Proposed bypass of Great Eastern Highway at Northam

Main Roads Department of Western Australia

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 715
November 1993

THE PURPOSE OF THIS REPORT

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

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

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

APPEALS

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

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

ADDRESS

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

CLOSING DATE

Your appeal (with the $10 fee) must reach the Minister's office no later than 5.00 pm on **18 November 1993**.

Environmental Impact Assessment (EIA)

Process Timelines in weeks

Date	**Timeline commences from receipt of full details of proposal by proponent**	**Time (weeks)**
9/8/93	Proponent Document Released for Public Comment	
3/9/93	Public Comment Period Closed	4
24/9/93	Issues Raised During Public Comment Period Summarised by EPA and Forwarded to the Proponent	3
11/10/93	Proponent response to the issues raised received	2.5
4/11/93	EPA reported to the Minister for the Environment	3.5

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Summary and recommendations

The Great Eastern Highway presently runs through the Town of Northam (see Figure 1 for location). This current alignment has inherent problems for local traffic in terms of congestion and the frequency of accidents. Further problems include noise and visual pollution caused by traffic, particularly heavy vehicles. To alleviate these problems, three different alignments around the town have been put forward by Main Roads Western Australia for environmental impact assessment.

The proposal was referred to the Environmental Protection Authority in September 1992. The Environmental Protection Authority required that a Consultative Environmental Review be undertaken to consider the environmental impacts of the preferred option 6 and the two alternative alignments (6A and 9). The different routes all start at 88.9 Straight Line Kilometres (SLK) from Perth and rejoin the existing Highway at 102.00 SLK from Perth. They differ in their alignment around the Townsite of Northam as can be seen in Figure 2.

Guidelines were provided to assist the proponent, Main Roads of Western Australia, in the preparation of the necessary documentation. The Consultative Environmental Review document was available for a four week submission period which ended on 3 September 1993. Sixteen Submissions were received.

There were a number of issues of significance identified by the Environmental Protection Authority and by public submissions in the assessment of the proposal. These issues were specific to Routes 6 and 6A or Route 9.

Environmental Issues

Routes 6 and 6A

The key environmental issues for these routes are (not in order of significance) :

- filling of the floodplain of the Avon River;
- loss of fringing vegetation along the Avon River;
- bridging the Avon and Mortlock Rivers;
- visual impact of the bypass from Northam, particularly during construction;
- siltation of the Avon River during construction;
- alteration of the landscape by extensive cut and fill;
- potential vehicle spills;
- impact on environmental amenity (noise, loss of amenity, visual impact); and
- impact on areas of Aboriginal and European heritage.

Route 9

The key environmental issues for this route are (not in order of significance):

- bridging the Avon and Mortlock Rivers;
- some alteration of the landscape by cut and fill;
- impact on farming operations.

From the issues raised and through assessment by the Authority, a number of environmental impacts were determined for each of the alternative alignments. A short description of these impacts is as follows :

Environmental Impacts

Route 6

Route 6 has the largest number of environmental impacts. This alternative would require a section of the Avon River floodplain to be filled and various mature riverine trees along the

banks of the Avon would have to be cleared. These activities would create the potential for associated erosion and siltation of the already degraded Avon river. The Authority is opposed to roads along major watercourses and, in general, expect that rivers and their floodplains be protected from this type of proposal.

Bridge structures and associated embankments would have to be constructed for this alternative to proceed. The bridges would be required for road, rail and river crossings which occur along the route. The bridges which are of most concern to the Authority are those which would be constructed over the Avon and Mortlock Rivers.

In addition, there would be substantial noise and visual impacts on the local community during the construction and post construction stages of development. Various Aboriginal and European sites of significance would be affected by Route 6. All of these impacts have led the Authority to the conclusion that Route 6 is considered to be environmentally unacceptable.

Route 6A

As Route 6A is similar to Route 6, while it affects less area of the riverine environment, it has a similar level of environmental impacts to Route 6. The slight deviation around Northam Cemetery would lessen the impact on this Cemetery, however all the other environmental management considerations for Route 6 also apply to Route 6A. Consequently, Route 6A is also considered to be environmentally unacceptable.

Recommendation 1

The Environmental Protection Authority concludes that Routes 6 and 6A are not environmentally acceptable, because of their potential impact on the Avon River, and recommends that they do not proceed. The environmental amenity of the community will also be adversely impacted to a greater degree for these Routes than Route 9.

Route 9

The Authority believes that Route 9 is the best alternative route alignment because it has the least environmental impact. The only significant environmental issue is the concern over the effects of bridging the Avon and Mortlock Rivers, an issue which is also common to routes 6 and 6A. The Authority considers that the environmental issues associated with the construction of the bridges could be managed through an acceptable floodplain development strategy and other management commitments. This strategy would have to meet the requirements of the Water Authority of Western Australia and the Waterways Commission.

Route 9 was seen to have environmental benefit to the local environment through the potential to create a new corridor of native vegetation through cleared farmland within the road reserves of the bypass. There was community support expressed to the EPA for Route 9 in that thirteen of the sixteen submissions received supported this alternative. This route also costs less than route 6 and 6A.

Accordingly, the Authority has concluded that Route 9 is environmentally acceptable subject to Commitments made by Main Roads and the recommendations below being converted into stringent Environmental Conditions, as outlined in the Recommended Environmental Conditions contained in Section 6 of this Report.

Recommendation 2

The Environmental Protection Authority has concluded that Route 9 of the proposal to create a Great Eastern Highway bypass around the Town of Northam, as discussed during the process of interaction between the proponent, the Environmental Protection Authority, the public and the Government agencies that were consulted, is environmentally acceptable.

In reaching its conclusion the Environmental Protection Authority identified the main environmental factor requiring detailed consideration as:

- **protection of the Avon and Mortlock Rivers from adverse impacts caused by bridge construction.**

To avoid adverse impacts on the Avon and Mortlock Rivers, the following environmental management objectives should be met .

Recommendation 3

The Environmental Protection Authority recommends the bridge structures for Route 9 over the Avon and Mortlock Rivers should :

- **not adversely affect the hydrology and water quality of the rivers; and**

- **be designed according to a floodplain management strategy which meets the requirements of the Water Authority of Western Australia and the Waterways Commission.**

1. Introduction

The Great Eastern Highway/Fitzgerald street alignment presently runs through the Town of Northam and performs the various functions of a local access, district distributor and primary distributor road for the town. This current alignment has inherent problems for local traffic in terms of congestion and the frequency of accidents. Further problems include the issues of noise and visual pollution caused by traffic, particularly from heavy vehicles. To alleviate these problems, a Northam Bypass has been proposed. Planning for the bypass began about thirty years ago, with approximately 12 different routes previously outlined and evaluated by a Northam Bypass Steering Committee.

The current proposal was referred to the Environmental Protection Authority in September 1992. The Environmental Protection Authority required that a Consultative Environmental Review of the proposal be undertaken, to assess the impacts of the Main Roads preferred option, alignment 6, as well as two other options studied in more detail by a Northam Bypass steering group, that is alignments 6A and 9 (see Figure 1 for locations). The Environmental Protection Authority required that the proposal be assessed at this level because of its potential impacts on the Avon and Mortlock Rivers, and their associated floodplains and riverine vegetation. Guidelines were provided to assist the proponent in the preparation of the necessary documentation. The Consultative Environmental Review document was available for a four week submission period which ended on 3 September 1993.

2. The proposal

The present proposal is to create a Great Eastern Highway bypass around the Town of Northam, using one of three alternative routes (the preferred option 6, or alternatives 6A or 9). All three alternative routes start at 88.9 Straight Line Kilometres (SLK) from Perth and rejoin the Highway at 102.00 SLK from Perth. The routes differ in the actual alignment around the townsite of Northam as can be seen in Figure 2 and the descriptions below :

Route 6: from the common starting point (88.9 SLK from Perth) this route then traverses the railway line and Avon River requiring bridges for both crossings, the alignment then continues along the northern bank of the Avon for approximately 2 kilometres, passing the Northam Cemetery and then through the Doctors Hill locality. The Doctors Hill portion of this Route requires extensive cut and fill to achieve required gradients and some noise minimisation. Finally, Route 6 crosses the Mortlock River and another railway line before running behind the Northam Racecourse and linking up with the existing Great Eastern Highway. In 1993 terms, the Route 6 alignment would cost approximately $38 million to construct.

Route 6A: after the common staring point, Route 6A crosses the railway line and Avon River then continues in a wide arc around the Northam Cemetery requiring some degree of cut and fill. The route then continues in an easterly direction and travels along the northern bank of the Avon until it links up with the same alignment as Route 6 to eventually rejoin the existing Great Eastern Highway. In 1993 terms, the Route 6A alignment would cost just over $40 million to construct.

Route 9: after the common starting point, Route 9 traverses an arc through rural farming land requiring bridges over the railway, Avon River, Katrine Road and Irishtown Road. Route 9 then passes over the Northam-Pithara Road, behind the Doctors Hill locality and to the north of the Northam racecourse to finally link up with the existing Great Eastern Highway. In 1993 terms, the Route 6 alignment would cost approximately $32 million to construct.

Main Roads propose to construct the bypass in two stages. Stage 1 will involve the construction of a single carriageway with land acquisitions and road reserves capable of eventually accommodating the second (stage 2) carriageway (Figure 3). Overall, the final dual carriageway bypass including median strip and road reserve will be approximately 33 metres wide, with its length dependent upon the chosen alternative route.

