

# East of Joondalup urban development

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Homeswest, Yatala Nominees Pty Ltd and the R&I Bank

Report and recommendations  
of the Environmental Protection Authority

Environmental Protection Authority  
Perth, Western Australia  
Bulletin 637  
July 1992

## 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 recommendations.

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 assessment report 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  
18th Floor, Allendale Square  
77 St George's Terrace  
PERTH WA 6000

## CLOSING DATE

Your appeal (with the \$10 fee) must reach the Minister's office no later than 5.00 pm on the 1 August 1992.

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# Contents

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	<b>Page</b>
<b>Summary, advice and recommendations</b>	<b>i</b>
<b>1. Introduction, background and project description</b>	<b>1</b>
<b>2. Existing environment</b>	<b>1</b>
2.1 Topography and landforms	1
2.2 Vegetation	1
2.3 Hydrology	3
<b>3. The planning context</b>	<b>3</b>
<b>4. Issues raised during the public review period.</b>	<b>4</b>
4.1 Overview	4
4.2 A summary of the issues and concern raised	4
<b>5. Environmental impacts and management</b>	<b>4</b>
5.1 The key environmental issues	4
5.2 Potential to pollute ground and surface water resources, including downstream wetlands	5
5.3 Water balance changes to nearby wetlands, including Lake Joondalup, and the effect on wetland vegetation	5
5.4 The significance of the native flora and fauna of the site	5
5.5 Impact on Neerabup National Park	6
5.6 The environmental impact of any major roads servicing this development	6
5.7 The proximity of the four motor racing venues, and the likely noise impacts on the residents	6
<b>6. Environmental impacts and their management - the Authority's advice and recommendations</b>	<b>7</b>
6.1 Advice to the planning agencies	7
6.1.1 Traffic management	7
6.1.2 Advice to the planning agencies regarding noise impacts from the motor racing venues north of this site on future residents	7
6.2 General recommendation	9
6.3 Potential to pollute ground and surface water resources, and water balance changes to nearby wetlands, including Lake Joondalup	10
6.4 The significance of the native flora and fauna of the site	10
<b>Figures</b>	
1. Location map	2
2. Location of the four motor racing venues north of the proposed development	8

## Contents (cont'd)

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Page

---

### Tables

- |                                    |   |
|------------------------------------|---|
| 1. A summary of public submissions | 4 |
|------------------------------------|---|

### Appendices

1. Issues raised during the public review period
2. The proponents' response to the public submissions
3. The Authority's advice to the Department of Planning and Urban Development on the regional roads issues during the review of the draft North-West Corridor Structure Plan, 1991
4. Proponents' commitments

## Summary, advice and recommendations

The proposal is for residential development on 829 hectares of land north of the Wanneroo townsite and east of Wanneroo Road, between Clarkson Avenue, Pinjar Road, the eastern portion of Flynn Drive and the Carramar Special Rural Zone.

Development will be largely comprised of small lot residential areas and accompanying services, yielding between 10 to 15 housing units per hectare.

It is expected that between 8 000 and 9 000 dwellings will be built, providing homes from between 24 000 and 28 000 people.

The site lies on elevated land on the Karrakatta sub-unit of the Spearwood Dune System.

About half of the site is almost completely cleared of native vegetation (the southern section), and about half the site remains as uncleared bushland (the northern section). The bushland is typical of the vegetation types Karrakatta South and Central, and best described as jarrah-*Banksia* woodlands.

The site is located over the large superficial groundwater formation known as the Gnangara Mound. Groundwater under this site flows in a general east-west direction, with some of the water ending up in the northern part of Lake Joondalup. The site is not located over any of the Water Authority of Western Australia's Priority Source Protection Areas, and there are no Priority 1 or 2 Source Protection Areas downstream of this site.

The Department of Planning and Urban Development's most recent plans recommend that this parcel of land become urban. The City of Wanneroo's Draft Rural Strategy proposed that this land be developed for special rural.

The key environmental issues related to the proposed development are:

- potential to pollute ground and surface water resources, including downstream wetlands;
- water balance changes to nearby wetlands, including Lake Joondalup, and the effect on wetland vegetation;
- the significance of the native flora and fauna of the site;
- impact on Neerabup National Park;
- the environmental impact of any major roads servicing this development; and
- the proximity of the four motor racing venues, and the likely noise impacts on the residents.

A total of 24 submissions were received during the public review period, with 15 from individuals, 7 from organisations and companies (one was a joint submission from two organisations, and one a joint submission from 5 organisations), and two from government agencies.

The main environmental issues raised in those submissions were:

- impact on the water levels, water quality and vegetation of nearby System 6 wetlands;
- the impact of a major north-south road, servicing this development, on wetlands to the south of the site;
- the regional and local importance of the remnant bushland;
- the site is close to Neerabup National Park which will come under increased pressure through increased recreational use; and
- impact on the groundwater resource.

A number of other issues were raised, mainly related to planning matters, including the proximity of the Wanneroo Raceway, and the likely noise impacts on residents.

After considering all of the environmental issues, and the matters raised in the public submissions, the Environmental Protection Authority finds that the proposal is environmentally acceptable.

The development will have some environmental impacts, but they are seen to be acceptable because:

- the vegetation does not have regional importance and is represented within an existing National Park;
- there are no rare species of flora and fauna on the site;
- the rise in the water levels of nearby wetlands are not so severe as to be unacceptable, including impacts on wetland vegetation;
- the loss of water quality will not impact on the Water Authority's Priority 1 and 2 areas;
- the loss in water quality experienced in downstream wetland will be minimal; and
- impacts on Neerabup National Park due to increased recreational usage will be minimised because of planned additions to the Park.

The management of the traffic is acceptable provided that:

- any major road south of this site should not cross the Priority 1 source protection area, or impact on wetlands; and
- development east of Wanneroo Road is not used to justify additional east-west links through Neerabup National Park.

## **Advice to the planning agencies regarding the regional roads**

Any major road south of this land should be referred to the Authority for assessment. It should avoid Priority 1 Source Protection Areas and wetlands. Stormwater run-off from the road should not flow directly into any wetlands.

It is the Authority's view that further east-west roads through Neerabup National Park are not needed to service development east of Wanneroo Road. The Environmental Protection Authority does not support additional roads through Neerabup National Park, and, should any be proposed, they should also be referred to the Authority for assessment. Further, rather than taking a case by case approach to east-west linkages through Neerabup National Park, the Authority recommends a regional view is taken to examine regional solutions to this issue.

## **Advice to the planning agencies regarding noise impacts from the motor racing venues north of this site on future residents**

It is the Authority's view that, while some problems could arise because of the proximity of the motor racing tracks, development on this land can proceed provided that the planning agencies and the proponents make suitable provisions to minimise the noise impacts on future residents. The decision on which mechanism(s) is/are put in place to manage these noise impacts is a matter for the planning agencies to determine.

## Recommendation 1

The Environmental Protection Authority has concluded that the proposal to develop the land Location 2579, and Lots 1 and 2 Flynn Drive, as modified during the process of interaction between the proponents, the Environmental Protection Authority, the public and the relevant government agencies, is environmentally acceptable.

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

- potential to pollute ground and surface water resources, including downstream wetlands;
- water balance changes resulting in water level rises in nearby wetlands, including Lake Joondalup, and the effect on wetland vegetation;
- the significance of the native flora and fauna of the site;
- impact on Neerabup National Park; and
- the environmental impact of any major roads servicing this development.

Accordingly, the Environmental Protection Authority recommends that the proposal could proceed subject to the Environmental Protection Authority's recommendations and the commitment made by the proponents.

With regard to the impacts on the local groundwater resource, which in turn impact on the nearby wetlands, the proponent need not be required to carry out any special remedial actions.

## Recommendation 2

The Environmental Protection Authority recommends that the proponents should maximise the amount of native vegetation left on the site. On the land currently covered with bushland, the proponents should, prior to subdivision receiving final approval, produce a remnant vegetation plan. This plan should show:

- the location of the public open space areas, and the sections which will be left as native bushland;
- the corridors that will be left as native bushland; and
- any other areas where native vegetation can be left subject to further development.

Where substantial re-landscaping is necessary, this requirement will not be necessary. However, all species replanted should be those typical of the vegetation types Karrakatta South and Central, according to the requirements of the City of Wanneroo.

Each plan is to be developed according to the requirements of the State Planning Commission with advice from the City of Wanneroo.





# 1. Introduction, background and project description

The proposal is for residential development on 829 hectares of land north of the Wanneroo townsite and east of Wanneroo Road. The site, comprising three parcels of land, is located between Clarkson Avenue, Pinjar Road, the eastern portion of Flynn Drive and the Carramar Special Rural Zone (refer to Figure 1). The three parcels are:

- Loc 2579 (379 ha), owned by Yatala Nominees Pty Ltd;
- Lot 2 Flynn Drive (385 ha), owned by Homeswest; and
- Lot 1 Flynn Drive (65 ha), owned by R&I Bank.

The proposed development was referred to the Authority in December 1989, with level of assessment set at Public Environmental Review.

Development will be largely comprised of normal residential densities with accompanying services, yielding between 10 to 15 housing units per hectare. As a transition between this development and the surrounding rural areas, some special residential lots of 5 000 square metres will be provided adjacent to the existing special rural zones.

It is expected that between 8 000 and 9 000 dwellings will be built, providing homes for between 24 000 and 28 000 people.

The development will be staged over 10 years starting in mid 1993.

## 2. Existing environment

### 2.1 Topography and landforms

The site lies on elevated land on the Karrakatta sub-unit of the Spearwood Dune System.

There are two lines of wetlands to the east and west of the site. The western chain, including Lake Joondalup, is set between dunes within the Spearwood Dune System. The wetlands to the east, including Lakes Pinjar and Adams, are set in series of depressions that mark the intersection of the Spearwood and Bassendean Dune Systems.

### 2.2 Vegetation

The site can be categorised into two sections based on existing vegetation cover: the southern section is almost completely cleared, and the northern section is uncleared bushland.

The cleared section is typical of land used for grazing with mainly exotic grasses and scattered remnants of the original native woodlands.

The uncleared bushland is typical of the vegetation types Karrakatta South and Central (as defined in the Atlas of Natural Resources, Darling System WA), described as open forest of tuart-jarrah-marri. Tuarts are found on the shallower soils on the western portion of the Spearwood Dune System. The vegetation on this site is best described as jarrah-*Banksia* woodland. Other tree species include *Banksia attenuata*, *B menziesii*, *Eucalyptus todtiana*, *E calophylla* and *Allocasuarina fraseriana*.

Detailed vegetation mapping of the site carried out as part of the Public Environmental Review identified three generalised vegetation types: Jarrah-*Banksia* woodland, *Banksia* woodland and *Melaleuca* dampland.

The bushland shows signs of degradation consistent with its location near urban areas. There are a number of tracks that cut through the area, and rubbish dumping has occurred next to these tracks. Weed invasion has occurred on the perimeter of the bushland and around the

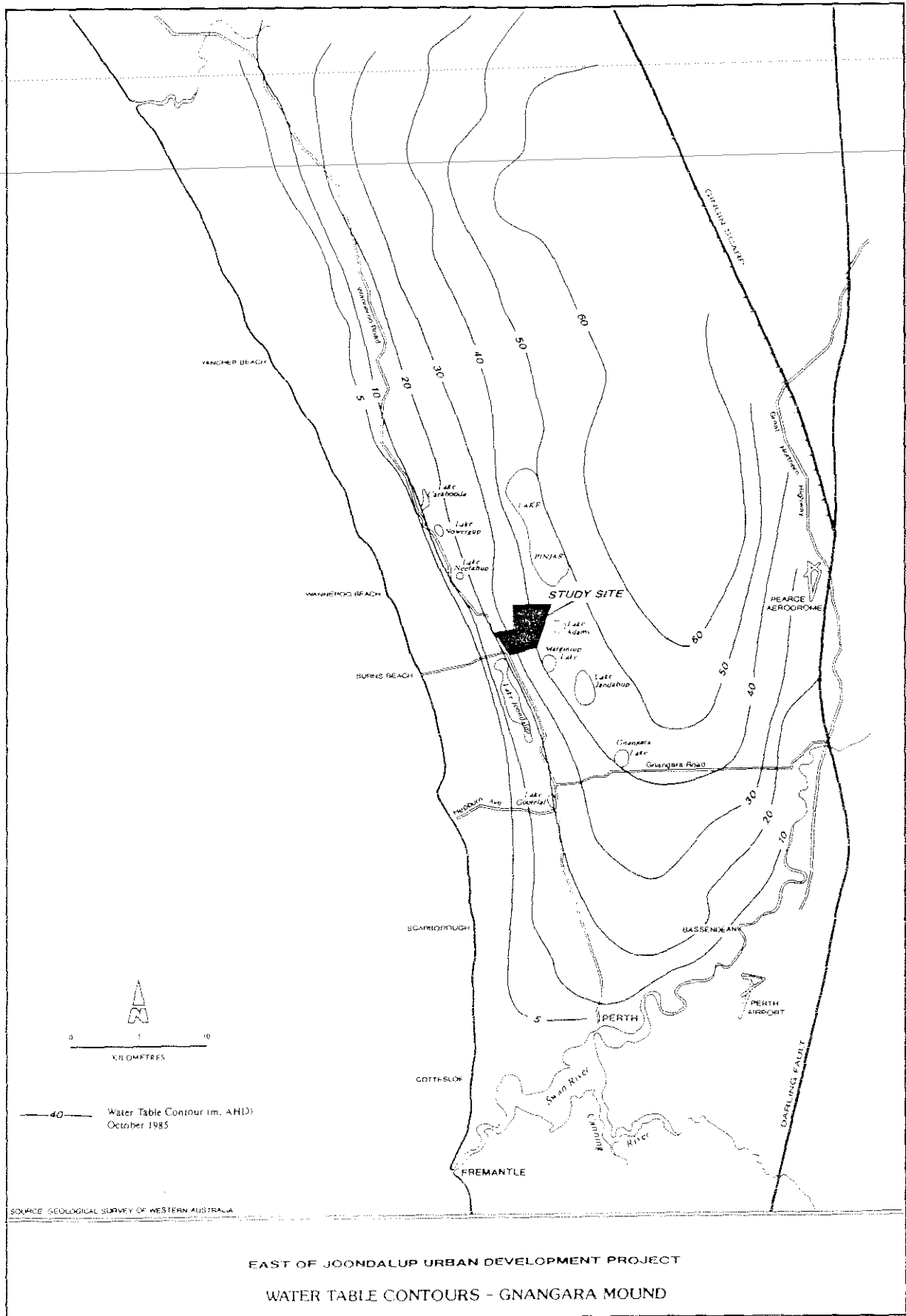


Figure 1: Location map

heavily used tracks. Away from these areas of disturbance, the bushland is in near pristine condition.

There is a dampland near the north-east corner of the site, the dominant species being *Melaleuca preissiana*, *Eucalyptus rudis* and *Banksia illicifolia*.

No rare flora or fauna has been found on the site.

## 2.3 Hydrology

The site is located over the large superficial groundwater formation known as the Gnangara Mound. ("Superficial" refers to recent geological deposits laid over more ancient ones. The groundwater found in this formation is known as "superficial groundwater" and is found near or at the surface.)

The porous nature of the soils on the Swan Coastal Plain generally does not allow rain to run off as creeks and rivers. Instead, the rain mostly infiltrates down through the sandy soils where it forms the groundwater mound.

The general movement of the groundwater on the Coastal Plain is from east to west, with some localised variation particularly near wetlands and water courses. Groundwater under this site follows this general east-west trend, with some of the water ending up in the northern part of Lake Joondalup.

The Water Authority of Western Australia currently draws water from certain areas of the mound, and has plans to extend to other areas. In order to protect the groundwater within these areas, the Water Authority has designated certain areas of the mound as "Source Protection Areas", and classified them into three "Priority" types based on the level of protection required.

Priority 1 Source Protection Areas require the greatest level of protection, and are mostly on Crown land, in particular, State Forest pine plantations. Land use activities are restricted to those that do not threaten water quality.

Priority 2 Source Protection Areas cover land where water production has a high priority, but is not necessarily the primary consideration. It mainly covers private land where land use activities generally offer a low risk to water quality.

Priority 3 Source Protection Areas are catchment areas where other land use activities have priority over water production and protection. The Water Authority accepts that these land uses may cause the quality of groundwater to become degraded, and that treatment of the water will be required to make it potable.

Much of the Priority 3 Source Protection Areas in the North-West Corridor is either developed for urban purposes, or planned for future urban development. The land which is the subject of this report is not within any of these Priority Source Protection Areas, and there are no Priority 1 or 2 Source Protection Areas downstream.

## 3. The planning context

The need for urban development in this locality was first mentioned in the Department of Planning and Urban Development's 1987 Corridor Review Report.

The City of Wanneroo's Draft Rural Strategy released in 1988 proposed an alternative development in the form of special rural zones.

The Department of Planning and Urban Development's Metroplan released in 1990, and the 1992 North-West Corridor Structure Plan, confirmed that this parcel of land was recommended to become urban.

## 4. Issues raised during the public review period.

### 4.1 Overview

A total of 24 submissions received during the public review period and are summarised in Table 1.

**Table 1. A summary of public submissions**

	No of submissions in support	No of submissions opposed or which raised concerns	TOTAL
Individuals	11	4	15
organisations/companies	4	3*	7
TOTAL	15	7	22
Government agencies	2		

\* One submission was submitted on behalf of two groups, and another was submitted on behalf of five groups.

### 4.2. A summary of the issues and concern raised

The main environmental issues raised during the public review period were:

- impact on the water levels, water quality and vegetation of nearby System 6 wetlands;
- the impact on wetlands to the south of the site of a major north-south road servicing this development;
- the regional and local importance of the remnant bushland;
- the site is close to Neerabup National Park which will come under increased recreational pressure; and
- impact on the groundwater resource.

