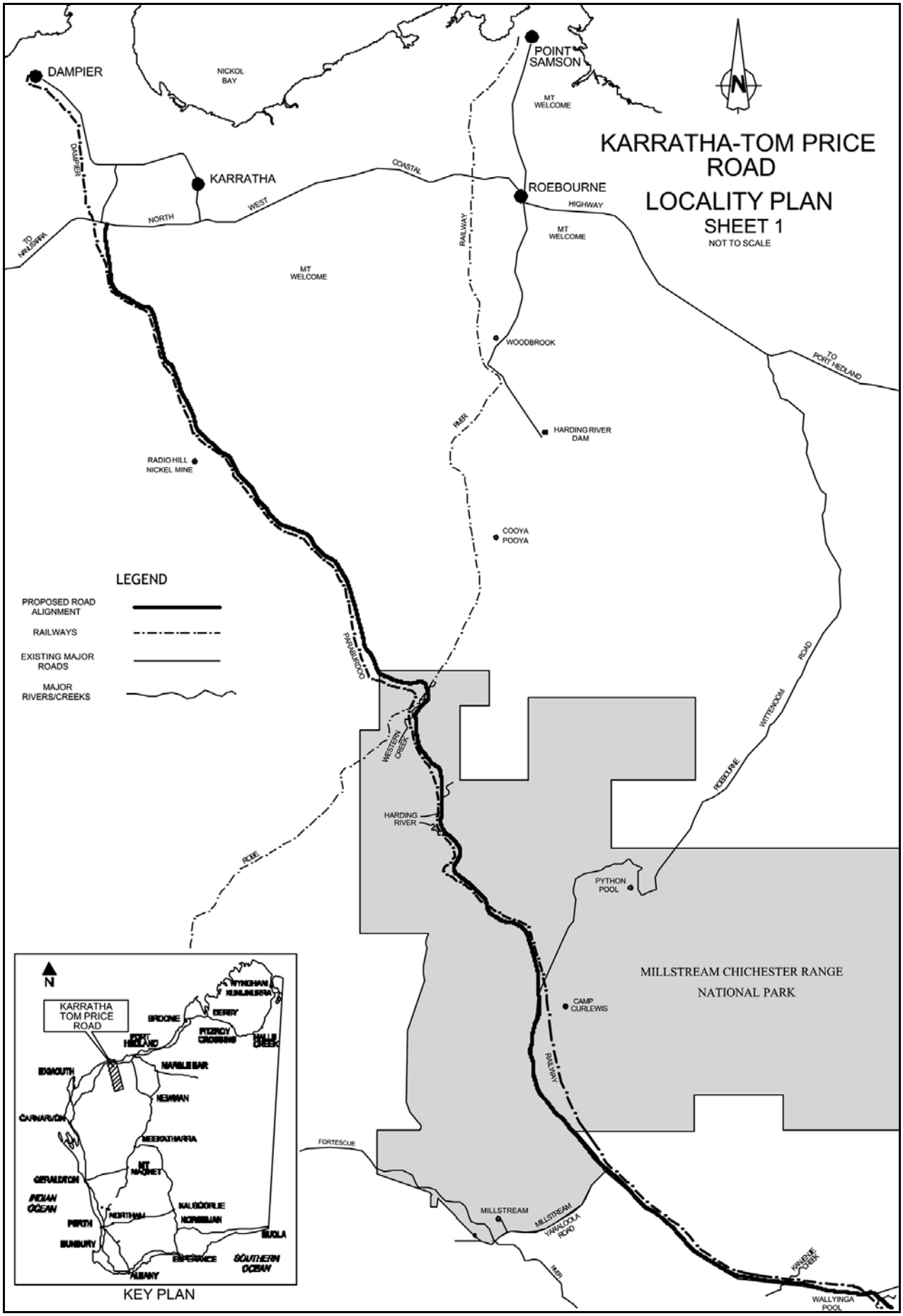

Figure 1: Proposal location and location of road alignment – northern section

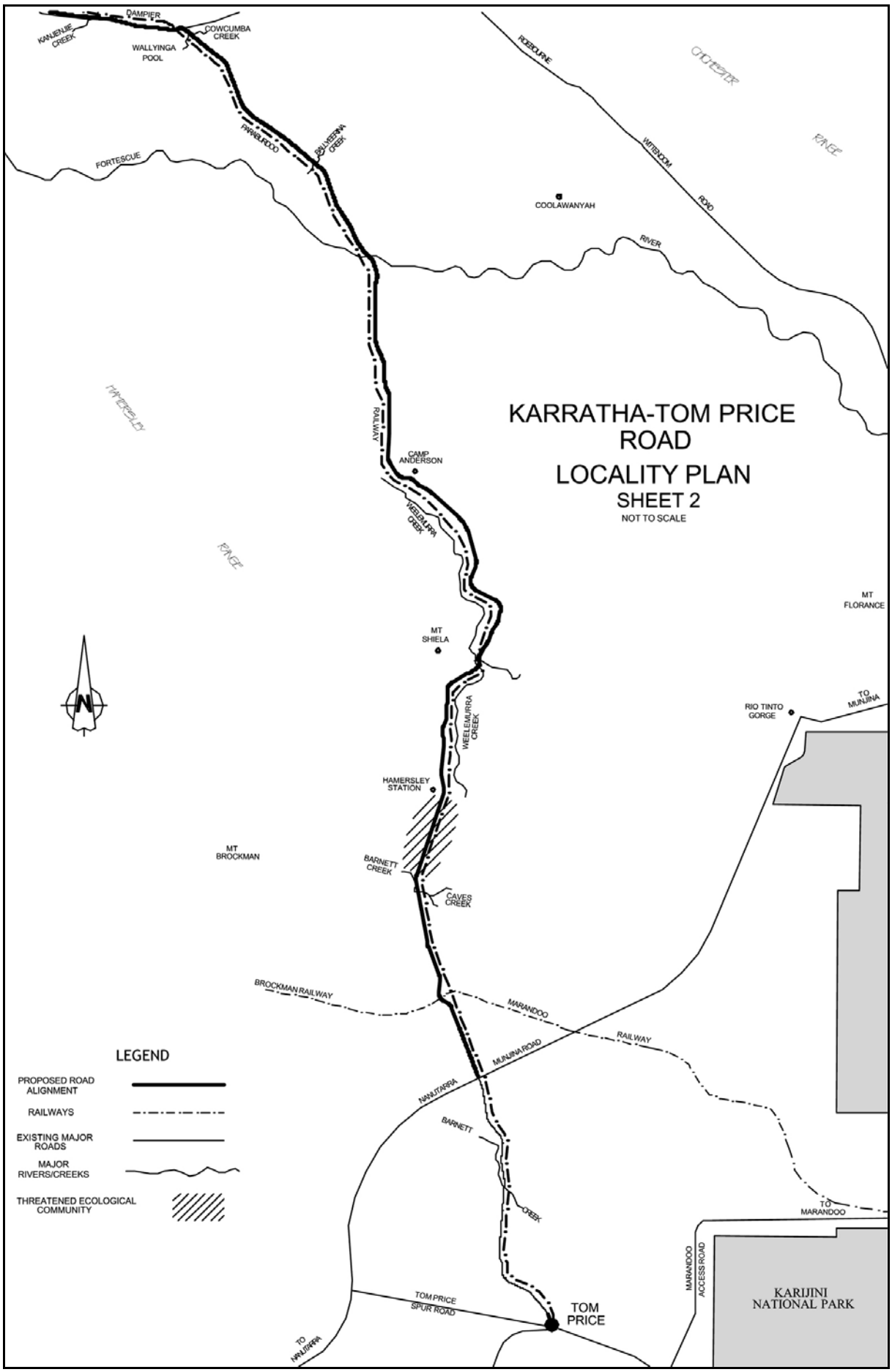

Figure 2: Location of road alignment – southern section

3. Relevant environmental factors

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

The identification process for the relevant factors selected for detailed evaluation in this report is summarised in Appendix 3. The reader is referred to Appendix 3 for the evaluation of factors not discussed below. A number of these factors, such as Aboriginal Heritage, are very relevant to the proposal, but the EPA is of the view that the information set out in Appendix 3 provides sufficient evaluation.

It is the EPA's opinion that the following environmental factors relevant to the proposal require detailed evaluation in this report:

a) Biodiversity; and
b) Surface Drainage.

In relation to the factor of Biodiversity above, the EPA's assessment of this factor is based on the discussion of the proposal's impacts on the following four key issues:

1) key impacts and issues identified within the NP (Section 3.1.1);
2) impacts on the threatened ecological community (Section 3.1.2);
3) impacts and management outside the NP (Section 3.1.3); and
4) rehabilitation (Section 3.1.4).