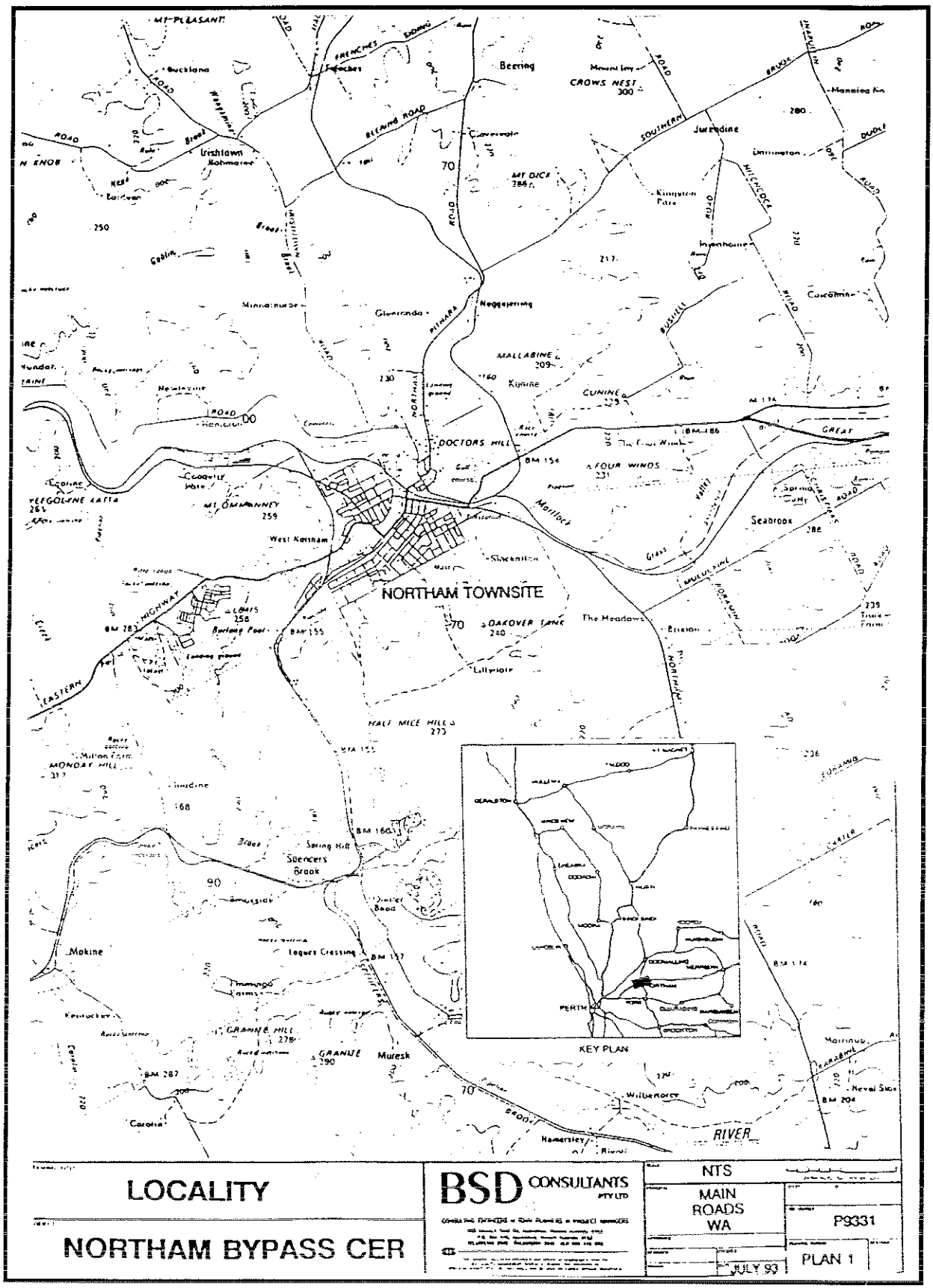

Figure 1: Regional location of Northam Bypass. Source: CER - BSD Consultants

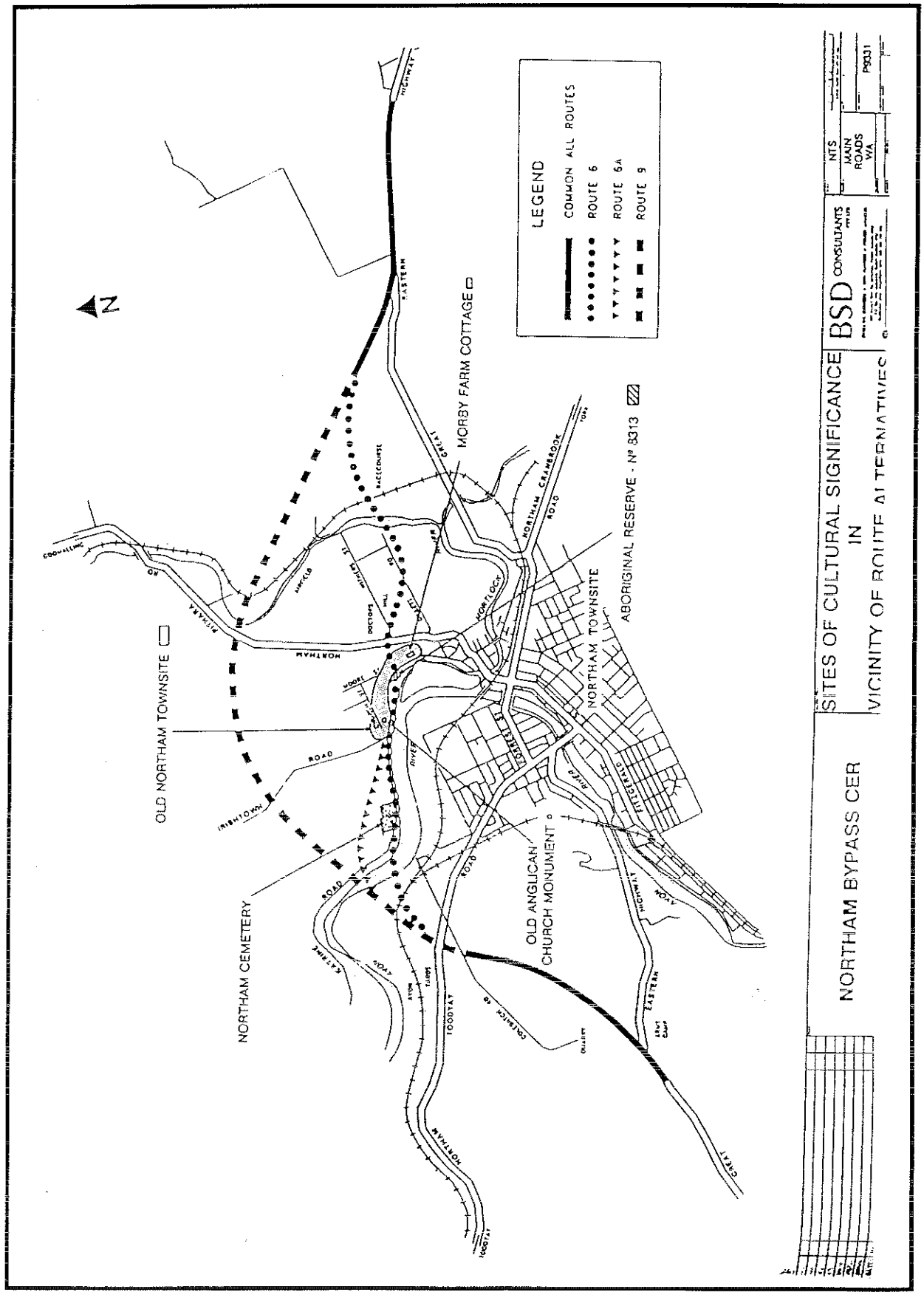

Figure 2: Alternative alignment options. Source: CER - BSD Consultants

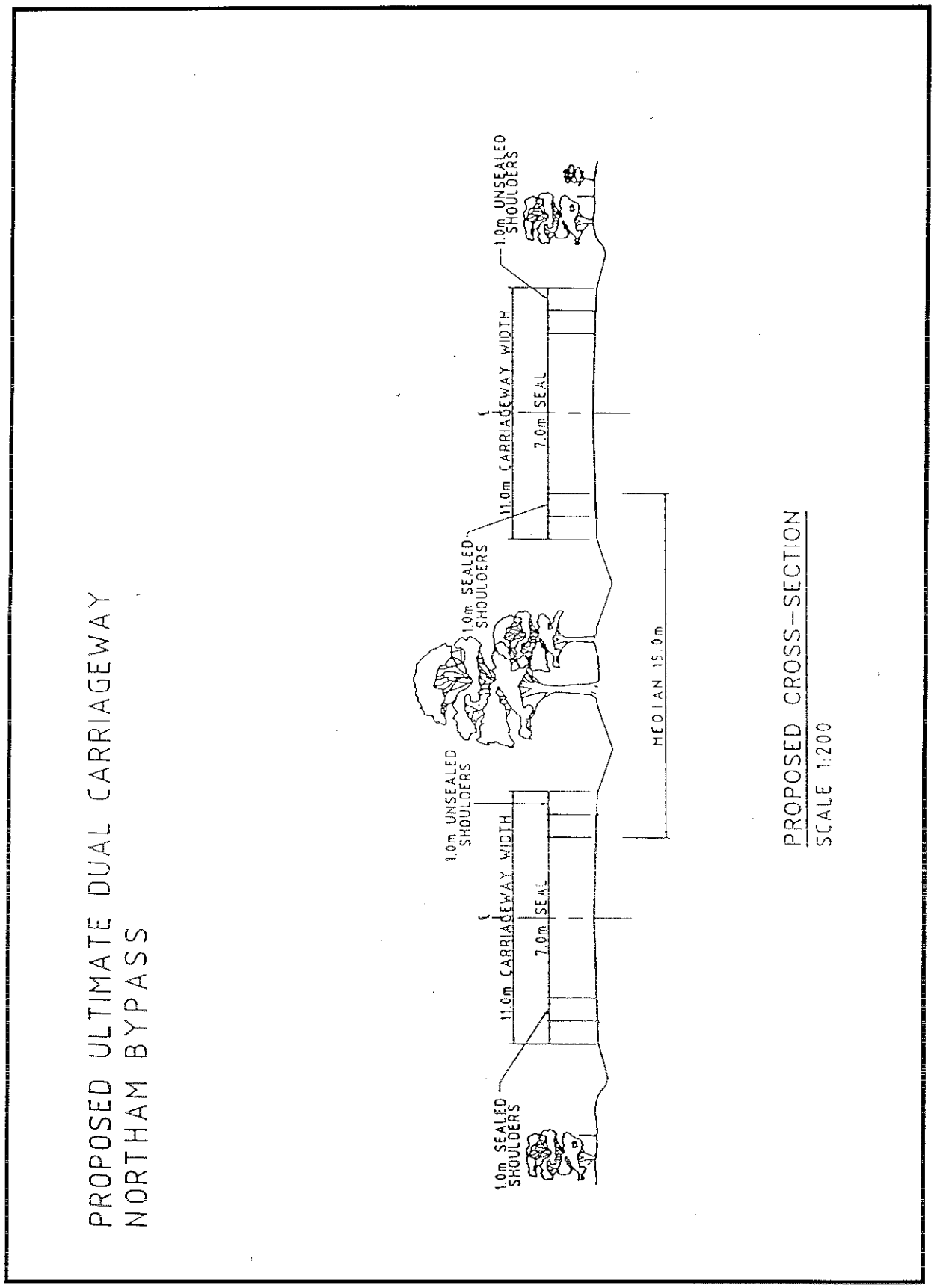

Figure 3: Cross-section of ultimate dual carriageway Northam Bypass. Source: Main Roads Department

3. Review of public submissions

The Consultative Environmental Review document prepared for the proposal was available for a four week public submission period which closed on 3 September 1993. During this time a total of sixteen submissions were received. The submissions could be separated according to the following categories :

* 8 submissions from the general public (including a petition with 108 signatures)
* 3 submissions from community groups and organisations
* 5 submissions from Local or State Government authorities and departments

Thirteen of the sixteen submissions supported Route 9 and objected to Route 6 or 6A . These submissions supported Route 9 because of its perceived minimal impact on the surrounding environment. In addition, some submitters were in favour of Route 9 because of the value which the local community placed on the Avon riverine environment as a place for passive recreation. These recreation values were perceived to be incompatible with a dual carriage highway running alongside the river banks as proposed for Routes 6 and 6A.

There was an extensive range of issues raised by the submitters. The following is a list of the principle areas of concern (the list is not in any prioritised order) :

- impacts of route 6 on floodplain, drainage, water quality, overall hydrology of rivers;
- impact of route 6 and 6A on riverine ecosystems;
- protection of Aboriginal reserve No 8313 and other sites of European or Aboriginal cultural significance;
- land acquisition issues for all three alternatives;
- risk of toxic pollution from road accidents entering Avon/Mortlock Rivers;
- noise, visual and air pollution from traffic;
- planning limitations on Northern expansion of the townsite due to the chosen route;
- potential for subdivision of rural land due to the chosen route;
- remnant vegetation;
- location of proposed walktrail;
- potential for the creation of native vegetation corridor along Route 9 through cleared farmland;

The Environmental Protection Authority prepared a list of 25 issues that Main Roads was requested to comment on. The responses provided by Main Roads are included in this assessment report as Appendix 2. The Authority has considered the submissions received and the responses from Main Roads during the assessment process, and in the preparation of this report.