A number of other issues were raised that mainly related to planning matters, including the proximity of the Wanneroo Raceway, and the likely noise impacts on the residents.

A full list of the issues raised is included in Appendix 1, with the proponents' response included in Appendix 2

## 5. Environmental impacts and management

### 5.1 The key environmental issues

The key environmental issues related to the proposed development are:

- potential to pollute ground and surface water resources, including downstream wetlands;
- water balance changes to nearby wetlands, including Lake Joondalup, and the effect on wetland vegetation;
- the significance of the native flora and fauna of the site;

- impact on Neerabup National Park;
- the environmental impact of any major roads servicing this development; and
- the proximity of four motor racing venues, and the likely noise impacts on the residents.

## **5.2 Potential to pollute ground and surface water resources, including downstream wetlands**

As discussed in Section 2.3, water quality is likely to deteriorate under land developed for urbanisation. The land the subject of this report is not within any of the Priority 1 and 2 Source Protection Areas, nor are there such areas downstream. The development of this land for urban purposes does not pose an unacceptable risk to the groundwater resource of the region.

Lake Joondalup is downstream of this property but it is expected that only a small proportion of the groundwater flowing under the site will make its way into the lake. Any loss of water quality is likely to be minimal, and, therefore, environmentally acceptable.

## **5.3 Water balance changes to nearby wetlands, including Lake Joondalup, and the effect on wetland vegetation**

It is likely that, as the section of this site covered in native vegetation is cleared and developed for urban purposes, the local watertable will rise. Much of the native vegetation is deep rooted and draws water from the groundwater during evapo-transpiration. The removal of this vegetation and its replacement with roads, houses and shallow rooted grasses reduces the rate of evapo-transpiration. With less draw on the water, the watertable rises.

Runoff from roofs, roads and other hard surfaces in urban areas is often directed to specific points in the landscape in stormwater basins. This concentration of water percolating into the soil decreases the chances of it being taken up by the vegetation, increasing the rate of recharge of the groundwater.

This predicted rise of the watertable can be seen as beneficial as it could negate, and possibly reverse, the recent decline in the water levels of the wetlands of the region. Evidence was produced in the Public Environmental Review report showing a recent fall in watertable for Lake Adams: the most likely causes are a combination of increased draw-down on the groundwater by the nearby pine plantations and private bores, and a below average rainfall over the last 10 to 15 years.

It is likely that any watertable rise resulting from this development, in either Lake Joondalup or Lake Adams will be gradual, and the wetland vegetation should adjust to these changes. Change in species structure in the wetland, and nearby dryland, fringe areas due to the rising water levels will also be gradual. Such gradual changes are considered environmentally acceptable.

## **5.4 The significance of the native flora and fauna of the site**

There are two aspects to this issue: the regional significance of the vegetation type represented in the uncleared bushland, and the presence of rare and endangered species of flora and fauna.

As discussed in Section 2.2, the uncleared bushland is typical of the vegetation types Karrakatta South and Central, and is represented in the conservation reserve Yalgorup National Park, south of Mandurah.

The System 6 study, which identified areas desirable for National Parks, Nature Reserves and regional recreation, did not identify land which is the subject of this report for reservation.

The *Melaleuca* damp-land vegetation is commonly found in wetlands within conservation reserves throughout the region.

No rare flora or fauna has been found on the site.

The remnant native vegetation found on this site does not have regional significance, and the Authority does not recommend that it be included in a conservation reserve. However, the vegetation has local importance in that it is poorly represented in reserves in the Wanneroo area, and the proponents should maximise its retention in the public open space areas and road verges where vegetation would normally be left or replanted.

## **5.5 Impact on Neerabup National Park**

The System 6 report recognised that there were significant management problems associated with Neerabup National Park (M6) due to its long, narrow shape and proximity to the urban areas in the North-West Corridor. Urbanisation of the land, which is the subject of this report will probably add to the pressures on the park.

In recognition of these pressures, the Department of Planning and Urban Development has proposed, as part of the North-West Corridor Structure Plan, that additions be made to the park over and above those recommended in the System 6 report. These additions are supported by the Authority, and will help to alleviate some of the pressure on the park.

Within this context, the likely recreational impacts on Neerabup National Park are considered environmentally acceptable.

## **5.6 The environmental impact of any major roads servicing this development**

The development of this land will put added pressure on the local and regional road networks. The Authority raised concerns regarding this issue when the North-West Corridor Structure Plan was first released as a draft in 1991. The Authority's advice regarding this issue is shown in Appendix 3. The main points of that advice relevant here are:

- any major north-south road link should not cross the Priority 1 source protection area, or impact on wetlands; and
- development east of Wanneroo Road does not require additional east-west links through Neerabup National Park.

## **5.7 The proximity of the four motor racing venues, and the likely noise impacts on the residents**

There are four motor racing venues to the north of the site which are used mainly on weekends for specific events throughout the year. Their locations are shown in Figure 2. These venues are:

- Wanneroo Park Motor Racing Circuit - 2km to the north;
- Wanneroo Park Motorcycle Racing Circuit - 2km to the north;
- The International Standard Go-Kart Racing Circuit - 2km north of the site; and
- The Wanneroo Motocross Track - 750m north of the site.

During the public review period, the City of Wanneroo expressed concern that unacceptable noise levels will be experienced for residents living in the north of this site when events are held at these venues. The proponents have recently carried out additional studies, and the results are included in Appendix 2.

Based on the information given as part of the Public Environmental Review, and the additional information collected by the proponents, the following advice is offered to the planning agencies:

- noise generated from certain events will be audible within houses on the north of this site, and complaints will follow;

- regulatory limits may be exceeded on some occasions; and
- events on the weekends will cause the greatest problem because more people will be at home, and they will be expecting some "peace and quiet";

Accordingly, the proponents should be required to ensure that prospective purchasers of lots within the northern section of the site are made aware of the possible noise problems prior to their purchase being finalised.

While these racing facilities remain, any additional residential development further to the north of this proposed development would certainly have the potential to experience noise problems, and, therefore, would be undesirable.

## **6. Environmental impacts and their management - the Authority's advice and recommendations**

### **6.1 Advice to the planning agencies**

#### **6.1.1 Traffic management**

The Authority recognises that the development of this land for residential purpose will put added pressure on the existing road network. Pressure will also grow to upgrade the number and standard of the east-west roads linking this land to the freeway/rapid transit corridor, the urban areas to the west, and the beaches.

**Any major road south of this land should be referred to the Authority for assessment. It should avoid Priority 1 Source Protection Areas and wetlands. Stormwater run-off from the road should not flow directly into any wetlands.**

**It is the Authority's view that further east-west roads through Neerabup National Park are not needed to service development east of Wanneroo Road. The Environmental Protection Authority does not support additional roads through Neerabup National Park, and, should any be proposed, they should also be referred to the Authority for assessment. Further, rather than taking a case by case approach to east-west linkages through Neerabup National Park, the Authority recommends a regional view is taken to examine regional solutions to this issue.**

#### **6.1.2 Advice to the planning agencies regarding noise impacts from the motor racing venues north of this site on future residents**

The following advice is offered to the planning agencies regarding this issue:

- noise generated from certain events will be audible within houses on the north of this site, and complaints will follow;
- regulatory limits may be exceeded on some occasions; and
- events on the weekends will cause the greatest problem because more people will be at home, and they will be expecting some "peace and quiet";



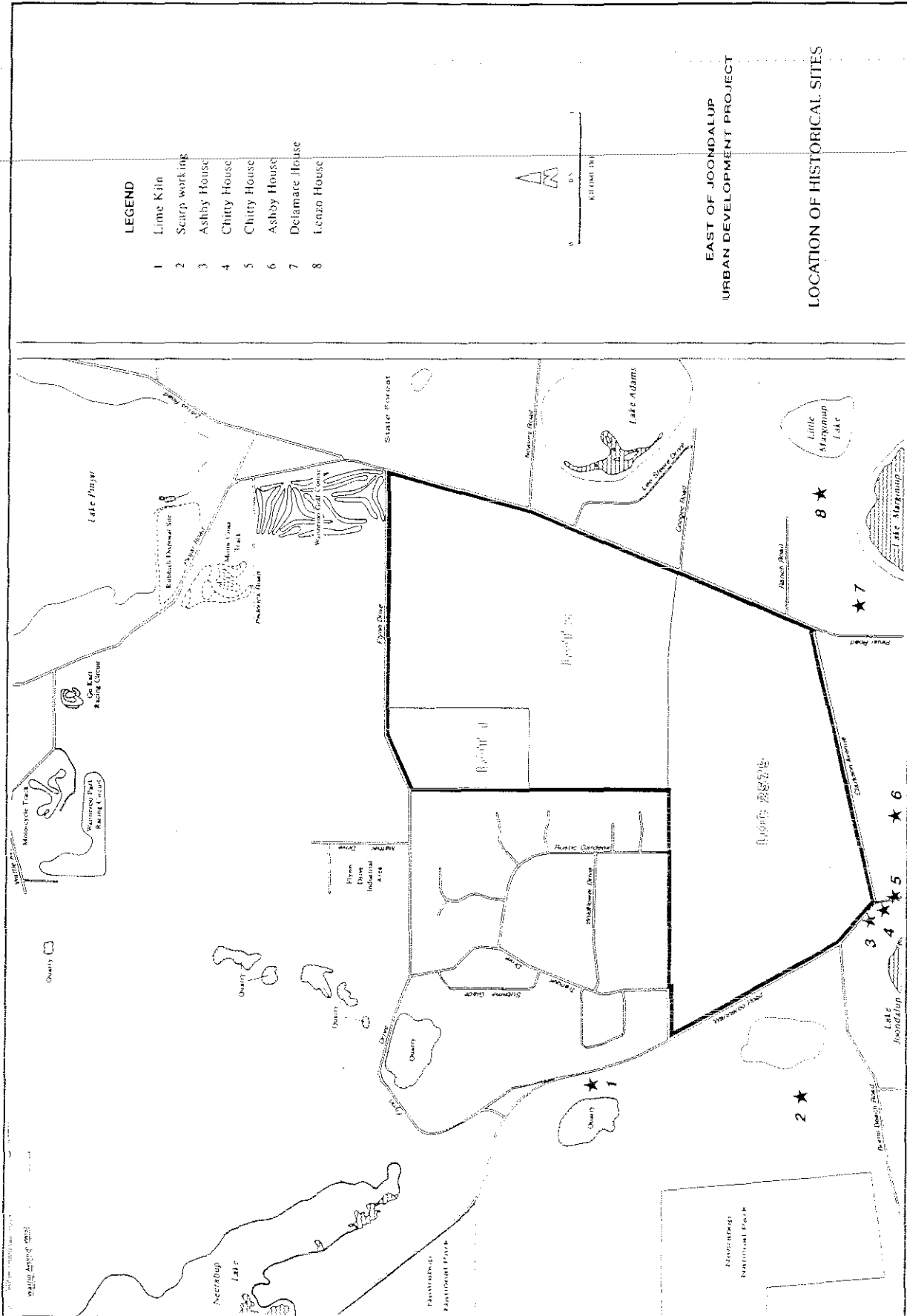


Figure 2: Location of the four motor racing venues north of the proposed development

Accordingly, the proponents should be required to ensure that prospective purchasers of lots within the northern section of the site are made aware of the possible noise problems prior to their purchase being finalised.

While these racing facilities remain, any additional residential development further to the north of this proposed development would be undesirable.

**It is the Authority's view that, while some problems could arise because of the proximity of the motor racing tracks, development on this land can proceed provided that the planning agencies and the proponents make suitable provisions to minimise the noise impacts on future residents. The decision on which mechanism(s) is/are put in place to manage these noise impacts is a matter for the planning agencies to determine.**

## **6.2 General recommendation**

The environmental impacts of the development of the land for residential purposes are likely to be:

- the loss of a significant area of near pristine bushland;
- a rise in water levels of nearby wetlands;
- a deterioration in the quality of the groundwater downstream of the site; and
- recreational impacts on Neerabup National Park.

The Environmental Protection Authority after considering the environmental issues, and taking into account the views expressed during the public review period, considers that the potential impacts are acceptable in that:

- the vegetation does not have regional importance and is represented within an existing National Park;
- there are no rare species of flora and fauna on the site;
- the probable rise in the water levels of nearby wetlands resulting from urbanisation of this land is not so severe as to be unacceptable, including impacts on wetland vegetation;
- the loss of water quality will not impact on the Water Authority's Priority 1 and 2 areas;
- the loss in water quality experienced in downstream wetland will be minimal; and
- impacts on Neerabup National Park due to increased recreational usage will be minimised because of planned additions to the Park.

### **Recommendation 1**

**The Environmental Protection Authority has concluded that the proposal to develop the land Location 2579, and Lots 1 and 2 Flynn Drive, as modified during the process of interaction between the proponents, the Environmental Protection Authority, the public and the relevant government agencies, is environmentally acceptable.**

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

- potential to pollute ground and surface water resources, including downstream wetlands;
- water balance changes to nearby wetlands, including Lake Joondalup, and the effect on wetland vegetation
- the significance of the native flora and fauna of the site;
- impact on Neerabup National Park; and

- the environmental impact of any major roads servicing this development.

Accordingly, the Environmental Protection Authority recommends that the proposal could proceed subject to the Environmental Protection Authority's recommendations and the commitment made by the proponents.

### **6.3 Potential to pollute ground and surface water resources, and water balance changes to nearby wetlands, including Lake Joondalup**

The Environmental Protection Authority recognises that there will be some impacts on the local groundwater resource which will in turn impact on the nearby wetlands. These impacts, however, are environmentally acceptable, and the proponent will not be required to carry out any special remedial actions.

### **6.4 The significance of the native flora and fauna of the site**

The vegetation on this site is not considered to be of regional importance, as it is represented in Yalgorup National Park. It does, however, have some local value, in that it is poorly represented in reserves in the Wanneroo area. To maximise the amount of the native vegetation left on the site, the proponents should be required to produce, prior to each stage being approved for subdivision, a remnant native vegetation plan showing the locations where native vegetation will be preserved.

Where replanting is required as part of development, the proponent should be required to plant species of trees and shrubs typical of the vegetation types Karrakatta South and Central.

#### **Recommendation 2**

The Environmental Protection Authority recommends that the proponents should maximise the amount of native vegetation left on the site. On the land currently covered with bushland, the proponents should, prior to subdivision receiving final approval, produce a remnant vegetation plan. That plan should show:

- the location of the public open space areas, and the sections which will be retained as native bushland;
- the corridors that will be retained as native bushland; and
- any other areas where native vegetation can be retained subject to further development.

Where substantial re-landscaping is necessary, this requirement will not be necessary. However, all species replanted should be those typical of the vegetation types Karrakatta South and Central, according to the requirements of the City of Wanneroo.

Each plan is to be developed according to the requirements of the State Planning Commission with advice from the City of Wanneroo.

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## **Appendix 1**

**Issues raised during the public review period**



## **1. Issues raised in support of the proposal**

### **1.1 Planning issues**

A number of submissions gave general support to the proposal citing a number of arguments related to planning issues, including:

1. local employment is available for future residents because of the site's proximity to Joondalup Commercial area and Flynn Drive industrial areas;
2. the retailing and other services at the Joondalup Centre will received a boost providing services to the residents of the development;
3. the new rail service will be nearby;
4. the soil type and general landforms are ideal for residential development requiring minimal engineering;
5. recent planning documents have included this land for future urban; and
6. the provision of 5000 square metre lots on the perimeter of the development will act as a buffer between the existing nearby special rural zones and the small lots for the majority of the development.

### **1.2 Environmental issues**

A number of submissions supported the general conclusions of the Public Environmental Review report that the environmental impacts of the proposal are acceptable and manageable.

## **2. Submissions which raised concerns about the proposal**

### **2.1 Planning issues, including loss of rural amenity**

A number of submissions raised concerns about urbanisation within an historically rural area. It was felt that the general rural amenity of the area would be lost causing the following problems.

1. Valuable agricultural land would be lost to residential development.
2. The existing special rural zones would suffer a loss of amenity with urbanisation so close.
3. A large urban cell east of Wanneroo Road would remove the existing clear transition between rural and urban areas.
4. The City of Wanneroo's Rural Strategy proposed that this area be developed as a special rural zone. This proposal is inconsistent with that plan.
5. The development would increase the likelihood of the major road being built through the east Wanneroo area south of the development. Such a road would impact severely on the rural nature of that area.

### **2.2 Impact on important System 6 wetlands**

1. Water levels in nearby wetlands - Lakes Joondalup and Adams - are likely to rise. Wetland vegetation may not cope with this change and deaths will occur.
2. The change in water levels will lead to a change in the structure of the vegetation within the wetlands, and this is seen as undesirable.
3. The development would increase the likelihood of the major road being built through the east Wanneroo area south of the development. Such a road would likely have an adverse

impact on important wetland south of the site through increased stormwater run-off from the road, and the possibility of chemical spills from trucks that use the road.

### **2.3 Issues related to the remnant bushland in the north section of the site**

1. The vegetation type found on the northern portion is poorly represented in conservation reserves, and this example should be set aside for conservation.
2. The damplands in the north and south-east part of the land are valuable habitats and should be conserved as part of the public open space.
3. The northern bushland section is part of a valuable corridor for birds which includes the Neerabup National Park and the Carramar Park Special Rural Zone. To protect the integrity of this corridor this bushland section of the land should not be developed for small lot housing but rather as a mixture of bushland public open space and special rural lots.
4. A recent biological survey of the Carramar Park area indicated that it contains more species of reptiles and land birds than does Neerabup and Yanchep National Parks, and Yellagonga Regional Park. The area should, therefore, be conserved because of this species richness.