The above relevant factors were identified from the EPA's consideration and review of all environmental factors generated from the CER document and the submissions received, in conjunction with the proposal characteristics.

Details on the relevant environmental factors and their assessment are contained in Sections 3.1 - 3.2. The description of each factor shows why it is relevant to the proposal and how it will be affected by the proposal. The assessment of each factor is where the EPA decides whether or not a proposal meets the environmental objective set for that factor.

3.1 Biodiversity

Description

The primary impacts of the proposal on biodiversity will be due to loss of native vegetation and fauna habitats associated with clearing for road construction.

Based on concept design of the route, MRWA has provided revised estimates of areas of native vegetation to be cleared for the road as part of its response to submissions. These areas with respect to the relevant land tenures are provided in Table 2 below.

As indicated in Section 2, the proposed road and associated infrastructure will require the clearing of approximately 474 hectares of native vegetation. Clearing of vegetation will occur within Crown Lands, Pastoral leases, existing road reserves and the NP. Those areas disturbed during construction which do not form part of the carriageway will be rehabilitated during, or at the completion of construction works. In its response to submissions, MRWA estimated that approximately 137 hectares will be available for rehabilitation and this estimation takes into account areas of rock cuttings where revegetation may not be possible. Taking into account the areas to be rehabilitated, the EPA notes that the construction of the road and associated elements will result in the net loss of approximately 337 hectares of native vegetation. A breakdown of areas to be cleared and rehabilitated is provided in Table 2 below.

Table 2: Table of estimated areas of vegetation to be cleared and rehabilitated

Land Tenures	**Estimated area of vegetation to be impacted in hectares**	**Estimated area to be rehabilitated in hectares**
Millstream-Chichester National Park	110	34
Existing Road Reserve	46	23
Crown Land/Pastoral Lease	318	80
Total	**474**	**137**

MRWA has not provided detailed estimates of clearing required for material sources (borrow and basecourse materials), however it has been indicated that up to a further 100 hectares of native vegetation could be required for the sourcing of materials subject to further investigations within the environmental study corridor.

MRWA has conducted flora, vegetation and fauna surveys of the project area as reported in the CER (GHD, 2003). No Declared Rare Flora species have been identified within the project area. A threatened ecological community (TEC) which supports the priority 3 species *Themeda* sp. Hamersley Station (M.E. Trudgen 11431), (a perennial grass species) as a dominant of the community occurs south of the Hamersley Ranges and will be impacted by the road. This community is classed as vulnerable under CALM's list of TECs. The criterion for this classification is that the community has been adequately surveyed and is not critically endangered or endangered, but is facing a high risk of total destruction or significant modification in the medium to long-term future. Existing threats to this TEC are from indiscriminate burning, grazing pressure and introduced species. This community is not listed for the purposes of the Commonwealth's *Environmental Protection and Biodiversity Conservation Act 1999.*

Apart from the TEC, MRWA has advised that all other vegetation communities found within the alignment study corridor are well represented in the local and broader region.

MRWA's fauna assessment indicates the project area has a rich vertebrate fauna, with the Fortescue plain landform supporting more species than any other landform unit in the project area. A total of 105 species were recorded during the field survey. Based on fauna surveys within the study corridor and assessments of habitats and fauna species likely to occur in the area, the project area could support 41 mammal species, 137 bird species, 96 reptile species, 9 amphibian species and 7 fish species. These include a number of threatened or priority species.

Of significance, is the Pilbara Olive Python (*Morelia olivecea barroni*) which was recorded during the fauna survey. This species is likely to be present wherever there are watercourses and river pools in the Chichester and Hamersley Ranges and on the Fortescue Plain. This species is listed as Vulnerable under the Western Australian *Wildlife Conservation Act 1950* and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*. MRWA recognises the significance of watercourses in the Pilbara as important fauna habitats/refuges and has located river crossings close to existing areas of disturbance or infrastructure where safety standards allow, and proposed strategies for minimising habitat loss and maintaining flow regimes and river pools (Surface Drainage Management Plan - Commitment 2). These strategies are discussed in Section 3.2 – Surface Drainage.

Fauna habitats of local significance include mulga woodlands, cracking clay communities, watercourses and associated riparian vegetation.

Submissions

The main points raised in submissions focused on:

- the alignment through the NP;
- the need to minimise railway crossings;
- the need to locate the alignment as close as possible to existing infrastructure and utilise existing tracks and disturbed areas;
- the need to limit impacts in the NP and the TEC;
- the use of existing material pits in the NP;
- standard of rehabilitation;
- support for the commitment to fence the road reserve;
- the impacts of the road on level of visitation to the NP with consequent impacts on environmental and social values;
- the importance of controlling weeds particularly for the control and management of Ruby Dock; and
- the need to undertake a further flora survey as the initial flora survey was undertaken under unfavourable drought conditions.

It should be noted that with respect to the need for an additional flora survey, CALM was satisfied with the standard of an additional flora survey undertaken in June 2004, following favourable climatic conditions.

The proponent's summary of, and detailed response, to issues raised in submissions is provided in electronic format (compact disk) in Appendix 5.

Assessment

The area considered for assessment of this factor is the 245 kilometres road alignment from Northwest Coastal Highway (near Karratha), through the NP, to the Nanutarra-Munjina Road intersection (north of Tom Price) and includes the various elements required to be constructed to support the road.

The EPA's environmental objectives for the integrated factor of biodiversity that are of relevance to this proposal are:

- to maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities, terrestrial flora and fauna;
- to protect Declared Rare and Priority flora and Specially Protected (Threatened) Fauna consistent with the provisions of the *Wildlife Conservation Act 1950*; and
- to ensure the purpose and usage of conservation reserves and national parks are not compromised.

The EPA's assessment of this factor is based on the discussion of the proposal's impacts on the following four key issues:

1) key impacts and issues within the NP (Section 3.1.1);
2) impacts on the threatened ecological community (Section 3.1.2);
3) impacts and management outside the NP (Section 3.1.3); and
4) rehabilitation (Section 3.1.4).

3.1.1 Key impacts and issues within the National Park

Footprint and alignment

The footprint of the road through the NP is approximately 110 hectares based on a concept design of a 55 kilometre long alignment in the NP. Taking into account the areas to rehabilitated following construction (34 hectares), it is noted that the proposed road would result in the net loss of approximately 76 hectares in the NP. The EPA considers that restricting clearing within the NP is of particularly importance and hence has specified the maximum clearing area and the rehabilitation of disturbed areas in the recommended conditions to be imposed by the Minister for the Environment (Condition 7-2 & 7-3).

In terms of proximity to existing infrastructure, MRWA's preferred alignment through the NP is located almost entirely within the 1 kilometre corridor from the existing Paraburdoo to Dampier railway line, and in some cases, adjacent to the railway lease (defined as 40 metres on either side of the rail centreline). This is generally consistent with the position set out in the EPA's assessment of the West Angelas project (EPA

Bulletin 924). There are two sections of the road alignment that deviate more than 1 kilometre from the existing rail line but from an environmental perspective these deviations are not considered to be significant. The alignment near the Pilbara Iron communications tower has been located approximately 1.3 kilometres from the existing line to avoid topographic and infrastructure constraints and would have required large volumes of cuttings together with difficulties in accommodating drainage. The section near the southern boundary of the NP, while outside the 1 kilometre corridor, follows the existing Roebourne-Wittenoom Road reserve, which is an existing transport corridor and an area of disturbance.

In relation to the section of the alignment north of Barawanna Hill and the Roebourne-Wittenoom Road turn-off, CALM has advised its preference for this section be located on the western side of the railway to avoid disturbing areas containing poorly known and inadequately collected flora. Following MRWA's response to submissions and further consultation with CALM, this section of the alignment is now proposed to be located on the western side. The EPA notes that this section now remains as close as practical to the existing disturbance of the access road and rail line and avoids the undisturbed section of the flat adjacent to the Roebourne-Wittenoom Road.

The proposed alignment through the NP is considered to be acceptable in view of the MRWA's ongoing consultation with CALM, the alignment's proximity to the existing infrastructure and disturbed areas, the utilisation of existing tracks (where possible), and the MRWA's commitment to restrict clearing widths.

Material sources

CALM has advised that MRWA's proposal for eight new borrow pits (up to 6 hectares) to be located in the NP is of concern. However, given that there are already numerous borrow pits (active and abandoned) in the NP, CALM has advised that existing borrow pits should be accessed for gravel and subsequently rehabilitated by MRWA, rather than creating new pits in the NP.