4. Evaluation of alternative alignment routes

A number of significant environmental issues for each alternative alignment option were identified by the Environmental Protection Authority and through submissions on the CER. The following is a summary of the issues and the Authority's assessment of potential impacts.

4.1 Routes 6 and 6A

These two alternatives only differ in their orientation around the Northam cemetery (see Figure 2). Therefore the only issue which does not apply to Route 6A is the potential impacts on the Northam Cemetery which could result if Route 6 became the chosen alternative. All of the other issues raised in this section of the EPA's report and recommendations can be equally applied to both Routes 6 and 6A.

4.1.1 Destruction of Avon Riverine vegetation and associated habitats

Issue :

Both Routes 6 and 6A would require extensive clearing of the fringing native vegetation on the Avon River floodplain to allow the bypass to be constructed. This vegetation is one of the only remaining greenbelts of native vegetation in the area, although it is noted that certain areas are severely degraded. Notwithstanding, the Authority is concerned about retaining the function of this vegetated corridor along the banks of the Avon to assist in minimising the pollutant loading to the Avon River, limiting erosion potential, retaining some features of wildlife habitat and enhancing the visual amenity of the area.

EPA's evaluation

The proponent addressed this issue through their response to Issue 1 in Appendix 2. From the calculations displayed in Appendix 2 it can be seen that a total of 15.6 hectares and 5.3 hectares of floodplain and riverine vegetation would be lost through construction of Routes 6 and 6A respectively. Furthermore, the CER stated that a general reduction of the foreshore reserve could be expected from the current average of 40 - 80 metres down to 10-30 metres from river banks.

The Authority considers that this reduction in the foreshore reserve width and associated vegetation would further compromise its function in minimising pollutant loading of the river, limiting erosion and to retention of some degree of wildlife habitat and visual amenity for the area. **Consequently, the amount of riverine vegetation clearing required for Routes 6 and 6A is considered to be environmentally unacceptable.**

One submission raised concerns over the CER's failure to recognise a Waterways Protection Precinct for the Avon River which parts of Route 6 and 6A would run through. Once the Avon River Management Authority is formed, it will be their responsibility to ensure protection of the riverine environment as identified in these Waterways Protection Precincts. Currently the Waterways Commission, in advance of the formation of the Avon River Management Authority, opposes any development which would detract or diminish any of the following values of the Avon Riverine environment :

- natural components of the ecological system;
- scenic values;
- historic values;
- cultural values; and
- recreational values.

The Authority considers that construction of Routes 6 or 6A would require a level of clearing which could detract or diminish the natural components of the Avon river ecological system, particularly along the section of the route which crosses or runs parallel to the Northern bank of the Avon river

4.1.2 Filling of floodplains and construction of bridges near the Avon and Mortlock Rivers

Issue:

Both Routes 6 and 6A require 15.6 hectares and 5.3 hectares of floodplain and river bank area respectively to be filled in order to construct the road, two bridges and necessary embankments in areas where the alignments are parallel with, or crossing the Avon and Mortlock Rivers. These issues are of concern to the Authority and were mentioned in several submissions. Concern has been raised over the impact which these operations would have on the landscape of the area and the increased flooding risks which may result from filling the floodplains. One submission raised concerns over the backwater effects of creating a new bridge over the rivers.

EPA's evaluation:

The Authority supports the Water Authority of Western Australia in their policy on Floodplain Management, which states that development in floodways should be avoided and any developments in the area known as the floodfringe should be subject to appropriate floodplain management programmes. Both routes 6 and 6A require cut and fill operations in areas of the floodway and floodfringe for the Avon and Mortlock Rivers. **The Authority considers cut and fill required in the floodway for Routes 6 and 6A to be environmentally unacceptable.**

Cut and fill required in the floodfringe for the bridges associated with routes 6 and 6A could be considered environmentally acceptable if Main Roads could demonstrate that the proposed alignments could be managed according to an acceptable floodplain development strategy. The Authority acknowledges the proponent's pre - construction commitment No 3 to liaise with the Water Authority of Western Australia over management of this issue for Route 6. A similar commitment should have been made for Route 6A.

The backwater effect of a new bridge refers to upstream ponding of water due to the culverts in a bridge trapping water flow and essentially acting as an inefficient dam, constraining water movement. In extreme cases, backwater from a bridge may contribute to flooding of nearby river banks and the floodplain area. The Authority considers that these concerns for bridges created by the Northam bypass have been adequately addressed through the proponent's commitment to comply with the Water Authority's maximum backwater surcharge constraints and through recommendation 3 made by the Authority which recommends that the bridges should not adversely affect the hydrology and quality of the rivers. Commitment 3 should be amended to refer to the likely impacts of Route 6A if it became the chosen option.

4.1.3 Erosion and Siltation of the Avon River during construction

Issue:

Several submissions raised concerns over the potential for further siltation of the Avon as a consequence of clearing the Avon riverine vegetation, especially as it could be some time before new vegetation became established.

EPA's evaluation:

Erosion and siltation of the Avon River is an issue which the Authority requested Main Roads to address in their response to submissions. The Authority considers that this issue has been adequately addressed by the proponent through a series of environmental commitments as outlined in Appendix 1. However, it is acknowledged that due to their alignments being adjacent to the river, Routes 6 and 6A pose a larger erosion hazard than Route 9.

4.1.4 Impact on areas of Aboriginal and European Heritage

Issue

Aboriginal Reserve 8313 and other sites in the vicinity will be severely impacted by Routes 6 and 6A. In addition, the Northam Cemetery would be severely impacted by the Route 6 alignment and various other sites of European heritage occur along routes 6 and 6A.

EPA's evaluation:

The Authority believes that the issues associated with sites of Aboriginal significance are of importance and should be dealt with through the Aboriginal Heritage legislation and consultation with the Department of Aboriginal Sites. Liaison between the Northam Aboriginal Community Progress Association and Main Roads (see Appendix 1 commitment 4) could also assist in this matter.

Similarly, issues raised in submissions concerning sites of European significance, like the Northam Cemetery, are considered important issues which could be resolved by the local authority and through Main Roads commitments to ensure physical disturbance and possible damage to historic sites along the Route 6 alignment (and 6A) is minimised through design,

planning and careful management of earthworks in the vicinity of known sites (see commitments 39 and 29A in Appendix 1)

4.1.5 Access to Avon Riverbank

Issue:

The Avon riverbank is an area recognised by the community for its importance as a site for passive recreation activities such as horse riding, jogging, bushwalking and nature study. It is anticipated that there will be limitations during and post construction on access to the riverbank if routes 6 or 6A became the chosen alternative.

EPA's evaluation:

The Authority recognises that a temporary impact on access to the riverbank is likely to occur due to construction of Routes 6 and 6A. After construction , the access to and use of the foreshore reserve could be adversely affected by the need to negotiate a dual carriage highway to gain access, and due to the significant reduction in width of foreshore reserve. Consequently the Authority believes that construction of Routes 6 or 6A could reduce the opportunity for passive recreation activities such as horse riding, jogging, bushwalking and nature study along the Avon riverbank.

4.1.6 Noise and Visual Pollution

Issue:

Several submissions were critical of potential construction and post construction noise impacts, in terms of blasting and construction vehicles, which could result from the construction of routes 6 and 6A. There was also concern expressed regarding the noise from traffic using the bypass once constructed. In addition, members of the Northam community believed that the bypass (using Routes 6 or 6A) would be seen as a visual intrusion from the townsite. This argument is in direct opposition to the view of Main Roads that Routes 6 and 6A would be able to attract business to the town because Northam could be seen from the Highway as people drove past.

EPA's evaluation:

The Authority acknowledges that a noise level impact assessment was undertaken for Route 6 and included as Appendix 5 in the CER. In addition, Main Roads addressed the issue of noise caused by construction of Routes 6 and 6A in Appendix 1 (see Issue 14). The Authority considers that the noise impacts associated with construction have been adequately addressed by the proponent.

However, there is a general recognition that routes 6 and 6A would be close to the town of Northam and the residents of Northam could expect that as the level of traffic increases, so too could the level of noise experienced by local residents.

The Authority considers there will be visual impacts of the bypass on the Town which could be resolved through consultation between the relevant planning authorities, Main Roads and concerned local residents and community groups.

4.1.7 Risk of toxic vehicle spills

Issue:

The Great Eastern Highway is a designated heavy haulage route which currently performs the multiple roles of a local access, district distributor and primary distributor road for the town. Several submissions raised concerns over the potential risk of toxic vehicle spills occuring along Route 6 or 6A and consequently entering the nearby Avon and Mortlock Rivers.

EPA's Evaluation:

Main Roads responded to this issue by outlining a number of management provisions which would improve the current situation (see Appendix 2 issue 20). However, due to the close proximity of Routes 6 and 6A to the Avon river, especially the stretch which would run parallel

to the Northern river bank, this issue is seen as a consideration which is not so prominent for the alternative Route 9.

4.2 Route 9

This alternative is vastly different to Routes 6 and 6A. Route 9 mainly passes across farming land. As a result of the alignment the impacts from this alternative are constrained to the issues discussed in the following sections.

4.2.1 Bridging the Avon and Mortlock Rivers

Issue:

Route 9 requires the construction of bridges and associated embankments over the Avon and Mortlock Rivers. The Authority is concerned about the impact these structures may have on the river floodplains and associated fringing riverine vegetation. One submission raised concerns over the backwater effects of creating a new bridge over the rivers.

EPA's evaluation:

Route 9 could be environmentally acceptable if the bridges and associated works required for Route 9 were managed according to an acceptable floodplain development strategy.

The backwater effect of a new bridge refers to upstream ponding of water due to the culverts in a bridge trapping water flow and essentially acting as an inefficient dam, constraining water movement. In extreme cases, backwater from a bridge may contribute to flooding of nearby river banks and the floodplain area. The Authority considers that these concerns regarding the construction of bridges for the Northam bypass have been adequately addressed through the proponents commitment to comply with the Water Authority's maximum backwater surcharge constraints and through recommendation 3 made by the Authority which recommends that the bridges should not adversely affect the hydrology and quality of the rivers. However, commitment 3 should refer to the likely impacts of Route 9 if it became the chosen option.

4.2.2 Impact on farming operations

Issue:

A large portion of Route 9 is planned to run through several rural properties. Concern was raised through submissions over the possible fragmentation of rural properties should Route 9 become the chosen alternative. Adequate compensation for lost production and severance of land was seen by some landowners as an important issue in relation to Route 9.

EPA's evaluation:

Fragmentation of rural properties and adequate compensation are both issues which could be resolved through consultation between the relevant planning authorities, Main Roads and the affected landowners. The Authority acknowledges that this issue has been addressed by the proponent in their response to Issue 24 as outlined in Appendix (2).