### **2.4 Impact on Neerabup National Park**

1. No consideration has been given to the impact the development will have on Neerabup National Park. The expected 24 000 to 28 000 people will put unacceptable pressure on the Park causing a further degradation of this important bushland. To avoid this impact the development should provide a large area of bushland for passive recreation as part of the public open space.

### **2.5 A nutrient management plan for the development**

1. Concern was expressed that the development does not provide a detailed strategy to avoid the pollution of the groundwater and the downstream Lake Joondalup, with the main pollution fear being increased nutrient levels. The development should maximise the retention of native vegetation by keeping the small lot subdivisions on the cleared land, a nutrient irrigation and management plan should be developed for the public grassed areas, and residents should be educated on how to minimise fertilizer application rates.

### **2.6 Data inadequacies**

1. Some of the information used in the PER is outdated and makes some of the predictions about, for example, the impact on the watertable, invalid. In particular, a recent article about the flora of the area was not quoted.
2. Insufficient data were given about the flora and fauna surveys. Full details of the methodology should be given so that a judgement could be made about the adequacy of the surveys. If they were not carried out properly, it could then be argued that rare flora and fauna could be on the site.
3. Table 7 of the PER, listing areas of remnant vegetation, is misleading because some of the areas listed - Bold Park and Kings Park - are severely degraded. Their inclusion creates the false sense that the vegetation types are well represented in conservation reserves.
4. The discussion of the protection of the vegetation type included reference to examples found on private land within the region. It is misleading to include these examples because they are not secure conservation reserves.
5. There are numerous lime kilns closer to the land than the one in Neerabup Park (page 37). Those on Flynn Drive are closer and well preserved.
6. The landform is not all Spearwood as claimed in the PER. Lot 2 is transitional to the Bassendean Dune System.

## **2.7 Loss of remnant bushland in the metropolitan area**

1. Concern was expressed about the continued growth of the Perth metropolitan area, and the loss of native bushland. Small lot development in the corridor should avoid areas of native bushland. Instead, such areas should be developed for special rural zones.

## **2.8 Impact on Gnangara Mound**

1. The proposal is likely to degrade the quality of water in the Gnangara Mound, which is an important source of both public and private water.
2. One of the findings of a 1986 Water Authority study of the use of the water from the Gnangara mound was that the impacts of long term extraction of groundwater were unknown. This conclusion was based on the then proposed extent of urbanisation within the North-West corridor. Urbanisation on this land was not proposed at that time. It is likely, therefore, that this development will put further pressure on the mound as more water will be required to service the area. Wetlands and native bushland which are supported by the mound are likely to be further threatened.

## **2.9 Unsustainable growth of the Perth metropolitan area**

1. The continued expansion of the Perth Metropolitan area is seen as environmentally unsustainable.





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## **Appendix 2**

**The proponents' response to the public submissions**



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**PROPONENT'S RESPONSE  
TO EAST OF JOONDALUP  
URBAN DEVELOPMENT PROJECT  
PER PUBLIC SUBMISSIONS  
July, 1992**

**Prepared for:**

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**Report No: MA2138**

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## **EAST OF JOONDALUP URBAN DEVELOPMENT PROJECT**

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### **Proponents Response to Issues and Questions Raised During the PER Public Review Period**

This document forms the proponent's (Homeswest, Yatala Nominees Pty Ltd, and the R&I Bank) principal responses to submissions regarding the Public Environmental Review (PER) for the proposed East of Joondalup Urban Development Project, Swan Location 2579 Clarkson Avenue and Lots 1 and 2 Flynn Drive, Neerabup.

The document is presented in two parts:

#### **Part A**

- Responses to the issues and comments within public submissions upon the PER that were summarised in Environmental Protection Authority (EPA) correspondence to the proponent, dated 1st May, 1992 (Appendix A). For ease of reference, the following comments and responses within Part A are numbered in accordance with the EPA correspondence.

#### **Part B**

- Responses to the issue raised in correspondence from the City of Wanneroo to the EPA regarding the proposal, dated 8th May, 1992 (Appendix B).

#### **Part A**

##### **A. Support for the Proposal**

The proponent acknowledges that a number of submissions gave support to the proposal, on the basis that it constitutes efficient, orderly development, and has acceptable and manageable environmental impacts.

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## **B. Concerns Raised About the Development**

### **1. Planning issues, including loss of rural amenity.**

#### **1.1 Valuable agricultural land would be lost to residential development.**

##### **Response:**

The southern portion of the site was parkland cleared for cattle grazing approximately 25 years ago. This pursuit proved unviable, as have a variety of agricultural and farming land uses since that time, including sheep, cattle and horse grazing and a riding school. The land has been somewhat degraded due to overstocking and non-sustainable farm management practises, which have resulted in vegetation loss and limited erosion. Consequently, the land has not been utilised for farming for many years. The cleared portion of the site cannot therefore, be considered as "valuable agricultural land".

Groundwater abstraction restrictions imposed by the Water Authority of Western Australia effectively preclude viable irrigated horticulture on the land.

#### **1.2 The existing Special Rural zones would suffer loss of amenity with urbanisation so close.**

##### **Response:**

The potential impact of the proposal upon the amenity of the adjacent Special Rural subdivision is highly subjective. Potential adverse impacts of the proposal, including increased traffic, people and the effects of light and noise, will be minimised by appropriate incorporation of a buffer zone of Special Residential lots with minimum area of 5000 square metres and minimum depth of 80 metres, between the existing rural-residential area and the proposed residential development. Perceived negative impacts will be compensated by easily identifiable positive impacts on the amenity of the area, including the provision of schools, community and health facilities, public transport and shopping facilities.

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**1.3 A large urban cell east of Wanneroo Road would remove the existing clear transition between rural and urban areas.**

**Response:**

The creation of an urban cell east of Wanneroo Road is in accordance with current planning for the North-West Corridor. The transition between rural and urban areas will not be "lost", but relocated to allow for expansion within the Perth Metropolitan Area, as has occurred many times.

**1.4 The City of Wanneroo's Rural Strategy proposed that this area be developed as a Special Rural zone. This proposal contradicts that plan.**

**Response:**

The Wanneroo Rural Strategy was released by the City of Wanneroo in draft form in 1988, but did not proceed beyond draft stage before being superseded by subsequent strategic planning, viz the Council's 1991 Draft East Wanneroo District Structure Plan and the Department of Planning and Urban Development's North-West Corridor Structure Plan (1992). Reference to the draft Rural Strategy released in 1988 is therefore clearly out-moded.

**1.5 The development would increase the likelihood of the major road being built through the east Wanneroo area south of the development. Such a road would impact severely on the rural nature of that area.**

**Response:**

A major road in this area is an accepted part of the North-West Corridor Structure Plan (DPUD, 1992), formulated with extensive community consultation, including members of the Eastern Perimeter Arterial Road Action Group (EPARAG). The planning process

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developed options and reached consensus for the most appropriate alignment based on existing road reserves, and considering environmental and groundwater protection factors. Full details of the options considered and the consultation process are provided in the North-West Corridor Structure Plan (DPUD, 1992). The PER referred to this document in the explanation of the planning background which led to the proposal.

## **2. Impact on important System 6 wetlands**

### **2.1 Water levels in nearby wetlands - Lakes Joondalup and Adams - are likely to rise. Wetland vegetation may not change and deaths will occur.**

#### **Response:**

Wetlands and their surrounding vegetation should not be considered static, as they are constantly adapting in response to changing environmental characteristics, both seasonal and long-term.

For example, the PER presented data which shows that Lake Adam's water level varies by 1.0 metre or more in some years (PER Figure 7). Lake Joondalup exhibits a similar seasonal variation (PER Figure 14).

The PER also presented data which shows that groundwater and lake water levels in the Wanneroo area have generally declined since the early 1960's. In lakes such as Lake Adams, this has caused peripheral vegetation to encroach upon areas which were previously too deep to colonise.

The Water Authority (1989) used computer modelling to predict that groundwater levels beneath the site under a suite of proposed development and management strategies for the Wanneroo area, would fall by approximately 0.5 metres under average rainfall conditions. The PER predicted that groundwater levels beneath the site would rise between 0.5 and 0.9 metres due to urbanisation, based on detailed water balance equations derived for the proposal, attached as appendices to that report. The anticipated overall effect on groundwater levels was a nett increase of 0.4 metres (40 centimetres).



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The PER predicted that an increase in Lake Adams water level, returning to seasonal depths closer to historic levels, may lead to a shift in the distribution of vegetation types, including an outward expansion of fringing reed vegetation and Flooded Gums.

A water level rise in Lake Joondalup may lead to some inundation of the innermost zone of the fringing vegetation but would not be expected to encroach upon the Tuart/Marri woodland. Any rise in water levels would be mitigated by discharge to adjoining caves in the coastal limestone, which are thought to act as spillways thus controlling water levels in the lake (Allen, 1981).

Therefore while it is possible that some trees may die over a period of 20-30 years due to a rise in groundwater level, others will have germinated and grown in areas previously unsuitable for their survival.

It should also be noted that if the Water Authority increases groundwater abstraction over the next 2-3 decades due to increased demand, a rise in water table levels may never eventuate.

**2.2 The change in water levels will lead to a change in the structure of the vegetation within the wetlands, and this is seen as undesirable.**

**Response:**

There is no evidence to suggest that the vegetation structure surrounding the wetlands will change. As detailed in response 2.1, it is anticipated that there may be a gradual shift in the distribution of wetland vegetation structure types over a 20-30 year period, reversing the shift that has occurred as groundwater levels have declined since the 1960's. The shift may be considered to be of a similar order to that which is likely to occur naturally over a long period of time, in response to climatic variations.

**2.3 The development would increase the likelihood of a major road being built through the east Wanneroo area south of the development. Such a road would have an adverse impact on**

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**important wetland south of the site through increased stormwater run-off from the road, and the possibility of chemical spills from trucks that use the road.**

**Response:**

It was not the purpose of the PER to assess the potential impacts of a major road possibly being constructed in the vicinity of the site.

As for all such proposals, it will be for the EPA to determine whether a major road in this area should be assessed in accordance with the provisions of the Environmental Protection Act, (1986), and its acceptability or otherwise determined at that time.

**3. Issues related to the remnant bushland in the north section of the site.**

**3.1 The vegetation type found on the northern portion is poorly represented in conservation reserves (reference given), and this example should be set aside for conservation and not developed.**

**Response:**

The vegetation type on the northern portion of the site was botanically assessed and mapped by a regional scale survey carried out for the Department of Conservation and Environment in 1978, and was classified as Karrakatta Vegetation Complex Central and South. This vegetation type can be described in general terms as *Banksia* and Jarrah-*Banksia* woodland. This classification has been confirmed by site survey.

The PER prepared for the project addressed, among other matters:

- from a general landscape perspective, the degree to which *Banksia* woodland is conserved in the CALM Wanneroo District (which contains the site), and
- at a more detailed level, the extent to which Karrakatta Vegetation Complex Central and South is represented in System Six conservation reserves.

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The PER concluded that there was more than 20,000 hectares of reserves within the CALM Wanneroo District specifically for the purpose of conservation of *Banksia* and associated woodland. Additionally, the PER identified at least seventeen areas of Karrakatta Vegetation Complex Central and South in fifteen System Six reserves. The reserves containing examples of Karrakatta Vegetation Complex Central and South totalled approximately 5,500 ha.

However since the release of the PER, a more detailed assessment of the occurrence of *Banksia* woodland and Karrakatta Vegetation Complex Central and South in Government reserves in the Metropolitan Area and southwest parts of the State has been conducted by the proponent.

The first stage of the additional assessment determined the extent to which vegetation with similar general landscape values to that on the site, occurs in conservation reserves in the (now extended) CALM Wanneroo District. This was achieved in consultation with CALM Officers who provided detailed plans and information regarding the distribution and areas of *Banksia* woodland in reserves.

This work concluded that:

- There are approximately 68,000 hectares of existing or proposed reserves which contain *Banksia* woodland in the CALM Wanneroo District.

The second, more detailed stage of assessment examined the areas of Karrakatta Vegetation Complex Central and South in conservation and other reserves in the Perth Metropolitan and southern regions, using current aerial photography.

The results of the survey are summarised as follows:

- Twenty three reserves totalling approximately 1300 ha of Karrakatta Vegetation Complex Central and South occur in the Metropolitan Area. Seventeen of these are existing or proposed reserves for the purpose of conservation, and support an area totalling approximately 780 hectares of Karrakatta Complex Central and South vegetation. The other six Metropolitan Reserves are vested for purposes other than conservation, and total approximately 530 hectares of the vegetation complex.

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- Four conservation reserves located between Mandurah and Bunbury contain approximately 650 hectares of Karrakatta Vegetation Complex Central and South.
  - The total area of Karrakatta Vegetation Complex Central and South reserved in the Perth Metropolitan and southern regions is therefore approximately 1960 hectares, based on the mapping available and the methodology utilised.

This figure **does not** include examples of the vegetation type on land in private ownership.

It is also noted that an environmental audit of the northern corridor, carried out for CALM by the Semenuik Research Group in 1991, did not identify the site as an area of significant conservation value (DPUD, pers. comm., 1992).

**3.2 The damplands in the north and southeast part of the land are valuable habitats and should be conserved as part of the public open space.**

**Response:**

Through the process of ensuring that the PER document was suitable for public release, the EPA has agreed with the proponent that there are no areas of "wetland" and/or "dampland" on the site that are of any particular conservation significance, compared with the multitude of wetlands in the area.

Nonetheless, the proponent has incorporated the "dampland" remnant vegetation area that occurs in the southeast of the site into an area of public open space (PER Figure 12). The primary purpose for protecting this area was to ensure the protection of the remnant Jarrah-*Banksia* woodland rather than any remnant "dampland" characteristics of this portion of the site.

**3.3 The northern bushland section is part of a valuable corridor for birds which includes the Neerabup National Park and the Carramar Park Special Rural Zone. To protect the integrity of this corridor this bushland section of the land should not be developed for small lot housing but rather a mixture of bushland public open space and special rural lots.**

**Response:**

The term "corridor" in the comment implies that the site forms part of the passageway between two significant bird habitats which will be severed when the development proceeds.

Figure 8 of the PER presented the distribution of vegetation types within and surrounding the site, being predominantly *Banksia* and Jarrah-*Banksia* woodland. This vegetation type extends for several kilometres to the north and north-west of the site before a transition to heath east of Neerabup Lake. The *Banksia* woodland vegetation type extends eastward to Pinjar Road.

Even if the site was to be totally cleared, which it will not, an expansive area of bushland abutting both Neerabup National Park and Carramar Park would remain.

In addition to the vegetation surrounding the site, it is proposed to retain a significant number of distinct areas of public open space within the development. Considering the mobility of the majority of bird species recorded from the area, it can reasonably be concluded that birds could use these areas as a "passageway" through the site, together with the large area of bushland surrounding the site.

**3.4 A recent biological survey of the Carramar Park area indicated that it contains more species of reptiles and land birds than does Neerabup and Yanchep National Parks, and Yellagonga Regional Park. The area should, therefore, be conserved because of this species richness.**

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**Response:**

The proponent doubts the validity of the comment. No details have been provided of the survey, nor of any other information critical to establish whether the comparisons of data obtained were relevant. It may well be the case that the reptiles and birds of the National Parks are poorly recorded and documented.

Nonetheless, the validity of the statement is highly improbable. Neerabup National Park, Yanchep National Park and the (proposed) Yellagonga Regional Park have areas of approximately 1135 ha (MRS), 2,780 ha and 1,500 ha (proposed) respectively, compared to only approximately 345 ha for the Carramar Special Rural area, including public open space. Using land areas as an indication of habitat availability, the statement is considered to be improbable.

**4. Impact on Neerabup National Park.**

**4.1 No consideration has been given to the impact the development will have on Neerabup National Park. The expected 24,000 to 28,000 people will put unacceptable pressure on the Park causing further degradation of this important bushland. To avoid this impact the development should provide a large area of bushland for passive recreation as part of the public open space.**

**Response:**

Both the proponent and State Government (through the Department of Planning and Urban Development) recognise that the expansion of the Perth Metropolitan Area will place added pressures on natural resources. This issue has been addressed through both the proponent's Development Plan for the site and the North-West Corridor Structure Plan for the region (DPUD, 1992).

As detailed in the PER, to assist in the mitigation of these additional pressures, the proponent intends to incorporate a significant number of public open space, many including considerable areas of bushland, into the development. These areas will be

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actively managed to provide recreation, habitat and cultural amenity, and will assume a number of functional roles.

The Department of Planning and Urban Development's 1992 North-West Corridor Structure Plan has recognised National Parks as a key element in the structure of the region, both as important conservation resources and as major components in the system of strategic open space for public use.

To avoid over-utilisation of the resource, the structure plan proposes the following:

- to extend Yanchep National Park eastwards to include current State Forest land, and in a south-west direction to incorporate Pipidinny Swamp. This will effectively increase the total area of the Park by 2,455 ha.
- to expand and consolidate the southern portion of Neerabup National Park to include all the land between Wanneroo Road and the Mitchell Freeway. This will add approximately 880 ha of land to the Park.
- to extend the Parks and Recreation reservation north of Romeo Road to provide a regional open space link between Neerabup and Yanchep National Parks, adding a further 315ha to the regional open space system. Neerabup Lake and approximately 315ha of land east of Wanneroo Road, near the site, is also proposed to be added to the system.

The expansion of National Parks and regional open space in the area, together with the proposed 1500ha Yellagonga Regional Park to the south west of the site, will ensure that sufficient areas within the Corridor exist to minimise degradation to these resources through human pressures.

