Water supply for Kemerton Industrial Park

Water Authority of Western Australia

Report and recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
Bulletin 758
October 1994

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 27 October 1994.

Environmental Impact Assessment (EIA) Process Timelines in weeks

Date	Timeline commences from receipt of full details of proposal by proponent	Time (weeks)
15.11.93	Proponent Document Released for Public Comment	9
17.1.94	Public Comment Period Closed	
31.1.94	Issues Raised During Public Comment Period Summarised by Environmental Protection Authority and Forwarded to the Proponent	2
31.5.94	Proponent response to the issues raised received	17
13.10.94	Environmental Protection Authority reported to the Minister for the Environment	19

ISBN. 0 7309 5698 9
ISSN. 1030 - 0120
Assessment No.757

Contents

	Page
Summary	i
1. Introduction and background	**1**
2. Summary description of the proposal	**1**
3. Environmental impact assessment method	**3**
4. Evaluation	**3**
4.1 Introduction	3
4.2 Evaluation of alternative water sources	4
4.2.1 Objective	4
4.2 2 Evaluation framework	4
4.2.3 Evaluation	6
4.3 Relationship of weir proposal to System 6 Recommendations C67 (Collie, Brunswick & Wellesley rivers) and C66 (Leschenault Inlet)	6
4.3.1 Objective	6
4.3.2 Evaluation framework	6
4.3.3 Evaluation	8
4.4 Pipeline route from the pipehead weir to Kemerton	8
4.4.1 Objective	8
4.4.2 Evaluation framework	8
4.4.3 Evaluation	9
5. Discussion and synthesis	**10**
6. Conclusions and recommendations	**10**
7. Recommended environmental conditions	**12**
8. References	**14**

Tables

1. Summary of alternative water supply sources for Kemerton. (Source: WAWA 1993) 4
2. Summary of alternative means of supply from Collie River. 5

Figure

1. Location of proposed pipehead weir on the Collie River and preferred route for pipeline to Kemerton Industrial Park. 2

Appendices

1. Environmental impact assessment administrative procedures 1993.
2. Summary of submissions and proponent's response.
3. List of submitters.
4. Proponent commitments.

Summary

The Water Authority of Western Australia proposes to develop a water supply for the Kemerton Industrial Park by releasing water from the Wellington Dam. The water would be collected through a pipehead weir on the Collie River and piped along the Australind Bypass to a water tank within the Kemerton Industrial Park.

The major issues identified through this Public Environmental Review process are summarised below:

- the evaluation of alternative water sources;
- protection of the System Six recommendation areas C67 (Collie, Brunswick and Wellesley rivers) and C66 (Leschenault Inlet);
- management of the pipehead weir to ensure that upstream migration of aquatic fauna is maintained;
- the alignment and construction of the pipeline from the pipehead weir to Kemerton Industrial Park, in particular, the management of impacts on the Brunswick River (C67), the lake gazetted for protection by the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992, and the Kemerton Conservation Park; and
- potential impacts on roadside remnant vegetation.

The Environmental Protection Authority considers that these issues have been addressed in commitments made by the Water Authority and that no significant environmental impacts will result from the implementation of the proposal.

The Environmental Protection Authority has concluded that the project is environmentally acceptable subject to the proponent's commitments and recommendations in this assessment report.

Number	Summary of Recommendation
1	The proposal is environmentally acceptable and the process of consideration of options and the selection made are supported. The proponent should prepare and implement a detailed Environmental Management Programme.
2	The proponent should commence data collection to determine the water allocation from the Wellington Dam that is required to meet the environmental water requirements of the Collie River.
3	The pipehead weir should be constructed to ensure that upstream migration of aquatic fauna is maintained.
4	The proponent should conduct a dieback survey along the intended alignment of the pipeline within the Kemerton Conservation Park.

1. Introduction and background

Kemerton Industrial Park is the major heavy industrial estate servicing the South-West region of the State. The park has been progressively developed with two major industries, SCM Chemicals (a chloride process titanium dioxide plant) and SIMCOA (a silicon plant), established and operating. Various scenarios have been investigated that indicate more than 20 additional industries could ultimately be located within the park, with 1000ha of the industrial park yet to be developed (WAWA, 1993).

The proposal by the Water Authority of Western Australia investigates the alternative water supplies that could be used to provide water required by future industries establishing at Kemerton. It does not address the use of the water within the Kemerton Industrial Park nor any disposal or treatment of wastewater or effluent that may be required. These will be examined when individual industry development proposals are being considered. The Environmental Protection Authority has previously advised Landcorp, the estate manager, that options involving deep well injection or ocean discharge of effluent (other than uncontaminated cooling water) would be likely to be found to be environmentally unacceptable (Environmental Protection Authority, 1993).

The Environmental Protection Authority decided to formally assess the proposal at the level of Public Environmental Review because of the potential for environmental impacts, particularly on areas identified as having regional conservation and recreation value. The Collie, Brunswick and Wellesley rivers (C67) and the Leschenault Inlet (C66) are nominated for protection in the System Six Report (Environmental Protection Authority, 1983b); the Collie River is also the subject of a general recommendation for a regional park (Environmental Protection Authority, 1983a).

2. Summary description of the proposal

A significant limiting factor to the expansion of the Kemerton Industrial Park is the availability of water for process or cooling. The Kemerton Advisory Board and the Water Authority have evaluated potential demand for water within the industrial estate and have estimated that a total of ten million kilolitres (per annum) is required (WAWA, 1993).

The Water Authority examined a number of alternative water sources for the Kemerton Industrial Park and identified the preferred source as a supply from the existing Wellington Dam, drawn from a new structure known as a pipehead weir, on the Collie River.

A number of sites on the Collie River from which the water could be piped to Kemerton were examined in the Public Environmental Review. The preferred option for the water offtake site for the pipeline is from a new pipehead weir to be built on the Collie River just below the South West Highway at Rose Road (see Figure 1). This weir would be less than 2.25 metres high allowing the river to flow over the structure. The quantity of water that is withdrawn from the Collie River to supply the Kemerton Industrial Park would be released from the Wellington Dam.

The Water Authority has predicted there would be minimal changes to the water flow regime of the Collie River. Upstream of the South West Highway water levels would be increased by approximately five millimetres. During the summer months a permanent pool would form behind the weir and raise water levels between the weir and the South West Highway by approximately one metre. Downstream of the offtake point, river flows would be substantially unchanged except that overflows from the Wellington Dam would be slightly reduced.

The Public Environmental Review examined a number of alternative routes for the pipeline from the pipehead weir to Kemerton (see Figure 1). The preferred alignment would follow Treendale and Raymond roads, the Australind Bypass and Stanley Road. The 750 millimetre pipe would be buried along its length, except for the Brunswick River crossing where it would be suspended from the road bridge.

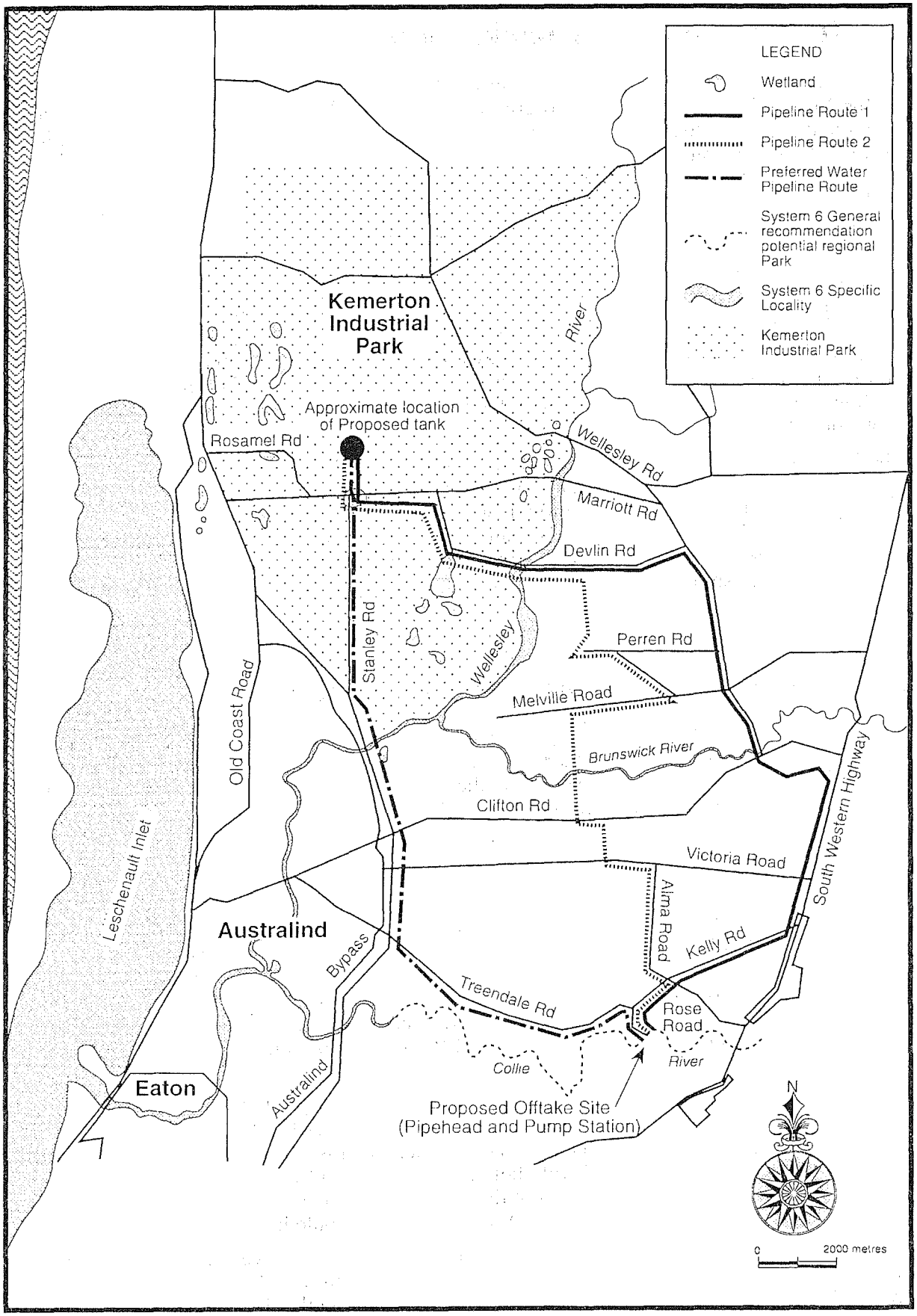


Figure 1: Location of proposed pipehead weir on the Collie River and preferred route for pipeline to Kemerton Industrial Park.