4.2.3 Creation of a new corridor of native vegetation

Issue:

A large portion of Route 9 is planned to run through several rural properties. The Authority and several submitters see this as an opportunity to create a new corridor of native vegetation through an otherwise extensively cleared landscape.

EPA's evaluation:

The Authority supports commitment 34 made by Main Roads in Appendix 1, which indicates that revegetation techniques will be used along the road reserves to create suitable habitat areas and wildlife corridors. The Authority sees this opportunity as a substantial benefit to the local environment should Route 9 become the chosen alternative.

4.3 Unexploded ordinances (UXO)

Issue:

A submission from the West Australian Police (Unexploded ordinance branch) raised concerns that the Northam region (including Routes 6,6A and 9) has been used extensively by the military as a live firing training area, and over the years, numerous UXO have been identified in the region. As such, the UXO branch of the West Australian Police recommended that a survey of the chosen alignment should be conducted to determine the presence of UXO before any disturbance to the earth's surface occurs.

EPA's evaluation:

The Authority acknowledges the addition of pre-construction commitment No (5A) to commission a UXO survey for the bypass route.

5. Conclusion and recommendations

After consideration of these issues and the proponent's response to them, the Authority has concluded that Routes 6 and 6A are environmentally unacceptable, that Route 9 is the only environmentally acceptable alternative and recommendations have been made in accordance with this conclusion.

Recommendation 1

The Environmental Protection Authority concludes that Routes 6 and 6A are not environmentally acceptable, because of their potential impact on the Avon River, and recommends that they do not proceed. The environmental amenity of the community will also be adversely impacted to a greater degree for these Routes than Route 9.

Recommendation 2

The Environmental Protection Authority has concluded that Route 9 of the proposal to create a Great Eastern Highway bypass around the Town of Northam, as discussed during the process of interaction between the proponent, the Environmental Protection Authority, the public and the Government agencies that were consulted, is environmentally acceptable.

In reaching its conclusion the Environmental Protection Authority identified the main environmental factor requiring detailed consideration as:

- **protection of the Avon and Mortlock Rivers from adverse impacts caused by bridge construction.**

Recommendation 3

The Environmental Protection Authority recommends the bridge structures for Route 9 over the Avon and Mortlock Rivers should :

- **not adversely affect the hydrology and water quality of the rivers; and**
- **be designed according to a floodplain management strategy which meets the requirements of the Water Authority of Western Australia and the Waterways Commission.**

6. Recommended environmental conditions

Route 9 of this proposal may be implemented subject to the following conditions:

1 Proponent Commitments

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

1-1 In implementing the proposal, the proponent shall fulfil the commitments (which are not inconsistent with the conditions or procedures contained in this statement) made in the Consultative Environmental Review and in response to issues raised following public submissions. These commitments are consolidated in Environmental Protection Authority Bulletin 715 as Appendix 1. (A copy of the commitments is attached.)

2 Implementation

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

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

3 Proponent

These conditions legally apply to the nominated proponent.

3-1 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

4 Management of bridge structures over the Avon and Mortlock Rivers

4.1 The proponent shall ensure that impacts from realignment of the highway upon the hydrology and water quality of the Avon and Mortlock rivers are minimised.

4.2 Prior to any site works and in consultation with the Water Authority of Western Australia and Waterways Commission, the proponent shall prepare final alignment and construction plans, to meet the requirements of condition 4.1.

4.3 In the preparation of the plans required by condition 4.2, the proponent shall address, but not be limited to the following:

(1) management of the Avon and Mortlock River floodplains affected by the proposal;
(2) management and rehabilitation of riverine vegetation affected by the proposal;and
(3) mitigation of the likely backwater effects of constructing bridges over the Avon and Mortlock rivers.

4.4 The proponent shall implement any management and monitoring requirements arising from the plans required by conditions 4.2 and 4.3.

5 Time Limit on Approval

The environmental approval for the proposal is limited.

5-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced. Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period, to the Minister for the Environment by way of a request for a change in the condition under Section 46 of the Environmental Protection Act. (On expiration of the five year period, further consideration of the proposal can only occur following a new referral to the Environmental Protection Authority.)

6 Compliance Auditing

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

6-1 The proponent shall prepare periodic "Progress and Compliance Reports", to help verify the environmental performance of this project, in consultation with the Environmental Protection Authority.

7 Decommissioning

The satisfactory decommissioning of the project, removal of the plant and installations and rehabilitation of the site and its environs is the responsibility of the proponent.

7-1 At least six months prior to decommissioning, the proponent shall prepare a decommissioning and rehabilitation plan.

7-2 The proponent shall implement the plan required by condition 7-1.

Procedure

The Environmental Protection Authority is responsible for verifying compliance with the conditions contained in this statement, with the exception of conditions stating that the proponent shall meet the requirements of either the Minister for the Environment or any other government agency.

If the Environmental Protection Authority, other government agency or proponent is in dispute concerning compliance with the conditions contained in this statement, that dispute will be determined by the Minister for the Environment.

7. Bibliography

Binnie and Partners Consultants, 1987, Waterway Investigation for the Proposed Northam Bypass - Final Investigation Report for the Main Roads Department.

BSD Consultants, 1993, Northam Bypass Consultative Environmental Review, Perth, Western Australia.

Main Roads Department, 1992, Environmental Assessment and Management Plan for Great Eastern Highway Northam Bypass Section 88.9 SLK - 102.00 SLK, Northam Division, Western Australia.

Waterways Commission, 1993, Avon River Management Strategy, Waterways Commission, Perth, Western Australia.

Appendix 1

Proponent's list of Environmental Management Commitments

Proposed bypass of Great Eastern Highway at Northam (756)

Main Roads Department of Western Australia

8.0 ENVIRONMENTAL COMMITMENTS

8.1 Objective

The objective for the preparation of environmental commitments for the proposed Route 6 alignment of the Northam Bypass is to provide necessary guidance on the management of potential environmental impacts. The environment commitments ascertain what management strategy is required, who will implement the strategy and the timing of implementation. Where appropriate, commitments which are required to be undertaken to the satisfaction of a regulatory authority, will have the abbreviation of the approval body shown in brackets after the commitment eg (EPA), Environmental Protection Authority. A list of regulatory authorities and their abbreviations is provided at the end of this section.

The environmental commitments have been categorised into:

- Pre-construction commitments;
- During construction commitments;
- Post-construction commitments.

8.2 Pre-Construction Commitments

(1) Main Roads to commission a fauna study to ascertain the existence and population of a group of Echidna reported to inhabit the Cemetery area prior to any construction works being undertaken (EPA, CALM).

(2) Main Roads to negotiate with affected landowners, where land resumption is required, in order to arrange an equitable agreement and compensation for loss of property.

(3) Main Roads to liaise with WAWA regarding the outcome of the Avon River Floodway Study and the implications of study findings with respect to the Route 6 alignment and compliance with WAWA's maximum backwater surcharge constraints (WAWA, EPA).

* (4) Main Roads are to continue to liaise with the Northam Aboriginal Community Progress Association in order to resolve the issue of Aboriginal Reserve 8313 and any other recently discovered Aboriginal Sites of significance prior to any construction work being undertaken (ALT,AAPA).

(5) Main Roads to undertake public education and consultation should Route 6 be approved by all relevant authorities and pursued by Main Roads prior to the implementation of this alignment.

* (5A) Main Roads to commission a UXO survey at the bypass route between its commencement north of the Northam Army Camp and the Northam/Toodyay Road.

8.3 During Construction Commitments

(6) Main Roads to make all contractors, associated with the construction of the Route alignment, aware of environmental commitments aimed at protecting the environment during construction and built these commitments into their work contracts.

(7) Main Roads to ensure all re-contouring of embankments and batter slopes to be achieved to acceptable gradients in order to minimise erosion and subsequent siltation of watercourses (EPA, ARMA).

(8) Main Roads to revegetate cleared areas of road reserve not required for Stage 1 road purposes (EPA, CALM, ARMA).

(9) Main Roads to revegetate embankments and batter slopes susceptible to short term erosion impacts during the construction phase of the project (EPA, CALM, ARMA).

(10) Main Roads to provide scour protection (eg. rock reinforcement or similar) to all bridge and road embankments within the 100 year floodplain (EPA, ARMA, WAWA).

(11) Scour protection structures to be monitored by Main Roads to examine their stability and durability with the results to be reported as appropriate.

(12) Main Roads to ensure all major road structures are constructed to accommodate a 100 year ARI flood event and comply with backwater constraints set by the Water Authority (WAWA).

(13) Main Roads to ensure all minor transverse structures such as culverts will be constructed to cater for a 50 year ARI storm event (WAWA).

(14) Should drainage flows need to be dammed temporarily, Main Roads will ensure that the ponded water is treated appropriately before it is pumped downstream (WAWA, ARMA, EPA).

(15) Main Roads to ensure stormwater drainage structures are constructed to design specifications to achieve necessary retention times and storage capacities to collect sediments and compensate stormwater runoff (ARMA, WAWA, EPA).

(16) Main Roads to carefully plan and manage all earthworking and construction related activities in order to minimise loss of soil material and subsequent siltation along the Avon and Mortlock rivers (WAWA, EPA, ARMA).

(17) Main Roads to restrict vegetation clearing and machinery movements to the road reserve area along important areas such as the Northam Scout Block and Avon River bank (EPA).

(18) Main Roads to re-contour and prepare the ground surfaces of revegetation areas to appropriate standards in order to facilitate the successful establishment of indigenous plant species (EPA, CALM, ARMA).

(19) In road reserve areas of the Route 6 alignment where noxious weed proliferation is obvious, Main Roads are to arrange the removal and burial of affected topsoils to borrow pits.

(20) Main Roads shall prepare a revegetation program outlining key areas to be revegetated, selected species and timetable for revegetation.

(21) Main Roads will monitor the establishment of revegetation annually for a period of 2 years after practical completion of the bypass proposal. Results of monitoring will be included in the Annual Monitoring Report (EPA, ARMA, CALM).

(22) If revegetation is not progressing to the satisfaction of approval authorities, Main Roads will implement appropriate measures to remedy revegetation establishment (EPA, ARMA, CALM).

(23) Main Roads to ensure noise and vibration levels associated with blasting activities comply with standards set by the EPA's Pollution Control Division (EPA).

(24) Main Roads are to undertake before and after inspections of houses in the vicinity of blasting in order to assess potential vibration disturbance (EPA).

(25) Main Roads will ensure inconvenience caused by re-routing cross roads affected during construction of the bypass alignment will be kept to a minimum and provide appropriate signage to achieve this.

(26) During construction, Main Roads shall notify relevant agencies such as the Northam Tourist Centre, Shire of Northam and Town of Northam regarding restricted access to the foreshore areas along the Avon River.

(27) Main Roads to ensure earthworking is undertaken during suitable ground conditions or employ dust suppression measures, such as water carts, when dust levels become problematic (EPA).

(28) Main Roads to implement approved contingency plan during the construction of the Bypass project in order to contain and/or recover chemical or fuel spillages.

(29) Main Roads to seek input from the local community in regard to planning and rehabilitating the foreshore areas in an effort to incorporate community needs for this important recreation/conservation area (EPA, ARMA).

* (29A) Main Roads to ensure physical disturbance and possible damage to historic sites along the Route 6 (and 6A) alignments is minimised through design, planning and careful management of earthworks in the vicinity of known sites.