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**5. A nutrient management plan for the development.**

- 5.1 Concern was expressed that the development does not provide a detailed strategy to avoid the pollution of the groundwater and the downstream Lake Joondalup, the main pollution fear being increased nutrient levels. The development should maximise the retention of native vegetation by keeping the small lot subdivisions on cleared land, a nutrient irrigation and management plan should be developed for the public grassed areas, and residents should be educated how to minimise fertiliser application rates.**

**Response:**

The proponent reiterates the commitments made in the PER, specifically:

*"8.1 Detailed Design*

2. *The proponent will formulate the subdivision design to maximise the retention of existing vegetation as far as is practical within public open space, schools, community centres and commercial areas, to the satisfaction of the Department of Planning and Urban Development and the City of Wanneroo.*

*8.3 Post-Construction Phase.*

20. *The proponent will request that following their establishment, the management of grassed areas of public open space (which will be the responsibility of the City of Wanneroo) accommodate guidelines recently prepared by the Water Authority to protect the groundwater from nutrient contamination and to conserve water, to the satisfaction of the Water Authority.*
21. *In the course of the land transfer process, the proponent will advise the future managers of areas which support or could support native vegetation reserves, of the desirability of retaining natural vegetation and the appropriate management strategies for these areas, to the satisfaction of the City of Wanneroo."*



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In addition to these measures, in 1993/94 the Water Authority of WA intend to instigate a comprehensive water quality monitoring program for major wetlands on the Gnangara Mound, which will include nutrient analysis and monitoring of water fluctuations in Lake Joondalup.

Following discussions with the Environmental Protection Authority, the proponent has agreed to undertake a brief annual review of Water Authority data regarding water levels in Lakes Joondalup and Adams, and Water Authority nutrient levels in Lake Joondalup. A report of this review will be provided to relevant agencies.

The proponent has also agreed to prepare a Remnant Vegetation Plan for the northern portion of the project area at the time of subdivision. The plan will detail a management program for remnant vegetation within the subdivision, determined in conjunction with the City of Wanneroo.

## **6. Data inadequacies.**

**6.1 Some of the information used in PER is outdated and makes some of the predictions about, for example, the impact on the watertable, invalid. In particular, a recent article about the flora of the area was not quoted - Ecoscape, November 1991.**

### **Response:**

The proponent's consultants assessed all known, relevant and up-to-date data available to prepare the PER. Detailed consultations also occurred with Government Departments and other scientific personnel where considered necessary.

With regard to an "Ecoscape November 1991 article", the proponent has recently determined that this comment refers to a report prepared by a consultant for the City of Wanneroo. As such, the report remains the property of the City of Wanneroo, and is not a public document.

The proponent considers that every effort has been made to utilise contemporary information in the preparation of the PER.

**6.2 Insufficient data was given about the flora and fauna surveys. Full details of the methodology should be given so that a full judgement about the adequacy of the surveys (can be made). If they were not carried out properly it could then be argued that rare flora and fauna could be on the site.**

**Response:**

The proponent considers that the full survey methodologies, or literature sources where the full survey methodology could be found, were clearly referenced in the PER and does not intend to repeat them here.

In terms of rare or endangered flora, Section 3.2.2.3 (Page 22) of the PER, "Rare and Endangered Flora," clearly details the methodology of the literature research and the site survey, and presents the results of the investigations. The likely impacts of the proposal are assessed in Section 5.2.1.3.

In terms of fauna, the site was assessed using historical records, museum records, limited site survey, and by discussion with the Department of Conservation and Land Management's Metropolitan Regional Office. Full results of the investigation, including methodologies, are given in the PER (pages 23-29 inclusive). Potential environmental impacts are given in Section 5.2.2.

**6.3 Table 7, listing areas of remnant vegetation, is misleading because some of the areas listed - Bold Park and Kings Park - are severely degraded. Their inclusion creates the false sense that the vegetation types (Karrakatta Central and South) are well represented in conservation reserves.**

**Response:**

Table 7 of the PER makes no reference to degradation levels in listed areas, and therefore cannot reasonably be considered as misleading.

Please also refer to Response 3.1.

**6.4 The discussion of the protection of the vegetation type included reference to examples found on private land found within the region. It is misleading to include these examples because they are not secure conservation reserves.**

**Response:**

The PER clearly states, following the listing of stands of Karrakatta Central and South Complex on private land referred to above, that:

*"The data presented above leads to the conclusion that although a large single coherent stand of Karrakatta Central and South vegetation complex will be cleared to enable the development to proceed, there are a number of other remnant stands of the vegetation type within the vicinity that are not affected by this proposal, and additionally some represented within secure reserves" (page 64.).*

The section preceding this paragraph described the potential impacts on the vegetation and flora from both regional and local perspectives, and referred to representations of vegetation in both private land, and in secure reserves which were System Six areas. Areas of private land were included to illustrate that the vegetation of the site is not unique in the area. The PER clearly stated that these areas existed and would not be affected by this proposal.

**6.5 There are numerous lime kilns closer to the land than the one in Neerabup Park (page 37). Those on Flynn Drive are closer and well preserved. (reference given).**

**Response:**

The comment relates to unlisted or unregistered sites of European heritage near the proposed development. The proponent is uncertain as to the relevance of the lime kilns to which reference is made. No lime kilns or other sites of European heritage will be disturbed by the proposed development.

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**6.6 The landform on the land is not all Spearwood as claimed. Lot 2 is transitional to the Bassendean Dune System (reference Geological Survey and Environmental Geology maps).**

**Response:**

The Department of Conservation and Environment (1980) mapping referred to in the PER was conducted at a regional scale of 1:250,000. At a more refined scale of 1:50,000, Gozzard (1982) identifies the entire development site, including all of Lot 2, as contained within the S7 land unit, corresponding to sand derived from Tamala Limestone. The geomorphological classification of the site is E<sub>d</sub>: degraded surface of eolian origin, Spearwood Dunes.

Reference: Gozzard, J.R. (1982). Muchea Sheet 2034 I and part Sheet 2134 IV, Perth Metropolitan Region, Environmental Geology Series, Geological Survey of Western Australia. (Copy supplied to the Environmental Protection Authority).

**7. Loss of remnant bushland in the Metropolitan area.**

**7.1 Concern was expressed about the continued growth of the Perth Metropolitan area, and the loss of native bushland. Small lot development in the corridor should avoid areas of native bushland. Instead, such areas should be developed for special rural zones. This proposal should be amended to be consistent with this approach.**

**Response:**

The PER did not, and could not be expected to, address or comment on the continued growth of the Perth Metropolitan Area.

The proponent's plan conforms with the North-West Corridor Structure Plan, which is the strategic planning document for the development corridor prescribed by METROPLAN, which is the State Government's strategic plan for the Perth Metropolitan Region. Concern regarding the pattern of growth of the region has no direct relevance to the PER,

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but to the strategic planning decisions previously made in the formulation of METROPLAN and the North-West Corridor Structure Plan. Each of these plans were formulated after detailed consultations and were subject to extensive public submission periods.

## **8. Impact on the Gnangara Mound.**

### **8.1 The proposal is likely to degrade the quality of water in the Gnangara Mound, which is an important source of both public and private water.**

#### **Response:**

There is no evidence to suggest the proposal would affect the quality of water in the Gnangara Mound. The development will utilise a reticulated sewage system. Management commitments presented in the PER, and reiterated in Response 5.1, will ensure that groundwater resources are protected.

The CSIRO Division of Water Resources has measured water quality criteria beneath the Subiaco/Shenton Park and Nedlands/Dalkeith areas, where urban development began more than seventy years ago. The CSIRO study area is sewerage (similar to the proposal), with shallow stratigraphy and superficial sediments comparable to those which occur at the project site. This is an important aspect, as all residences and community facilities proposed within the development will be connected to reticulated sewerage.

In brief, groundwater quality underlying Subiaco/Shenton Park and Nedlands/Dalkeith was well within accepted water quality criteria for drinking water quality, published by the National Health and Medical Research Council (NHMRC) and Australian Water Resources Council (AWRC) and used as guidelines by the Water Authority of WA.

It is extremely unlikely therefore, that sewerage urban development at Neerabup will result in either local groundwater or water from the Gnangara Mound becoming unsuitable as a public or private water source.

**8.2 One of the findings of a 1986 Water Authority study of the use of the water from the Gnangara Mound was that the impacts of long term extraction of groundwater were unknown. This conclusion was arrived at based on the then proposed extent of urbanisation within the North-West corridor. Urbanisation on this land was not proposed at that time. It is likely, therefore, that this development will put further pressure on the mound as more water will be required to service the area. Wetlands and native bushland that are supported by the mound are likely to be further threatened.**

**Response:**

It should be recognised that the Gnangara Mound is a groundwater resource covering 2,200 km<sup>2</sup>, containing approximately 19,500 x 10<sup>6</sup> m<sup>3</sup> of groundwater in storage. It is not a small, local resource restricted to land in the vicinity of the site, nor is it dependent upon the land use of the site for its water quality. In fact, the total area of the site is less than 0.4 of one percent of the area of the Mound.

METROPLAN estimated that Perth's population will grow by nearly one million people over the next 30 years, thereby creating a demand for 400,000 new homes. Up to 80,000 dwellings can be provided in established suburbs, however the remaining 320,000 dwellings will need to be provided in new urban areas.

The North-West Corridor will continue to be a major urban growth area, and will contribute a significant number of dwellings. Indeed, the North-West Corridor Structure Plan (DPUD,1992) anticipated that approximately 40,000 new dwellings may be established in Category A1 expansion areas alone within the corridor (those areas most likely to be urbanised in the normal course of development within the next five to ten years). Urban development east of Wanneroo Road, is expected to extend from Hepburn Avenue northwards to Flynn Drive, accommodating approximately 23,000 dwellings by the year 2021. Most of this expansion will occur over the Gnangara Mound.

Regardless of whether the subject land is urbanised, further groundwater abstraction will be required from groundwater resources to supply the expanding population. However, two important factors must be noted in relation to these reserves and their management.

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Firstly, the PER has predicted, using information provided by the Water Authority, that groundwater levels beneath the site may potentially display a nett rise of 0.4 metres due to the current and other proposals for urbanisation in the locality. The nett increase offers the opportunity for greater abstraction to service the area, thus partially offsetting extraction requirements for the region.

Secondly, the Water Authority has demonstrated a pro-active role in the management and maintenance of ecosystems, to avoid over-abstraction and the degradation of wetlands and native bushland over the Mound. The 1986 Environmental Review and Management Program (ERMP) for the Gnangara Mound groundwater resources identified the formulation of a sustainable management plan to cater for the predicted population growth of the North-West Corridor as a primary objective. Page 1 of the summary of the ERMP states:

*"A major consideration in the management of groundwater resources is the maintenance of wetlands. Groundwater usage must be managed to ensure that important wetlands are not significantly affected."*

and in the Environmental Management Commitments

*"Appropriate management is required so that these resources (the Gnangara Mound in the North-West Corridor) can be developed whilst avoiding effects such as:*

- *over exploiting the resource*
- *degradation of water quality*
- *lowering of lake levels and degradation of native flora and*
- *fauna, and*
- *salt water intrusion and*
- *these factors were also emphasised in the Perth Urban Water*
- *Balance Study, published by the Water Authority in 1987."*

It is therefore clear that the Water Authority is aware of its responsibilities as the manager of the resource, and is additionally bound by legislation such as the Environmental Protection (Swan Coastal Plain Groundwater, Wetlands and Associated Ecosystems) Policy 1990 to protect these ecosystems, under the Environmental Protection Act, 1986.

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**9. Unsuitable growth of the Perth metropolitan area.****9.1 The continued expansion of the Perth Metropolitan area is seen as environmentally unsustainable.****Response:**

The proponent is committed to environmentally sensitive design and management, to ensure that the proposed urbanisation will be environmentally acceptable. It is also acknowledged that the final judgement rests with the EPA and the Minister for the Environment, following comments from members of the public.

The proponent also supports the current environment assessment process which requires proposals contributing to the urban expansion of the Perth Metropolitan Area to be assessed on their merits.

**Part B**

**3.0 Wanneroo Council, at its April 29, 1992 meeting resolved to advise the EPA that they do not consider that the noise issue in relation to the motor sports area and its impact on the proposed urban area, had been adequately addressed in the PER, and that this matter should require further investigation by the Authority.**

**No other matters were raised in respect of the Public Environmental Review.**

**Response:**

Based on the correspondence from the City of Wanneroo to the EPA (Appendix B), it is unclear which aspect of the noise assessment regarding motor sport in the area Council considers inadequate. However, the proponent has investigated noise emissions from the Wanneroo Park Raceway further, and offers the following additional information.



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The PER reported sound levels data from the Wanneroo Park circuit recorded in 1989. At this time, noise levels near the track from each vehicle were estimated to be in the range of 110-120 dB(A).

Since that time, the Confederation of Australian Motor Sports (CAMS), which represents all car clubs nationally (including Wanneroo), has passed a resolution stating that the maximum permissible noise from all "flat track" racing vehicles is 95 dB(A), and additionally that all vehicles must be fitted with noise suppression devices.

Sound pressure levels are now measured on the "straight" of the track, approximately 10m from the edge, by scrutineers using sound measuring equipment supplied by the CAMS Perth office. If the noise emissions of any vehicle exceeds 95 dB(A), it is given a "black flag", forcing it to enter the pits area. If the vehicle cannot subsequently comply with the noise level limit of 95 dB(A), it is refused permission to re-enter the track. The enforcement of this regulation has been confirmed by the WA Sporting Car Club, which uses the Wanneroo facility.

Consequently, vehicles using the Wanneroo circuit have achieved a 15-25 dB(A) reduction in noise emission levels from their cars. To determine the effect of this noise reduction on the proposed development, the proponent commissioned specialist noise and vibration consultants to re-assess predicted noise levels within the site, and additionally to determine whether a 2.5 metre high brick perimeter wall along the Flynn Drive boundary of the subdivision would have significant sound attenuation affects, or if a wall was necessary at all.

A summary of results for 20 vehicles operating simultaneously at approximately 95 dB(A), and a comparison with those results produced in the PER for 1989 data from sites adjacent to Flynn Drive, is presented in Table 1 below.

Predicted noise levels for another four locations within the site were calculated, however as these locations were at a greater distance from the source and up to 7 dB(A) lower than those on Flynn Drive, the results are not included here.

**Table 1****Sound levels predicted and recorded for sites adjacent to Flynn Drive  
(dB(A))**

	Measuring Station	
	L1	L2
PER data recorded in 1989:	40-48	35-44
Predicted level with vehicle noise reduction:	27	24
Predicted level with vehicle noise reduction and perimeter wall:	27	24
Predicted overall noise reduction:	<b>13-21</b>	<b>11-20</b>

Table 1 demonstrates that the implementation and enforcement of the CAMS resolution has reduced the predicted noise at the Flynn Drive boundary of the subdivision by 11-21 dB(A) compared to previously measured levels, resulting in noise levels of between 24 and 27 dB(A). The assessment of predicted noise levels also indicate that a 2.5 metre high brick perimeter fence along Flynn Drive would not be effective in further reducing noise levels.

With the noise emissions levels for vehicles set at a maximum of 95 dB(A), noise generated from the Wanneroo Circuit with up to 20 race cars in operation will be below background noise recorded on the site, and will therefore be inaudible. It is acknowledged that background noise will vary at the site depending on the time of day, however it is unlikely they will fall below 30 dB(A) (residential background noise levels are typically 35-50 dB(A)) during the daytime, when racing is carried out.

It is further anticipated that the large reduction in noise levels achieved for the Wanneroo Circuit will have a significant effect on any short-term cumulative noise levels which may occur in the event of simultaneous racing in the area.



---

**APPENDIX B**

**Correspondence to the EPA from the City of Wanneroo  
Dated 8th May, 1992**



# City of Wanneroo



When replying please quote:

OUR REF: 790-606

DATE: 8 May 1992

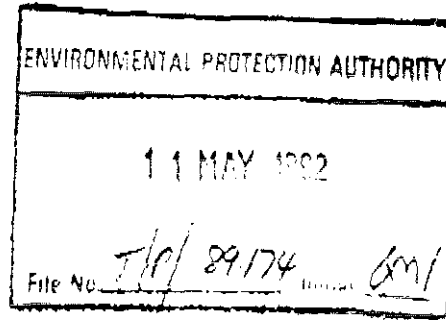
ADMINISTRATION CENTRE,  
BOAS AVENUE,  
JOONDALUP  
WESTERN AUSTRALIA.

YOUR REF:

ENQUIRIES: Mr R W Zagwocki  
Town Planning

TELEPHONE: (08) 406 0333  
FACSIMILE: (08) 300 1383

The Chairman  
Environmental Protection Authority  
8th Floor  
"Westralia Square"  
38 Mounts Bay Road  
PERTH WA 6000



Attention: Gary Middle

Dear Sir

EAST JOONDALUP URBAN DEVELOPMENT NEERABUP (ASSESSMENT NO 344)

I refer to your correspondence dated 18 February 1992 in regard to the Public Environmental Review for the abovementioned project and advise that Council considered this matter at its April meeting on 29 April 1992.

At that meeting, the Council resolved to advise the Authority that they do not consider that the noise issue in relation to the motor sports area and its impact on the proposed urban area, has been adequately addressed in the Public Environmental Review and that this matter should require further investigation by the Authority.

No other matters were raised in respect of the Public Environmental Review.

Yours faithfully

*R F Coffey*  
R F COFFEY  
Town Clerk

RWZ:DT

*cc book*

*city Env Health  
M J  
Crosby*

*6-1-92*

56397 INFO

All Communications to be addressed to the Town Clerk

POST OFFICE BOX 21, WANNEROO, WESTERN AUSTRALIA, 6065

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## **Appendix 3**

**The Authority's advice to the Department of Planning and Urban Development on the regional roads issues during the review of the draft North-West Corridor Structure Plan, 1991**



Chief Executive  
Department of Planning and Urban Development  
469-489 Wellington Street  
PERTH WA 6000

Your ref: 802/2/1/8 PT 3  
Our ref: 39/91 PT 1  
Enquiries: Mr Garry Middle

ATTENTION: Roger Hill

### EASTERN PERIMETER ARTERIAL ROAD WORKING GROUP - THE FINAL RECOMMENDATION

At the last meeting of this group the various options for this road were discussed, and there was a qualified agreement that option C would be supported. The officer representing the Authority at that meeting, Mr Garry Middle, indicated that he could not give the Authority's unqualified support for that option. I would like to formally reiterate that view.