3. Environmental impact assessment method

The environmental impact assessment for this proposal followed the *environmental impact assessment administrative procedures 1993* as shown in the flow chart in Appendix 1. The summary of submissions and the proponent's response to those submissions appears in Appendix 2 and a list of submitters appears in Appendix 3. The proponent's commitments appear in Appendix 4.

In addition to the administrative procedures, officers of the Department of Environmental Protection undertook site visits to become familiar with the project area, and liaised with the proponent, interested parties and other government departments.

Comments on the proposal were received from the public, community groups and local and state government authorities. Of 10 submissions received, two were from the general public, one from a conservation organisation, and seven from local or State Government authorities. The Environmental Protection Authority considered these submissions in the preparation of this report.

Limitation

This evaluation has been undertaken using currently available information. The information has been provided by the proponent through preparation of the Public Environmental Review document (in response to guidelines issued by the Department of Environmental Protection), by Department of Environmental Protection officers utilising their own expertise and reference material, by utilising expertise and information from other State Government agencies, and by contributions from Environmental Protection Authority members. The Environmental Protection Authority recognises that further studies and research may affect the conclusions.

4. Evaluation

4.1 Introduction

The major environmental issues related to this proposal that have been identified through the environmental impact assessment process, including public submissions, are:

- the evaluation of alternative water sources;
- protection of the water levels and ecology of System Six recommendation areas C67 (Collie, Brunswick and Wellesley rivers) and C66 (Leschenault Inlet) from impacts caused by the removal of additional water from the river system;
- allocation of water from the Wellington Dam to meet the environmental needs of the river environment and riverine vegetation;
- route of the pipeline from the pipehead weir to Kemerton Industrial Park;
- management of the pipehead weir to ensure that upstream migration of aquatic fauna is maintained;
- management of impacts arising from construction of the pipehead weir;
- management of impacts arising from construction of the pipeline over the Brunswick River (C67) and the lake gazetted for protection by the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992, and through the Kemerton Conservation Park; and
- potential impacts on roadside remnant vegetation.

These environmental issues have been addressed in three sections in greater detail below.

4.2 Evaluation of alternative water sources

4.2.1 Objective

To protect regionally significant conservation values and allocated uses of water resources from adverse impacts due to the removal or diversion of water resources.

4.2.2 Evaluation framework

Technical information

Potential water sources examined by the Water Authority included groundwater (the Yarragadee Formation, which is a confined aquifer), the Harvey River, a pipehead on the Brunswick River, and conjunctive use of existing sources. None of these were considered by the Water Authority to be viable and were therefore not considered further (see Table 1 for summary).

Table 1. Summary of alternative water supply sources for Kemerton.(Source: WAWA 1993)

Source	Comment
Groundwater (local and regional)	Water from a number of groundwater sources was assessed and it was found that each source is either already allocated for townsite or agricultural use or, where available (Yarragadee Formation), would be expensive to supply because of the nature of the aquifer.
Piped from the existing weir or dam on the Harvey River	Available water from the Harvey River is already allocated to existing townsites or proposed townsite expansion and is not available for new industry at Kemerton.
Piped from a new dam on the Brunswick River	The cost (including the construction of a new dam) is at least 50 per cent more than other options investigated.
Piped from a pipehead weir from the Brunswick River	Without a dam, constant supply could not be guaranteed from a small weir relying on the natural flows of the River.
Piped from a pipehead weir on the Collie River	Supply would be adequate as a portion of the water released from the Wellington Dam that is currently allocated to industrial use is not used. Some concern was expressed because the water is saline and may not be suitable for some industries. It would be suitable, however for most industries and could be treated for those requiring a higher quality supply. This source was considered to have an acceptable level of social and environmental impact and met cost and quality criteria for industry. This is the preferred option.
Conjunctive use (more than one source used)	This option would prove too costly as it involves the use of available sources which are expensive (excluding the Wellington Dam).

The Water Authority examined several means of developing a supply from the Collie River. The conclusions are presented in Table 2.

Table 2. Summary of alternative means of supply from the Collie River.

Alternative	Comment
Use of the existing Burekup Weir on Collie River	The cost is very high because of the length of pipeline required.
Use of the existing irrigation pipeline	Water supply from the irrigation pipe would be erratic, and due to maintenance schedules and the needs of other users, would necessitate backup storage at Kemerton. Even so, security of supply for the industrial users could not be guaranteed.
Off-take from the Wellington Dam	The pipeline from this point to Kemerton would have extreme environmental impacts as it would have to pass through the Collie River valley, and the proposed Lennard and Gervasse Conservation Parks (Department of Conservation and Land Management, 1992). The length of the pipeline also means that cost is very high.
A pipehead weir on the Collie River, downstream of the South West Highway at Rose Road	This would minimise environmental impacts and meet supply requirements, and is the preferred option.

The preferred proposal requires the release of additional water from Wellington Dam to supply the water withdrawn for Kemerton at the Collie River offtake. The Water Authority (1993) has advised that when the Wellington Dam was constructed, 107 million kilolitres per year was allocated to agricultural or urban use as follows:

Agricultural irrigation	68 million kilolitres per year
Industry	20 million kilolitres per year
Great Southern Towns water supply	10 million kilolitres per year
Balance winter scouring (salinity control in the dam)	9 million kilolitres per year

The Great Southern Region town water is now supplied by the Harris River Dam and the town water allocation from the Wellington Dam is available for reallocation. In addition, the industrial allocation has never been used and only about 50 per cent of the irrigation allocation has been taken up over the past few years, although this allocation was completely used when the Harvey Irrigation District was fully operational.

The varying unused portion of the allocation has not been released from the Wellington Dam into the Collie River unless required for scouring or as part of natural overflows[1].

The Water Authority has predicted there would be minimal changes to the water flow regime of the Collie River. Upstream of the South West Highway water levels would be increased by approximately five millimetres. During the summer months a permanent pool would form behind the weir and raise water levels between the weir and the South West Highway by approximately one metre. Downstream of the offtake point, river flows would be substantially unchanged except that overflows from the Wellington Dam would be reduced slightly.

[1] Water scouring involves the release of saline water from the dam in winter to enable the dam to fill with fresh water. When the full allocation of urban and agricultural uses are taken up, only small volumes need to be released for scouring. In years when urban or agricultural allocations are not fully used, the amount released as scouring to reduce the dam's water levels is increased.

Comments from key government agencies

The section of the Collie River from the Leschenault Inlet to the Wellington Dam is within the area managed by the Leschenault Inlet Management Authority. The Leschenault Inlet Management Authority questioned the validity of the assessment of alternate water sources, particularly the dismissal of the groundwater option (Yarragadee Formation). The Leschenault Inlet Management Authority suggested that the Water Authority should be able to calculate the abstraction rate for this formation, and details of the full assessment of this option should have been provided in the Public Environmental Review.

The Leschenault Inlet Management Authority also expressed concern over the potential impacts of the preferred option on the environmental values of the Collie River.

Proponent's response

The Water Authority has indicated that estimates of sustainable yield for the Yarragadee Formation are currently under review, which will provide answers about the aquifer and its sustainable yield. However, the Water Authority expressed concern that excessive abstraction rates may lead to a landward migration of the saltwater/freshwater interface, and considered this option to be prohibitively expensive.

The Water Authority has predicted that changes in the river flow regime would be marginal, and there would not be any meaningful impacts on the riparian ecosystems of the lower Collie River (refer section 4.3.2).

4.2.3 Evaluation

The Environmental Protection Authority notes that much of the present water allocation from Wellington Dam is not used, particularly the industry allocation, and is sufficient to meet the estimated demand for Kemerton Industrial Park.

The Environmental Protection Authority has concluded that the removal of water from the Collie River as proposed and managed in accordance with the recommendations in this report would be environmentally acceptable.

4.3 Relationship of weir proposal to System Six Recommendations C66 (Leschenault Inlet) and C67 (the Collie, Brunswick and Wellesley rivers)

4.3.1 Objective

To protect areas recommended for regional conservation and recreation in the System Six recommendations, specifically Leschenault Inlet (Recommendation C66) and the Collie, Brunswick and Wellesley rivers (Recommendation C67). The Collie River is also identified as a potential regional park, as recommended in the System Six general recommendations (Environmental Protection Authority, 1983a).