In its response to submissions, MRWA has advised that existing material pits within the NP have been tested for suitability and in some cases the material is suitable for use as fill. MRWA has advised however that none of the material from the existing pits is suitable for constructing the basecourse and is therefore actively searching for basecourse materials outside the NP. Should suitable material not be found elsewhere, MRWA has advised that it may have to consult with CALM in relation to the potential use of basecourse materials in the NP.

The creation of new material pits in a NP should be avoided in the first instance as a matter of best practice. The EPA recommends that if other options for material sourcing have been examined and exhausted, new pits in the NP should only proceed following consultation and approval from CALM and the CC and under strict environmental procedures that address hygiene, drainage and rehabilitation issues.

Managing indirect impacts

The location of the road within a NP accentuates the need for careful management of impacts beyond the road's footprint, particularly in relation to the potential impacts from the spread of weeds, fire, erosion, potential drainage shadows and management of wastes and hydrocarbons.

For the issue of weeds, CALM has expressed concerns in relation to the potential impacts from the spread of weeds and the proponent's estimation of the extent and potential spread of Ruby Dock (*Acetosa vesicaria*). The EPA has noted CALM's concerns and has recommended conditions for the control and management weeds, particularly Ruby Dock (Condition 6-1).

MRWA has committed to including a range of environmental management strategies and procedures in the Surface Drainage Management Plan (Commitment 2), the Vegetation Protection and Rehabilitation Plan (Commitment 4), and a Plan to manage the construction and ongoing impacts in the NP (Commitment 10). These plans are to be prepared in consultation with CALM and prior to the commencement of construction. Following the release of the CER, MRWA has also committed to ensure that an environmental co-ordinator is available in the field during the construction of the proposal to ensure that environmental advice and the relevant environmental procedures are communicated to the construction workforce and that a high standard of environmental management is applied during construction (Commitment 1). The EPA considers that the above commitments, procedures for construction workforce awareness and ongoing involvement with CALM, can ensure the potential indirect impacts from the road are appropriately managed.

CALM is of the view that the construction of the road will have a dramatic impact on the level of visitation to the NP with a consequent impact on environmental and social (i.e. visitor experience) values. The predicted increase in number of visitors to the park will place considerably more pressure on facilities within the park (i.e. the Visitor Centre, camping areas, day use areas) and create significant maintenance requirements for the Millstream Yaraloola and Millstream access roads. In view of the above concerns CALM has suggested the provision of a sealed access road from the proposed road to the Millstream visitor centre in the NP, as an environmental offset.

MRWA acknowledges that providing a new high standard road through the NP is likely to encourage more visitors to access the park and that providing a sealed access road to the Millstream visitor centre would assist in management of the NP. However, MRWA is of the opinion that traffic numbers to the NP resulting from the proposal would still be small in absolute terms and that there are existing avenues through Local Government to access funding for the improvement of the access road in question. While MRWA considers that the provision of sealed access road through the NP is not appropriate as an environmental offset, it has indicated that it will continue to liaise and cooperate with CALM regarding management strategies for the NP, wherever possible. Further discussion on MRWA's package of environmental offsets is provided below.

Environmental Offsets

Following the release of the CER and advice from CALM, MRWA has committed to a package of environmental offsets to mitigate the impacts of the road within the NP. MRWA's environmental offset package includes the following components:

- the rehabilitation of existing railway access tracks that will no longer be required for track inspection and maintenance. This will be undertaken in consultation with the rail operator and CALM. Preliminary estimates inside the NP indicate that an area of approximately 25 hectares would be available for rehabilitation. Further discussion on the standard of rehabilitation is provided in Section 3.1.4 below;

- the renewal/reconstruction of approximately 30 kilometres of fencing between Pyramid Station, to the north, and the NP (as suggested by CALM). This will assist in controlling stock and some feral animal movements into the NP and would have benefits for native vegetation; and

- a five year contribution of $25 000 per annum to the ongoing weed control programme at Millstream (as suggested by CALM). CALM has advised that the weeds to be controlled would include date palm, cotton palm, morning glory, khaki weed, Galland's curse, Indian water fern and Parkinsonia.

The above offsets have been recommended as requirements in Condition 7 and Commitments 16 and 17 respectively.

In addition to the above environmental offset activities, which are all located within the NP, MRWA has also committed to rehabilitating redundant access tracks and redundant material pits outside the NP. Some of these redundant access tracks are associated with the adjacent railway and rehabilitation of these areas will be undertaken in consultation with the rail operator. There are also other access tracks and disused pits elsewhere in the Pilbara, for example along the North-West Coastal Highway, that MRWA has identified as being suitable for rehabilitation. MRWA has estimated that a further 180 hectares outside the NP would be available for rehabilitation work, as an environmental offset activity.

MRWA's overall package of environmental offsets is considered to be acceptable. It is noted that the package of offsets is broadly consistent with the EPA's *Environmental Offsets Preliminary Position Statement No. 9* (EPA, July 2004) to the extent that MRWA has demonstrated that it has followed a mitigation sequence and proposed 'primary' and 'secondary' offset activities. The Preliminary Position Statement on environmental offsets is currently being reviewed in light public submissions, prior to being finalised by the EPA.

3.1.2 Impacts on the threatened ecological community (TEC)

The TEC to be impacted is located outside the NP and is associated with cracking clay soils located near the Hamersley Station and includes a Priority 3 species (*Themeda* sp. Hamersley Station, perennial grass species) as a dominant of the community. CALM designated the status of this ecological community as *Vulnerable: Category A*.

MRWA's examination of CALM records indicates that this TEC covers approximately 34,600 hectares.

Direct impacts on the TEC includes a footprint of up to 17.5 hectares, over a distance of approximately 7 kilometres. The proposed road will therefore impact on a small proportion of the TEC relative to its current distribution (17.5 hectares out of 34,600 hectares). In addition to the impacts from this proposal, it should be noted that the TEC is currently traversed and impacted by the existing railway, associated access tracks, powerlines and also grazed by cattle from the surrounding pastoral leases.

Due to its large area, MRWA has indicated that minor realignments to the road will not provide an opportunity to avoid the TEC. To minimise impacts of the road through the TEC, MRWA will ensure that:

- borrow pits, parking bays, turning areas for construction and construction camps are not located in the TEC;
- that the width of the construction corridor will be limited to less than 20 metres; and
- a 200 metre wide road reserve will be fenced to assist in the protection of a small portion of the TEC from stock grazing, identified as one of the threatening processes.

The above has been recommended as requirements to be included in Condition 7-1 and Commitment 6 (TEC Protection Plan).

CALM has advised in its submission that MRWA's intent to limit the footprint of the proposal on the TEC is commendable and also the commitment to fence a 200 metre wide road corridor thought the TEC will be a positive outcome for biodiversity conservation as the major threat to this resilient community appears to be overgrazing by livestock.

In summary, having regard to CALM's advice, MRWA's commitments to limit impacts in the TEC and the relatively small footprint of the proposal (up to 17.5 hectares) relative to the distribution of the remaining area of the TEC, it is unlikely that the long term survival of the dominant Priority 3 species or the conservation status of the TEC will be significantly compromised by this proposal.

3.1.3 Impacts and management outside the National Park

Apart from the TEC described above, the impacts of the road on other species and vegetation communities along the alignment are not considered to be significant, mainly because they are more widely distributed and the areas to be impacted are in close proximity to an existing transport corridor. There are however a number of indirect impacts on fauna habitats such as those associated with watercourses and mulga woodland that will require management and monitoring by the proponent.

The construction of the road has the potential to modify surface drainage patterns with consequent impacts on native vegetation. This is an issue likely to require attention for areas that support mulga communities and where sheet flows predominate. Large stands of mulga associations occur at the southern end of the alignment within the Fortescue floodplain, between the Hamersley Ranges and the Fortescue River.

MRWA's preliminary drainage assessments indicates that the direction of sheet flows through these areas is likely to be parallel to the direction of the road and therefore sheet flow is unlikely to be significantly impacted by the road. MRWA has committed to undertake further detailed drainage assessment of the risk to mulga communities during the final design stage to ensure drainage shadows are not created or exacerbated as a result of the road. This will be included in Proponent's Surface Drainage Management Plan (Commitment 2) and the Vegetation Protection and Rehabilitation Plan (Commitment 4).