8.4 Post-Construction Commitments

(30) Main Roads to ensure the revegetation of all road reserve, embankments and batter slopes, including those areas revegetated during construction, are revegetated with appropriate indigenous plant species (EPA, ARMA).

(31) Main Roads to periodically check all minor transverse drainage structures for possible obstructions and if it is demonstrated that road construction has exacerbated local flooding, Main Roads are to investigate remedial measures.

(32) Main Roads to periodically maintain stormwater drainage structures and remove material that may inhibit their function (ARMA, EPA).

(33) If the chemical control of weeds is necessary prior, during or after revegetation, Main Roads shall take care to avoid contaminated runoff entering waterways (EPA, ARMA).

(34) Main Roads shall revegetate road reserves with the intention of creating suitable habitat areas and providing wildlife corridors that minimise fauna road kills.

(35) Main Roads to construct the infrastructure for information bays and enlist the support of local authorities, local businesses and the Northam Tourist Centre regarding the content of accompanying signage.

(36) Following community involvement, Main Roads will upgrade the foreshore areas along the north bank of the Avon River and on the floodplain area in the vicinity of the Moore Street/York Road intersection. This will involve revegetation with indigenous riverine species and the provision of passive recreational facilities (eg informal walk trail, picnic seating and tables and barbeques).

(37) Main Roads to implement approved contingency plan during the construction phase of the project. During the post-construction phase of the project, the implementation of the contingency plan will be the responsibility of the relevant authorities (eg, Police Department, Fire Brigade, Town of Northam, Shire of Northam, EPA, ARMA, State Emergency Service, etc).

(38) Main Roads shall undertake annual monitoring of:

- revegetation areas;
- scour protection structures within 100 year flood plain

for a 2 year period following practical construction of the Route 6 alignment. Results of the monitoring shall be submitted to relevant agencies as appropriate (EPA, ARMA, WAWA, CALM).

* (39) Main Roads to undertaken before and after inspections of graves and tombstones in the Northam Cemetery to ascertain the validity of possible damage claims.

* Additional and/or modified commitments arising from submissions received during the Public Review period for the Northam Bypass CER.

Commitment Abbreviations

AAPA Aboriginal Affairs Planning Authority
ALT Aboriginal Lands Trust
ARMA Avon River Management Authority
CALM Department of Conservation and Land Management
EPA Environmental Protection Authority
WAWA Water Authority of Western Australia

Appendix 2

Proponent's Response to Submissions

Proposed bypass of Great Eastern Highway at Northam (756)

Main Roads Department of Western Australia

NORTHAM BYPASS PROPOSAL
CONSULTATIVE ENVIRONMENTAL REVIEW
RESPONSE TO SUBMISSIONS RECEIVED DURING THE PUBLIC REVIEW PERIOD

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Date: September 1993

The EPA's summary of the comments and concerns in relation to the Northam Bypass proposal as described in the CER have been individually dealt with to a level of detail which answers and/or acknowledges each of the issues raised. The issues have been grouped by the EPA under the headings :

- CONSERVATION
- HERITAGE
- AMENITY
- MISCELLANEOUS

The format for the responses are as follows:

(i) Details of each issue raised.

(ii) Response and discussion on each issue.

(iii) Recommendations to the EPA in relation to each issue.

In some cases, it was considered necessary to recommend an additional commitment to satisfactorily address an issue which has been brought to the proponent's attention. The content of additional commitments are shown under the recommendation for that particularly issue and a summary of additional commitments is provided at the end of this document.

CONSERVATION

(i) Detail of Issue

ISSUE 1

The loss of the riverine environment has not been considered in detail including issues such as:

- *direct loss of vegetation;*
- *direct loss of habitat;*
- *direct loss of fauna; and*
- *loss of plant and animal communities and the riverine ecosystem as a whole.*

(ii) Response to Issue

The loss of riverine environment was considered in terms of vegetation, fauna and habitat for each of the route alignments based on the findings of the biological survey undertaken by specialist ecological consultants. The scope and impact significance of the Northam Bypass proposal recognised the condition and conservation values of the riverine environment and assessed this accordingly as described in the CER.

In most cases, the native vegetation and habitat areas were significantly modified and degraded with subsequent weed invasion. It was therefore considered inappropriate to simply assign an area measurement detailing the direct loss of the riverine environment, particularly given that extensive areas at this locality were devoid of native vegetation and dominated by poor quality pasture species.

Nevertheless, for the purpose of addressing this issue the following area calculations for the riverine environment are provided.

(a) Direct loss of vegetation.

Route 6

- 5.1 ha (inside 100 year floodplain - Avon River)
- 9.9 ha (outside 100 year floodplain - Avon River)
- 0.6 ha (inside 100 year floodplain - Mortlock River)

15.6 ha TOTAL

Route 6A

- 3.0 ha (inside 100 year floodplain - Avon River)
- 1.8 ha (outside 100 year floodplain - Avon River)
- 0.5 ha (inside 100 year floodplain - Mortlock River)

5.3 ha TOTAL

Route 9

- 0.8 ha (inside/outside 100 year floodplain - Avon River)
- 0.7 ha (inside/outside 100 year floodplain - Mortlock River)

1.5 ha TOTAL

(b) Direct loss of habitat.

- as above for Route 6, 6A and 9

(c) Direct loss of fauna.

The direct loss of fauna associated with each of the route alignments is an extremely difficult impact to determine given the intrinsic nature of fauna and their movements within a given locality. It is argued that in order to accurately measure such an impact, it may be necessary to conduct seasonal 'mark and recapture' surveys for a range of animal types along each of the survey routes in order to determine species diversity and population sizes. It is considered that this approach is well beyond the required scope of assessment and that the CER's reliance on the results of the fauna survey, conducted by consultants experienced in this field, is justified and of sufficient detail.

(d) Loss of plant and animal communities and the riverine ecosystem as a whole.

The loss of plant and animal communities is dealt with in points a, b and c above. In terms of the loss of the riverine ecosystem as a whole, it was considered that the impact on ecosystem would be of minor significance given the conservation value for flora and fauna as determined by previous biological surveys for Route 6.

(iii) Recommendation

That the issue be noted. Given the degraded nature, scope of the CER, conclusions of flora/fauna surveys and conservation values for areas impacted upon by the bypass proposal, it is considered that the CER covered the loss of riverine environment in sufficient detail.

(i) Detail of Issue

ISSUE 2

There has been no discussion of the impacts of increased flooding from the proposal on riverine vegetation.

(ii) Response to Issue

It is anticipated that the impacts on riverine vegetation from the proposal would be negligible.

Flood level data (provided in Plan 14 of the CER) shows that water levels for the Avon River fluctuate considerably for various flood events (ie. 2.25 metres between 1 and 5 year ARI events, 4.25 metres between 1 and 100 year ARI events). In addition, seasonal water levels vary by an average of 1.3 metres between summer and winter. The riverine vegetation has survived along the Avon (and Mortlock) Rivers and adapts to seasonal and longer term water level fluctuations accordingly.

The Binnie and Partners Waterway Investigation Study (1987) using detailed computer modelling packages estimated that the Route 6 alignment (which has greater floodplain impact than Route 6A or 9) would result in a 25mm increase in upstream flood levels during a 100 year ARI event. For lesser flood events the impact would decrease proportionally.

Therefore, in the overall context of the changing water level regime within the Avon and Mortlock Rivers (ie. 25mm or 1.9% of seasonal water level fluctuation), it is considered that the impact on riverine vegetation would be negligible.

(iii) Recommendation

That the issue be dismissed as it is highly unlikely that increased flooding associated with the Northam Bypass proposal will adversely affect riverine vegetation.

(i) Details of Issue

ISSUE 3

The revegetation along Route 6 will take many years to reach maturity during which time the habitat values will be less than now exists.

(ii) Response to Issue

It is true that the revegetation along Route 6 (and Route 6A and 9) will take time to mature and this is likely to reduce habitat values during this period. This is particularly relevant along the north bank of the Avon River and in the Northam Scout Block where mature remnant trees exist. However, this statement is only applicable to areas currently possessing some value as fauna/flora habitat and does not recognise the benefits of revegetating and creating additional valuable habitat in locations presently lacking in native vegetation types.

In addition, it is relevant to note that revegetation is likely to enhance the habitat values in any location in the longer term as it provides the opportunity to re-create habitats with greater species diversity and a wider range of habitat types than presently exists.

The revegetation areas can be linked together or incorporated with existing remnant vegetation blocks to form larger and more viable habitat corridors.

(iii) Recommendation

This issue is noted and generally accepted as one of the unavoidable shortcomings of revegetation with juvenile and/or immature plant species. The proponent has made a commitment to revegetation with the intention of providing suitable habitat (see Commitment 34, page 134) and therefore it is recommended that no further action is required.

(i) Details of Issue

ISSUE 4

The risk of sediment entering the Avon from bridge and road construction before the revegetation is established is too high.

(ii) Response to Issue

The risk of sediment entering the Avon River from bridge and road construction is not considered unduly high given the proposed management and river siltation protection measures put forward in the CER, eg.

- Careful planning of bridge and embankment construction.
- Ensuring all earthworks are undertaken when ground conditions are suitable (ie. spring and autumn when river water levels are usually lowest).
- Recontouring to acceptable batters.
- Provision of scour protection along embankments and culverts (eg. rock reinforcement or similar) to minimise erosion and reduce the likelihood of river siltation.

If the need arises to temporarily dam drainage flows, Main Roads will ensure that the ponded water is treated appropriately (ie. suspended material allowed to settle out) before it is pumped downstream. The above management measures have been reinforced in the CER in the form of numerous during construction and post-construction environmental commitments (see Section 8.3 and 8.4).

(iii) Recommendations

Given the above erosion and siltation management measures (supported by numerous environmental commitments), it is considered that the residual impacts (and risks) associated with sediment entering the river before vegetation is established would be minimal.

It is recommended that there is no further action required to address this issue.

(i) Details of Issue

ISSUE 5

Filling of the floodplain and the extensive cut and fill required for routes 6 and 6A will alter the landscape to an unacceptable degree.

(ii) Response to Issue

Many past and present land use activities such as:

- clearing native vegetation for agriculture
- excavation and sand mining along river banks
- river training schemes
- provision of roads, railways, services etc

alter the landscape to varying degrees.

The acceptability of these activities from a landscape point of view is largely subjective and dependant upon an individual's personal perception.

The filling of the floodplain and cut/fill requirements for the Route 6 and 6A alignments will alter the landscape. It is possible to mitigate the impacts on landscape amenity by recontouring, revegetation and careful bridge/culvert/embankment design. In the long term, the visual impacts will most likely subside as people become accustomed to these man-made structures. Given this, it is considered that the landscape will not be affected by the proposal to an unacceptable degree.

Nevertheless, it is relevant to note that the Route 6 and 6A alignments constitute a permanent visual intrusion on the natural landscape amenity of the region, particularly along the Avon River (bridge/embankments) and in the Doctors Hill locality (cuttings/ excavations/embankments).

(iii) Recommendation

That the issue be acknowledged, although given the proposed management measures designed to mitigate landscape impacts, it is considered that the Route 6 and 6A alignments will not alter the landscape to unacceptable degree.