4.3.2 Evaluation framework

Existing policy framework

In 1972, the Environmental Protection Authority established the Conservation Through Reserves Committee to make recommendations for the reservation of land for conservation and recreation purposes. The State was divided into 12 regions or Systems with the most intensively used areas in and around the Perth metropolitan area included in the Darling System, known as System Six (Environmental Protection Authority, 1983 a & b).

The Water Authority's proposal potentially affects two areas recommended for conservation and recreation in the System Six report. The areas of Recommendations C66 (Leschenault Inlet) and C67 (the Collie, Brunswick and Wellesley rivers) may be affected by changing river flows following construction of the pipehead weir.

Recommendation C67 comprises the Brunswick River downstream from Brunswick Junction, the Wellesley River downstream from about one kilometre north of its intersection with Wellesley Road and the Collie River from its mouth in the Leschenault Inlet to approximately four kilometres upstream (refer Figure 1).

In addition, the System Six Report recommends that many rivers in the State be made into regional parks, which includes the Collie River up to the Wellington Dam (refer Figure 1).

Recommendation C66 covers the Leschenault Inlet and recognises that the whole area is under increasing pressure from urban development, recreation and industrial development. The shallower waters of the inlet are an important nursery area for commercial species of fish.

Comments from key government agencies

The Department of Conservation and Land Management and Leschenault Inlet Management Authority both made comment related to the possible effect of the proposed weir and removal of water on downstream portions of the Collie River and the Leschenault Inlet. It was commented that the Public Environmental Review did not fully discuss the implications of the weir on the conservation values of the System Six recommended areas. These agencies also emphasised the importance of maintaining sufficient river flow downstream of the weir to protect the river and its uses, and specifically not impede movement of aquatic fauna.

The Department of Conservation and Land Management submission considered that the releases of water from Wellington Dam could enhance the recreational use of the Collie River Valley downstream of the dam.

Public submissions

Members of the public raised similar concerns about the effect of the weir on aquatic fauna movement in the Collie River, as well as the potential effect on riparian vegetation.

Proponent's response

The Water Authority has indicated that the implementation of the proposal would require additional releases of water from Wellington Dam and is committed to maintaining and managing water flows downstream of the pipehead weir similar to those applying before construction of the weir (Appendix 4, commitment 2-2).

The banks of the Collie River in the vicinity of the offtake weir site and upstream to the South West Highway are generally very steep and largely denuded of vegetation for some distance above the existing range of water levels. Impacts from the expected rise in water levels are therefore not anticipated to be significant.

Impacts downstream of the weir would relate to any changes in flow patterns that result from extracting ten million kilolitres for the Kemerton water supply. The Water Authority has studied the overflow pattern over the past 18 years (1974 to 1992) and advises that the dam has overflowed nine times in that period. The Water Authority has estimated that if the additional ten million kilolitres per year had been extracted over that time, overflow events would have been reduced to eight, rather than nine, in the 18 years studied (WAWA, 1993).

The Water Authority has concluded that the river flow regime would vary only marginally from the existing regime and that there would not be any significant impacts on the riparian ecosystems of the lower Collie River.

Nonetheless, the Water Authority is prepared to undertake a study of the Collie River before the weir is constructed to determine the current riparian ecology both upstream and downstream of the weir.

Currently, the Water Authority is undertaking a needs analysis of rivers in the South-West of the State which are controlled by dams. The aim of which is to determine the water resource and flow regimes required to maintain the ecology of each river. This approach is currently being developed, with trialing of the methodology due to be completed by December 1995.

The Water Authority is prepared to undertake a study on the environmental water requirements of the Collie River (Appendix 2) upon completion of this trial.

These studies will enable the Water Authority to develop adaptive management strategies to offset any adverse impacts associated with the weir and the taking of water for Kemerton Industrial Park.

In relation to the potential barrier effect of the pipehead weir, the Water Authority has committed to designing the weir to ensure that migration of native fauna species is not prevented (Appendix 4, commitment 2-3).

The Water Authority has identified potential for impacts on riverine vegetation and has made several commitments to minimise any such impacts. Construction would minimise destruction of vegetation, and rehabilitation and revegetation programmes would be implemented where necessary (Appendix 4, commitment 1-1, 7-1).

4.3.3 Evaluation

The Environmental Protection Authority considers that there is potential for restriction of aquatic fauna movement following construction of the pipehead weir, and sought additional advice from the Fisheries Department of Western Australia. It was suggested by the Fisheries Department that following construction of the Rose Road weir, conditions need to be examined to assess whether assistance should be given in the migratory passage of lamprey. Although the proponent has committed to constructing the weir to ensure that upstream migration of aquatic fauna is maintained (Appendix 4, commitment 2-3), the Environmental Protection Authority recommends that monitoring of aquatic fauna migration should be undertaken, to the requirements of the Fisheries Department. If movement is shown to be affected, the proponent should implement measures to allow the movement of aquatic fauna.

It is predicted that flows in the Collie River would be maintained or increased as a result of releases from Wellington Dam. In addition, the Water Authority will undertake studies to determine both the current riparian ecology of the Collie River prior to construction of the weir, and the environmental water requirements of the Collie River.

The Environmental Protection Authority considers that the proposal can be managed such that it does not cause significant adverse impacts upon the environmental and recreational values identified in the System Six Recommendations C66 and C67 and the general regional park recommendation.

4.4 Pipeline route from the pipehead weir to Kemerton

4.4.1 Objective

To minimise the impacts arising from the pipeline traversing the lake gazetted for protection by the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992, the Brunswick River (Reserve C67) and the Kemerton Conservation Park.

4.4.2 Evaluation framework

Technical information

The three pipeline routes considered by the Water Authority are presented in Figure 1. Following a review of these routes and discussion with the community through a consultative process, the Water Authority chose its preferred route. Each route potentially affects Recommendation C67 because of the need for the pipeline to cross the Brunswick River.

In addition, two wetland areas are located along the preferred pipeline route. One of these, where the Australind Bypass crosses the Brunswick River, is protected by the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992. The other wetland is near the corner of Stanley Road and Marriott Road, within the industrial core of the Kemerton Industrial Park.

A population of Priority 3 species flora *Acacia semitrullata* is located within the Australind Bypass road reserve and could be affected by the proposed pipeline alignment.

Comments from key government agencies

Main Roads Western Australia has indicated to the Water Authority that it is opposed in principle to a pipeline alignment within the Australind Bypass reserve (see WAWA, 1993, Appendix D). The road is proposed as a control of access freeway, and it is national policy that no new services should be permitted within the road reserve. Main Roads Western Australia is prepared to support the Water Authority suspending the pipeline from the road bridge over the Brunswick River.

The Department of Conservation and Land Management recommended that the pipeline be located in road reserves to minimise disturbance to vegetation, and that the Water Authority carry out dieback surveys in the road reserve for Stanley Road, which is within the Kemerton Conservation Park.

The Shire of Harvey indicated its concern about the impacts of the proposed pipeline alignment on the road reserve vegetation of Treendale/Raymond roads and suggested the Water Authority prepare a plan showing the location of the pipeline in relation to drains, other services and existing vegetation.

Public submissions

A submission was made requesting that the pipeline be located within the road reserve of the Perth-Bunbury Highway (Australind Bypass Section) rather than on private property, and that Main Roads and Water Authority negotiate to have the pipeline within the road reserve.

Other local landowners are committed to protecting trees in the road reserve for Rose Road and encourage the Water Authority to locate the pipeline on their properties rather than remove locally important and attractive remnant vegetation.

Proponent's response

The Water Authority of Western Australia has maintained its preferred pipeline alignment. The precise location of the alignment, along the eastern boundary of the Australind Bypass or through adjoining private property, has yet to be resolved between the Water Authority and Main Roads Western Australia.

By suspending the pipeline beneath the Brunswick River bridge on the Australind Bypass, the Water Authority believes that any impacts on the Brunswick River or the lake gazetted for protection by the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 would be limited. The wetland near Marriot and Stanley roads would be protected by location of the pipeline within cleared land and recontouring of the disturbed ground to maintain existing drainage (Appendix 2).

The Water Authority has given a commitment to consult with the Department of Conservation and Land Management prior to design and construction and to rehabilitate disturbed areas to ensure appropriate management of the population of *Acacia semitrullata* (Appendix 2, commitment 1-4).

The Water Authority has recognised the needed to protect a stand of mature trees within the road reserve for Rose Road which is near the pipehead weir. The proponent will consult with the Shire of Harvey and local landowners with the purpose of minimising the potential for impacts upon the existing natural environment and public amenity.

4.4.3 Evaluation

The Environmental Protection Authority considers that the proposal should not adversely affect the areas identified in the System Six report or the lake gazetted for protection in the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992. Suspension of the pipeline

from the existing Brunswick River road bridge would avoid disturbance to the Brunswick River and the protected lake.

The Environmental Protection Authority concludes that the environmental values have been considered and would be protected through detailed design of the preferred pipeline route. To protect the remnant vegetation the Water Authority should consult with the Department of Conservation and Land Management with particular reference to the dieback survey within the Kemerton Conservation Park. The Water Authority should continue to consult with the local community to negotiate the pipeline alignment which protects the community interests in remnant vegetation within the road reserves.

5. Discussion and synthesis

The Environmental Protection Authority considers that the Water Authority of Western Australia has evaluated the potential environmental impacts and prepared an appropriate design and management strategy. The Environmental Protection Authority has essentially reaffirmed the need to implement the commitments given by the Water Authority. By doing so, the Environmental Protection Authority believes that the proposal, as modified to be consistent with the recommendations of this report, will not have any significant environmental impacts.