In view of the location of proposed alignment in close proximity to an existing transport corridor, which is likely to already have had impacts on surface hydrology and vegetation, and given that MRWA has had experience in drainage management techniques such as multiple culverts and spreader banks for maintaining sheet flow in other road projects in the Pilbara (eg. Karijini Drive), the EPA considers that the impacts of the road on sheet flow and mulga associations to be manageable.

The design and construction of river and creek crossings have the potential to impact the hydrology of watercourses which have been identified as important fauna refuge and habitat. Further discussion on the design and management of watercourse crossings is included in Section 3.2 (Surface Drainage) of this report.

MRWA has committed to fencing the new road reserve over the length of the alignment, where it occurs outside of the NP. Depending on the proximity of the road to the existing rail line, this commitment could result in a 200 metre strip of vegetation being included in the fenced area. While this is primarily a safety driven initiative, the new fence will provide protection from grazing pressures to a considerable area of native vegetation. MRWA estimates this area to be approximately 1950 hectares and anticipates this commitment will have long-term biodiversity benefits.

In summary, the road alignment (outside the NP) is proposed to be located in close proximity to existing infrastructure to minimise adverse impacts on drainage, vegetation and the landscape. In terms of minimising impacts on fauna habitats, key strategies will involve designing the road to minimise alterations to surface water flow along watercourses, and maintaining sheet flow through areas supporting mulga associations. These strategies will be included in the Proponent's Surface Drainage Management Plan (Commitment 2) and Vegetation Protection and Rehabilitation Management Plan (Commitment 4).

3.1.4 Rehabilitation

Elements of the proposal that include a rehabilitation component include:

- areas disturbed within the construction corridor (approximately 137 hectares);
- environmental offsets - rehabilitation of redundant access tracks and material pits within, and outside the NP (approximately 205 hectares); and
- various other components including construction camps, material pits etc.

MRWA has advised that, where possible, rehabilitation work will include ripping to ameliorate compaction, recontouring or other preparatory works, respreading of topsoil, brushing with material salvaged during clearing, and supplementary seeding using Pilbara provenance seed. Given that the Pilbara region contains a large variety of plant species and communities, the EPA emphasises the need for rehabilitation works to use plant species of local provenance.

The EPA considers that for rehabilitation of relatively large areas to be most effective, auditable and measurable targets and rehabilitation criteria should be developed in consultation with CALM, particularly where the road occurs within the NP. Preliminary rehabilitation criteria should be included in the Vegetation Protection and Rehabilitation Plan (Commitment 4) and, where possible should relate to soil stability, diversity and abundance of species, presence of weeds and disease, ecological processes and visual impacts etc. The EPA has recommended a condition which requires MRWA to develop rehabilitation criteria as part of the development of the Vegetation Protection and Rehabilitation Plan (Condition 7-4).

The EPA notes that MRWA has committed to work with CALM on the development of rehabilitation trials to assist in providing information on best practice rehabilitation procedures for similar projects in the Pilbara region (Commitment 8). These trials would also assist in the development of the rehabilitation criteria as described above.

Summary

Taking into account the information provided by MRWA and the discussion provided above in Sections 3.1.1, 3.1.2, 3.1.3 and 3.1.4, the EPA considers that it is unlikely that the EPA's objectives for biodiversity would be compromised by the proposal provided there is satisfactory implementation, by the proponent, of the recommended conditions and commitments set out in Appendix 4, and summarised in Section 4.

3.2 Surface Drainage – watercourses and water quality protection

Description

The major rivers and watercourses that are intercepted by the proposed road include the Harding and Fortescue Rivers and Western Creek. In addition to these there are a numerous other tributaries and smaller creek systems within the landscape. The risks to rivers crossed by the road can potentially include flow constriction or alteration, loss of riparian vegetation, sedimentation and the effects of backwaters and scouring due to poorly designed bridges and culverts. MRWA has advised that a number of drainage structures such as bridges and culverts will be required to ensure that stress on the surrounding vegetation from flooding or drainage shadow effects is minimised and that scour and erosion is reduced.

The proposed road also traverses two Priority 1 Public Drinking Water Source Areas (PDWSA), the Harding Dam Catchment and the Millstream Groundwater Reserve. Priority 1 PDWSAs are declared over land where the provision of the highest quality drinking water is the prime beneficial land use.

Submissions

The main points raised in submissions focused on:

- the importance of ecological and landscape values in the determining sites for waterway crossings;
- the need to take into account the Department of Environment's (DoE) *'Water Quality Protection Note – Roads in Sensitive Environments'*;
- safeguards for the protection of water source protection areas; and
- management of hydrocarbons and solid and liquid wastes.

The proponent's summary of, and detailed response, to issues raised in submissions is provided in electronic format (compact disk) in Appendix 5.

Assessment

The area considered for assessment of this factor is proposed road alignment where it passes through watercourses (particularly major rivers and creeks) and Water Source Protection Areas.

The EPA's environmental objectives for this factor are:

- to maintain the integrity, functions and environmental values of watercourses; and
- to maintain the quality of surface and groundwater so that existing and potential uses, including ecosystem maintenance, are protected.

As indicated in Section 3.1.3, the design and construction of river and creek crossings has the potential to impact the hydrology of watercourse ecosystems and riparian vegetation, which have been identified as important fauna habitats and refuges. These habitats are particularly important for the Pilbara Olive Python (as described in Section 3.1) which are likely to be present at watercourses and river pools in the Chichester and Hamersley Ranges.

MRWA has advised that for each major crossing, parameters for water flows, gradients, streambed material and riparian vegetation will be reviewed. These parameters in conjunction with hydrological modelling will then be used to determine the most appropriate culvert/bridge design and management to minimise flow constriction, risk of scour and backwaters. To ensure the appropriate design of bridges, floodways and culverts, all quantifications, assumptions and measurements used in calculations will be reviewed by the DoE during the final design stage and prior to construction. The above technical information is also likely to be required as part of MRWA's application to interfere with the beds and banks of watercourses pursuant to the *Rights in Water and Irrigation Act*, which is administered by the DoE. In addition to addressing the interruption of surface water flows, MRWA should also examine opportunities to minimise the 'footprint' and disturbance to riverbeds at watercourse crossings.

The above strategies and the need for ongoing monitoring and management of waterway integrity and erosion risks following construction will be included in MRWA's Surface Drainage Management Plan (Commitment 2).

In terms of the location and alignment through major rivers such as the Fortescue and Harding Rivers and Western Creek, these alignments are accepted as the best available given the constraints imposed by existing infrastructure and considering other approved infrastructures that have yet to be implemented.

As indicated above, the proposed road also traverses two Priority 1 PDWSAs, the Harding Dam Catchment and the Millstream Groundwater Catchment. For the Harding Dam PDWSA the road is located in the upper Harding Catchment and is located approximately 30 kilometres upstream of the Harding Dam from where it crosses the Western Creek.

There are risks that a significant spill on the proposed road could pose a pollution threat for Harding Dam, particularly at Western Creek and the Harding River. However, given the low likelihood of accidents involving vehicles carrying hazardous loads and the distance of the road from the reservoir area, MRWA has concluded these risks to be negligible. It is also noted that the Harding Dam Water Source Protection Plan (Water and Rivers Commission, 1999) identified the likelihood of threats from the proposed road contaminating the water source, to be low.

The proposed road also traverses the Millstream Water Reserve (groundwater reserve) and, at its closest point, is located approximately 12 kilometres from the Millstream well field. MRWA consulted with the Water and Rivers Commission (now DoE) on the degree of risk to the Millstream well field from contamination in the event of an accident/spillage and subsequently concluded the risk of pollution to the Millstream aquifer to be low based on the distance to the well field and the hydrogeology of the area.

Strategies to address the risk of the road contaminating water sources would include:

- designing the road to reduce the likelihood of accidents;
- special pavement design in vulnerable areas;
- the careful siting of rest and parking bays;
- the careful siting of and waste management at temporary construction camps;
- erosion and sediment control during construction, particularly near sensitive watercourses;
- hydrocarbon storage and management including contingency plans to deal with spills during the construction phase, particularly near sensitive watercourses;
- joint-agency spill contingency planning and emergency response procedures; and
- incorporating the guidance provided in the DoE's *Water Quality Protection Note – Roads in Sensitive Environments* (DoE, 2004) in the design of the road.

It is expected that the appropriateness of the above strategies will be reviewed during the detailed design stage in consultation with the DoE and be included in the MRWA's Surface Drainage Management Plan (Commitment 2) and the Construction Management Plan (Commitment 14).