While it is possible that Option C could be made environmentally acceptable, there are still some outstanding issues that need to be addressed, including:

- The alignment of the road near Little Mariginiup Lake should be altered so as not to pass through the wetland and its buffer area. This wetland is part of the System 6 M8 suite of wetlands, and is also protected under the Authority's draft Wetland Environmental Protection Policy.
- The northern section of the road which is shown as passing through State Forest and the Water Authority of Western Australia Priority One Source Area should be relocated away from this area. The Authority does not support additional major roads across Priority One Source Areas.
- \* Stormwater drainage off the road should be managed so as not to go directly into any wetlands. This issue can be dealt with at the detailed planning level.

If these issues are addressed at the appropriate level of planning, the Authority could give its support to the preferred option C.

Yours sincerely

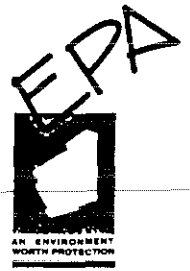
R A D Sippe  
DIRECTOR  
EVALUATIONS DIVISION  
23 October 1991

OptC EWRWG EPAposn DPUD 231091 GMI

Environment  
Protection Au

1 Mount Street  
Western Austral  
Telephone (08) 2  
Facsimile





Chief Executive  
Department of Planning and Urban Development  
469-489 Wellington Street  
PERTH WA 6000

Your ref:  
Our ref: 39/91  
Enquiries: Mr Garry Middle

ATTENTION: Mr R Stokes

## NORTH-WEST CORRIDOR STRUCTURE PLAN

### Introduction - the Environmental Protection Authority's strategy in considering the environmental issues raised by the North West Corridor Structure Plan

There are a number of environmental issues that arise from the North West Corridor Structure Plan, and the Authority has decided to adopt a three tiered approach in considering these issues. The first tier involves providing comments and advice that will form the framework for more detailed consideration of the issues at the other tiers. This letter contains those comments and that advice, and will be made available to the public.

The second level will apply during the various Amendments to the MRS that will be necessary to implement the Plan. The Authority will consider each Amendment on its merits, setting the level of assessment appropriate to the environmental issues raised. However, should an Amendment propose a significant changes to a System 6 areas that Amendment would require formal assessment. Notwithstanding any changes to System 6 areas that normally may be proposed during Amendments to the MRS, the final version of the Structure Plan should be consistent with the existing System 6 recommendations.

The final level will apply to specific developments likely to have significant environmental impacts. Detailed consideration of the environmental issues will be made at the development stage. Such proposals include:

- roads through National Parks;
- specific developments within System 6 area;
- the aerodrome; and
- marinas.

## The environmental issues - a summary

As you are aware, the Authority has been considering its response to this Structure Plan for some time, and there have already been several discussions between officers of your Department and the Authority. Further, there have been two working groups/committees that have been addressing specific issues related to the Plan, with officers from the Authority providing advice on environmental issues.

The eastern perimeter arterial road was one issue resolved through a working group, and a letter from the Department dated 14 November 1991 confirms that this issue has been resolved to our satisfaction.

The remaining environmental issues are of two types:

- issues related to System 6 areas; and
- other issues with likely significant environmental impacts.

## System 6 areas

### General comments

It is recognised that in some cases the areas recommended by the System 6 report are not clearly defined. It is likely, therefore, that the final boundary of these areas will need minor modifications, subject to on-going discussions with the Authority, and consideration of local factors, including topography. Further, not all System 6 recommendations require that land be purchased and reserved, and avenues exist to retain land in private ownership and still be consistent with System 6 recommendations. However, the general principles of Part I of the System 6 report were accepted by Cabinet in 1984. Cabinet also approved the progressive implementation, as far as possible, of the detailed recommendations in Part II of the Report.

The Structure Plan, therefore, should be consistent with Cabinet's decision, and address the System 6 recommendations applicable to the region. The comments below relate to how the Structure Plan should be amended to be consistent with the System 6 principles.

### 1. M1 - Two Rocks open space

There is no specific recommendation regarding management of this land other than one suggesting that final land uses be subject to land use decisions to the north.

The 1977 version of the North West Corridor Structure Plan proposed that an area be set aside as Parks and Recreation to act as a buffer between the industrial area proposed at Wilbinga and the northern extent of urbanisation. The System 6 report, released in 1983, recommended that this area become a Regional Park. Such parks should "provide for a range of outdoor recreation activities within a largely natural setting". This area also contains vegetation of high conservation value, some particularly sensitive to disturbance.

I understand that the main reason that M1 was not included in the 1991 version of the Structure Plan was because the Government no longer desires to place industry in the Wilbinga area, and there is now no need for a buffer zone. However, M1 was included as a System 6 recommendation because it provides a regionally significant area of open

space. The need for this Regional Park still exists, and the Structure Plan should reflect this. Any proposed changes to M1 must take into account the environmental values of the region, and will require formal assessment by the Authority.

To be consistent with System 6, the final version of this Structure Plan should show the area known as M1 as Parks and Open Space.

## 2. M2 - Coastal strip from Two Rocks to Burns Beach

Currently, your Department is carrying out a study of the coastal area from Burns Beach to Jindalee. One of the aims of this study is to better define the coastal reserve to fit with existing topography. The boundary of M2 as defined in the System 6 report is based on cadastral features. A more rational definition of this boundary could be found acceptable, and the Burns Beach to Jindalee study should be extended up the coast to the edge of the Metropolitan Region Boundary.

The Structure Plan needs to demonstrate how the proposal for a coastal reserve is consistent with the recommendations contained in the System 6 report.

## 3. M3 and M4 - Yanchep National Park

There are three issues related to this area that need resolution:

- (i) The alignment of Mitchell Freeway in relation to the Park;
- (ii) The size and management of new access road; and
- (iii) The proposed north-western additions to the Park.

The current alignment of the Mitchell Freeway through the western "arm" of the Park is not supported. Any proposal for a road through the Park, or an upgrading of an existing road, would be subject to assessment under Part IV of the Environmental Protection Act.

The Structure Plan has not included as proposed extensions to the Park the land to the north west of the existing Park recommended in the System 6 report for inclusion. It is still the Authority's view that this land should become part of the Park, and should be shown as such in the final Plan. Any proposed changes to the Park will require formal assessment.

The upgrading of Yanchep Beach Road through the Park will need careful planning. Discussions should be held between the National Park and Nature Conservation Authority and the Authority to determine how best to manage this road.

## 4. M 6 - Neerabup National Park

The creation of the continuous "green" strip including Neerabup National Park and extending up to Yanchep National Park is supported. The additional land set aside for Regional Open Space provides the opportunity to focus active recreation for the region and away from the environmentally sensitive areas of Neerabup National Park. However, there are a number of other issues that are of concern and may need addressing through formal assessment under Part IV of the Environmental Protection Act

Firstly the proposed building of new roads through the Park, and the re-alignment of Romeo Road, are environmentally unacceptable. The planning of the areas both east and west of Neerabup National Park should not be done on the expectation of access through the Park.

The second issue relates the freeway/rapid transit corridor on the west side of the Park. The Authority does not support any further loss of the Park for this facility. However, it does recognise that the freeway/rapid transit system could form a useful barrier between the residential areas and the Park.

#### 5. Western Arm of M6

A marina in a System 6 area is not generally supported, however, should one be proposed for this site it would require formal assessment under Part IV of the Environmental Protection Act. The likelihood of approval is made more difficult because a Regional Park is proposed for the land surrounding this site, and there are two other marinas within a reasonable distance.

The other proposals for this area - a golf course, tourist facility, water treatment plant and the rehabilitated tip site - would have to be implemented in a manner consistent with the Regional Park concept otherwise they would require formal assessment under Part IV of the Environmental Protection Act.

#### 6. M7 - Lakes Joondalup and Goollelal

This matter is currently being addressed through the formation of the Yellagonga Regional Park.

#### M8 - Wanneroo wetlands

The formation of a Landscape Protection Zone, along with selective purchase of the most significant wetlands, is supported. This would provide the basis for a significant Regional Park using both private and public land. It is important that the final report addresses the issues related to the formation of that Park, including possible land-use controls applicable for new developments. Such controls should be aimed at providing adequate buffers, controlling nutrient loss to the groundwater and water balance considerations.

The Authority acknowledges that some of the wetlands identified as part of M8 may not now be appropriate for inclusion in the Regional Park. They may be severely degraded due to a combination of vegetation loss and a severely lowered local watertable. A full assessment of the wetlands of the area should be carried, leading to recommendations on which wetlands could be considered for exclusion from the Park. Any exclusion would need approval from the Authority.

## Other environmental issues

### 1. Transport planning

A significant environmental issue facing society is the need to reduce the level of vehicle emissions, including greenhouse gases, lead, gases causing photochemical smog, and other pollutants.

Recent figures indicate that the City's air quality has reached, if not exceeded, its assimilative capacity. For the last five years levels of atmospheric lead have been above that recommended by the World Health Organisation for prolonged periods of time. In February this year ozone levels were recorded at Caversham 1.75 times above the recommended limits.

A growing Perth metropolitan area should be planned so as to make efficient use of energy, aimed particularly at the use of motor vehicles. Initiatives that are supported include:

- the move to higher density developments;
- the provision of adequate local public transport infrastructure that links residential areas to regional facilities, including employment centres;
- creating greater employment within the region; and
- providing cycleways in conjunction with major transport routes so as to encourage the use of cycles for commuting.

### 2. The proposed water treatment plants

Adequate buffers should be provided around these facilities to protect residents from both odours and chlorine associated risks. The recommended distance is 1 km.

### 3. Basic Raw Materials Zone

The Portland Cement quicklime project at Nowergup, located in the proposed Basic Raw material Zone, and associated Consultative Environmental Review report, should be used to guide development of extractive industries within this Zone.

The final use of this land for urban purposes is supported provided that the environmental integrity of Lake Nowergup is protected, and adequate buffers are provided from the horticulture area to the north and the industrial area to the south. Further, urbanisation within the area should not be used as a reason to provide east-west access through Neerabup National Park.

### 4. Aerodromes

Given what is being proposed for the region in the Structure Plan, it may be difficult to find a location for an aerodrome. Adequate buffers from residential areas are required, and the aerodrome should not be located on environmentally sensitive areas, including priority one groundwater areas.

If the need for an aerodrome can be demonstrated, its location should be proposed at this time so that planning of the land nearby can be adjusted accordingly. Formal assessment would also be required by the Authority.

#### 5. Tonkin Highway

The construction of any new road across the Priority One Gnangara Groundwater Mound management area is environmentally unacceptable. Around 35% of all the water supplied by the Water Authority comes from underground water, mostly from priority one groundwater areas. The quality of water from priority one sources is currently near pristine, requiring minimal treatment. Placing roads across these areas threatens the quality of that water.

Drainage off roads carries pollutants, including hydrocarbons, benzene derivatives and lead, down through the sand into the the unconfined aquifer. These pollutants can cause health problems if found in sufficiently high concentrations in drinking water. Further, there is the added danger of transportation spills from a whole variety of toxic substances being carried on trucks using the road.

#### 6. Industrial buffers

Mention should be made of the need for appropriate buffers to separate the proposed industrial areas from the nearby residential areas. In general, the guidelines set by the Victorian Environmental Protection Authority as published in Publication No. AQ2/86 are applied in Western Australia (copy attached).

#### 7. Horticulture

This is an important land use within the region, but expansion of that activity in the catchment of Lake Nowergup would likely have a deleterious impact on that wetland and would be opposed by the Authority.

#### 8. Lake Neerabup

The inclusion of this important wetland as Parks and Recreation is supported.

#### 9. Marina at the Alkimos wastewater treatment plant outlet

Such a proposal would likely require assessment under Part IV of the Environmental Protection Act.

#### 10. Regional drainage

The need to dispose of drainage water from the area east of Wanneroo Road to the ocean is not justified. On-site drainage disposal should be provide using the concepts of water

sensitive urban design. Restriction on vegetation clearing in the Landscape Protection Zone would also minimise the need for off-site drainage.

#### 11. Waste disposal

The current tip site at Tamala Park may not last the life of this plan. Alternatives for rubbish disposal need to be canvassed, and, if a site is required within the region, options for its location should be discussed.

It is also possible that some land near the tip site might be unsuitable for urbanisation while the tip is still operational. The Department of Health is currently developing guidelines for buffers around waste disposal sites, and planning for the area around Tamala Park would need to be consistent with that policy.

#### 12. Management of residential areas abutting the transport system (freeway and rail), National Parks and regional open space areas

Your Department is currently formulating a policy regarding noise buffers for major roads and the need for such buffers should be made clear in the report.

The practice of not having residential lots abutting National Parks and Regional Open space should be continued in the corridor.

The above comments are offered as the first level of advice from the Authority. The various issues raised will require ongoing consultation between officers of both Agencies so that any concerns are resolved satisfactorily. Should you require further information on any of the above issues please contact Mr Garry Middle on 222 7103.

Finally, this advice will be made available to the public, with copies sent to the various groups who have shown an interest in this matter during the time the Authority has been considering the Structure Plan.

Yours sincerely

*RAD Sippe*

R A D Sippe  
DIRECTOR  
EVALUATION DIVISION  
16 December 1991

CC: City of Wanneroo  
Quinns Rock Environmental Research Group  
Conservation Council of Western Australia (Inc)  
Wanneroo Rural Federation (Inc)  
Jackie Watkins, MLA  
L. C. Hawkins  
Coalition for Wanneroo's Environment

enc

NWCor Advice 1 DPUD 1291 GMI

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## **Appendix 4**

### **Proponents' commitments**





# Appendix 4

## Proponents' commitments

The proponents undertake to comply with each of the commitments which are made in this document to the satisfaction of the relevant statutory authority. It is to be noted that the present proposal is for rezoning rather than for subdivision and that the present proponents will not be the owners of future development lots created by the Development Plan, or the proponents for all subsequent development work.

This requires accommodation and acknowledgment by the relevant regulatory authorities in the course of processing this proposal. This section of the report reiterates and enumerates individual commitments which have been made within this Public Environmental Review document.

### 8.1 Detailed Design

1. The proponent will accommodate environmental management objectives listed below in the following commitments within the forthcoming subdivision design to the greatest practical extent, to the satisfaction of the Department of Planning and Urban Development and the City of Wanneroo.
2. The proponent will formulate the subdivision design to maximise the retention of existing native vegetation as far as is practical within public open space, schools, community centres and commercial areas, to the satisfaction of the Department of Planning and Urban Development and the City of Wanneroo.
3. The proponent will incorporate to the greatest practical extent, recent design principles for water conservation reported by the Western Australian Water Resources Council (WAWRC, 1990), to the satisfaction of the Water Authority and the City of Wanneroo.
4. The proponent will design stormwater handling and disposal facilities during the detailed engineering design phase of the project, in accordance with current regulatory design specifications and to the satisfaction of the City of Wanneroo. All stormwater will be disposed of on-site using current design approaches.

5. Should groundwater abstraction within the project area be proposed by the proponent, abstraction will be designed and carried out to the satisfaction of the Water Authority.
6. The proponent will accommodate the protection of the Aboriginal mythological honey possum site by the retention of approximately 4 ha of land as public open space, and the retention of all native vegetation within this area, to the satisfaction of the Department of Planning and Urban Development and the City of Wanneroo.

## 8.2 Construction Phase

The proponent will achieve effective noise and dust control during the construction phase of the project, to the satisfaction of the Environmental Protection Authority, as follows:

7. The operation of heavy machinery will be restricted to between 0630 and 1830 hours or in accordance with Local Authority regulations and all vehicles will be fitted with noise suppressing devices which will comply with standard vehicle emission and noise regulations.
8. Compliance with appropriate EPA Dust Guidelines for the development sites will be ensured by the adoption of appropriate site works procedures.
9. Preparatory vehicle access roads will be watered during operation.
10. Disturbed areas will be covered with top soil, and in the event that nuisance conditions arise, the areas will be stabilised.

The proponent will minimise smoke nuisance during the construction phase of the project, to the satisfaction of the City of Wanneroo, as follows:

11. The disposal of cleared vegetation by methods other than burning will be utilised to the greatest practical extent.
12. Wherever possible, any burning that must be carried out will be conducted under favourable meteorological conditions.

13. Non-vegetative material will not be burnt or used to promote burning.

The proponent will carry out fuel management during the construction phase of the project, to the satisfaction of the Water Authority, as follows:

14. Any fuel storage vessel which is utilized on-site will be located within an area which is sealed with a continuous double-thickness polythene sheet covered with soil, of sufficient volume to contain any spill which may occur during refuelling.
15. In the event that a fuel spillage occurs outside the compound, the contaminated soil will be immediately removed for disposal in an approved manner.

The proponent will manage heavy vehicle traffic during the construction phase of the project, to the satisfaction of the City of Wanneroo, as follows:

16. Heavy vehicle movements will be restricted to between 0630 and 1830 hours or in accordance with Local Authority regulations, Monday to Saturday. Vehicles will be restricted to the major roads where possible.

The proponent will accommodate dieback protection procedures during the construction phase of the project, to the satisfaction of the Environmental Protection Authority, as follows:

17. In the event that dieback is detected, a detailed dieback hygiene strategy will be defined to limit the risk of spread within or beyond the site. In the event that fill is required, it will not be imported from dieback infected areas.
18. Public safety will be recognised by the restriction of access to the development site during the construction phase and the erection of appropriate warning signs.
19. The proponent will optimise revegetation success by the recovery and re-application of top soil during site preparation works, to the greatest practical extent, to the satisfaction of the City of Wanneroo.