6. Conclusions and recommendations

The Environmental Protection Authority concludes that the proposal is environmentally acceptable provided the proponent's commitments and the recommendations of this report are implemented.

Recommendation 1

The Environmental Protection Authority concludes that the proposal by the Water Authority of Western Australia to release water from the Wellington Dam, construct a pipehead weir on the Collie River and construct a pipeline to the Kemerton Industrial Park is environmentally acceptable. In reaching this conclusion, the Environmental Protection Authority identified the main environmental factors requiring detailed consideration as:

- **the evaluation of alternative water sources;**
- **protection of the water levels and ecology of System Six recommendation areas C67 (Collie, Brunswick and Wellesley rivers) C66 (Leschenault Inlet) from impacts caused by the removal of additional water from the river system;**
- **allocation of water from the Wellington Dam to meet the environmental needs of the river environment and riverine vegetation;**
- **route of the pipeline from the pipehead weir to Kemerton Industrial Park;**
- **management of the pipehead weir to ensure that upstream migration of aquatic fauna is maintained;**
- **management of impacts arising from construction of the pipehead weir;**
- **management of impacts arising from construction of the pipeline over the Brunswick River (C67) and the lake gazetted for protection by the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992, and through the Kemerton Conservation Park; and**
- **potential impacts on roadside remnant vegetation.**

The process of consideration of options and the selection of the preferred option by the Water Authority is supported.

The Environmental Protection Authority recommends that the proponent prepare and implement a detailed Environmental Management Programme addressing the above environmental issues, to the requirements of the Department of Environmental Protection on the advice of the Department of Conservation and Land Management, the Fisheries Department and the Waterways Commission, where appropriate.

The Environmental Protection Authority also recommends that the proposal proceed subject to the following recommendations which are reflected in the Environmental Protection Authority's recommended environmental conditions (as listed in section 7).

Recommendation 2

The Environmental Protection Authority recommends that the Water Authority of Western Australia should commence data collection to determine the water allocation from the Wellington Dam that is required to meet the environmental water requirements of the Collie River (Recommended Environmental Condition 3-2).

Recommendation 3

The Environmental Protection Authority recommends that the pipehead weir should be constructed to ensure that upstream migration of aquatic fauna is maintained and that the proponent undertake monitoring programmes to ascertain the extent of movement of aquatic fauna, to the requirements of the Department of Environmental Protection on the advice of the Fisheries Department and the Waterways Commission (Recommended Environmental Condition 4-1, 4-2).

Recommendation 4

The Environmental Protection Authority recommends that the proponent conduct a dieback survey along the intended alignment of the pipeline within the Kemerton Conservation Park, to the requirements of the Department of Environmental Protection on advice of the Department of Conservation and Land Management (Recommended Environmental Condition 6-1).

The Environmental Protection Authority has established an implementation and auditing system which requires the proponent to advise the Authority on how it would meet the requirements of the environmental conditions and commitments of the project. The proponent would be required to develop a progress and compliance report for this project as a component of the recommended audit programmes.

The Environmental Protection Authority's experience is that it is common for details of a proposal to alter through the detailed design and construction phase. In many cases alterations are not environmentally significant or have a positive effect on the environmental performance of the project. The Environmental Protection Authority believes that such non-substantial changes, and especially those which improve environmental performance and protection, should be provided for.

The Environmental Protection Authority believes that any approval for the proposal based on the assessment should be limited to five years. Accordingly, if the proposal has not been substantially commenced within five years of the date of this report, then such approval should lapse. After that time, further consideration of the proposal should occur only following a new referral to the Environmental Protection Authority.

7. Recommended environmental conditions

Based on the assessment of this proposal and recommendations in this report, the Environmental Protection Authority considers that the following Recommended Environmental Conditions are appropriate:

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 made in the Public Environmental Review and in response to issues raised following public submissions; provided that the commitments are not inconsistent with the conditions or procedures contained in this statement. These commitments are included in Environmental Protection Authority Bulletin 758 as Appendix 4. (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 River Ecology

3-1 The proponent shall manage the flow of water in the Collie River so that there is no environmentally significant change downstream of the off-take site.

3-2 Prior to commencement of construction, to achieve the objective of condition 3-1, the proponent shall prepare an Environmental Management Programme to the requirements of the Department of Environmental Protection on advice of the Department of Conservation and Land Management, the Fisheries Department and the Waterways Commission, as appropriate.

This programme shall address, but not be limited to:

1 Data collection to determine the environmental water requirements of the Collie River;
2 The surveying of Collie River riparian vegetation prior to construction of the off-take weir;
3 Water level monitoring; and
4 Aquatic fauna (refer condition 4).

3-3 The proponent shall implement the Environmental Management Programme required by condition 3-2.

4 Aquatic Fauna

4-1 The proponent shall design the pipehead weir, in consultation with the Fisheries Department and the Waterways Commission, to ensure that migration of aquatic fauna is maintained.

4-2 Following construction, the proponent shall undertake monitoring of aquatic fauna to the requirements of the Department of Environmental Protection on advice of the Fisheries Department and the Waterways Commission.

4-3 In the event that the monitoring required by condition 4-2 indicates that aquatic fauna movement is restricted, the proponent shall make provision for improved migration of fauna to achieve the objective of condition 4-1.

5 Lake Protection

5-1 The proponent shall design the pipeline to avoid unacceptable environmental impacts on the lake gazetted for protection by the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992.

5-2 The proponent shall construct the pipeline according to the design arising from condition 5-1.

6 Dieback Management

6-1 The proponent shall conduct a dieback survey along the intended alignment of the pipeline within the Kemerton Conservation Park, to the requirements of the Department of Environmental Protection on advice of the Department of Conservation and Land Management.

6-2 The proponent shall construct and maintain the pipeline in a manner consistent with the findings and management requirements arising from the dieback survey required by condition 6-1.

7 Proponent

These conditions legally apply to the nominated proponent.

7-1 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.

8 Time Limit on Approval

The environmental approval for the proposal is limited.

8-1 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.)

9 Compliance Auditing

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

9-1 The proponent, in consultation with the Department of Environmental Protection, shall prepare an Audit Programme, which includes requirements for the preparation of periodic Compliance Reports.

9-2 The proponent shall subsequently implement the Audit Programme required by condition 9-1.

Procedure

1 The Department of Environmental Protection 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.

2 If the Department of Environmental Protection, 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.

8. References

Department of Conservation and Land Management (1992), *Management Strategies for the South-West Forests of Western Australia - A Review*, Draft for Public Comment, Department of Conservation and Land Management, Western Australia.

Environmental Protection Authority (1993) Correspondence to Landcorp.

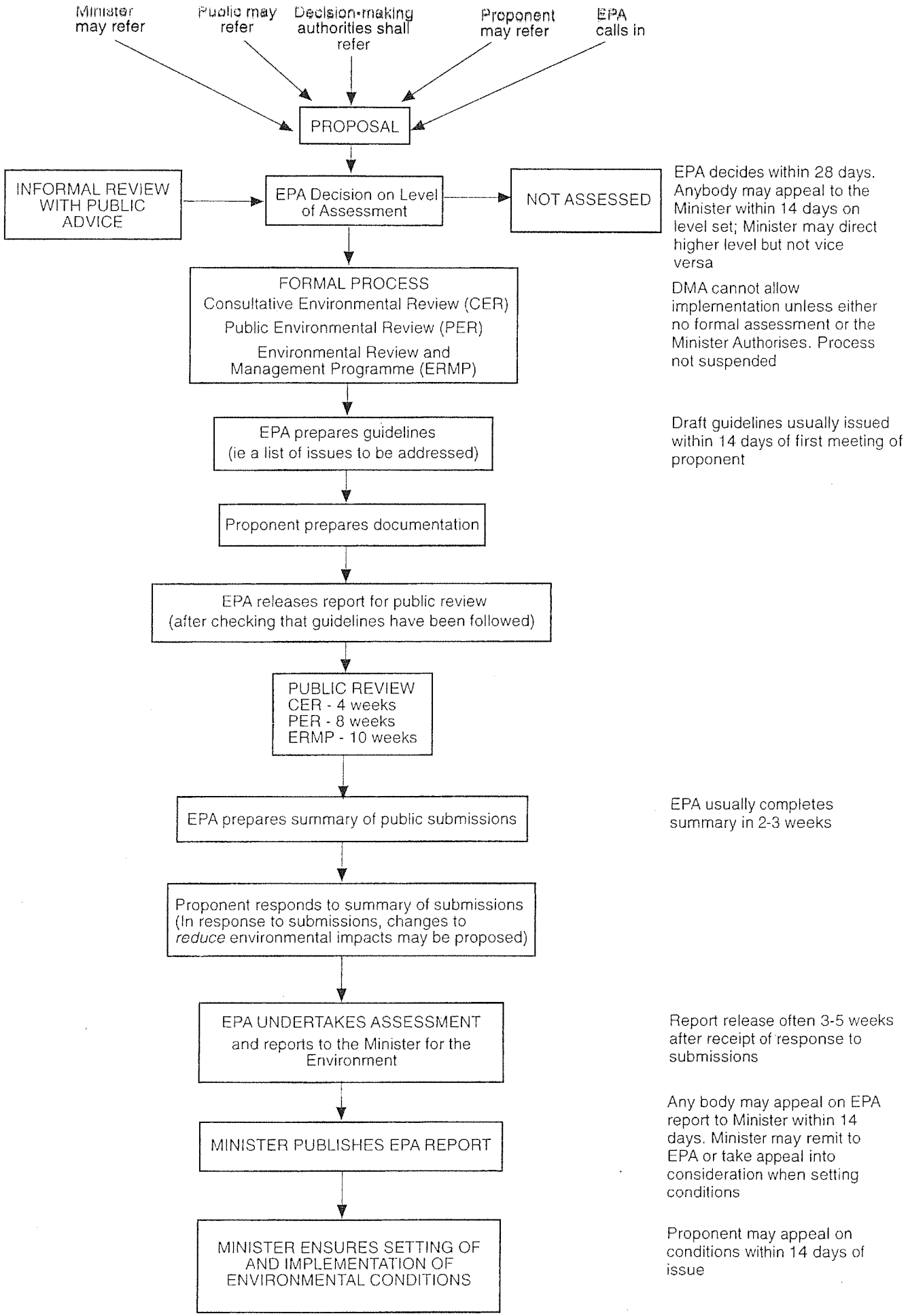
Environmental Protection Authority (1983a), *Conservation Reserves for Western Australia as recommended by the Environmental Protection Authority, the Darling System - System Six. Part I General Principles and Recommendations,* Department of Conservation and Environment, Western Australia, Report 13.