Summary

Having particular regard to:

- the risks to river and creek habitats at crossings can be addressed through the general process of flow investigations, modelling and subsequent bridge and floodway design and ongoing monitoring and management (Commitment 2 – Surface Drainage Management Plan); and
- the risks of the road contaminating water source protection areas to be low,

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objectives for this factor.

4. Conditions and Commitments

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

In developing recommended conditions for each project, the EPA's preferred course of action is to have the proponent provide environmental commitments to ameliorate the impacts of the proposal on the environment. The commitments are considered by the EPA as part of its assessment of the proposal and, following discussion with the proponent, the EPA may seek additional commitments.

4.1 Proponent's commitments

The proponent's commitments as set in the CER and subsequently modified, as shown in Appendix 4, should be made enforceable. These include:

- employing a dedicated environmental co-ordinator to provide advice and supervise the environmental aspects of the construction phase of the proposal (Commitment 1);
- preparation and implementation of a Surface Drainage Management Plan (Commitments 2 & 3);
- preparation and implementation of a Vegetation Protection And Rehabilitation Plan (Commitments 4 & 5);
- preparation and implementation of a TEC Protection and Management Plan (Commitments 6 & 7);
- commitment to undertake rehabilitation trials in consultation with CALM (Commitments 8 & 9);
- preparation and implementation of a National Park Plan (Commitments 10 & 11);
- preparation and implementation of an Aboriginal Heritage Management Plan (Commitments 12 & 13);
- preparation and implementation of a Construction Management Plan (Commitments 14 & 15);
- construction of approximately 30 kilometres of fencing along the northern boundary of the National Park (Commitment 16); and

- contribution of $25000 a year for five years towards a weed control program in the National Park (Commitment 17).

4.2 Recommended conditions

Having considered the proponent's commitments and the information provided in this report, the EPA has developed a set of conditions that the EPA recommends be imposed if the proposal by MRWA to construct and maintain a road from the North West Coastal Highway, near Karratha to the Nanutarra-Munjina Road, north of Tom Price, is approved for implementation.

These conditions are presented in Appendix 4. Matters addressed in the conditions include the following:

a) that the proponent shall fulfil the environmental management commitments as set out in Schedule 2 to the recommended conditions in Appendix 4;

b) the control of weeds along the road alignment both during and following construction (Condition 6);

c) restricting the width and area of disturbance in the TEC and the NP during construction (Condition 7-1 and 7-2);

d) the rehabilitation of areas disturbed during construction and as environmental offsets (Condition 7-3); and

e) the development of completion criteria for areas to be rehabilitated (Condition 7-4).

5. Conclusions

The EPA has considered the proposal by MRWA to construct and maintain a road from North West Coastal Highway, near Karratha to the Nanutarra-Munjina Road, north of Tom Price and has concluded that it can be managed to meet the EPA's objectives for the relevant environmental factors.

In developing this proposal, MRWA has taken into account the need to avoid creating new corridors and to locate the road as close as possible to existing infrastructure. This is particularly important where the road occurs within the Millstream-Chichester National Park (NP) to avoid adverse impacts on the Park's values.

Within the constraints imposed by the topography of the Chichester Ranges and the location of existing and proposed infrastructure, MRWA has identified a road alignment within the NP that is almost entirely within a 1 kilometre corridor from the existing railway and associated infrastructure. While there are two minor deviations (outside the 1 kilometre corridor) these are to avoid topographical and infrastructure constraints and are not considered to be significant deviations. In addition to locating the road in close proximity to existing infrastructure, MRWA has committed to restricting the width of disturbance during construction and also aligned some sections of the road to cover existing tracks and disturbed areas to effect further reductions in clearing.

In relation to the impacts of the road on the *Themeda* grassland threatened ecological community (TEC), the EPA notes that a relatively small proportion of the remaining extent of this TEC will be permanently impacted by the proposal and that MRWA has committed to restrict the width of disturbance through this sensitive area to less than 20 metres. The EPA has therefore recommended conditions to restrict disturbance widths through the NP and the TEC (Condition 7-1). CALM has advised that MRWA's commitment to fence a 200 metre road reserve through the TEC will be a positive outcome for biodiversity conservation as the major threat to this community appears to be overgrazing by livestock.

MRWA has developed an environmental offset package to mitigate the impacts of the proposal. The offset package consists of the rehabilitation of redundant access tracks and material pits both within and outside the NP (approximately 205 hectares), and contributions towards the management of the NP, including the re-construction of the fence along the northern boundary of the NP and the control of weeds in focus areas within the NP, such as Millstream.

MRWA recognises the significance of areas containing mulga associations and watercourses as important fauna habitats. For areas supporting mulga, MRWA has committed to undertake detailed drainage surveys to design the road to maintain sheet flows and this will be included in the Surface Drainage Management Plan (Commitment 2). While the road would necessarily affect watercourses in that a small proportion of riverine vegetation would need to be cleared, the function of watercourses should not be significantly affected, provided that MRWA undertakes a process of flow investigations, hydrological modelling, and subsequent bridge, culvert and floodway design. This process is aimed at preventing unnecessary flow constriction or alteration, loss of riparian vegetation, sedimentation and the effects of backwaters and scouring associated with poorly designed bridges, floodways and culverts. This process of addressing watercourse crossings will be set out in MRWA's Surface Drainage Management Plan (Commitment 2).

There are also operational risks associated with the location of the road through two Priority 1 water source protection areas, the Harding Dam catchment area and the Millstream Water Reserve. MRWA has consulted with the Water and Rivers Commission (WRC, now Department of Environment) during the earlier planning stages of the proposed road and has concluded the risk of the road contributing to the contamination of the water catchments to be low.

Based on the above, the EPA has concluded that it is unlikely that the EPA's objectives would be compromised provided there is satisfactory implementation by the proponent of the their commitments and the recommended conditions set out in Appendix 4 and summarised in Section 4.

6. Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister notes that the proposal being assessed is for the construction and maintenance of the road from North West Coastal Highway, near Karratha to the Nanutarra-Munjina Road, north of Tom Price.
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3.
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions set out in Appendix 4, and summarised in Section 4, including the proponent's commitments.
4. That the Minister imposes the conditions and procedures recommended in Appendix 4 of this report.

Appendix 1

List of submitters

Organisations:
Department of Conservation and Land Management
Hamersley Iron Pty Ltd
Robe River Mining Pty Ltd
Department of Environment
Pilbara Development Commission
Heritage Council of Western Australia
Department of Indigenous Affairs
Wildflower Society of Western Australia Inc

Individuals:
Dr Stephen van Leeuwen

Appendix 2

References

EPA (1999) *West Angelas Iron Ore Project – East Pilbara, Ashburton, Roebourne*. EPA Bulletin 924, January 1999.

EPA (2004) *Environmental Offsets - Preliminary Position Statement No. 9.* EPA, July 2004.

GHD (2003) *Karratha – Tom Price Road, Karratha to Nanutarra-Munjina Road Section – Consultative Environmental Review,* Volume 1, unpublished report for Main Roads Western Australia, January 2003.

GHD (2003) *Karratha – Tom Price Road, Karratha to Nanutarra-Munjina Road Section – Consultative Environmental Review, Technical Appendices*, Volume 2, unpublished report for Main Roads Western Australia, January 2003.

Appendix 3

Summary of identification of relevant environmental factors

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factors
BIOPHYSICAL			
Biodiversity	Clearing of approximately 474 hectares of native vegetation for road construction.	See Section 3.1 of the EPA report.	**Biodiversity is considered to be a relevant environmental factor and is discussed in Section 3.1 – Biodiversity of the EPA's report.**
Terrestrial Flora	Clearing of approximately 474 hectares of native vegetation for road construction.	See Section 3.1 of the EPA report.	**Terrestrial flora is considered to be a relevant environmental factor and is discussed in Section 3.1 – Biodiversity of the EPA's report.**
Terrestrial Fauna	Clearing of approximately 474 hectares of native vegetation and fauna habitats for road construction.	See Section 3.1 of the EPA report.	**Terrestrial fauna is considered to be a relevant environmental factor and is discussed in Section 3.1 – Biodiversity of the EPA's report.**
Wetlands /Watercourses	Construction of bridges, floodways, and culverts over watercourses.	It is recommended that the Department of Environment *'Water Quality Protection Note – Roads in Sensitive Environments'* be consulted for recommended best management practice for locating waterway crossings.	**Watercourse is considered to be a relevant environmental factor and is discussed in Section 3.2 – Surface Drainage of the EPA's report.**
Land Degradation	Clearing of approximately 474 hectares of native vegetation for road construction.	No comments provided.	The areas most at risk from soil erosion will be in the Chichester and Hamersley Ranges due to cut and fill required to traverse the hills. MRWA has advised careful design and management of embankments will be required in order to minimise the risks of land degradation in localised areas adjoining the road. It is unlikely that the construction of the road through pastoral leases will result in soil degradation. MRWA has advised that suitable design of drainage and minimisation of clearing, with