(i) Details of Issue

ISSUE 6

The effect on water flow of filling 15ha of floodplain and building large bridges has not been fully investigated. The following issues need to be addressed:

- *the length of bridge described by BSD in the CER is 190m as opposed to 150m in the Binnie and Partners 1987 flood study. This extra length of bridge will increase the restriction of water flow;*

- *are the Water Authority of Western Australia convinced that the proposal for Route 6 will have an "acceptable" impact on water flows?;*

- *recent extensive flooding in the Kimberleys has been blamed on the backwater effect of bridges. Has the Binnie and Partners study been updated in light of this new information?; and*

- *the CER report on flooding is based on a 1 in 100 year flood at 1000 cubic metres a second over the Northam Weir. However, the Binnie and Partners study quotes 1300 cubic metres a second. In addition, at times the flow from the Mortlock River has been so great that water has flowed upstream over the Northam Weir. Given this information it appears the flooding risk has not been adequately addressed.*

(ii) Response to Issue

The backwater effects in the Avon River have been fully investigated and reported for a number of alternative road alignments and bridge sizes in the "Waterway Investigation for the Proposed Northam Bypass, June 87" by Binnie and Partners Pty Ltd. The Binnie and Partners Route B Red 2 alignment closely reflects the Northam Bypass Route 6 alignment. The Water Authority has assessed the Route B Red 2 alignment and considered the impact on flooding from this alignment as acceptable.

Examination of Fig. 1 of the Waterway Investigation Report (when magnified to the same scale as Plan 12 of the Northam Bypass CER), indicates that Route 6 does not intrude as far into the floodplain as the Route B Red 2 alignment and that the Avon River bridge for Route 6 is located downstream of Route B Red 2. The backwater effect for Route 6 will, therefore be lower than for Route B Red 2 as a result of Route 6's bridge being further downstream and Route 6 having less intrusion into the floodplain. The different angles of skew for Route 6 and Route B Red 2 alignment will not directly affect the backwater effect provided the flow cross section for the adopted route is equal or greater than the cross section calculated for Route B Red 2.

(a) At the time of writing the CER, final design of the Avon River Bridge was not completed (refer Section 4.2.2 in CER). Details which had not been finalised included the number of piers and the abutment details. The distance between abutments and the skew angle contribute to the degree of the backwater effect. However, the flow cross sectional area below normal water surface for the 100 year flood event is critical to the backwater effect. Hence the length and skew angle may be varied and the backwater effect will not change provided the flow cross sectional area below normal water surface level for the 100 year flood event remains constant. In the CER (Section 8.2(3)) a Pre-Construction Commitment was made by the Main Roads to liaise with WAWA on the

implications of the study findings with respect to Route 6 alignment and compliance with WAWA's maximum backwater surcharge constraints. If the flow cross sectional area below normal water surface for the 100 year flood of the bridge configuration finally adopted by Main Roads is equal or greater than the flow cross-sectional area for the 150m Route B Red 2 bridge adjusted to 31° skew (refer Fig 11 of Waterway Investigation), then WAWA's backwater effect requirements will be met.

(b) As stated in the CER (refer Section 4.2.2, Section 5.2) the Water Authority have reviewed the Binnie and Partners Waterway Investigation Report and confirmed in writing (see Attachment A) to Main Roads their acceptance of the maximum backwater effect at the confluence of the Avon and Mortlock Rivers for the 100 year flood. In addition, a Pre-Construction Commitment (refer Section 8.2(3)) was made for the Main Roads to liaise with WAWA and comply with WAWA maximum backwater surcharge constraints for the Route 6 alignment which includes the final bridge configuration.

(c) WAWA's surface water branch have advised that the recent extensive flooding in the Kimberleys is unlikely to be caused by the backwater effect of bridges as the backwater effect only has an effect for a short distance upstream of a bridge. The backwater effect for all new bridges is determined as part of the bridge design process. Binnie and Partners study is not considered to require updating as the methods used to determine the backwater effects are considered to be acceptable.

(d) In the Avon River Study (refer Section 12.6 and 12.7) it is stated that the 100 year flood was estimated as 1130m³/s upstream of the weir and 1370m³/s downstream of the weir. The difference in the flows is the calculated inflow from the Mortlock which for modelling purposes was assumed to occur at the weir. When the flow from the Mortlock River is large it could be expected that there will be a backwater effect caused by the inflow from the Mortlock River which may drown the Northam Weir.

(iii) Recommendation

The various issues relating to flooding are noted, however, given the above response and the Pre-Construction Commitment (Section 8.2(3)) by the Main Roads to liaise with WAWA, it is considered that no additional action is required.

(i) Details of Issue

ISSUE 7

One of the benefits of Route 9 is that a wildlife corridor could be created in cleared farmland. MRD have set the precedent for this on the Australind Bypass and other roads in country areas.

(ii) Response to Issue

Revegetation of cleared farmland, particularly land parcels alienated from the main productive area, is potentially one of the benefits to wildlife associated with a bypass road construction project (either Route 6, 6A or 9) in the region of Northam.

Main Roads have successfully applied their revegetation/rehabilitation techniques to numerous road construction projects throughout WA and these will be employed for the Northam Bypass proposal.

Where possible, revegetation will incorporate remnants in order to facilitate the corridor movement for fauna, however care must be taken to minimise fauna road kills by concentrating revegetation to one side of the bypass road (see CER Section 7.4.2.2 and 7.4.2.3 and environmental commitment Nº 34).

(iii) Recommendation

This issue be acknowledged and noted accordingly.

(i) Details of Issue

ISSUE 8

The priorities for land use have not been evaluated. Farmland such as that along Route 9 is not a scarce resource in the region. In comparison, riverine environments such as that along Route 6 and 6A are a scarce resource.

(ii) Response to Issue

On an area for area basis, it is justified to consider good quality farmland as a well represented resource indicating that agricultural land use is fairly widespread throughout the Avon Valley region. Alternatively, riverine environments within this predominantly rural setting are not well represented and therefore land use pertaining to conservation/recreation of this relatively scarce (albeit highly modified) resource may be considered a priority when compared with productive farmland from a regional perspective.

With this in mind, it is correct to assume that the Route 6 and 6A alignments would have a greater land use impact on a limited resource, whilst the Route 9 alignment is likely to have less land use impact on a well represented resource.

(iii) Recommendation

That the issue be acknowledged and noted.

HERITAGE

(i) Details of Issue

ISSUE 9

Routes 6 and 6A have severe impacts on the Northam Aboriginal Reserve and other significant Aboriginal sites in the vicinity. If the Main Roads Department wish to construct either of these routes they will need the agreement of the Aboriginal Community.

(ii) Response to Issue

The Route 6 and 6A alignments have a severe impact on Northam Aboriginal Reserve 8313 and it is understood that several other possible Aboriginal sites along the north bank of the Avon River may also be adversely affected.

The Aboriginal Lands Trust (ALT), in whom the Class "A" Reserve 8313 is vested, passed a resolution in February 1987 "to seek an appropriate exchange of land for the loss of part of the Northam Reserve to Main Roads" and agreed "to relinquish the portion required by the Main Roads Department". Negotiations for a suitable land exchange subsequently commenced.

Main Roads commissioned an ethnographical and archaeological survey of the Route 6 alignment in 1988 and it was the opinion of the authors of the ethnographical report that Reserve 8313 was an Aboriginal Site within the meaning of the Aboriginal Heritage Act. The report indicated that a land exchange agreement by negotiation with the ALT and Northam Aboriginal Community Progress Association (NACPA) was the most preferable option available for dealing with the situation. On-going negotiations were continuing at that stage on a suitable land exchange. Recently however, the previous land swap agreement has been disputed by local Aboriginals who now wish to retain and develop Reserve 8313.

In regards to other possible Aboriginal sites affected by the Route 6 and 6A alignments along the north bank of the Avon River, these were not identified in the previous Aboriginal survey and have only become apparent most recently. At this stage, the significance of these sites is not yet clear and therefore it is difficult to accurately

determine the most appropriate course of action. It is suffice to say, however, that Main Roads has no intention of adversely affecting any known or recently discovered Aboriginal sites.

Furthermore, should Route 6 or 6A be pursued as the Northam Bypass alignment, Main Roads will obtain agreement from the Northam Aboriginal Community prior to any construction works being undertaken. Main Roads have made a commitment (see CER pre-construction commitment Nº 4) to resolve this issue to the satisfaction of the local Aboriginal Community and this commitment can be extended to include newly discovered sites of significance.

(iii) Recommendation

That the issue be noted, along with the commitment by Main Roads to resolve the issue of Aboriginal Reserve 8313.

Environmental Commitment Nº 4 should be rewritten to read as follows:

(4) Main Roads are to continue to liaise with the Northam Aboriginal Community Progress Association in order to resolve the issue of Aboriginal Reserve 8313 and any other recently discovered Aboriginal Sites of significance prior to any construction work being undertaken (ALT, AAPA).

(i) Details of Issue

ISSUE 10

Routes 6 and 6A will have severe impacts on the Northam Cemetery. The peaceful environment that exists for burials or grave visits will be destroyed by the close proximity of a 110km/h highway. The physical impacts such as vibration from road transport may damage graves and tombstones. Will the MRD provide safe access for funeral processions (which generally drive slowly) into the cemetery?

(ii) Response to Issue

When compared to the existing noise levels around the Northam Cemetery, the Route 6 and 6A bypass alignments will increase background noise levels substantially.

Route 6 would have the greatest impact where distance separation from the Cemetery boundary to the carriageway is approximately 45m and 20m for Stage 1 and 2 respectively. During Stage 1, the major earthworking for Stage 2 will be undertaken and revegetated accordingly. The revegetation area is likely to be 25 metres wide and densely planted to provide adequate noise attenuation.

Furthermore, for both Stages 1 and 2 there is a possible requirement for a small cutting at this location which has the potential to reduce noise impacts to the Cemetery considerably. There is also the possibility (particularly for Stage 2 of the Route 6 proposal) to further reduce noise impacts with the provision of a noise barrier along the bypass section close to the Cemetery.

It is relevant to note that there are examples of cemeteries located in close proximity to busy roads (eg. (a) Fremantle Cemetery - Leach Highway, Carrington Street (b) Karrakatta Cemetery - Railway Road, Loch Street) which are subject to various degrees of traffic noise without serious impacts on the use and amenity of these areas. However, it is also recognised that the comparisons between constant, large volume traffic flows (such as those associated with metropolitan cemeteries) and high speed, intermittent traffic flows (as that expected at Northam) may not be entirely valid, with the latter usually producing greater perceived noise impacts due to lower background noise levels.

Nevertheless, through implementation of appropriate management measures (eg. screening, landscaping, noise barriers), it is expected that noise levels at the Northam Cemetery will be well within prescribed noise levels (ie. less than 63 dB(A)) following construction of either the Route 6 or 6A alignments.

In regard to physical impacts, such as vibration from road transport, there is not expected to be any grave or tombstone damage to the Cemetery. The inherently high standards associated with modern highway construction generally ameliorate potential vibration impacts.

Safe access for funeral processions into the Cemetery will be provided for Stage 1 and Ultimate future duplication for both Routes 6 and 6A. Route 6 will retain Katrine Road throughout Stage 1 with the Moore Street underpass maintaining access to the town centre. In the Ultimate stage of development, the Moore Street underpass would provide town centre access although a new Cemetery access road (linked by either Irishtown Road or Church Street), would need to be constructed.