Environmental Protection Authority (1983b), *Conservation Reserves for Western Australia as recommended by the Environmental Protection Authority, the Darling System - System Six. Part II: Recommendations for Specific Localities*, Department of Conservation and Environment, Western Australia, Report 13.

Water Authority of Western Australia (1993), *Kemerton Industrial Park Water Supply - Public Environmental Review*. Report No. WP 198.

Appendix 1

Environmental impact assessment flow chart


Minister may refer
Public may refer
Decision-making authorities shall refer
Proponent may refer
EPA calls in
PROPOSAL
INFORMAL REVIEW WITH PUBLIC ADVICE
EPA Decision on Level of Assessment
NOT ASSESSED
EPA decides within 28 days. Anybody may appeal to the Minister within 14 days on level set; Minister may direct higher level but not vice versa
FORMAL PROCESS
Consultative Environmental Review (CER)
Public Environmental Review (PER)
Environmental Review and Management Programme (ERMP)
DMA cannot allow implementation unless either no formal assessment or the Minister Authorises. Process not suspended
EPA prepares guidelines (ie a list of issues to be addressed)
Draft guidelines usually issued within 14 days of first meeting of proponent
Proponent prepares documentation
EPA releases report for public review (after checking that guidelines have been followed)
PUBLIC REVIEW
CER - 4 weeks
PER - 8 weeks
ERMP - 10 weeks
EPA prepares summary of public submissions
EPA usually completes summary in 2-3 weeks
Proponent responds to summary of submissions (In response to submissions, changes to *reduce* environmental impacts may be proposed)
EPA UNDERTAKES ASSESSMENT and reports to the Minister for the Environment
Report release often 3-5 weeks after receipt of response to submissions
MINISTER PUBLISHES EPA REPORT
Any body may appeal on EPA report to Minister within 14 days. Minister may remit to EPA or take appeal into consideration when setting conditions
MINISTER ENSURES SETTING OF AND IMPLEMENTATION OF ENVIRONMENTAL CONDITIONS
Proponent may appeal on conditions within 14 days of issue

Appendix 2

Summary of submissions and proponent's response

Kemerton Industrial Park Water Supply

Public Environmental Review

Assessment Number (757)

A list of concerns and questions has been compiled from submissions received during the period of public comment. The Environmental Protection Authority would appreciate responses to these concerns / questions as soon as possible. This list and the responses from the Water Authority of Western Australia will be reproduced in the Authority's report on the project to the Hon Minister for the Environment.

The Leschenault Inlet Management Authority and the Department of Conservation and Land Management have prepared substantial submissions which contain a number of questions and comments. These submissions have been included as an appendix to this list. Each issue raised by those submissions should also be addressed.

1 Riparian vegetation and fauna habitat

1.1 Construction of the dam will affect the water levels in the Leschenault Estuary and the lower reaches of the Collie River. The altered water levels will disrupt the ecological balance between water height and the tolerances of floral and faunal species.

1.2 There will be loss of riparian vegetation along the banks of the River due to construction of the off-take dam. This vegetation should be rehabilitated.

1.3 Protection of native fish is vital due to their limited abundance and distribution. Migration patterns and ultimately their lifecycles will be adversely affected by the construction of the dam.

1.4 Sedimentation created by the construction work for the pipehead weir, will affect the turbidity of the surrounding waters and ultimately affect the ecology of the Collie River system.

1.5 The pipehead weir should be designed to ensure that a ford crossing of the river at Rose Road is achieved. A crossing is required by slow moving farm machinery and vehicles, and horse riders.

2 Pipeline route

2.1 Land owners adjacent to the Australind Bypass have expressed their "strongest opposition to the proposal to situate the pipeline within their property". These landowners do not support the Main Roads position that the pipeline cannot, or should not, be situated within the road reserve.

2.2 Placing another utility (in addition to the Bunbury Highway and the Dampier to Bunbury gas pipeline) and its restraining easement over the farming properties alongside the Australind Bypass will cause unnecessary social disruption, land severance and is likely to also cause problems with cattle grazing activities.

2.3 As a prerequisite to gaining approval for Special Rural subdivision some owners on the east side of the Australind Bypass are required to undertake a substantial re-vegetation programme over the cleared land. Will the Water Authority of Western Australia compensate these people for the vegetation which will be destroyed. Also the special rural lots will be more exposed to noise and amenity loss.

2.4 Approximately half of the land abutting the Highway, between Brunswick River and Clifton Road, consists of uncleared natural bushland containing Jarrah / Marri / Banksia woodland, also with a strong presence of peppermints. This is an attractive stretch of bushland which the planning authorities are keen to preserve as a natural buffer along the highway entrance into the Bunbury Region. The road reserve immediately abutting this area is substantially cleared of bush.

2.5 Disturbance to the population of *Acacia semitrullata* through the construction of the pipeline should be avoided. Protection of these species is essential for their continued survival.

2.6 Water Authority of Western Australia should consult with the Shire of Harvey to determine the precise alignment of the pipeline in the Treendale / Raymond Road reserves. A plan showing the proposed location of the pipeline in relation to drains, other services and existing trees should be submitted to Council in order to minimise damage to the natural environment.

3 Wellington Dam

3.1 The Wellington Dam Planning Committee has carried out extensive studies on recreational opportunities on the Dam waters and it is assumed that these studies have been ignored since they are not referenced in the Public Environmental Review, nor was there any consultation with people in the Shire of Collie.

4 Water resources issues

4.1 The destination of the polluted water from the heavy industry park was not considered. This is a fundamental part of the proposal and the Water Authority of Western Australia should be required to consider this issue.

KEMERTON INDUSTRIAL PARK WATER SUPPLY
PUBLIC ENVIRONMENTAL REVIEW
ASSESSMENT NUMBER (757)

The following is the Water Authority of Western Australia's response to the various concerns and questions which were raised from submissions received during the period of public comment.

GENERAL ISSUES OF CONCERN

1. Riparian Vegetation and Fauna Habitat

1.1 Construction of the dam will affect the water levels in the Leschenault Estuary and the lower reaches of the Collie River. The altered water levels will disrupt the ecological balance between water height and the tolerances of floral and faunal species.

The Authority recognises the criticality of the ecological balance in the Leschenault Estuary and the Lower Collie River and will endeavour to minimise impact to the ecosystem as a whole and in particular to sensitive flora and fauna species. The offtake weir is designed to be submerged during normal flows and operation of the scheme will ensure that flow regimes downstream of the offtake weir will approximate those prior to construction of the scheme.

The proposal requires the release of additional water from Wellington Dam to supply the water withdrawn for Kemerton at the Collie River offtake. This water is currently allocated to industry but is not used. The additional water released for Kemerton will result in a marginal increase in river flow between Wellington Dam and the offtake with an increase in flow depths estimated to be less than 50 mm. The flow downstream from the offtake will remain substantially the same as present, except that there will be some reduction in winter overflows and consequently occasionally reduced winter flows downstream of the offtake.

(Public Environmental Review - Section 7.1.2 page 25 refers)

The Authority has committed to manage the project so that the flow of water in the Collie River will be similar downstream of the offtake site to that prior to implementing the proposal *(Public Environmental Review - Section 8 Management Commitments - Commitment 2-2)*. Significant water height changes during most years will avoided. Therefore water height changes are not expected to perceptably impact on floral and faunal species.

1.2 There will be loss of riparian vegetation along the banks of the River due to construction of the off-take dam. This vegetation should be rehabilitated.

Impacts to riparian vegetation along the banks of the Collie River will be limited wherever possible. However the Water Authority of Western Australia recognises that some, unavoidable, loss of vegetation may occur during the construction of the pipehead weir. The Authority will seek to minimise such impacts through construction planning, controlled clearing and subsequent rehabilitation and revegetation of disturbed areas. Revegetation of these areas will be undertaken using suitable indigenous species.

(See Public Environmental Review - Section 8.0 Management Commitments - Commitment 1-2 and 7-1)

1.3 Protection of native fish is vital due to their limited abundance and distribution. Migration patterns and ultimately their life cycles will be adversely affected by the construction of the dam.

International and Australian research on the effect and ecological significance of obstructing fish passage in freshwater streams has identified the following factors as contributing to affecting fish migration patterns by restricting their movement. They are:

- height of the obstacle,
- waterflow velocity,
- size of the fish; and
- depth of water approach before the restriction.[1]

The Water Authority of Western Australia recognises the importance of the not altering the available habitat of the native fish species and will employ appropriate measures that would ensure that the pipehead weir does not present a barrier to the migration of native fauna species that use the Collie River.