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factors
			appropriate rehabilitation, should be sufficient to ensure that soil condition is retained or improved. **Based on the above land degradation does not require consideration in the EPA's report.**
POLLUTION			
Air Quality	Gaseous emissions from increased traffic.	No comments provided.	**Air Quality does not require consideration in the EPA's report.**
Water – Surface and Ground water quality - contamination	Surface water runoff from the road has the potential to impact on surface and groundwater resources.	Initially, WRC advised that the 'Route option for the approach into Karratha' should avoid the Harding Dam catchment on the basis of total avoidance of the contamination risk of the drinking water source. Recent opinion, however, recognises advantages in the route following the Water Corporation's access road to Harding Dam, and then continuing through the catchment area, in accordance with the original option described in earlier planning documents (G.B. Hill report). Both WRC and Water Corporation agree that this earlier option would provide the best tourism outcome, best access to Karratha Township and safer access to Harding Dam filtration plant by WC personnel. Safeguards for the protection of the water source could be incorporated into the actual pavement design in vulnerable areas. It is accepted however, that this earlier option is unlikely to be re-considered at this late stage. An important requirement is for use of local surface water and groundwater to be managed through licensing. Prior to commencement, the proponent is required to obtain licences under the '*Rights In Water and Irrigation Act 1914'* for both well drilling and water extraction.	**Groundwater quality is considered to be a relevant environmental factor and is discussed in Section 3.2 – Surface Drainage of the EPA's report.**
SOCIAL SURROUNDINGS			
Aesthetic	Clearing of native vegetation.	No comments provided.	The visually significant areas of the route are generally considered to be the areas in and around the Chichester and Hamersley Ranges. Careful design and construction of

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factors
			cut and fill areas and shaping of batters will assist in reducing the visual impacts of the road through the ranges. Locating the road alignment in close proximity to an existing infrastructure corridor would also assist in minimising the impacts of the road on visual amenity and landscape values in the National Park. **In view of the above, the EPA considers that aesthetics and landscape do not require further consideration in the EPA's report.**
Landscape	Clearing of native vegetation.	No comments provided.	As above.
Culture and Heritage	Clearing of native vegetation. Registered archaeological and ethnographic Aboriginal sites have been identified in the vicinity of the preferred alignment.	The Department of Indigenous Affairs (DIA) expressed concern that Aboriginal heritage issues and consultation was not being considered early enough in the planning process. The DIA requested that copies of the relevant Aboriginal heritage studies be made available so that an assessment of the adequacy of the studies can be made. One submission mentioned the heritage value of the 'Old Camel Trail'. There are apparently a number of old flagstones that exist along the route south of Barowanna Hill and the Heritage value of this trail had not been addressed in the CER.	MRWA advise that it has undertaken consultation and preliminary surveys and identified a number of registered archaeological and ethnographic Aboriginal sites in the vicinity of the preferred alignment. These preliminary surveys have been provided to the Department of Indigenous Affairs (DIA). MRWA has advised the DIA and the local aboriginal communities that further survey work and consultation will need to be undertaken as part of the detailed design phase of the road to accommodate all heritage requirements once the alignment has been finalised and approved. It is noted that MRWA has

Preliminary Environmental Factors	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Environmental Factors
			committed to prepare and implement an Aboriginal Heritage Management Plan (Commitment 8 & 9) in consultation with the DIA to ensure that further surveys and consultation are undertaken and the proposal complies with the requirements of the *Aboriginal Heritage Act 1972*. In relation to the potential impacts of the proposal on the 'Old Camel Trail', MRWA advises that the impacts will only become clear during detailed design. The protection of any heritage material will be undertaken in consultation with the Heritage Council of Western Australia. **In view of MRWA's commitments and the requirements under the *Aboriginal Heritage Act 1972*, the EPA considers that Culture and Heritage does not require further consideration in the EPA's report.**

Appendix 4

Recommended Environmental Conditions and Proponent's Consolidated Commitments

Statement No.

Recommended Environmental Conditions

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

Road from Karratha to Tom Price, Shires of Ashburton and Roebourne

Proposal: The proposal is to construct and maintain a new road from the North West Coastal Highway, near Karratha to the Nanutarra-Munjina Road, north of Tom Price, as documented in Schedule 1 of this Statement.

The road which is approximately 245 kilometres in length traverses the Millstream-Chichester National Park.

Proponent: Main Roads Western Australia

Proponent Address: PO Box 6202
EAST PERTH WA 6004

Assessment Number: 1244

Report of the Environmental Protection Authority: Bulletin 1159

The proposal referred to above may be implemented by the proponent subject to the following conditions and procedures:

1 Implementation

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

2 Proponent Commitments

2-1 The proponent shall implement the environmental management commitments documented in schedule 2 of this Statement, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

3 Proponent Nomination and Contact Details

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

3-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent and provide a letter with a copy of this statement endorsed by the proposed replacement proponent that the proposal will be carried out in accordance with this statement. Contact details and appropriate documentation on the capability of the proposed replacement proponent to carry out the proposal shall also be provided.

3-3 The nominated proponent shall notify the Department of Environment of any change of contact name and address within 60 days of such change.

4 Commencement and Time Limit of Approval

4-1 The proponent shall substantially commence the proposal within five years of the date of this statement or the approval granted in this statement shall lapse and be void.

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

4-2 The proponent shall make application for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement to the Minister for the Environment, prior to the expiration of the five-year period referred to in condition 4-1.

The application shall demonstrate that:

1. the environmental factors of the proposal have not changed significantly;

2. new, significant, environmental issues have not arisen; and

3. all relevant government authorities have been consulted.

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

5 Compliance Audit and Performance Review

5-1 The proponent shall prepare an audit program and submit compliance reports to the Department of Environment which address:

1. the status of implementation of the proposal as defined in schedule 1 of this statement;

2. evidence of compliance with the conditions and commitments; and

3. the performance of the environmental management plans and programs.

Note: Under sections 48(1) and 47(2) of the *Environmental Protection Act 1986*, the Chief Executive Officer of the Department of Environment is empowered to monitor the compliance of the proponent with the statement and should directly receive the compliance documentation, including environmental management plans, related to the conditions, procedures and commitments contained in this statement.

6 Weed Control

6-1 In addition to Commitment 4 (Vegetation Protection and Rehabilitation Management Plan) in Schedule 2, to manage and control the spread of weeds, the proponent shall ensure that:

1. earthmoving vehicles and construction equipment are free of soil and vegetative material prior to entering the construction area;

2. quarries and borrow pits are surveyed for Ruby Dock (*Acetosa vesicaria*) prior to utilising the material from these pits for road construction;

3. borrow pits and areas containing Ruby Dock (*Acetosa vesicaria*) are delineated in the field (by roping or a system of markers) to prevent access for construction crew and machinery;

4. soil and construction materials brought into the construction area from other areas are weed free; and

5. a Weed Control and Monitoring Program is prepared and implemented in collaboration with the Department of Conservation and Land Management and the neighbouring railway operator(s) with the objective of controlling and eradicating existing weeds and future outbreaks of weeds along the road, particularly Ruby Dock (*Acetosa vesicaria*), both during and following construction,

to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.

7 Vegetation Protection and Rehabilitation

7-1 During road construction, the proponent shall limit the disturbance width of the road, where it traverses the *Themeda* grassland threatened ecological community, near Hamersley Station, as shown in Figure 2 in Schedule 1, to less than 20 metres, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.

7-2 During road construction, the proponent shall limit the area of vegetation to be cleared within the Millstream-Chichester National Park to less than 110 hectares to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.

7-3 During and following construction, the proponent shall rehabilitate:

1) approximately 137 hectares of land disturbed for the construction of the road. This includes all land disturbed from road construction which do not form part of the carriageway; and

2) approximately 205 hectares of redundant access tracks, including those tracks associated with the existing railway and redundant material pits as an environmental offset activity,

to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.

For the purpose of this condition, the specific locations, and methods and procedures for rehabilitation shall be included in the Vegetation Protection and Rehabilitation Plan (see Commitment 4).

7-4 To enure that rehabilitation is undertaken to an acceptable standard, prior to the commencement of construction, the proponent shall develop rehabilitation completion criteria to apply to the rehabilitation required by condition 7-3, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.