### **8.3 Post-Construction Phase**

20. The proponent will request that following their establishment, the management of grassed areas of public open space (which will be the responsibility of the City of Wanneroo) accommodate guidelines recently prepared by the Water Authority to protect the groundwater from nutrient contamination and to conserve water, to the satisfaction of the Water Authority.
21. In the course of the land transfer process, the proponent will advise the future managers of areas which support or could support native vegetation reserves, of the desirability of retaining natural vegetation and the appropriate management strategies for these areas, to the satisfaction of the City of Wanneroo.

### **8.4 Additional Commitments**

1. The proponents will undertake a review of Water Authority of Western Australia's data regarding water levels in Lakes Joondalup and Adams, and Water Authority of Western Australia's nutrient levels in Lake Joondalup. This review will then be reported to the relevant agencies including the Environmental Protection Authority.
2. The proponents will prepare a Remnant Vegetation Plan for the northern portion of the project area at the time of subdivision. The plan will detail a management program for remnant vegetation within the subdivision, determined in conjunction with the City of Wanneroo.

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## **Appendix 2**

**The proponents' response to the public submissions**



**PROPONENT'S RESPONSE  
TO EAST OF JOONDALUP  
URBAN DEVELOPMENT PROJECT  
PER PUBLIC SUBMISSIONS  
July, 1992**

**Prepared for:**

**Homeswest, R&I Bank and  
Yatala Nominees Pty Ltd  
C/O Homeswest  
99 Plain Street  
EAST PERTH WA 6004**

**Prepared by:**

**Bowman Bishaw Gorham  
2/294 Rokeby Road  
SUBLACO WA 6008  
Telephone: 388 1859  
Fax: 381 7362**

**Report No: MA2138**



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## EAST OF JOONDALUP URBAN DEVELOPMENT PROJECT

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### Proponents Response to Issues and Questions Raised During the PER Public Review Period

This document forms the proponent's (Homeswest, Yatala Nominees Pty Ltd, and the R&I Bank) principal responses to submissions regarding the Public Environmental Review (PER) for the proposed East of Joondalup Urban Development Project, Swan Location 2579 Clarkson Avenue and Lots 1 and 2 Flynn Drive, Neerabup.

The document is presented in two parts:

#### **Part A**

- Responses to the issues and comments within public submissions upon the PER that were summarised in Environmental Protection Authority (EPA) correspondence to the proponent, dated 1st May, 1992 (Appendix A). For ease of reference, the following comments and responses within Part A are numbered in accordance with the EPA correspondence.

#### **Part B**

- Responses to the issue raised in correspondence from the City of Wanneroo to the EPA regarding the proposal, dated 8th May, 1992 (Appendix B).

#### **Part A**

##### **A. Support for the Proposal**

The proponent acknowledges that a number of submissions gave support to the proposal, on the basis that it constitutes efficient, orderly development, and has acceptable and manageable environmental impacts.

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## **B. Concerns Raised About the Development**

### **1. Planning issues, including loss of rural amenity.**

#### **1.1 Valuable agricultural land would be lost to residential development.**

##### **Response:**

The southern portion of the site was parkland cleared for cattle grazing approximately 25 years ago. This pursuit proved unviable, as have a variety of agricultural and farming land uses since that time, including sheep, cattle and horse grazing and a riding school. The land has been somewhat degraded due to overstocking and non-sustainable farm management practises, which have resulted in vegetation loss and limited erosion. Consequently, the land has not been utilised for farming for many years. The cleared portion of the site cannot therefore, be considered as "valuable agricultural land".

Groundwater abstraction restrictions imposed by the Water Authority of Western Australia effectively preclude viable irrigated horticulture on the land.

#### **1.2 The existing Special Rural zones would suffer loss of amenity with urbanisation so close.**

##### **Response:**

The potential impact of the proposal upon the amenity of the adjacent Special Rural subdivision is highly subjective. Potential adverse impacts of the proposal, including increased traffic, people and the effects of light and noise, will be minimised by appropriate incorporation of a buffer zone of Special Residential lots with minimum area of 5000 square metres and minimum depth of 80 metres, between the existing rural-residential area and the proposed residential development. Perceived negative impacts will be compensated by easily identifiable positive impacts on the amenity of the area, including the provision of schools, community and health facilities, public transport and shopping facilities.

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**1.3 A large urban cell east of Wanneroo Road would remove the existing clear transition between rural and urban areas.**

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**Response:**

The creation of an urban cell east of Wanneroo Road is in accordance with current planning for the North-West Corridor. The transition between rural and urban areas will not be "lost", but relocated to allow for expansion within the Perth Metropolitan Area, as has occurred many times.

**1.4 The City of Wanneroo's Rural Strategy proposed that this area be developed as a Special Rural zone. This proposal contradicts that plan.**

**Response:**

The Wanneroo Rural Strategy was released by the City of Wanneroo in draft form in 1988, but did not proceed beyond draft stage before being superseded by subsequent strategic planning, viz the Council's 1991 Draft East Wanneroo District Structure Plan and the Department of Planning and Urban Development's North-West Corridor Structure Plan (1992). Reference to the draft Rural Strategy released in 1988 is therefore clearly out-moded.

**1.5 The development would increase the likelihood of the major road being built through the east Wanneroo area south of the development. Such a road would impact severely on the rural nature of that area.**

**Response:**

A major road in this area is an accepted part of the North-West Corridor Structure Plan (DPUD, 1992), formulated with extensive community consultation, including members of the Eastern Perimeter Arterial Road Action Group (EPARAG). The planning process

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developed options and reached consensus for the most appropriate alignment based on existing road reserves, and considering environmental and groundwater protection factors. Full details of the options considered and the consultation process are provided in the North-West Corridor Structure Plan (DPUD, 1992). The PER referred to this document in the explanation of the planning background which led to the proposal.

## **2. Impact on important System 6 wetlands**

### **2.1 Water levels in nearby wetlands - Lakes Joondalup and Adams - are likely to rise. Wetland vegetation may not change and deaths will occur.**

#### **Response:**

Wetlands and their surrounding vegetation should not be considered static, as they are constantly adapting in response to changing environmental characteristics, both seasonal and long-term.

For example, the PER presented data which shows that Lake Adam's water level varies by 1.0 metre or more in some years (PER Figure 7). Lake Joondalup exhibits a similar seasonal variation (PER Figure 14).

The PER also presented data which shows that groundwater and lake water levels in the Wanneroo area have generally declined since the early 1960's. In lakes such as Lake Adams, this has caused peripheral vegetation to encroach upon areas which were previously too deep to colonise.

The Water Authority (1989) used computer modelling to predict that groundwater levels beneath the site under a suite of proposed development and management strategies for the Wanneroo area, would fall by approximately 0.5 metres under average rainfall conditions. The PER predicted that groundwater levels beneath the site would rise between 0.5 and 0.9 metres due to urbanisation, based on detailed water balance equations derived for the proposal, attached as appendices to that report. The anticipated overall effect on groundwater levels was a nett increase of 0.4 metres (40 centimetres).

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The PER predicted that an increase in Lake Adams water level, returning to seasonal depths closer to historic levels, may lead to a shift in the distribution of vegetation types, including an outward expansion of fringing reed vegetation and Flooded Gums.

A water level rise in Lake Joondalup may lead to some inundation of the innermost zone of the fringing vegetation but would not be expected to encroach upon the Tuart/Marri woodland. Any rise in water levels would be mitigated by discharge to adjoining caves in the coastal limestone, which are thought to act as spillways thus controlling water levels in the lake (Allen, 1981).

Therefore while it is possible that some trees may die over a period of 20-30 years due to a rise in groundwater level, others will have germinated and grown in areas previously unsuitable for their survival.

It should also be noted that if the Water Authority increases groundwater abstraction over the next 2-3 decades due to increased demand, a rise in water table levels may never eventuate.

**2.2 The change in water levels will lead to a change in the structure of the vegetation within the wetlands, and this is seen as undesirable.**

**Response:**

There is no evidence to suggest that the vegetation structure surrounding the wetlands will change. As detailed in response 2.1, it is anticipated that there may be a gradual shift in the distribution of wetland vegetation structure types over a 20-30 year period, reversing the shift that has occurred as groundwater levels have declined since the 1960's. The shift may be considered to be of a similar order to that which is likely to occur naturally over a long period of time, in response to climatic variations.

**2.3 The development would increase the likelihood of a major road being built through the east Wanneroo area south of the development. Such a road would have an adverse impact on**

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important wetland south of the site through increased stormwater run-off from the road, and the possibility of chemical spills from trucks that use the road.

**Response:**

It was not the purpose of the PER to assess the potential impacts of a major road possibly being constructed in the vicinity of the site.

As for all such proposals, it will be for the EPA to determine whether a major road in this area should be assessed in accordance with the provisions of the Environmental Protection Act, (1986), and its acceptability or otherwise determined at that time.

**3. Issues related to the remnant bushland in the north section of the site.**

**3.1 The vegetation type found on the northern portion is poorly represented in conservation reserves (reference given), and this example should be set aside for conservation and not developed.**

**Response:**

The vegetation type on the northern portion of the site was botanically assessed and mapped by a regional scale survey carried out for the Department of Conservation and Environment in 1978, and was classified as Karrakatta Vegetation Complex Central and South. This vegetation type can be described in general terms as *Banksia* and Jarrah-*Banksia* woodland. This classification has been confirmed by site survey.

The PER prepared for the project addressed, among other matters:

- from a general landscape perspective, the degree to which *Banksia* woodland is conserved in the CALM Wanneroo District (which contains the site), and
- at a more detailed level, the extent to which Karrakatta Vegetation Complex Central and South is represented in System Six conservation reserves.

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The PER concluded that there was more than 20,000 hectares of reserves within the CALM Wanneroo District specifically for the purpose of conservation of *Banksia* and associated woodland. Additionally, the PER identified at least seventeen areas of Karrakatta Vegetation Complex Central and South in fifteen System Six reserves. The reserves containing examples of Karrakatta Vegetation Complex Central and South totalled approximately 5,500 ha.

However since the release of the PER, a more detailed assessment of the occurrence of *Banksia* woodland and Karrakatta Vegetation Complex Central and South in Government reserves in the Metropolitan Area and southwest parts of the State has been conducted by the proponent.

The first stage of the additional assessment determined the extent to which vegetation with similar general landscape values to that on the site, occurs in conservation reserves in the (now extended) CALM Wanneroo District. This was achieved in consultation with CALM Officers who provided detailed plans and information regarding the distribution and areas of *Banksia* woodland in reserves.

This work concluded that:

- There are approximately 68,000 hectares of existing or proposed reserves which contain *Banksia* woodland in the CALM Wanneroo District.

The second, more detailed stage of assessment examined the areas of Karrakatta Vegetation Complex Central and South in conservation and other reserves in the Perth Metropolitan and southern regions, using current aerial photography.

The results of the survey are summarised as follows:

- Twenty three reserves totalling approximately 1300 ha of Karrakatta Vegetation Complex Central and South occur in the Metropolitan Area. Seventeen of these are existing or proposed reserves for the purpose of conservation, and support an area totalling approximately 780 hectares of Karrakatta Complex Central and South vegetation. The other six Metropolitan Reserves are vested for purposes other than conservation, and total approximately 530 hectares of the vegetation complex.

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- Four conservation reserves located between Mandurah and Bunbury contain approximately 650 hectares of Karrakatta Vegetation Complex Central and South.
  - The total area of Karrakatta Vegetation Complex Central and South reserved in the Perth Metropolitan and southern regions is therefore approximately 1960 hectares, based on the mapping available and the methodology utilised.

This figure **does not** include examples of the vegetation type on land in private ownership.

It is also noted that an environmental audit of the northern corridor, carried out for CALM by the Semenuik Research Group in 1991, did not identify the site as an area of significant conservation value (DPUD, pers. comm., 1992).

**3.2 The damplands in the north and southeast part of the land are valuable habitats and should be conserved as part of the public open space.**

**Response:**

Through the process of ensuring that the PER document was suitable for public release, the EPA has agreed with the proponent that there are no areas of "wetland" and/or "dampland" on the site that are of any particular conservation significance, compared with the multitude of wetlands in the area.

Nonetheless, the proponent has incorporated the "dampland" remnant vegetation area that occurs in the southeast of the site into an area of public open space (PER Figure 12). The primary purpose for protecting this area was to ensure the protection of the remnant Jarrah-*Banksia* woodland rather than any remnant "dampland" characteristics of this portion of the site.



**3.3 The northern bushland section is part of a valuable corridor for birds which includes the Neerabup National Park and the Carramar Park Special Rural Zone. To protect the integrity of this corridor this bushland section of the land should not be developed for small lot housing but rather a mixture of bushland public open space and special rural lots.**

**Response:**

The term "corridor" in the comment implies that the site forms part of the passageway between two significant bird habitats which will be severed when the development proceeds.

Figure 8 of the PER presented the distribution of vegetation types within and surrounding the site, being predominantly *Banksia* and Jarrah-*Banksia* woodland. This vegetation type extends for several kilometres to the north and north-west of the site before a transition to heath east of Neerabup Lake. The *Banksia* woodland vegetation type extends eastward to Pinjar Road.

Even if the site was to be totally cleared, which it will not, an expansive area of bushland abutting both Neerabup National Park and Carramar Park would remain.

In addition to the vegetation surrounding the site, it is proposed to retain a significant number of distinct areas of public open space within the development. Considering the mobility of the majority of bird species recorded from the area, it can reasonably be concluded that birds could use these areas as a "passageway" through the site, together with the large area of bushland surrounding the site.

**3.4 A recent biological survey of the Carramar Park area indicated that it contains more species of reptiles and land birds than does Neerabup and Yanchep National Parks, and Yellagonga Regional Park. The area should, therefore, be conserved because of this species richness.**

**Response:**

The proponent doubts the validity of the comment. No details have been provided of the survey, nor of any other information critical to establish whether the comparisons of data obtained were relevant. It may well be the case that the reptiles and birds of the National Parks are poorly recorded and documented.

Nonetheless, the validity of the statement is highly improbable. Neerabup National Park, Yanchep National Park and the (proposed) Yellagonga Regional Park have areas of approximately 1135 ha (MRS), 2,780 ha and 1,500 ha (proposed) respectively, compared to only approximately 345 ha for the Carramar Special Rural area, including public open space. Using land areas as an indication of habitat availability, the statement is considered to be improbable.

**4. Impact on Neerabup National Park.**

**4.1 No consideration has been given to the impact the development will have on Neerabup National Park. The expected 24,000 to 28,000 people will put unacceptable pressure on the Park causing further degradation of this important bushland. To avoid this impact the development should provide a large area of bushland for passive recreation as part of the public open space.**

**Response:**

Both the proponent and State Government (through the Department of Planning and Urban Development) recognise that the expansion of the Perth Metropolitan Area will place added pressures on natural resources. This issue has been addressed through both the proponent's Development Plan for the site and the North-West Corridor Structure Plan for the region (DPUD, 1992).

As detailed in the PER, to assist in the mitigation of these additional pressures, the proponent intends to incorporate a significant number of public open space, many including considerable areas of bushland, into the development. These areas will be

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actively managed to provide recreation, habitat and cultural amenity, and will assume a number of functional roles.

The Department of Planning and Urban Development's 1992 North-West Corridor Structure Plan has recognised National Parks as a key element in the structure of the region, both as important conservation resources and as major components in the system of strategic open space for public use.

To avoid over-utilisation of the resource, the structure plan proposes the following:

- to extend Yanchep National Park eastwards to include current State Forest land, and in a south-west direction to incorporate Pipididdy Swamp. This will effectively increase the total area of the Park by 2,455 ha.
- to expand and consolidate the southern portion of Neerabup National Park to include all the land between Wanneroo Road and the Mitchell Freeway. This will add approximately 880 ha of land to the Park.
- to extend the Parks and Recreation reservation north of Romeo Road to provide a regional open space link between Neerabup and Yanchep National Parks, adding a further 315ha to the regional open space system. Neerabup Lake and approximately 315ha of land east of Wanneroo Road, near the site, is also proposed to be added to the system.

The expansion of National Parks and regional open space in the area, together with the proposed 1500ha Yellagonga Regional Park to the south west of the site, will ensure that sufficient areas within the Corridor exist to minimise degradation to these resources through human pressures.

**5. A nutrient management plan for the development.**

**5.1 Concern was expressed that the development does not provide a detailed strategy to avoid the pollution of the groundwater and the downstream Lake Joondalup, the main pollution fear being increased nutrient levels. The development should maximise the retention of native vegetation by keeping the small lot subdivisions on cleared land, a nutrient irrigation and management plan should be developed for the public grassed areas, and residents should be educated how to minimise fertiliser application rates.**

**Response:**

The proponent reiterates the commitments made in the PER, specifically:

*"8.1 Detailed Design*

*2. The proponent will formulate the subdivision design to maximise the retention of existing vegetation as far as is practical within public open space, schools, community centres and commercial areas, to the satisfaction of the Department of Planning and Urban Development and the City of Wanneroo.*

*8.3 Post-Construction Phase.*

*20. The proponent will request that following their establishment, the management of grassed areas of public open space (which will be the responsibility of the City of Wanneroo) accommodate guidelines recently prepared by the Water Authority to protect the groundwater from nutrient contamination and to conserve water, to the satisfaction of the Water Authority.*

*21. In the course of the land transfer process, the proponent will advise the future managers of areas which support or could support native vegetation reserves, of the desirability of retaining natural vegetation and the appropriate management strategies for these areas, to the satisfaction of the City of Wanneroo."*

In addition to these measures, in 1993/94 the Water Authority of WA intend to instigate a comprehensive water quality monitoring program for major wetlands on the Gnangara Mound, which will include nutrient analysis and monitoring of water fluctuations in Lake Joondalup.