(See Public Environmental Review - Section 8.0 Management Commitments - Commitment 2-3)

---

1 Environmental Protection Authority (now Department of Environmental Protection), 1987, *Effects of Gauging Station Control Structures on Native Fish Migration in Freshwater Streams of South West Australia* Bulletin 282, Western Australia.

In the detail design of the pipehead weir, the Authority will incorporate appropriate structures that will assist and maintain continued aquatic fauna migration at the pipehead weir.

The Authority has also committed to maintaining and managing the flow of water in the Collie River so that it is similar downstream of the pipehead weir to the flow prior to implementation of the proposal.

(See Public Environmental Review - Section 8.0 Management Commitments - Commitment 2-2)

The release of water from Wellington Dam, to supply the water withdrawn for Kemerton at the Collie River pipehead weir, will result in a marginal increase in the river flow between Wellington Dam and the offtake with an increase in flow depth of less than 5 millimetres.

The flow downstream of the pipehead weir will remain substantially the same as at present except that there will be some reduction in winter overflows at Wellington Dam and occasional reduced winter flows downstream of the pipehead weir.

The Authority considers the commitments it has made will ensure that the effect of the pipehead weir on the flow regime of the Collie River would not generate any meaningful impacts on the life cycles of the native aquatic fauna.

1.4 *Sedimentation created by the construction work for the pipehead weir, will affect the turbidity of the surrounding waters and ultimately affect the ecology of the Collie River system.*

Although it is expected to be minimal, the Water Authority of Western Australia acknowledges that the potential for sediment contamination of the Collie River will be greatest during construction of the pipehead weir.

The Authority will ensure that construction activities are managed, through appropriate construction planning, to limit sediment potential and, if necessary, will install sediment interception facilities.

(See Public Environmental Review - Section 8.0 Management Commitments - Commitment 2-1 and Section 7.2.2)

1.5 *The Pipehead Weir should be designed to ensure that a flood crossing of the river at Rose Road is achieved. A crossing is required by slow moving farm machinery, vehicles, and horse riders.*

The location chosen for the offtake weir is the site of an abandoned bridge crossing which used to provide access to the public for crossing of the Collie River at this point. The Authority has no objection to modifying the design of the structure to allow for a ford crossing of the river at this location providing the extra cost incurred is born by the beneficiaries (the Shire and/or other parties).

2. Pipeline Route

2.1 *Landowners adjacent to the Australind Bypass have expressed their "strongest opposition to the proposal to situate the pipeline within their property". These landowners do not support the Main Roads position that the pipeline can not, or should not, be situated within the road reserve.*

The route preferred by the Water Authority is within the Australind Bypass Reserve. Appendix D of the Public Environmental Review documents correspondence from the Main Roads Department documenting their position in relation to this issue. For the pipeline alignment to be situated within the Australind Bypass Road Reserve, it will be necessary for the Main Roads Department to change their position relating to this issue.

2.2 *Placing another utility (in addition to the Bunbury Highway and the Dampier to Bunbury Gas Pipeline) and its restraining easement over the farming properties along side the Australind Bypass will cause unnecessary social disruption, land severance and is likely to also cause problems with cattle grazing activities.*

The Authority concurs with the concern that placement of the pipeline will cause social disruption, land severance and problems with cattle grazing activities but is constrained by the position adopted by the Main Roads Department (refer to response to question 2.1 above). An analysis of the impacts of this alignment when compared with other alternative alignments shows that the net impacts of the proposal are less than or equal to the net impacts of the other alternatives. However, if the pipeline could be placed within the Australind Bypass Road Reserve, the impacts would be minimal.

2.3 *As a pre-requisite to gaining approval for Special Rural subdivision some owners on the east side of the Australind Bypass are required to undertake a substantial revegetation program over the cleared land. Will the Water Authority of Western Australia compensate these people for the vegetation which will be destroyed? Also Special Rural lots will be more exposed to noise and amenity loss.*

The Authority recognises that some, unavoidable, localised loss of vegetation may occur during construction of the pipeline. The Authority will minimise this through construction planning and management, controlled clearing and subsequent rehabilitation and revegetation of disturbed areas. Revegetation of these areas will be undertaken using suitable indigenous species. It is anticipated that, upon regrowth of the revegetation introduced as part of this project exposure to noise and amenity on special rural lots will not be substantially different from the current situation.

2.4 *Approximately half of the land abutting the Highway, between Brunswick River and Clifton Road, consists of uncleared natural bushland containing Jarrah / Marri / Banksia woodland, also with a strong presence of peppermints. This is an attractive stretch of bushland which the planning authorities are keen to preserve as a natural buffer along the highway entrance into the Bunbury Region. The road reserve immediately abutting this area is substantially cleared of bush.*

The Water Authority agrees with the concern raised about preserving natural bushland and regrets that some unavoidable localised loss of vegetation may occur during construction and operation of the pipeline. The Authority will minimise this through construction planning and management, controlled clearing as a subsequent rehabilitation and revegetation of disturbed areas. Revegetation of these areas will be undertaken using suitable indigenous species. It is further acknowledged that the road reserve immediately abutting this area is substantially cleared of bush, however, *(as documented in a response to question 2.1 above)* in order for the pipeline alignment to be situated within the Australind Bypass Road Reserve it will be necessary for the Main Roads Department to change their position relating to this issue. The least impact alignment for the pipeline would be within the Road Reserve (which is the Water Authority's preferred alignment), but unless the Main Roads Department changes their position, an alignment within the Road Reserve is not an available option.

2.5 *Disturbance to the population of Acacia semitrullata through the construction of the pipeline should be avoided. Protection of these species is essential for their survival.*

The Water Authority of Western Australia will endeavour to protect as much vegetation as possible during construction, and rehabilitate and revegetate where unavoidable disturbance to vegetation has occurred. The Authority recognises the role and value in protecting these vegetation communities to preserve visual amenity and remnant habitat.

During the detailed design stage and the development of a precise alignment of the pipeline the Authority will consult with the Department of Conservation and Land Management in regard to ensuring that:

- wherever possible the population of *Acacia semitrullata* is not disturbed; and
- where this is unavoidable, appropriate construction planning and management and rehabilitation measures are developed for implementation during construction activity.

(See Public Environmental Review - Section 8.0 Management Commitments - Commitment 1-4)

2.6 *Water Authority of Western Australia should consult with the Shire of Harvey to determine the precise alignment of the pipeline in the Treendale/Raymond Road reserves. A plan showing the proposed location of the pipeline in relation to drains, other services and existing trees should be submitted to council in order to minimise damage to the natural environment.*

The Water Authority of Western Australia acknowledges that the construction of the pipeline along the road reserve may impact on trees and services and has actively consulted with the local community during the initial planning stages of this proposal. The Authority will continue to ensure that impacts to trees, drains and other services are avoided wherever possible.

The precise alignment of the water pipeline within the Treendale and Raymond Road Reserves will be determined at the detailed design stage of the project. During this stage the Authority will consult with the Shire of Harvey and local landowners with regard to minimising the potential for impacts to the existing natural environment and public amenity from the alignment of the pipeline within the road reserve.

(See Public Environmental Review - Section 8.0 Management Commitments - Commitment 4-1 and 4-3)

3. Wellington Dam

3.1 The Wellington Dam Planning Committee has carried out extensive studies on recreational opportunities on the Dam waters and it is assumed that these studies have been ignored since they are not referenced in the Public Environmental Review, nor was there any consultation with people in the Shire of Collie.

The Water Authority has conducted and considered studies into recreational opportunities on Wellington Dam. The policy regarding this issue is documented in the Public Environmental Review *(Section 7.1.2 page 27.)* The Water Authority has been involved in discussions about recreation on the Wellington Dam with local and regional groups since 1985. The Authority participated in preparation of a recreation plan for the dam in 1986 and is currently represented on the Wellington Dam Advising Committee.

The attached letter which documents the Water Authority policy about recreation on Wellington Dam was sent to the South West Shire Council's Association (which includes the Collie Shire) in response to resolutions made at their 14th May 1993 Conference. This letter was followed up by discussions at the 5th November 1993 Conference. The letter clearly states that 20 million cubic metres per year has been allocated to industry (eg. Kemerton) and clearly states that while recreational use of Wellington Dam will be accommodated, priority will be given to consumptive users of the resource.

The estimated amount of water that would be released from Wellington Dam to supply Kemerton will not significantly lower water levels within the dam. In fact, as stated by Department of Conservation and Land Management "it would appear likely that the normal seasonal variation in water level would mask the influence of the Kemerton supply". Therefore it is unlikely that a noticeable reduction in the recreational opportunities which are currently enjoyed would be experienced. The prime purpose of Wellington Dam is as a water supply source and recreation is accepted only on an opportunity basis.

4. Water Resources Issues

4.1 The destination of the polluted water from the heavy industry park was not considered. This is a fundamental part of the proposal and the Water Authority of Western Australia should be required to consider the issue.

The destination of polluted water can not be determined until the quantity and especially contaminants from each industry are known. Clearly this must be done on an industry by industry basis. The type of contaminants could vary widely requiring completely different approaches. The type and concentration of contaminants varies widely from industry to industry and the approach to be used may vary significantly depending on the type and concentration of contaminants produced by any given industry. The treatment and disposal of effluent from industries can only be addressed when the industry and the nature of its effluent is known. Thus the disposal of effluent can only be treated during the planning stage for each future industry and can be dealt with through the environmental and pollution control provisions of the Environmental Protection Act. It is not possible at this time to address this issue.