The rehabilitation completion criteria shall have timeframes and be included in the Vegetation Protection and Rehabilitation Management Plan (see Commitment 4 in Schedule 2).

7-5 The proponent shall monitor the progress of rehabilitation against the rehabilitation completion criteria referred to in condition 7-4 and shall implement contingency measures and supplementary rehabilitation works where the criteria are not being met, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management.

Schedule 1

The Proposal (Assessment No. 1353)
The proposal is to construct and maintain a sealed new road from the North West Coastal Highway, near Karratha to the Nanutarra-Munjina Road, north of Tom Price, as documented in Schedule 1 of this Statement.

The road traverses the Millstream-Chichester National Park.

The location and alignment of the proposal are shown in Figures 1 and 2. The Key Proposal Characteristics are shown in Table 1 below.

Table 1 - Key Proposal Characteristics

Element	**Quantities/Description**
Length	Approximately 245 kilometres.
Connections to existing roads	North West Coastal Highway Roebourne-Wittenoom Road Millstream-Yaraloola Road Mt Bruce Road Nanutarra-Munjina Road
Area of Disturbance • Road formation • Material sources	 Approximately 474 hectares – Of this, approximately 137 hectares will be rehabilitated following construction. Approximately 100 hectares.
Design Speed	110 kilometres per hour.
Formation Width	Approximately 9 metres.
Waterway crossings	Up to 9 bridges across major watercourses and railway lines. Culverts and low-level floodways will be used for all other waterway crossings.
Railway crossings	1 road over rail bridge. 4 new level crossings.
Fencing of road reserve	Approximately 200 kilometres of fence will be erected along the road reserve outside the Millstream-Chichester National Park.

Figures (attached)

Figure 1: Location of the proposal and location of road alignment.
Figure 2: Location of road alignment.

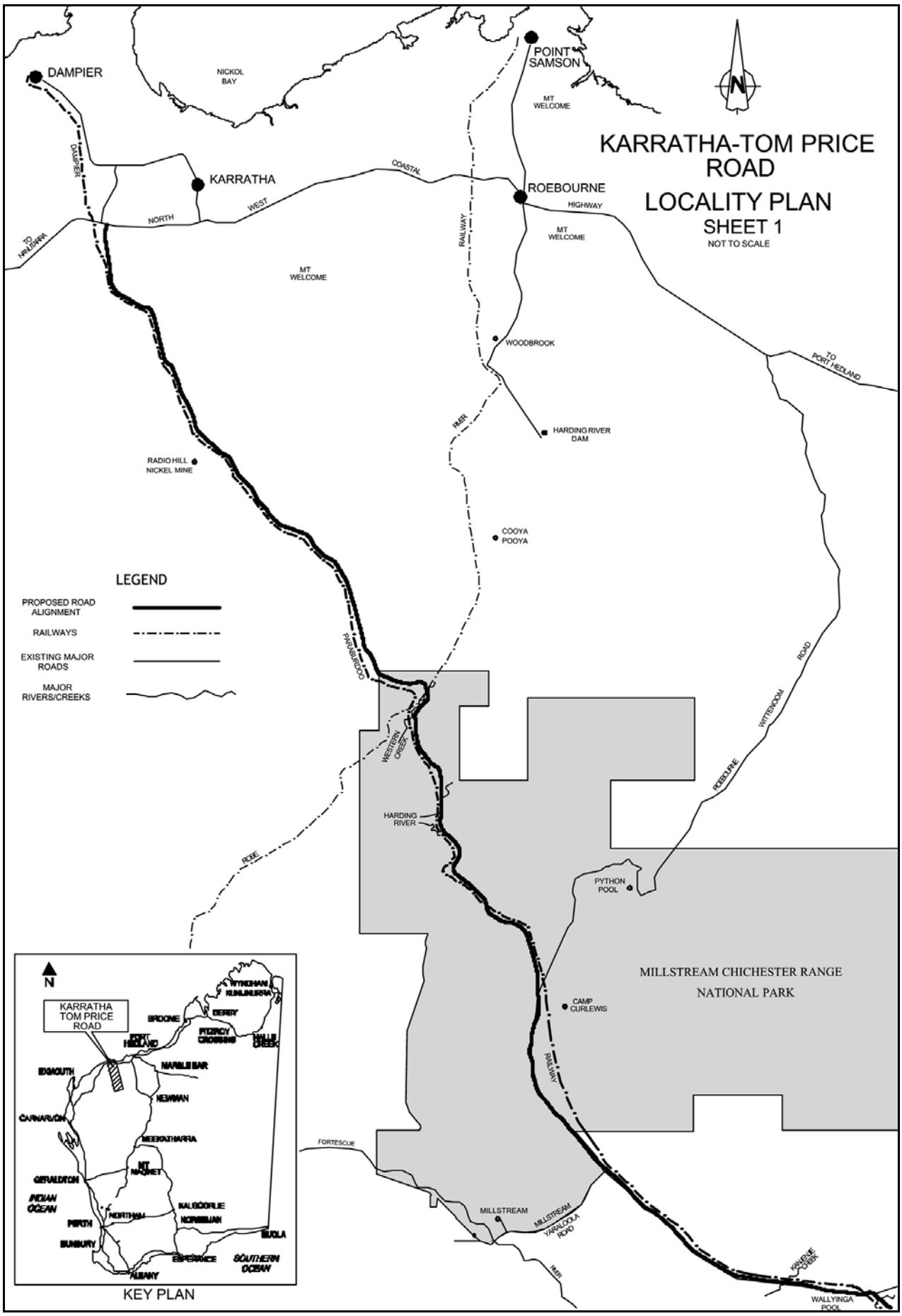

Figure 1: Location of the proposal and location of road alignment.

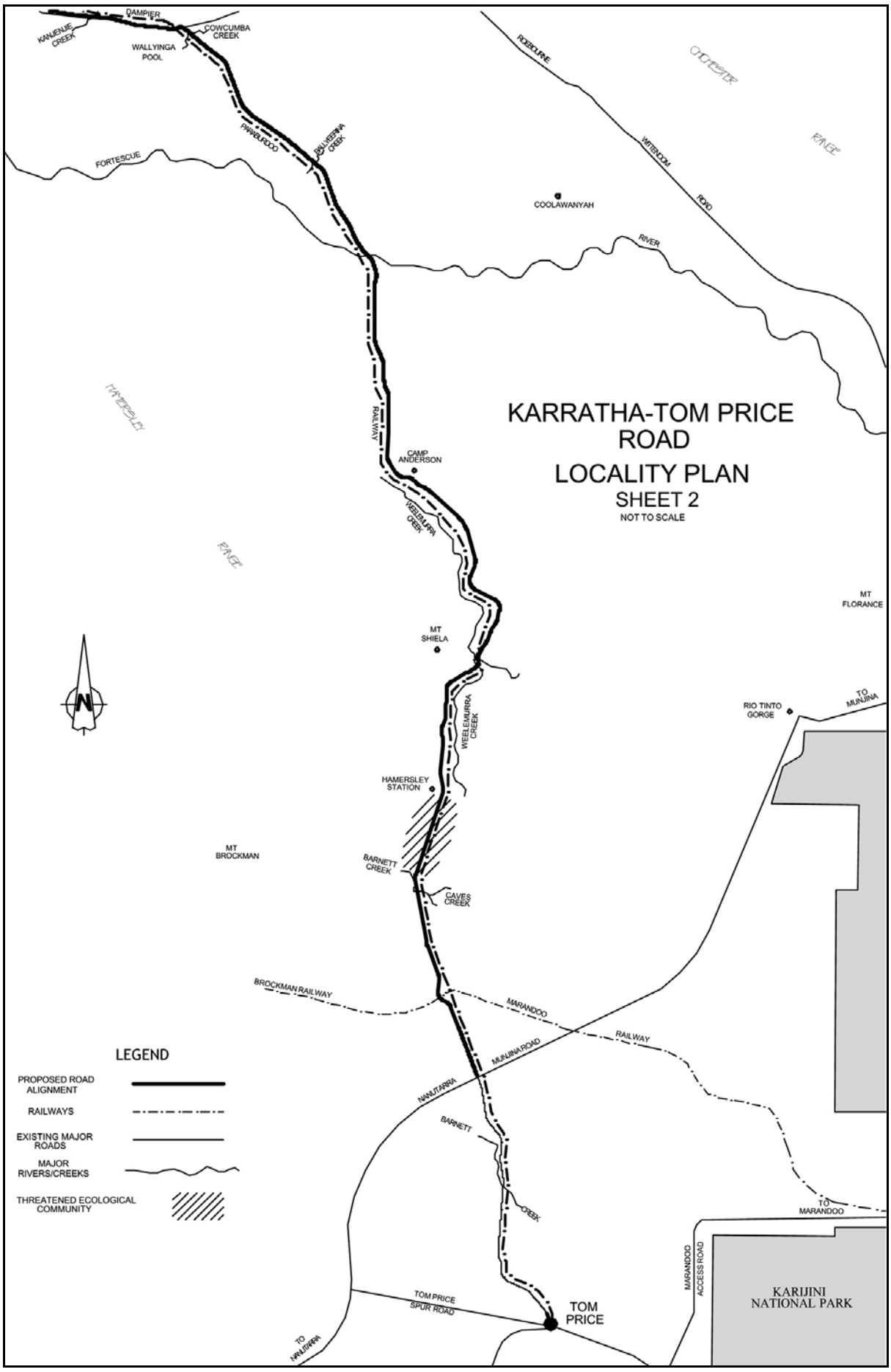

Figure 2: Location of road alignment

Schedule 2

Proponent's Environmental Management Commitments

December 2004

Road from Karratha to Tom Price, Shires of Ashburton and Roebourne

(Assessment No. 1244)