Following discussions with the Environmental Protection Authority, the proponent has agreed to undertake a brief annual review of Water Authority data regarding water levels in Lakes Joondalup and Adams, and Water Authority nutrient levels in Lake Joondalup. A report of this review will be provided to relevant agencies.

The proponent has also agreed to prepare a Remnant Vegetation Plan for the northern portion of the project area at the time of subdivision. The plan will detail a management program for remnant vegetation within the subdivision, determined in conjunction with the City of Wanneroo.

## **6. Data inadequacies.**

**6.1 Some of the information used in PER is outdated and makes some of the predictions about, for example, the impact on the watertable, invalid. In particular, a recent article about the flora of the area was not quoted - Ecoscape, November 1991.**

### **Response:**

The proponent's consultants assessed all known, relevant and up-to-date data available to prepare the PER. Detailed consultations also occurred with Government Departments and other scientific personnel where considered necessary.

With regard to an "Ecoscape November 1991 article", the proponent has recently determined that this comment refers to a report prepared by a consultant for the City of Wanneroo. As such, the report remains the property of the City of Wanneroo, and is not a public document.

The proponent considers that every effort has been made to utilise contemporary information in the preparation of the PER.

- 6.2 Insufficient data was given about the flora and fauna surveys. Full details of the methodology should be given so that a full judgement about the adequacy of the surveys (can be made). If they were not carried out properly it could then be argued that rare flora and fauna could be on the site.**

**Response:**

The proponent considers that the full survey methodologies, or literature sources where the full survey methodology could be found, were clearly referenced in the PER and does not intend to repeat them here.

In terms of rare or endangered flora, Section 3.2.2.3 (Page 22) of the PER, "Rare and Endangered Flora," clearly details the methodology of the literature research and the site survey, and presents the results of the investigations. The likely impacts of the proposal are assessed in Section 5.2.1.3.

In terms of fauna, the site was assessed using historical records, museum records, limited site survey, and by discussion with the Department of Conservation and Land Management's Metropolitan Regional Office. Full results of the investigation, including methodologies, are given in the PER (pages 23-29 inclusive). Potential environmental impacts are given in Section 5.2.2.

- 6.3 Table 7, listing areas of remnant vegetation, is misleading because some of the areas listed - Bold Park and Kings Park - are severely degraded. Their inclusion creates the false sense that the vegetation types (Karrakatta Central and South) are well represented in conservation reserves.**

**Response:**

Table 7 of the PER makes no reference to degradation levels in listed areas, and therefore cannot reasonably be considered as misleading.

Please also refer to Response 3.1.

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**6.4 The discussion of the protection of the vegetation type included reference to examples found on private land found within the region. It is misleading to include these examples because they are not secure conservation reserves.**

**Response:**

The PER clearly states, following the listing of stands of Karrakatta Central and South Complex on private land referred to above, that:

*"The data presented above leads to the conclusion that although a large single coherent stand of Karrakatta Central and South vegetation complex will be cleared to enable the development to proceed, there are a number of other remnant stands of the vegetation type within the vicinity that are not affected by this proposal, and additionally some represented within secure reserves" (page 64.).*

The section preceding this paragraph described the potential impacts on the vegetation and flora from both regional and local perspectives, and referred to representations of vegetation in both private land, and in secure reserves which were System Six areas. Areas of private land were included to illustrate that the vegetation of the site is not unique in the area. The PER clearly stated that these areas existed and would not be affected by this proposal.

**6.5 There are numerous lime kilns closer to the land than the one in Neerabup Park (page 37). Those on Flynn Drive are closer and well preserved. (reference given).**

**Response:**

The comment relates to unlisted or unregistered sites of European heritage near the proposed development. The proponent is uncertain as to the relevance of the lime kilns to which reference is made. No lime kilns or other sites of European heritage will be disturbed by the proposed development.

- 6.6 The landform on the land is not all Spearwood as claimed. Lot 2 is transitional to the Bassendean Dune System (reference Geological Survey and Environmental Geology maps).**

**Response:**

The Department of Conservation and Environment (1980) mapping referred to in the PER was conducted at a regional scale of 1:250,000. At a more refined scale of 1:50,000, Gozzard (1982) identifies the entire development site, including all of Lot 2, as contained within the S7 land unit, corresponding to sand derived from Tamala Limestone. The geomorphological classification of the site is E<sub>d</sub>: degraded surface of eolian origin, Spearwood Dunes.

Reference: Gozzard, J.R. (1982). Muchea Sheet 2034 I and part Sheet 2134 IV, Perth Metropolitan Region, Environmental Geology Series, Geological Survey of Western Australia. (Copy supplied to the Environmental Protection Authority).

- 7. Loss of remnant bushland in the Metropolitan area.**

- 7.1 Concern was expressed about the continued growth of the Perth Metropolitan area, and the loss of native bushland. Small lot development in the corridor should avoid areas of native bushland. Instead, such areas should be developed for special rural zones. This proposal should be amended to be consistent with this approach.**

**Response:**

The PER did not, and could not be expected to, address or comment on the continued growth of the Perth Metropolitan Area.

The proponent's plan conforms with the North-West Corridor Structure Plan, which is the strategic planning document for the development corridor prescribed by METROPLAN, which is the State Government's strategic plan for the Perth Metropolitan Region. Concern regarding the pattern of growth of the region has no direct relevance to the PER,



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but to the strategic planning decisions previously made in the formulation of METROPLAN and the North-West Corridor Structure Plan. Each of these plans were formulated after detailed consultations and were subject to extensive public submission periods.

## **8. Impact on the Gnangara Mound.**

### **8.1 The proposal is likely to degrade the quality of water in the Gnangara Mound, which is an important source of both public and private water.**

#### **Response:**

There is no evidence to suggest the proposal would affect the quality of water in the Gnangara Mound. The development will utilise a reticulated sewage system. Management commitments presented in the PER, and reiterated in Response 5.1, will ensure that groundwater resources are protected.

The CSIRO Division of Water Resources has measured water quality criteria beneath the Subiaco/Shenton Park and Nedlands/Dalkeith areas, where urban development began more than seventy years ago. The CSIRO study area is sewerred (similar to the proposal), with shallow stratigraphy and superficial sediments comparable to those which occur at the project site. This is an important aspect, as all residences and community facilities proposed within the development will be connected to reticulated sewerage.

In brief, groundwater quality underlying Subiaco/Shenton Park and Nedlands/Dalkeith was well within accepted water quality criteria for drinking water quality, published by the National Health and Medical Research Council (NHMRC) and Australian Water Resources Council (AWRC) and used as guidelines by the Water Authority of WA.

It is extremely unlikely therefore, that sewerred urban development at Neerabup will result in either local groundwater or water from the Gnangara Mound becoming unsuitable as a public or private water source.

**8.2 One of the findings of a 1986 Water Authority study of the use of the water from the Gnangara Mound was that the impacts of long term extraction of groundwater were unknown. This conclusion was arrived at based on the then proposed extent of urbanisation within the North-West corridor. Urbanisation on this land was not proposed at that time. It is likely, therefore, that this development will put further pressure on the mound as more water will be required to service the area. Wetlands and native bushland that are supported by the mound are likely to be further threatened.**

**Response:**

It should be recognised that the Gnangara Mound is a groundwater resource covering 2,200 km<sup>2</sup>, containing approximately 19,500 x 10<sup>6</sup> m<sup>3</sup> of groundwater in storage. It is not a small, local resource restricted to land in the vicinity of the site, nor is it dependent upon the land use of the site for its water quality. In fact, the total area of the site is less than 0.4 of one percent of the area of the Mound.

METROPLAN estimated that Perth's population will grow by nearly one million people over the next 30 years, thereby creating a demand for 400,000 new homes. Up to 80,000 dwellings can be provided in established suburbs, however the remaining 320,000 dwellings will need to be provided in new urban areas.

The North-West Corridor will continue to be a major urban growth area, and will contribute a significant number of dwellings. Indeed, the North-West Corridor Structure Plan (DPUD,1992) anticipated that approximately 40,000 new dwellings may be established in Category A1 expansion areas alone within the corridor (those areas most likely to be urbanised in the normal course of development within the next five to ten years). Urban development east of Wanneroo Road, is expected to extend from Hepburn Avenue northwards to Flynn Drive, accommodating approximately 23,000 dwellings by the year 2021. Most of this expansion will occur over the Gnangara Mound.

Regardless of whether the subject land is urbanised, further groundwater abstraction will be required from groundwater resources to supply the expanding population. However, two important factors must be noted in relation to these reserves and their management.

Firstly, the PER has predicted, using information provided by the Water Authority, that groundwater levels beneath the site may potentially display a nett rise of 0.4 metres due to the current and other proposals for urbanisation in the locality. The nett increase offers the opportunity for greater abstraction to service the area, thus partially offsetting extraction requirements for the region.

Secondly, the Water Authority has demonstrated a pro-active role in the management and maintenance of ecosystems, to avoid over-abstraction and the degradation of wetlands and native bushland over the Mound. The 1986 Environmental Review and Management Program (ERMP) for the Gnangara Mound groundwater resources identified the formulation of a sustainable management plan to cater for the predicted population growth of the North-West Corridor as a primary objective. Page 1 of the summary of the ERMP states:

*"A major consideration in the management of groundwater resources is the maintenance of wetlands. Groundwater usage must be managed to ensure that important wetlands are not significantly affected."*

and in the Environmental Management Commitments

*"Appropriate management is required so that these resources (the Gnangara Mound in the North-West Corridor) can be developed whilst avoiding effects such as:*

- *over exploiting the resource*
- *degradation of water quality*
- *lowering of lake levels and degradation of native flora and*
- *fauna, and*
- *salt water intrusion and*
- *these factors were also emphasised in the Perth Urban Water*
- *Balance Study, published by the Water Authority in 1987."*

It is therefore clear that the Water Authority is aware of its responsibilities as the manager of the resource, and is additionally bound by legislation such as the Environmental Protection (Swan Coastal Plain Groundwater, Wetlands and Associated Ecosystems) Policy 1990 to protect these ecosystems, under the Environmental Protection Act, 1986.

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**9. Unsuitable growth of the Perth metropolitan area.**

**9.1 The continued expansion of the Perth Metropolitan area is seen as environmentally unsustainable.**

**Response:**

The proponent is committed to environmentally sensitive design and management, to ensure that the proposed urbanisation will be environmentally acceptable. It is also acknowledged that the final judgement rests with the EPA and the Minister for the Environment, following comments from members of the public.

The proponent also supports the current environment assessment process which requires proposals contributing to the urban expansion of the Perth Metropolitan Area to be assessed on their merits.

**Part B**

**3.0 Wanneroo Council, at its April 29, 1992 meeting resolved to advise the EPA that they do not consider that the noise issue in relation to the motor sports area and its impact on the proposed urban area, had been adequately addressed in the PER, and that this matter should require further investigation by the Authority.**

**No other matters were raised in respect of the Public Environmental Review.**

**Response:**

Based on the correspondence from the City of Wanneroo to the EPA (Appendix B), it is unclear which aspect of the noise assessment regarding motor sport in the area Council considers inadequate. However, the proponent has investigated noise emissions from the Wanneroo Park Raceway further, and offers the following additional information.

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The PER reported sound levels data from the Wanneroo Park circuit recorded in 1989. At this time, noise levels near the track from each vehicle were estimated to be in the range of 110-120 dB(A).

Since that time, the Confederation of Australian Motor Sports (CAMS), which represents all car clubs nationally (including Wanneroo), has passed a resolution stating that the maximum permissible noise from all "flat track" racing vehicles is 95 dB(A), and additionally that all vehicles must be fitted with noise suppression devices.

Sound pressure levels are now measured on the "straight" of the track, approximately 10m from the edge, by scrutineers using sound measuring equipment supplied by the CAMS Perth office. If the noise emissions of any vehicle exceeds 95 dB(A), it is given a "black flag", forcing it to enter the pits area. If the vehicle cannot subsequently comply with the noise level limit of 95 dB(A), it is refused permission to re-enter the track. The enforcement of this regulation has been confirmed by the WA Sporting Car Club, which uses the Wanneroo facility.

Consequently, vehicles using the Wanneroo circuit have achieved a 15-25 dB(A) reduction in noise emission levels from their cars. To determine the effect of this noise reduction on the proposed development, the proponent commissioned specialist noise and vibration consultants to re-assess predicted noise levels within the site, and additionally to determine whether a 2.5 metre high brick perimeter wall along the Flynn Drive boundary of the subdivision would have significant sound attenuation affects, or if a wall was necessary at all.

A summary of results for 20 vehicles operating simultaneously at approximately 95 dB(A), and a comparison with those results produced in the PER for 1989 data from sites adjacent to Flynn Drive, is presented in Table 1 below.

Predicted noise levels for another four locations within the site were calculated, however as these locations were at a greater distance from the source and up to 7 dB(A) lower than those on Flynn Drive, the results are not included here.

Table 1

**Sound levels predicted and recorded for sites adjacent to Flynn Drive  
(dB(A))**

	Measuring Station	
	L1	L2
PER data recorded in 1989:	40-48	35-44
Predicted level with vehicle noise reduction:	27	24
Predicted level with vehicle noise reduction and perimeter wall:	27	24
Predicted overall noise reduction:	<b>13-21</b>	<b>11-20</b>

Table 1 demonstrates that the implementation and enforcement of the CAMS resolution has reduced the predicted noise at the Flynn Drive boundary of the subdivision by 11-21 dB(A) compared to previously measured levels, resulting in noise levels of between 24 and 27 dB(A). The assessment of predicted noise levels also indicate that a 2.5 metre high brick perimeter fence along Flynn Drive would not be effective in further reducing noise levels.

With the noise emissions levels for vehicles set at a maximum of 95 dB(A), noise generated from the Wanneroo Circuit with up to 20 race cars in operation will be below background noise recorded on the site, and will therefore be inaudible. It is acknowledged that background noise will vary at the site depending on the time of day, however it is unlikely they will fall below 30 dB(A) (residential background noise levels are typically 35-50 dB(A)) during the daytime, when racing is carried out.

It is further anticipated that the large reduction in noise levels achieved for the Wanneroo Circuit will have a significant effect on any short-term cumulative noise levels which may occur in the event of simultaneous racing in the area.



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**APPENDIX B**

**Correspondence to the EPA from the City of Wanneroo  
Dated 8th May, 1992**





# City of Wanneroo



When replying please quote

OUR REF: 790-606

DATE: 8 May 1992

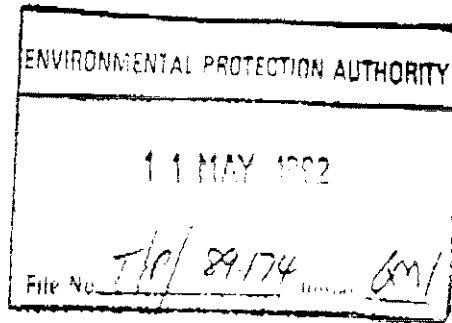
ADMINISTRATION CENTRE,  
BOAS AVENUE,  
JOONDALUP  
WESTERN AUSTRALIA.

YOUR REF:

ENQUIRIES: Mr R W Zagwockl  
Town Planning

TELEPHONE: (08) 406 0333  
FACSIMILE: (08) 300 1383

The Chairman  
Environmental Protection Authority  
8th Floor  
"Westralia Square"  
38 Mounts Bay Road  
PERTH WA 6000



Attention: Gary Middle

Dear Sir

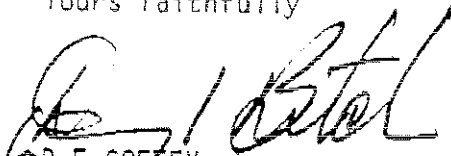
EAST JOONDALUP URBAN DEVELOPMENT NEERABUP (ASSESSMENT NO 344)

I refer to your correspondence dated 18 February 1992 in regard to the Public Environmental Review for the abovementioned project and advise that Council considered this matter at its April meeting on 29 April 1992.

At that meeting, the Council resolved to advise the Authority that they do not consider that the noise issue in relation to the motor sports area and its impact on the proposed urban area, has been adequately addressed in the Public Environmental Review and that this matter should require further investigation by the Authority.

No other matters were raised in respect of the Public Environmental Review.

Yours faithfully

  
R F COFFEY  
Town Clerk

RWZ:DT

cc kept

by En. Mark  
M. J. R.

Wanneroo 61-1-11-11

56397 INFO

All Communications to be addressed to the Town Clerk

POST OFFICE BOX 21, WANNEROO, WESTERN AUSTRALIA, 6065

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## Appendix 3

The Authority's advice to the Department of Planning and Urban Development on the regional roads issues during the review of the draft North-West Corridor Structure Plan, 1991



Chief Executive  
Department of Planning and Urban Development  
469-489 Wellington Street  
PERTH WA 6000

Your ref: 802/2/1/8 PT 3  
Our ref: 39/91 PT 1  
Enquiries: Mr Garry Middle

ATTENTION: Roger Hill

### EASTERN PERIMETER ARTERIAL ROAD WORKING GROUP - THE FINAL RECOMMENDATION

At the last meeting of this group the various options for this road were discussed, and there was a qualified agreement that option C would be supported. The officer representing the Authority at that meeting, Mr Garry Middle, indicated that he could not give the Authority's unqualified support for that option. I would like to formally reiterate that view.

While it is possible that Option C could be made environmentally acceptable, there are still some outstanding issues that need to be addressed, including:

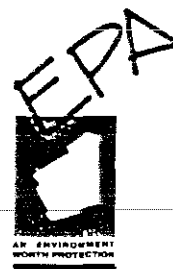
- The alignment of the road near Little Mariginiup Lake should be altered so as not to pass through the wetland and its buffer area. This wetland is part of the System 6 M8 suite of wetlands, and is also protected under the Authority's draft Wetland Environmental Protection Policy.
- The northern section of the road which is shown as passing through State Forest and the Water Authority of Western Australia Priority One Source Area should be relocated away from this area. The Authority does not support additional major roads across Priority One Source Areas.
- \* Stormwater drainage off the road should be managed so as not to go directly into any wetlands. This issue can be dealt with at the detailed planning level.