LESCHENAULT INLET MANAGEMENT AUTHORITY

1. *The water requirements of the river system need to be assessed before any changes to the flow or flood regime are made, to identify impacts and develop options for the management of those impacts. The WAWA have not made any commitment to research on the ecology of river systems.*

The flow and flood regime of the lower Collie River have been greatly altered by the construction and operation of Wellington Dam and the lower weir. These changes were made many years ago before it was understood that downstream environmental values need to be considered. Land adjacent to the downstream reaches of the river have been extensively developed for agriculture and this has also had a very significant impact on the river and its environmental values. However, the lower Collie still has significant environmental values, but these have to be considered in the context of the changes which have already occurred.

The change in flow regime now proposed will clearly have some environmental impact, however the additional impact will be very small in comparison with previous impacts. This statement is not meant to underestimate the importance of cumulative impacts, but more to put into perspective the changes which are now proposed.

The Water Authority is committed to undertaking studies on the environmental water requirements (EWRs) of rivers downstream of impoundments. It has been undertaking aquatic fauna studies on rivers between the Canning and the Murray River since 1984 and on the Warren River since 1987. Two of the aims of these studies were to provide information on the impacts of existing dams and to provide baseline data for future environmental impact assessment studies. The studies have also provided essential information on the life cycles of native fish species.

This earlier work has provided very useful information, but has fallen short of establishing water requirements for the maintenance of downstream ecosystems. To remedy this, the Authority is funding a major project to develop a process/methodology for establishing environmental (ie ecological) water requirements downstream of dams to meet agreed management objectives and environmental values. The project is entitled "Environmental Flow Requirements of Regulated River Systems" and will be undertaken as a joint venture by the Department of Zoology at the University of WA, and the Division of Australian Environmental Studies at Griffith University in Queensland.

As part of this project, it is proposed to apply the methodology on a major river system which is already regulated by water supply dams. Because the application of the methodology will almost certainly require good baseline information on aquatic fauna, it is likely that the Dandalup River system will be chosen for this purpose. Data collection commenced on this system in 1985.

The study on developing and trialing EWR methodology should be completed by December 1995.

The Authority is happy to commit itself to undertake an EWR study on the Collie River after the completion of the above work. However, as it will be necessary to collect baseline ecological information for 2 to 3 years before commencing the EWR study on the Collie River, it is unlikely that such a study could be completed before about 1998. It should also be recognised that such a study on the Collie River would be considerably more complicated than for the Dandalup Rivers because of the greater significance that would need to be given to a wider variety of beneficial uses ie ecosystem maintenance, irrigation, public water supply, power generation and recreation.

2. *If the proposal is to be approved, then a notional allocation of water should be specified for river use until such time as the Water Authority of Western Australia has carried out a needs assessment of the river system.*

See response to Question 1 above

The Authority has also committed to maintaining and managing the flow of water in the Collie River so that it is similar downstream of the pipehead weir to the flow prior to implementation of the proposal.

(See Public Environmental Review - Section 8.0 Management Commitments - Commitment 2-2)

The Authority considers the commitments it has made effectively meet the requirement of the intent implied in the question.

3. *The cost of the Yarragadee Formation option has not been assessed on its own and appears to have been lumped in with the Cockleshell Gully option which was discounted because of the poor quality of water (table 1). There are no costs presented for the development of the wellfield at Dardanup. This point needs to be further clarified by Water Authority of Western Australia.*

The costs of Regional groundwater as shown for Yarragadee/Cockleshell in Table 1 of the Public Environmental Review are for the Yarragadee Formation Option only. The cost of the Cockleshell Gully option has not been determined, as it is recognised that this will be a higher cost than the Yarragadee Formation, for water of a significantly lower quality. It was felt that this would therefore not warrant further investigation of Cockleshell Gully Formation options.

The cost of constructing a wellfield into the Cockleshell Gully Formation will be substantially more than the Yarragadee but the actual cost has not been determined as sufficient quantity is available from the Yarragadee at a far superior quality. The Cockleshell Gully option has not been further investigated and costs have not been determined.

4. *There are no details provided in the PER to enable a full assessment of the use of the Yarragadee Formation. The WAWA should be able to calculate the extraction rate based on the expected water use at Kemerton.*

   The impact of the extraction should be able to be calculated, to determine the likelihood of any movement in the salt water/fresh water interface. The WAWA have been managing extraction from these aquifers for many years and the full viability of this option needs to be addressed. These details should be provided to enable the community to adequately assess the viability of this option.

The allowable extraction rates from the Yarragadee Formation have been determined based on current estimates of sustainable yield for the aquifer. These estimates are currently under review and it is anticipated that the "Bunbury Area Groundwater Management Plan" will be published later this year. This will provide answers to the questions about the aquifer and its sustainable yield based on our current understanding of the groundwater systems in the Bunbury area. At this stage there is no reason to expect that the availability of water in the Yarragadee Formation will be substantially different from the indications in the Kemerton Public Environmental Review.

5. *The environmental use of overflow water from the Wellington Dam has not been recognised or discussed. The PER has not addressed this issue, and no information has been provided on changes to flow and flow regime downstream of the pipehead dam.*

See response to Question 1 on previous page

6. *The Water Authority of Western Australia have advised on the possible changes to frequency of overflow events at Wellington Dam, but have not indicated what changes will occur in the quantities of overflow water for each year that an overflow occurs. This information is just as important as the overflow frequency that has not been provided in the PER.*

As mentioned in page 26 of the Public Environmental Review, for the period between 1974-1992, the Wellington Dam overflowed in nine of those years. If the Kemerton water scheme had been in place during that time this would have been reduced to eight years, or a reduction of 6% of years. The total amount of overflow during that period was 695 million cubic metres. This would have been reduced by 27% to 505 million cubic metres over the 18 year period.

This question endorses the Authority's proposal as documented in the Public Environmental Review.

8. *The 10M kilolitre allocation to industry is being removed from an amount of water which has been available to the flow and flood regime of the river system, and a full environmental study of the needs of the river system downstream of the proposed pipehead dam should be carried out before changing this allocation. The amount of water available to the river will become more important in the future if the irrigation industry expands and uses all of its traditional allocations.*

It should be noted that (*section 7.1.2 page 26 of the Public Environmental Review*) the historic allocation to industry has been 20 million kilolitres per year. Of this amount it is proposed to allocate 10 million kilolitres per year (or less than 10% of the total annual yield) to Kemerton. There is no proposal to change this allocation.

There is a general trend as documented in the South West Irrigation Strategy for reduction of use of irrigation water in the Collie Irrigation District, it would therefore appear to be unlikely for the irrigation industry to 'expand and use all of its traditional allocation' in the foreseeable future. In fact the reverse appears to be true and is expected to continue. Further, the construction of Harris Dam has increased total available annual yield from the Collie River system and has allowed release of the 10 million kilolitres per year allocation for town water supply from the Wellington Dam.

This additional water is currently not allocated to any consumptive use and in the five years since the construction of the Harris Dam, this water allocation from Wellington Dam (which was previously used by the Great Southern Towns Water Supply) has been available for environmental release. It has in fact been released as part of the scouring policy which involves water releases during the winter months. This practice is required as part of the Harris Dam Environmental Management Program. Thus it can be demonstrated that any change to the amount of water available to the flow and flood regime of the river system which would be caused by the Kemerton Scheme will be minimal.

Also, see response to Question 1, on previous page

9. *With little known about the need of fauna species in this part of the river, there is a need for a thorough assessment of the needs of the river fauna and ecosystems with regard to the flow and flood regime.*

Baseline monitoring of aquatic fauna would be a prerequisite of an Environmental Water Requirements study referenced in our response to Question 1. Because the lower Collie is already greatly modified from its natural condition, it is not believed that the absence of this information should delay approval of the proposed project.

See response to Question 1, on previous page

10. *The impact of reduced water flows downstream of the pipehead weir on wetlands adjacent to the Collie River needs to be accessed.*

See response to Question 1, on previous page

11 *The pipeline along Treendale and Raymond Roads road reserve will need to be carefully placed to ensure the trees along the road reserve are not damaged or removed (protected under Shire of Harvey TPS provisions for Scenic Roads). How this protection will be implemented has not been addressed in the PER.*

The Water Authority of Western Australia acknowledges that the construction of the pipeline along the road reserve may impact on trees and services and has actively consulted with the local community during the initial planning stages of this proposal. The Authority will continue to ensure that impacts to trees, drains and other services are avoided wherever possible.

The precise alignment of the water pipeline within the Treendale and Raymond Road Reserves will be determined at the detailed design stage of the project. During this stage the Authority will consult with the Shire of Harvey and local landowners with regard to minimising the potential for impacts to the existing natural environment and public amenity from the alignment of the pipeline within the road reserve.

(See Public Environmental Review - Section 8.0 Management Commitments - Commitment 4-1 and 4-3)

12. *WAWA and EPA are advised that formal approval from LIMA is required for the construction work proposed within the Collie River to build the pipehead weir under the Waterways Conservation Act 1976.*

The requirement for formal approval from LIMA for construction work proposed within the Collie River is hereby acknowledged.

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

1 *There is no mention of dieback management during the installation of the pipeline. The proponent should conduct a dieback survey along the Stanley Road route within accordance with the dieback survey. It is preferable to do any earth moving or clearing work during summer.*

During the detailed design stage and prior to establishing an exact alignment of the pipeline route within the Kemerton Industrial Park, the Water Authority of Western Australia, in consultation with the Department of Conservation and Land Management, will undertake a dieback survey along the intended alignment and at the tank site.