Main Roads Western Australia

Schedule 2

Tom Price to Karratha Road (Assessment 1244)
PROPONENT'S ENVIRONMENTAL MANAGEMENT COMMITMENTS

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

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

No.	Issue	Action	Objective	Phase	Advice
1.	Environmental Co-ordination	Employ a dedicated environmental co-ordinator to provide environmental advice and to supervise clearing and rehabilitation activities, particularly in the Millstream-Chichester National Park and the section of the road that traverses the threatened ecological community.	To ensure that environmental co-ordination is effective.	Construction	Department of Conservation and Land Management (CALM)

No.	Issue	Action	Objective	Phase	Advice
2.	Surface Drainage Management	Prepare a Surface Drainage Management Plan which includes the following elements: 1. Confirmation of design requirements (waterways report) for all major waterways; 2. Protection of embankments and waterway banks and beds; 3. Protection of riparian vegetation; 4. Strategies for maintaining sheet flows and avoiding drainage shadows (for example in Mulga groves); 5. Management strategies for protecting water quality in the Harding Dam and Millstream water catchment areas; 6. Emergency Response Planning for potential spills in the Harding and Millstream water catchment areas; 7. Details for monitoring of waterway integrity and erosion risks during and following construction; 8. Management and remediation of any impacts found during monitoring; and 9. Measurement and evaluation of environmental performance.	To maintain existing drainage patterns and prevent soil erosion and sedimentation caused by construction activity or new waterways structures.	Prior to commencement of construction.	CALM and Water and Rivers Commission
3.	Surface Drainage Management	Implement the Surface Drainage Management Plan	To maintain existing drainage patterns and prevent soil erosion and sedimentation caused by construction activity or new waterways structures	Design, construction, post-construction.	CALM and Water and Rivers Commission

No.	Issue	Action	Objective	Phase	Advice
4.	Vegetation Protection and Rehabilitation	Prepare a Vegetation Protection and Rehabilitation Management Plan to include the following elements: 1. Design and construction strategies which minimise loss of native vegetation and fauna habitat; 2. Details of restrictions on clearing, and clearing boundaries; 3. Protection of rare or significant flora; 4. Treatment and protection of riparian zones; 5. Treatment of material pits; 6. A detailed rehabilitation strategy which includes topsoil and weed management, brushing and seeding; 7. Monitoring measures for ensuring that vegetation is protected and replaced; and 8. Measurement and evaluation of environmental performance.	To prevent loss of vegetation beyond the 'footprint' of the works, and minimise potential indirect effects on vegetation. To rehabilitate areas disturbed by construction of the road.	Prior to commencement of construction.	CALM
5.	Vegetation Protection and Rehabilitation	Implement the Vegetation Protection and Rehabilitation Management Plan	To prevent loss of vegetation beyond the 'footprint' of the works, and minimise potential indirect effects on vegetation. To rehabilitate disturbed by construction of the road.	Construction and post-construction	CALM
6.	Threatened Ecological Community (TEC) Protection and Management	Prepare a TEC Protection and Management Plan which includes: 1. Fencing of the road reserve to provide a minimum 200-metre wide reserve; 2. Limits on clearing and construction activities, and 3. Barring of material pits.	To ensure that construction management in the TEC is of a similar standard to that employed in the National Park, and that this is to the satisfaction of CALM.	Prior to commencement of construction	CALM

No.	Issue	Action	Objective	Phase	Advice
7.	Threatened Ecological Community Protection and Management	Implement the TEC Protection and Management Plan	To ensure that construction management in the Threatened Ecological Community is of a similar standard to that employed in the National Park, and that this is to the satisfaction of CALM.	Design, construction, post-construction	CALM
8.	Rehabilitation Trials	Prepare a scientifically based rehabilitation trial for the treatment of redundant roads and tracks. Monitor and report the outcome of these trials.	To rehabilitate redundant tracks and to provide information on best practice methodology for use by Main Roads and others in the Pilbara in the future.	Prior to commencement of construction	CALM
9.	Rehabilitation Trials	Rehabilitate redundant roads and tracks using results of the trials referred to in Commitment 8.	To rehabilitate redundant tracks and to provide information on best practice methodology for use by Main Roads and others in the Pilbara in the future.	Construction and post-construction	CALM

No.	Issue	Action	Objective	Phase	Advice
10.	National Park Plan	Prepare a National Park Plan which addresses impacts in the Millstream-Chichester National Park and which includes as elements: 1. Design of appropriate interpretive signage and rest bays to promote understanding of Park values and protection of flora and fauna; 2. Design to minimise the ecological and visual impact of the road through: a. Minimising cut and fill through the Park; b. Specifying the width of the construction corridor through the Park; c. Best practice design of batters in cut and fill areas to provide stable landforms which blend in with the surrounding contours; and d. Reducing vegetation clearing through forward planning and sensitive design. 3. Long term management of the road reserve through the Park; and 4. Measurement and evaluation of environmental performance.	To minimise the impacts of the road through the Millstream-Chichester National Park.	Prior to commencement of construction	CALM
11.	National Park Plan	Implement the National Park Plan.	To minimise the impacts of the road through the Millstream-Chichester National Park.	Design, construction and post-construction.	CALM

No.	Issue	Action	Objective	Phase	Advice
12.	Aboriginal Heritage	Prepare an Aboriginal Heritage Management Plan that incorporates the following elements (in compliance with the *Aboriginal Heritage Act* (1972)): 1. A strategy for further Aboriginal heritage assessment and consultation during the final design of the road; 2. Details of commitments and conditions for design and construction activities to avoid impacts on significant sites.	To protect and preserve Aboriginal cultural heritage within the area influenced by the roadworks.	Prior to commencement of works.	Department of Indigenous Affairs (DIA).
13.	Aboriginal Heritage	Implement the Aboriginal Heritage Management Plan	To protect and preserve Aboriginal cultural heritage within the area influenced by the roadworks.	Design and construction	DIA
14.	Construction Management	Prepare a Construction Management Plan to address: 1. Management of construction camps, including waste management; 2. Noise, dust and other construction nuisance; 3. Management of transport, storage and use of hazardous materials and hydrocarbons, particularly through the Harding and Millstream water catchment areas.	To ensure that environmentally and socially acceptable standards are established and maintained during construction works	Prior to commencement of works	CALM, Local Authorities
15.	Construction Management	Implement the Construction Management Plan.	To ensure that environmentally and socially acceptable standards are established and maintained during construction works	Construction, post-construction	CALM, Local Authorities
16	Fence construction at Millstream-Chichester National Park	Construct approximately 30 kilometres of fencing along the northern boundary of the Millstream-Chichester National Park where it is occurs adjacent to Pyramid Station.	To prevent stock access into the National Park.	During construction and Post-construction	CALM

No.	Issue	Action	Objective	Phase	Advice
17	Weed control at Millstream-Chichester National Park	Contribute $25,000 per year, for five years, towards a weed control program for the Millstream-Chichester National Park.	To contribute to the overall weed control and management of the National Park, in particular the control of date and cotton palm, morning glory, khaki weed, Galland's curse, Indian water fern and Parkinsonia.	During construction and Post-construction	CALM

Appendix 5

Summary of Submissions and
Proponent's Response to Submissions
(see attached compact disk)

Paper copies of the response to submissions document are available from the EPA Service Unit on request.