If these issues are addressed at the appropriate level of planning, the Authority could give its support to the preferred option C.

Yours sincerely

R A D Sippe  
DIRECTOR  
EVALUATIONS DIVISION  
23 October 1991

OptC EWRWG EPAposn DPUD 231091 GMI



Chief Executive  
Department of Planning and Urban Development  
469-489 Wellington Street  
PERTH WA 6000

Your ref:  
Our ref: 39/91  
Enquiries: Mr Garry Middle

ATTENTION: Mr R Stokes

## NORTH-WEST CORRIDOR STRUCTURE PLAN

### Introduction - the Environmental Protection Authority's strategy in considering the environmental issues raised by the North West Corridor Structure Plan

There are a number of environmental issues that arise from the North West Corridor Structure Plan, and the Authority has decided to adopt a three tiered approach in considering these issues. The first tier involves providing comments and advice that will form the framework for more detailed consideration of the issues at the other tiers. This letter contains those comments and that advice, and will be made available to the public.

The second level will apply during the various Amendments to the MRS that will be necessary to implement the Plan. The Authority will consider each Amendment on its merits, setting the level of assessment appropriate to the environmental issues raised. However, should an Amendment propose a significant changes to a System 6 areas that Amendment would require formal assessment. Notwithstanding any changes to System 6 areas that normally may be proposed during Amendments to the MRS, the final version of the Structure Plan should be consistent with the existing System 6 recommendations.

The final level will apply to specific developments likely to have significant environmental impacts. Detailed consideration of the environmental issues will be made at the development stage. Such proposals include:

- roads through National Parks;
- specific developments within System 6 area;
- the aerodrome; and
- marinas.

## The environmental issues - a summary

As you are aware, the Authority has been considering its response to this Structure Plan for some time, and there have already been several discussions between officers of your Department and the Authority. Further, there have been two working groups/committees that have been addressing specific issues related to the Plan, with officers from the Authority providing advice on environmental issues.

The eastern perimeter arterial road was one issue resolved through a working group, and a letter from the Department dated 14 November 1991 confirms that this issue has been resolved to our satisfaction.

The remaining environmental issues are of two types:

- issues related to System 6 areas; and
- other issues with likely significant environmental impacts.

## System 6 areas

### General comments

It is recognised that in some cases the areas recommended by the System 6 report are not clearly defined. It is likely, therefore, that the final boundary of these areas will need minor modifications, subject to on-going discussions with the Authority, and consideration of local factors, including topography. Further, not all System 6 recommendations require that land be purchased and reserved, and avenues exist to retain land in private ownership and still be consistent with System 6 recommendations. However, the general principles of Part I of the System 6 report were accepted by Cabinet in 1984. Cabinet also approved the progressive implementation, as far as possible, of the detailed recommendations in Part II of the Report.

The Structure Plan, therefore, should be consistent with Cabinet's decision, and address the System 6 recommendations applicable to the region. The comments below relate to how the Structure Plan should be amended to be consistent with the System 6 principles.

### 1. M1 - Two Rocks open space

There is no specific recommendation regarding management of this land other than one suggesting that final land uses be subject to land use decisions to the north.

The 1977 version of the North West Corridor Structure Plan proposed that an area be set aside as Parks and Recreation to act as a buffer between the industrial area proposed at Wilbinga and the northern extent of urbanisation. The System 6 report, released in 1983, recommended that this area become a Regional Park. Such parks should "provide for a range of outdoor recreation activities within a largely natural setting". This area also contains vegetation of high conservation value, some particularly sensitive to disturbance.

I understand that the main reason that M1 was not included in the 1991 version of the Structure Plan was because the Government no longer desires to place industry in the Wilbinga area, and there is now no need for a buffer zone. However, M1 was included as a System 6 recommendation because it provides a regionally significant area of open

space. The need for this Regional Park still exists, and the Structure Plan should reflect this. Any proposed changes to M1 must take into account the environmental values of the region, and will require formal assessment by the Authority.

To be consistent with System 6, the final version of this Structure Plan should show the area known as M1 as Parks and Open Space.

## 2. M2 - Coastal strip from Two Rocks to Burns Beach

Currently, your Department is carrying out a study of the coastal area from Burns Beach to Jindalee. One of the aims of this study is to better define the coastal reserve to fit with existing topography. The boundary of M2 as defined in the System 6 report is based on cadastral features. A more rational definition of this boundary could be found acceptable, and the Burns Beach to Jindalee study should be extended up the coast to the edge of the Metropolitan Region Boundary.

The Structure Plan needs to demonstrate how the proposal for a coastal reserve is consistent with the recommendations contained in the System 6 report.

## 3. M3 and M4 - Yanchep National Park

There are three issues related to this area that need resolution:

- (i) The alignment of Mitchell Freeway in relation to the Park;
- (ii) The size and management of new access road; and
- (iii) The proposed north-western additions to the Park.

The current alignment of the Mitchell Freeway through the western "arm" of the Park is not supported. Any proposal for a road through the Park, or an upgrading of an existing road, would be subject to assessment under Part IV of the Environmental Protection Act.

The Structure Plan has not included as proposed extensions to the Park the land to the north west of the existing Park recommended in the System 6 report for inclusion. It is still the Authority's view that this land should become part of the Park, and should be shown as such in the final Plan. Any proposed changes to the Park will require formal assessment.

The upgrading of Yanchep Beach Road through the Park will need careful planning. Discussions should be held between the National Park and Nature Conservation Authority and the Authority to determine how best to manage this road.

## 4. M 6 - Neerabup National Park

The creation of the continuous "green" strip including Neerabup National Park and extending up to Yanchep National Park is supported. The additional land set aside for Regional Open Space provides the opportunity to focus active recreation for the region and away from the environmentally sensitive areas of Neerabup National Park. However, there are a number of other issues that are of concern and may need addressing through formal assessment under Part IV of the Environmental Protection Act

Firstly the proposed building of new roads through the Park, and the re-alignment of Romeo Road, are environmentally unacceptable. The planning of the areas both east and west of Neerabup National Park should not be done on the expectation of access through the Park.

The second issue relates the freeway/rapid transit corridor on the west side of the Park. The Authority does not support any further loss of the Park for this facility. However, it does recognise that the freeway/rapid transit system could form a useful barrier between the residential areas and the Park.

#### 5. Western Arm of M6

A marina in a System 6 area is not generally supported, however, should one be proposed for this site it would require formal assessment under Part IV of the Environmental Protection Act. The likelihood of approval is made more difficult because a Regional Park is proposed for the land surrounding this site, and there are two other marinas within a reasonable distance.

The other proposals for this area - a golf course, tourist facility, water treatment plant and the rehabilitated tip site - would have to be implemented in a manner consistent with the Regional Park concept otherwise they would require formal assessment under Part IV of the Environmental Protection Act.

#### 6. M7 - Lakes Joondalup and Goollelal

This matter is currently being addressed through the formation of the Yellagonga Regional Park.

#### M8 - Wanneroo wetlands

The formation of a Landscape Protection Zone, along with selective purchase of the most significant wetlands, is supported. This would provide the basis for a significant Regional Park using both private and public land. It is important that the final report addresses the issues related to the formation of that Park, including possible land-use controls applicable for new developments. Such controls should be aimed at providing adequate buffers, controlling nutrient loss to the groundwater and water balance considerations.

The Authority acknowledges that some of the wetlands identified as part of M8 may not now be appropriate for inclusion in the Regional Park. They may be severely degraded due to a combination of vegetation loss and a severely lowered local watertable. A full assessment of the wetlands of the area should be carried, leading to recommendations on which wetlands could be considered for exclusion from the Park. Any exclusion would need approval from the Authority.



## Other environmental issues

### 1. Transport planning

A significant environmental issue facing society is the need to reduce the level of vehicle emissions, including greenhouse gases, lead, gases causing photochemical smog, and other pollutants.

Recent figures indicate that the City's air quality has reached, if not exceeded, its assimilative capacity. For the last five years levels of atmospheric lead have been above that recommended by the World Health Organisation for prolonged periods of time. In February this year ozone levels were recorded at Caversham 1.75 times above the recommended limits.

A growing Perth metropolitan area should be planned so as to make efficient use of energy, aimed particularly at the use of motor vehicles. Initiatives that are supported include:

- the move to higher density developments;
- the provision of adequate local public transport infrastructure that links residential areas to regional facilities, including employment centres;
- creating greater employment within the region; and
- providing cycleways in conjunction with major transport routes so as to encourage the use of cycles for commuting.

### 2. The proposed water treatment plants

Adequate buffers should be provided around these facilities to protect residents from both odours and chlorine associated risks. The recommended distance is 1 km.

### 3. Basic Raw Materials Zone

The Portland Cement quicklime project at Nowergup, located in the proposed Basic Raw material Zone, and associated Consultative Environmental Review report, should be used to guide development of extractive industries within this Zone.

The final use of this land for urban purposes is supported provided that the environmental integrity of Lake Nowergup is protected, and adequate buffers are provided from the horticulture area to the north and the industrial area to the south. Further, urbanisation within the area should not be used as a reason to provide east-west access through Neerabup National Park.

### 4. Aerodromes

Given what is being proposed for the region in the Structure Plan, it may be difficult to find a location for an aerodrome. Adequate buffers from residential areas are required, and the aerodrome should not be located on environmentally sensitive areas, including priority one groundwater areas.

If the need for an aerodrome can be demonstrated, its location should be proposed at this time so that planning of the land nearby can be adjusted accordingly. Formal assessment would also be required by the Authority.

#### 5. Tonkin Highway

The construction of any new road across the Priority One Gnangara Groundwater Mound management area is environmentally unacceptable. Around 35% of all the water supplied by the Water Authority comes from underground water, mostly from priority one groundwater areas. The quality of water from priority one sources is currently near pristine, requiring minimal treatment. Placing roads across these areas threatens the quality of that water.

Drainage off roads carries pollutants, including hydrocarbons, benzene derivatives and lead, down through the sand into the the unconfined aquifer. These pollutants can cause health problems if found in sufficiently high concentrations in drinking water. Further, there is the added danger of transportation spills from a whole variety of toxic substances being carried on trucks using the road.

#### 6. Industrial buffers

Mention should be made of the need for appropriate buffers to separate the proposed industrial areas from the nearby residential areas. In general, the guidelines set by the Victorian Environmental Protection Authority as published in Publication No. AQ2/86 are applied in Western Australia (copy attached).

#### 7. Horticulture

This is an important land use within the region, but expansion of that activity in the catchment of Lake Nowergup would likely have a deleterious impact on that wetland and would be opposed by the Authority.

#### 8. Lake Neerabup

The inclusion of this important wetland as Parks and Recreation is supported.

#### 9. Marina at the Alkimos wastewater treatment plant outlet

Such a proposal would likely require assessment under Part IV of the Environmental Protection Act.

#### 10. Regional drainage

The need to dispose of drainage water from the area east of Wanneroo Road to the ocean is not justified. On-site drainage disposal should be provide using the concepts of water

sensitive urban design. Restriction on vegetation clearing in the Landscape Protection Zone would also minimise the need for off-site drainage.

#### 11. Waste disposal

The current tip site at Tamala Park may not last the life of this plan. Alternatives for rubbish disposal need to be canvassed, and, if a site is required within the region, options for its location should be discussed.

It is also possible that some land near the tip site might be unsuitable for urbanisation while the tip is still operational. The Department of Health is currently developing guidelines for buffers around waste disposal sites, and planning for the area around Tamala Park would need to be consistent with that policy.

#### 12. Management of residential areas abutting the transport system (freeway and rail), National Parks and regional open space areas

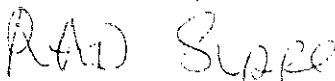
Your Department is currently formulating a policy regarding noise buffers for major roads and the need for such buffers should be made clear in the report.

The practice of not having residential lots abutting National Parks and Regional Open space should be continued in the corridor.

The above comments are offered as the first level of advice from the Authority. The various issues raised will require ongoing consultation between officers of both Agencies so that any concerns are resolved satisfactorily. Should you require further information on any of the above issues please contact Mr Garry Middle on 222 7103.

Finally, this advice will be made available to the public, with copies sent to the various groups who have shown an interest in this matter during the time the Authority has been considering the Structure Plan.

Yours sincerely



R A D Sippe  
DIRECTOR  
EVALUATION DIVISION  
16 December 1991

CC: City of Wanneroo  
Quinns Rock Environmental Research Group  
Conservation Council of Western Australia (Inc)  
Wanneroo Rural Federation (Inc)  
Jackie Watkins, MLA  
L. C. Hawkins  
Coalition for Wanneroo's Environment

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## Appendix 4

### Proponents' commitments



## Appendix 4

### Proponents' commitments

The proponents undertake to comply with each of the commitments which are made in this document to the satisfaction of the relevant statutory authority. It is to be noted that the present proposal is for rezoning rather than for subdivision and that the present proponents will not be the owners of future development lots created by the Development Plan, or the proponents for all subsequent development work.

This requires accommodation and acknowledgment by the relevant regulatory authorities in the course of processing this proposal. This section of the report reiterates and enumerates individual commitments which have been made within this Public Environmental Review document.

#### 8.1 Detailed Design

1. The proponent will accommodate environmental management objectives listed below in the following commitments within the forthcoming subdivision design to the greatest practical extent, to the satisfaction of the Department of Planning and Urban Development and the City of Wanneroo.
2. The proponent will formulate the subdivision design to maximise the retention of existing native vegetation as far as is practical within public open space, schools, community centres and commercial areas, to the satisfaction of the Department of Planning and Urban Development and the City of Wanneroo.
3. The proponent will incorporate to the greatest practical extent, recent design principles for water conservation reported by the Western Australian Water Resources Council (WAWRC, 1990), to the satisfaction of the Water Authority and the City of Wanneroo.
4. The proponent will design stormwater handling and disposal facilities during the detailed engineering design phase of the project, in accordance with current regulatory design specifications and to the satisfaction of the City of Wanneroo. All stormwater will be disposed of on-site using current design approaches.

5. Should groundwater abstraction within the project area be proposed by the proponent, abstraction will be designed and carried out to the satisfaction of the Water Authority.
6. The proponent will accommodate the protection of the Aboriginal mythological honey possum site by the retention of approximately 4 ha of land as public open space, and the retention of all native vegetation within this area, to the satisfaction of the Department of Planning and Urban Development and the City of Wanneroo.

## 8.2 Construction Phase

The proponent will achieve effective noise and dust control during the construction phase of the project, to the satisfaction of the Environmental Protection Authority, as follows:

7. The operation of heavy machinery will be restricted to between 0630 and 1830 hours or in accordance with Local Authority regulations and all vehicles will be fitted with noise suppressing devices which will comply with standard vehicle emission and noise regulations.
8. Compliance with appropriate EPA Dust Guidelines for the development sites will be ensured by the adoption of appropriate site works procedures.
9. Preparatory vehicle access roads will be watered during operation.
10. Disturbed areas will be covered with top soil, and in the event that nuisance conditions arise, the areas will be stabilised.

The proponent will minimise smoke nuisance during the construction phase of the project, to the satisfaction of the City of Wanneroo, as follows:

11. The disposal of cleared vegetation by methods other than burning will be utilised to the greatest practical extent.
12. Wherever possible, any burning that must be carried out will be conducted under favourable meteorological conditions.

13. Non-vegetative material will not be burnt or used to promote burning.

The proponent will carry out fuel management during the construction phase of the project, to the satisfaction of the Water Authority, as follows:

14. Any fuel storage vessel which is utilized on-site will be located within an area which is sealed with a continuous double-thickness polythene sheet covered with soil, of sufficient volume to contain any spill which may occur during refuelling.
15. In the event that a fuel spillage occurs outside the compound, the contaminated soil will be immediately removed for disposal in an approved manner.

The proponent will manage heavy vehicle traffic during the construction phase of the project, to the satisfaction of the City of Wanneroo, as follows:

16. Heavy vehicle movements will be restricted to between 0630 and 1830 hours or in accordance with Local Authority regulations, Monday to Saturday. Vehicles will be restricted to the major roads where possible.

The proponent will accommodate dieback protection procedures during the construction phase of the project, to the satisfaction of the Environmental Protection Authority, as follows:

17. In the event that dieback is detected, a detailed dieback hygiene strategy will be defined to limit the risk of spread within or beyond the site. In the event that fill is required, it will not be imported from dieback infected areas.
18. Public safety will be recognised by the restriction of access to the development site during the construction phase and the erection of appropriate warning signs.
19. The proponent will optimise revegetation success by the recovery and re-application of top soil during site preparation works, to the greatest practical extent, to the satisfaction of the City of Wanneroo.



### 8.3 Post-Construction Phase

20. The proponent will request that following their establishment, the management of grassed areas of public open space (which will be the responsibility of the City of Wanneroo) accommodate guidelines recently prepared by the Water Authority to protect the groundwater from nutrient contamination and to conserve water, to the satisfaction of the Water Authority.
21. In the course of the land transfer process, the proponent will advise the future managers of areas which support or could support native vegetation reserves, of the desirability of retaining natural vegetation and the appropriate management strategies for these areas, to the satisfaction of the City of Wanneroo.

### 8.4 Additional Commitments

1. The proponents will undertake a review of Water Authority of Western Australia's data regarding water levels in Lakes Joondalup and Adams, and Water Authority of Western Australia's nutrient levels in Lake Joondalup. This review will then be reported to the relevant agencies including the Environmental Protection Authority.
2. The proponents will prepare a Remnant Vegetation Plan for the northern portion of the project area at the time of subdivision. The plan will detail a management program for remnant vegetation within the subdivision, determined in conjunction with the City of Wanneroo.