If a Disease Risk Area is identified, the Authority will develop and implement an appropriate dieback management strategy. The strategy will be developed in conjunction with the Department of Conservation and Land Management and will include specific procedures regarding minimising dieback distribution and impact, and dieback precautions involving construction activity and personnel movement.

2 *To minimise clearing of native vegetation in Kemerton Park the pipeline should be placed in the proposed Stanley Road Reserve. The consultants should check with the Kemerton Board that the exact alignment of this road is known. We believe it may be a little indefinite at this stage. It would be best to have it formally surveyed prior to the pipeline route being determined. It is desirable to avoid a separate corridor for the pipeline.*

The precise alignment of the water pipeline within the Kemerton Industrial Park will be determined at the detailed design stage of the project. It is the intention of the Water Authority of Western Australia to locate the water pipeline within the Stanley Road Reserve. The Authority will consult with the Kemerton Board in defining the exact alignment of the Stanley Road Reserve prior to establishing the alignment of the water pipeline within the Kemerton Industrial Park.

3. *The Collie River Valley below the dam is a very popular recreation site. It would seem that the Kemerton water release would slightly enhance summer recreation below the dam. Planning is also underway for an increasing use of the dam foreshore and waterbody. Recreation facilities are being developed at Potter's Gorge.*

Kemerton water release will have minimal impact to recreation below the dam as water levels and volumes will not be significantly released any impact to recreation downstream of the dam will be positive as the volume of water being released will be slightly increased.

With regard to the issue of increasing recreational use of the dam foreshore and waterbody please refer to the Water Authority's response to question 3.1 above.

4. *The PER predicts that the Kemerton supply from the Collie Weir will have an "insignificant" effect on the water balance and therefore not affect the existing riparian environment.*

A summer rise of 5mm in the river level between the dam and the weir would not seem to matter. Presumably the Kemerton water is a winter loss to the river below the weir. The PER just asserts that this marginal difference will not have any "meaning" impacts on the ecosystems. Whilst the general water balance implication might support this conclusion, some index of the ecological influence of flood levels and variation in the Lower Collie River would give more assurance.

Likewise some measure of the period and season during which the weir is an unnatural barrier to fish might assist their dismissal of the issue. There would be some time during summer when the weir was cascading and forming a barrier. The seasonality of fish movement and activity would need to be assessed against the temporary barrier imposed by the weir. The need for fish ladders or the like could then be determined.

Refer to response to Question 1-3 above.

The Water Authority of Western Australia recognise the importance of protecting the available habitat of the native fish species and will employ appropriate measures that would ensure that the pipehead weir does not present a barrier to the migration of native fauna species that use the Collie River.

(See Public Environmental Review - Section 8.0 Management Commitments - Commitment 2-3)

The Authority will incorporate appropriate structures at the pipehead weir that will facilitate the continued migration of aquatic fauna at the pipehead weir in the Collie River. In addition the Authority have committed to ensuring that the flow in the Collie River is similar downstream of the pipehead weir to the flow prior to implementation of the proposal.

(See Public Environmental Review - Section 8.0 Management Commitments - Commitment 2-2)

5 *We note that the proponent will endeavour to protect as much roadside vegetation as possible, and replace it where necessary. Although there may not be any special conservation features within the roadside vegetation it is generally acknowledged that it should be protected and enhanced wherever possible to preserve visual amenity and remnant habitat. The commitment to consulting CALM regarding Acaccia semitrullata is noted.*

The Water Authority of Western Australia will endeavour to protect as much vegetation as possible during construction, and rehabilitate and revegetate where unavoidable disturbance to vegetation has occurred. The Authority recognises the role and value in protecting these vegetation communities to preserve visual amenity and remnant habitat.

During the detailed design stage and the development of a precise alignment of the pipeline the Authority will consult with the Department of Conservation and Land Management in regard to ensuring that:

- wherever possible the population of *Acacia semitrullata* is not disturbed; and
- where this is unavoidable, appropriate construction planning and management and rehabilitation measures are developed for implementation during construction activity.

(See Public Environmental Review - Section 8.0 Management Commitments - Commitment 1-4)

The Water Authority of Western Australia acknowledges that the construction of the pipeline along the road reserve may impact on trees and services and has actively consulted with the local community during the initial planning stages of this proposal. The Authority will continue to ensure that impacts to trees, drains and other services are avoided wherever possible.

The precise alignment of the water pipeline within the Treendale and Raymond Road Reserves will be determined at the detailed design stage of the project. During this stage the Authority will consult with the Shire of Harvey and local landowners with regard to minimising the potential for impacts to the existing natural environment and public amenity from the alignment of the pipeline within the road reserve.

(See Public Environmental Review - Section 8.0 Management Commitments - Commitment 4-1 and 4-3)

6 *The Kemerton Parkland Committee would appreciate that the parkland buffer around the industrial core owes its existence to the industrial purpose of Kemerton Industrial Park. Whilst it is intended to protect as much of the buffer in as natural a condition as possible there will be a need to accommodate some essential service corridors and facilities sites. (See definition of Park Purpose Feilman Report 1989). The site chosen for the tank is environmentally acceptable. The establishment of supplementary screening vegetation may be desirable.*

A water tank sited in the Kemerton Industrial Park, will receive the water from the pipeline. The tank will be constructed on a topographical high point to enable a gravity feed to Kemerton. The exact location of the water tank is subject to commencement of the detailed design stage.

The Water Authority of Western Australia will if possible select a site where additional vegetation can be retained to be used as a buffer or screen between the water tank and the major viewpoints while fulfilling design and geographical criteria. However if this is not possible the Authority will establish supplementary screening vegetation around the water tank site.

Appendix 3

List of submitters

Shire of Dardanup
The Leschenault Inlet Management Authority
Department of Conservation and Land Management
Shire of Collie
Shire of Harvey
Ms C Heal
Conservation Council of Western Australia Inc
Landcorp
the Howson family
the South West Development Authority

Appendix 4

Proponent's commitments

8.0 MANAGEMENT COMMITMENTS

The Water Authority undertakes responsibility for the implementation of the commitments listed below. This holds whether the work is done directly by Water Authority personnel of by others contracted for specific phases or elements of the project. All commitments will be expedited promptly at the appropriate stage during the design or construction of the project, and will be carried out to the satisfaction of the Project Manager through the Construction Co-ordinator.

1. Remnant Native Vegetation

1-1 Impacts on remnant native vegetation will be limited to those which are unavoidable for the construction and operation of the proposed pipeline and pipehead weir by controlled clearing and subsequent rehabilitation.

1-2 Revegetation of the Collie River banks will be undertaken using suitable indigenous species.

1-3 The stand of mature trees within the Rose Road reserve will be preserved.

1-4 Prior to commencement of detailed design and construction the Department of Conservation and Land Management will be consulted in regard to the management of the population of Acacia semitrullata. Areas which are disturbed will be rehabilitated at the completion of construction activity.

2. Collie River

2-1 Sediments from work associated with the project entering the Collie River will be minimised by containing runoff from the works.

2-2 During operation of the pipeline and pipehead dam, the flow of water in the Collie River will be managed so it is similar downstream of the offtake site to that prior to implementing the proposal.

2-3 The pipehead weir will be specifically designed to be submerged during all but the lowest of flows so as not to form a significant barrier to the migration of aquatic fauna.

3. Brunswick River

3-1 Sediments from work associated with the project will be minimised from entering the Brunswick River by containing runoff from the works.

3-2 The conservation and recreation values, and visual amenity properties of the Brunswick River and its banks will be preserved by ensuring all construction activity is managed to cause the least disturbance and that any impacts upon the riparian ecosystem are minimal.

4. Land Use

4-1 Throughout the project, land disturbed by work associated with the project will be contoured to restore the pre-construction drainage regime and access.

4-2 During construction of the pipeline and pipehead weir, any disruption to traffic will be managed in liaison with the local government authority or Main Roads Department of Western Australia as applicable.

4-3 Prior to construction of the pipeline and pipehead weir, agreements will be concluded with owners of land on which facilities are to be constructed.

5. Dust and Erosion

5-1 Throughout the project, land disturbed by work associated with the project will be contoured to restore the pre-construction drainage regime and access.

5-2 During construction of the pipeline and pipehead weir, fugitive dust will be prevented by watering.

5-3 During construction the following mitigation measures will be adopted:

- off road movement of vehicles during construction and operation would be kept to a practical minimum;
- where practicable, the removal of natural vegetation would be avoided; and
- construction traffic movements would be kept to a practical minimum in wet weather.

6. Noise

6-1 Throughout the project, noise will be abated to accord with statutory requirements.

6-2 Noise impact during construction will be controlled by implementing the following measures:

- use of appropriate noise limiting equipment on earthmoving and other construction equipment;
- minimising equipment activity outside normal working hours;
- provision of noise screens around stationary construction equipment where applicable; and
- offsite fabrication and use of pre-fabricated construction materials where applicable.

6-3 Measures to minimise the potential for any noise impact from the pump station would include:

- cladding the pump station building with sound absorbing material; and
- selection of pumps and motors with low noise levels.

7. Rehabilitation

7-1 Where trees or other vegetation need to be cleared, the following measures will be adopted to rehabilitate disturbed areas.

- Areas disturbed during construction would be contoured and revegetated with an appropriate species.

- Top soil and material would be respread following construction. Any excess spoil would be disposed of at an approved site.
- Trenches and backfill would be compacted and profiles shaped to minimise water erosion.
- Construction wastes would be collected and disposed of at an approved site.