Route 6A (Stage 1 and Ultimate) would also retain Moore Street and Katrine Road as underpasses and therefore there would be minimal disturbance for funeral processions to the Cemetery.

(iii) Recommendation

That the issue be noted and an additional commitment in relation to possible vibration damage to graves and tombstones by provided by Main Roads.

The commitment would become part of the post-construction commitments and read as follows:

(39) Main Roads to undertake before and after inspections of graves and tombstones in the Northam Cemetery to ascertain the validity of possible damage claims.

(i) Details of Issue

ISSUE 11

There are many areas of European heritage along Routes 6 and 6A including the old gaol site, the old St James Church site, the original Government well and Morby Cottage. In addition Katrine Road is an important scenic route. The bypass along Routes 6 and 6A will have a severe impact on these sites from physical destruction, loss of peaceful enjoyment or loss of revenue for the area from tourism. How will MRD mitigate these impacts to an acceptable level?

(ii) Response to Issue

It is understood that numerous heritage sites occur in close proximity to the proposed Route 6 and 6A alignments and Main Roads have been cognisant of this throughout the planning and design of the bypass alternatives. Although each of these alignments pass through an area believed to represent the old Northam townsite, the information available at the time of the assessment indicated that no direct physical impact to any of the heritage structures was likely. Should either Route 6 or 6A be pursued, Main Roads will ensure potential impacts to heritage sites will be minimised by detailed final design and through careful management of road construction works.

A small section of Katrine Road (ie. 600 metres or 3.6% of the tourist drive) would be replaced by the Route 6 under Stage 1 and a total of 2.7 km (or 16% of the tourist drive) would be replaced under the Stage 2 - Ultimate proposal for Route 6. Under the Route 6A proposal, a 600 metre section of the Katrine Road tourist drive would be affected to a similar degree for both Stage 1 and Stage 2.

It is recognised that there will be unavoidable loss of peaceful enjoyment along the 2 kilometre riverbank section affected by Route 6 and to a lesser extent (ie. 600 metres) by the Route 6A alignment, however this will be offset by the upgrading and rehabilitation of the riverbank areas which will provide the opportunity to enhance this currently degraded area.

In terms of potential loss of revenue from tourism, it is considered that tourism may be reduced marginally in the short term, although with appropriate management measures put in place (ie, tourist information bays, signage etc), the longer term residual impact on tourism from any of the route alignment alternatives is likely to be minimal.

(iii) Recommendation

Concerns over the potential impacts on heritage sites and tourism are noted. Most of the above mentioned management measures have been highlighted in the CER, although an additional environmental commitment regarding the minimisation of disturbance to heritage sites is considered necessary as part of the during construction phase.

The commitment would read as follows:

(29.A) *Main Roads to ensure physical disturbance and possible damage to historic sites along the Route 6 (and 6A) alignments is minimised through design, planning and careful management of earthworks in the vicinity of known sites.*

AMENITY

(i) Details of Issue

ISSUE 12

If there is line of sight from Routes 6 and 6A to the town, then surely there will be increased noise as well?

(ii) Response to Issue

The line of sight from Routes 6 and 6A to the town is not expected to increase noise levels due to the distance separation between the relevant receiving points (ie. residential areas, town centre) and the potential noise source (ie. the bypass).

The line of sight referred to in this issue presumably refers to the section of the bypass which passes closest to the town (ie. along the north bank of the Avon River).

The nearest resident along this stretch of the bypass is located approximately 750m from the Route 6 and 6A alignments. Over this distance the expected noise levels associated with the bypasses are expected to drop to around 30-35 dB(A) which is well below the Lio (18 hour) value of 63dB(A), which is the preferred noise criteria target set for residential areas in the region (see CER, Appendix 5). At its closest point, the town centre is located approximately 1.5km from the Route 6 and 6A alignments and therefore noise levels are also expected to be well below even residential criteria.

It is also relevant to note that the existing Great Eastern Highway/Fitzgerald Street traffic flows through the town centre and in so doing produces unacceptable noise levels for residents and businesses around this location.

(iii) Recommendation

That the issue be set aside as the relocation of the highway out of the town centre and the substantial distance separation between the town and the bypass will improve noise and traffic related impacts in the town.

(i) Details of Issue

ISSUE 13

The view of the town has been a major selling point for Route 6 but with revegetation and all the cuttings the views will be very limited anyway. The view of the road from the town will have much more negative impact.

(ii) Response to Issue

The view of the town from the bypass was previously considered an important attribute of the Route 6 and 6A alignments particularly in terms of attracting and maintaining local businesses/tourism. More recently however, the Northam Chamber of Commerce and others have indicated that there is less reliance on a visual link for maintaining local businesses. Revegetation and cuttings may limit views to the town, although in some instances this may reduce negative impacts with respect to viewing the bypass alignment from the town.

The main visual impacts associated with the Route 6 and 6A alignments are mostly attributable to the large cutting/embankments around the Doctors Hill locality and the bridge structure/embankments along the Avon River.

There is the opportunity to revegetate and rehabilitate the foreshore area to minimise visual impacts and methods to achieve this have been documented in section 7.4.3.4 of the CER. It is recognised however, that the Route 6 alignment (and to a lesser extent Route 6A alignment), constitutes a permanent visual intrusion on the landscape amenity of the riverine area which may be perceived as unacceptable by some members of the community.

Main Roads are proposing to undertake all practicable and reasonable measures to overcome the potential visual intrusions, however in some cases (eg. Doctors Hill, Avon River), the residual impacts are likely to prevail in the longer term.

(iii) Recommendation

That the issue is acknowledged and noted.

(i) Details of Issue

ISSUE 14

Blasting required for Routes 6 and 6A will have a severe impact on residents in the area from vibration, noise, risk of falling debris and the shock of hearing the blast.

(ii) Response to Issue

All blasting activities will be subject to licence conditions, issued by the EPA Pollution Control Branch, which stipulate noise and vibration standards not to be exceeding. The licence conditions are designed to take into account the surrounding land use, safety issues (ie. falling debris and the proximity of residences) in a manner that ensures the resultant impacts are acceptable.

In addition, the Main Roads have made a commitment (see environmental commitment Nº 24) to undertake before and after inspections of houses in the vicinity of blasting in order to assess possible vibration damage. If it is shown that blasting activities associated with the Northam Bypass project were responsible for damage to property the affected landowners would be compensated accordingly.

(iii) Recommendation

That the issue be noted, although given the above it is unlikely that severe impacts to residents will eventuate.

(i) Details of Issue

ISSUE 15

The noise impact on residents in the Doctors Hill area will be unacceptable, particularly given that vehicles will be travelling at 110km/h.

(ii) Response to Issue

Acoustic specialist have undertaken noise modelling for the Northam Bypass proposal (see Appendix 5 of the CER) using the following design criteria:

- Road type - bitumen chip seal
- Flow rate - year 2017 AADT - 1530
- Heavy vehicles - 17%
- Average speed - 110km/h
- Gradient - 10% uphill

and have concluded that the resultant noise levels are unlikely to cause any adverse impact to existing residences. Furthermore, it was recommended that no noise control measures are required and future residences along this route should have a minimum setback of 50 metres (from the centre of the road).

(iii) Recommendation

That community concerns regarding perceived noise impacts be noted and that the noise modelling using the above criteria suggests that noise levels in the Doctors Hill locality are likely to be within prescribed noise limits and therefore acceptable.

(i) Details of Issue

ISSUE 16

Routes 6 and 6A are still through a residential area (Doctors Hill) so the problems of traffic in Northam such as accident risk, congestion and pollution have been transferred not solved.

(ii) Response to Issue

The relocation of through traffic from the existing Great Eastern Highway/Fitzgerald Street to either the Northam Bypass Route 6 or 6A alignments is likely to have benefits in terms of accident risk, congestion and pollution.

Accident risk would be reduced in proportion to the estimated 20% reduction in vehicle traffic through the townsite. In addition, the Route 6 and 6A alignments have significantly less conflict points (ie. at level rail and road crossings, T-junctions, 4 way intersections, uncontrolled access etc) when compared to the existing alignment.

Traffic congestion will also be improved with most heavy goods vehicles (including dangerous and hazardous materials) likely to utilise the bypass road. This situation will drastically improve access and traffic flows within the town centre and provides the opportunity to further enhance traffic management through appropriate townscape development.

Traffic related pollution problems may be broadly categorised into air pollution and potential chemical spills. At present, the stop-start nature of traffic movements throughout the town centre results in an elevated air pollution levels which are exacerbated by the enclosed environment created by buildings and other town centre structures. Given the continuous traffic movements and greater air pollution dispersion potential offered by Routes 6 and 6A (or Route 9), it is considered that local air pollution would be greatly improved in comparison with the existing situation.

In regards to chemical spills, Issue 20 deals with concerns raised.

(iii) Recommendation

That both Route 6 and 6A offer benefits in terms of the aforementioned traffic problems and given the low average traffic volumes (ie. 700-800 vehicles per day), provision of access roads and the fact that the Doctors Hill area is a low density residential development, it is anticipated that neither bypass route is likely to result in adverse impacts on traffic accidents, congestion or pollution.

(i) Details of Issue

ISSUE 17

The proposed walk trail will be cause a severe erosion risk in an active part of the river.

(ii) Response to Issue

At present, the riverbank area proposed to incorporate the informal walk trail is sparsely vegetated and has numerous existing walking tracks within the active part of the river. This floodplain area is therefore subject to water erosion, although this is not considered a severe risk.

Through revegetation and rehabilitation, the proposed walk trail will be flanked by a variety of indigenous tree, shrub and groundcover species which will assist in stabilising the foreshore area and thereby minimising the risk of erosion.

In general, it is envisaged that the walk trail may become inundated every 2 years or so, however, during the associated peak flow periods in winter there is not expected to be significant utilisation of the walk trail.

(iii) Recommendation

That the issue be set aside as the proposed walk trail and foreshore revegetation is likely to reduce the risk of erosion when compared to the existing situation.

(i) Details of Issue

ISSUE 18

The loss of recreation values from implementation of MRD's preferred route has not been addressed. The proposed "informal walkway" between the river and Route 6 will flood on a regular basis. In addition people do not want to recreate on the edge of a major highway. The existing riverbank has great potential for recreation such as horse riding, cycling, running, sightseeing and walking.

(ii) Response to Issue

The loss of recreation values associated the Route 6 alignment have been addressed in the CER where it was anticipated that short term impacts (during construction) and long term impacts (after construction) were likely on recreational activities such as horse trail riding, jogging, bushwalking and nature study due to loss of foreshore area (see Sections 6.2.2.4 and 6.2.3.4).

It was proposed to manage the identified impacts through:

- Negotiating with the Pony Club with respect to suitable alternative riding trails (see page 118);
- Seeking input and involvement from the local community with regard to upgrading and enhancing the foreshore area (see page 118);
- establishing informal walking trails along the remaining foreshore area (see page 128);
- Revegetating foreshore area with suitable indigenous plant species (see page 128);
- Upgrading foreshore area and provide a range of picnic and barbecue facilities (see page 128); and
- Providing additional foreshore area on nearby land currently owned by Main Roads (see page 126).

It is agreed that the proposed informal walking trails will be inundated on a regular basis (ie. on average, once every 2 years), however, it is relevant to note that the existing network of walking tracks along this section of the river are situated in similar geographical locations and are also subject to periodic flooding.

Although it is also recognised that some members of the community may not wish to recreate adjacent to a major highway, there are examples of many recreational pursuits (ie. cycling, walking, birdwatching etc) being undertaken in similar situations - South Perth and Como foreshore (Kwinana Freeway/Narrows Bridge), Kings Park and Crawley foreshore (Stirling Highway), Coastal strip from City Beach to Sorrento (West Coast Highway) etc.

The existing riverbank has great potential for recreation such as horse riding, cycling, running sight seeing and walking. The Route 6 alignment will allow and make provisions for some of these pursuits to continue, however, it is recognised that the construction of this alignment will inhibit the potential of these activities along the affected 2 kilometre section of the Avon's north bank.

(iii) Recommendation

That the concerns raised in this issue be noted and it be recognised that Main Roads is prepared to take the necessary measures to address the impacts on recreation associated with the Route 6 and 6A alignments by the implementation of proposed management strategies.

MISCELLANEOUS

(i) Details of Issue

ISSUE 19

Routes 6 and 6A are not true bypasses as they traverse existing residential areas. If one of these routes is constructed a new bypass may be needed in the future along Route 9 anyway. In addition Routes 6 and 6A constrain the town from developing in a northerly direction.

(ii) Response to Issue

It is relevant to note that from engineering, traffic and planning perspectives, the Route 6 and 6A alignments may not be viewed as a true bypass, due to their close proximity to the Northam townsite and numerous access points along their lengths. This point was accentuated in many of the public submissions received during the CER 'Open Day'.

It may be argued that the Route 6 and 6A bypasses are likely to fulfil the function of an Urban Arterial Road, and in the longer term, further consideration to a true bypass (ie. Route 9 or another suitable route) may be necessary.

Routes 6 and 6A also restrict Northam's future development potential to the north. The long term impacts of this constraint are significant as both bypass alignments may physically divide the town and be the focus of future criticism with regard to town planning matters.

(iii) Recommendation

That the issue be noted and acknowledged.

(i) Details of Issue

ISSUE 20

Routes 6 and 6A have much greater potential for toxic spills on the road to enter the river due to its proximity. How will the MRD manage this issue effectively?

(ii) Response to Issue

In an unmanaged situation, it is agreed that Routes 6 and 6A possess a greater potential for toxic spills on the road to enter the river due to its proximity. Main Roads realises the implications of a large scale chemical spillage on the riverine environment and has put forward a specially designed stormwater drainage network to effectively contain and allow the recovery to potential contaminants. This, together with other relevant information on the management of chemical spills, was detailed in Section 7.3.1.2 of the CER which included a cross section and plan view of special drainage measures (see Figure 4).

In summary, the proposed management is as follows:

Special Drainage Measures

- Compensating basins designed to accommodate a 10 year ARI storm event with "dead" storage below outlet to contain chemical spills and collect potentially contaminated stormwater run off.

- Catch drains to intercept uphill catchment run off and discharge directly to the river.

- Kerbing or an appropriate lateral drain on the Avon River side of the southern carriageway to direct stormwater/chemical spills to collector pipes.

- Collector pipe drainage system for southern carriageway (where it cambers toward river) and median strip to direct stormwater/chemical spills to compensation basins.

Guard Rails

- To be installed on the Avon River side of the road to reduce the risk of vehicles running into the river, and therefore retain any spills onto the pavement carriageway.

Contingency Plan

- Outlining procedures to be undertaken in the event of a major chemical spillage (ie. notification, identification, containment, recovery, disposal, costs).

It is relevant to note that at present, dangerous goods vehicles pass through the town centre where numerous conflict points (eg. intersections, right angle turns, poor road surfaces, uncontrolled access etc) and limited chemical spillage provisions exist. For example along Forrest Street, which is commonly used as a heavy vehicle transport route, there are no management measures to contain chemical spills and the stormwater drainage network discharges directly into the Avon River. Clearly, this poses constitutes are serious risk of waterway contamination in the event of a chemical spillage.

(iii) Recommendation

Compared to the existing situation, the Routes 6, 6A (and 9) all reduce the potential of chemical spills entering the river and that Main Roads have adequately addressed this issue through the proposed management measures summarised in the above response and detailed in the CER.

(i) Details of Issue

ISSUE 21

Why is the Government considering spending an extra $6 million of taxpayers money on Route 6 as opposed to Route 9 when money is so scarce?

(ii) Response to Issue

The Government is committed to finding the best bypass alternative for Northam. The Northam Bypass CER is the environmental component associated with the preferred bypass alignment (Route 6). Main Roads will be considering the outcome of the environmental assessment process along with other relevant economic, engineering, social and commercial aspects before a final decision on this alignment is made.

However, it should be noted that there would be an estimated $3.5 million disbenefit over a 30 year period on choosing Route 9 over Route 6 due to the additional 1.0km travel distance.

Obviously, the $6 million cost differential between Route 6 and 9 will be taken into account as part of the economic evaluation of the proposal and may in fact become a major impediment to the implementation of the preferred alignment.

(iii) Recommendation

The issue be noted and that consideration of economic factors regarding the Northam Bypass proposal be taken into account by Main Roads and relevant State and Federal Government Agencies before a final decision on the most suitable route to bypass the town of Northam is made.

(i) Details of Issue

ISSUE 22

Since Route 6 was recommended by the Steering Committee several years ago community attitudes have changed and the MRD have not taken this into account in their project planning.

(ii) Response to Issue

In 1988, the Northam Bypass Steering Committee's recommendation that Route 6 be the selected alignment to bypass Northam initiated various pre-construction activities including the environmental assessment (ie. CER) of the proposal.

Since then, it is apparent that community attitudes toward the Route 6 alignment have changed and the large majority of public input received during the CER's public participation and consultation programme appear opposed to Route 6.

Main Roads is aware of changing community attitudes and have made reference to this throughout the CER document (see Sections 9.2 and 10.0). In an effort to address community concerns (perceived or otherwise), Main Roads adopted more stringent environmental controls for managing particular issues brought to their attention. In some instances, however, it is extremely difficult to manage community attitudes (particularly opposition) toward a development proposal which may not adequately respond to the most comprehensive environmental and/or social management initiatives.

Opposition to Route 6 and 6A is not likely to reduce in the short term and Main Roads will be taking this into account prior to the final decision to proceed or otherwise with either route alignment.

(iii) Recommendation

That the issue be acknowledged and Main Roads consider changing community attitudes toward the Route 6 and 6A alignments before a final decision on a bypass is made.

(i) Details of Issue

ISSUE 23

The risk of unexploded ordinances has not been addressed for any of the options.

(ii) Response to Issue

The issue of unexploded ordinances (UXO) had not been addressed in the CER for any of the bypass alternatives.

Recent correspondence from the Police Department (forwarded after lodgement of the CER) alerted Main Roads to the possibility of unexploded ordinances associated with weapon systems training in the region of the Northam Army Camp, although the precise location where these activities occurred have not been established.

Research suggests that the only portion of the bypass possibly affected (which is common to all three alignments) is the initial 3 kilometres at the western end. The Police Department have recommended that a UXO survey of the bypass route between its commencement north of the Northam Army Camp and the Northam/Toodyay Road be undertaken before any disturbance to the earth's surface on the proposed alignment occurs.

(iii) Recommendation

It is recommended that Main Roads provide an additional commitment to undertake the necessary UXO survey as described above. The environmental commitment will be included as a pre-construction commitment and read as follows:

(5A) Main Roads to commission a UXO survey at the bypass route between its commencement north of the Northam Army Camp and the Northam/Toodyay Road.

(i) Details of Issue

ISSUE 24

The impacts on farmers from Route 9 have not been substantiated. Route 9 would offer them lots of advantages in terms of compensation and ability to subdivide.

(ii) Response to Issue

Submissions received during the preparation of the CER from farmers affected by Route 9 indicated a preference to continue their farming operations on their land.

The advantages of compensation and subdivision referred to in this issue are dependant upon many factors.

In consideration of the options available to farmers affected by the Route 9 alignment, the following applies:

a) The farmer may be able to retain and utilise the alienated portion of land provided access and workability is guaranteed. Compensation to the landowner in the form of severance, reduced viability and fencing would be required.

b) The farmer may be able to sell the alienated portion of land which could be amalgamated with nearby holdings or subdivided accordingly. Subdivision potential would largely depend on road access and the demand for rural residential development in this location. Compensation to the landowner with regard to reduced viability of remaining land and severance would be required.

It is considered that either of the available options could result in satisfactory outcomes, providing appropriate compensation to the landowner is paid.

(iii) Recommendation

That the issue be noted subject to the above.

(i) Details of Issue

ISSUE 25

Routes 6 and 6A involve the resumption of a lot more properties which has a negative effect on the local population.

(ii) Response to Issue

Main Roads has already acquired over one third of the total land requirements for Routes 6 and 6A and therefore much of the heartache associated with land resumption has been previously dealt with to the satisfaction of affected landowners. It is expected that, if required, further negotiations for future acquisitions of property will also yield satisfactory outcomes and therefore the negative effect on the local population will be minimal.

(iii) Recommendation

That the issue be noted, however amicable compensation agreements regarding land resumption between affected landowners and Main Roads is likely to overcome the possible negative effects referred to in this issue.

ADDITIONAL/MODIFIED ENVIRONMENTAL COMMITMENTS ARISING FROM SUBMISSIONS RECEIVED DURING THE PUBLIC REVIEW PERIOD FOR THE NORTHAM BYPASS CER

Pre-Construction Commitments

(4) Main Roads are to continue to liaise with the Northam Aboriginal Community Progress Association in order to resolve the issue of Aboriginal Reserve 8313 and any other recently discovered Aboriginal Sites of significance prior to any construction work being undertaken (ALT,AAPA).

(5A) Main Roads to commission a UXO survey at the bypass route between its commencement north of the Northam Army Camp and the Northam/Toodyay Road.

During Construction Commitments

(29A) Main Roads to ensure physical disturbance and possible damage to historic sites along the Route 6 (and 6A) alignments is minimised through design, planning and careful management of earthworks in the vicinity of known sites.

Post Construction Commitments

(39) Main Roads to undertaken before and after inspections of graves and tombstones in the Northam Cemetery to ascertain the validity of possible damage claims.

ATTACHMENT A

WATER AUTHORITY of Western Australia

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Secretary
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GPO Box X2255
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Attention : Mr Flavell

Great Eastern Highway - Proposed Northam Bypass

Further to your letter dated July 7, 1987. The report by Binnie and Partners, "Waterway Investigation for the Proposed Northam Bypass, Final Investigation Report", June 1987 has been received and assessed by the Floodplain Management Section.

An afflux of 25 mm at the confluence of the Avon and Mortlock Rivers for the 100 year flood resulting from the Route B Red 2 alignment and a 150 metre long bridge is considered acceptable. It is understood that the slip road will run northward from the proposed alignment and will not intrude into the floodway.

for MANAGER, SURFACE WATER BRANCH

July 13, 1987
200W