

**Urban development of part lot 12 and Reserve  
34664 (affecting part of System Six  
Recommendation M107), Golden Bay**

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**H & B Developments Pty Ltd**

**Report and recommendations  
of the Environmental Protection Authority**

**Environmental Protection Authority  
Perth, Western Australia  
Bulletin 648  
September 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 2 October, 1992.

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## Summary and recommendations

A proposal to develop Part Lot 12 and Public Recreation Reserve 34 664 Golden Bay for urban purposes was first referred to the Environmental Protection Authority in May 1991. The Authority required that a Public Environmental Review of the proposal be undertaken and provided guidelines to assist the proponent, H & B Developments Pty Ltd, in the preparation of the necessary documentation. The Public Environmental Review document was available for an eight week public review period which ended on 29 June 1992. There were 54 individual and 256 pro forma submissions received. A petition was also received.

The proposal affects 163.6 hectares of land to the north and east of the existing township of Golden Bay, and involves the rezoning of land from mostly Urban Deferred to Urban (refer figure 1). The structure plan prepared for the proposal indicates that the major land uses proposed include; residential, Regional Open Space, Local Open Space, primary school, roads, neighbourhood centre, community uses, tourist uses and a service station (Alan Tingay and Associates, 1992). The Authority understands that this is not the final structure plan for the area and therefore the assessment is based on broad land use allocations rather than specific details.

There were a number of issues of significance identified by the public submissions and the Authority in the assessment of the proposal.

### *System Six Recommendation M107.*

The proposal is one of two proposals currently before the Environmental Protection Authority having implications for System Six Recommendation M107. The System Six Study which resulted in Recommendation M107 was undertaken to identify areas of recreation, conservation and landscape value to be protected (Environmental Protection Authority, 1983). The Public Environmental Review prepared was therefore required to address not only the impact of this proposal on System Six Recommendation M107, but also to discuss the context for this proposal and others for Recommendation M107 in its entirety.

Recommendation M107 consists of a north - south strip which runs along Mandurah Road from Golden Bay to Madora, and four east - west strips which run from the Mandurah Road section to the coast. The part of the System 6 recommendation M107 which is affected by this proposal is one east - west strip (Figure 2).

The main intent of Recommendation M107 was that the area's recreational and landscape values be protected by planning procedures which would not require public acquisition of the land involved (Environmental Protection Authority, 1983 & 1983b). As it has not been possible to achieve this through the planning process, and because of the management difficulties inherent in the protection of narrow strips of land surrounded by urban development, the Authority decided that it would be appropriate to consider alternatives to the actual areas proposed for protection by the Recommendation which would still achieve its original intent.

A range of alternatives were put forward for accommodating the objectives of System Six Recommendation M107 in the discussion paper in the Public Environmental Review. These alternatives included; extra wide foreshore reserves, provision of Open Space reserves in other areas, acquisition of the M107 areas for Parks and Recreation, complete residential development, partial residential development and partial retention of the System Six area for landscape protection and vegetation retention.

Of the alternatives and the information presented in the Public Environmental Review and from submissions, it was considered that the expanded coastal foreshore reserve would provide the best alternative to the System Six east - west link. This is because it preserves a landscape of significance to the area, that is, part of the coastal landform and its associated flora, and would provide for recreation, thereby satisfying the System Six objectives. This option would also

provide for opportunities for suitable alternatives for other properties affected by Recommendation M107, that is Singleton and Madora.

The parabolic dunes on the eastern edge of Part Lot 12 Golden Bay, particularly those bounded by Dampier and Crystaluna Drives also have landscape value for the area, and it may be possible to protect these values through application of appropriate planning mechanisms such as reduced lot densities or appropriate lot design.

#### *National Heritage listing and Peelhurst wetlands*

An area of approximately 2000 hectares which generally extends from the north of Port Kennedy to the north of Golden Bay and east to Warnbro Sound Avenue has been entered on the interim list of the Register of the National Estate. Registration does not mean that the area should be a national park or public reserve. The register is used as a basis for the development of programmes to protect, improve and present properties and places forming part of the National Estate.

The listing of the 'Port Kennedy' area has principally taken place because of its geomorphic values and because it contains the three Quindalup Dune wetland suites, that is the Coo loongup, Becher and Peelhurst wetlands.

The northern part of the Golden Bay property, which is subject to National Estate listing, contains Peelhurst wetlands. The Authority considers that it is important to protect these wetlands as far as possible, and therefore is recommending the widening of the proposed coastal reserve to accommodate this objective.

#### *Coastal stability*

The stability of the coastline and the effect of this proposal on it was questioned during the assessment of the proposal.

The information available indicates that the coastline is accreting rather than eroding, and that the foreshore reserve proposed should be adequate in this instance.

#### *Flora and Fauna*

The coastal reserve will provide for the protection of flora within it. There are however, two species of plants on the Department of Conservation and Land Management's Declared Rare and Priority Flora list (Priority 3 and 4) which are not within the coastal reserve. Their protection has been catered for within reserves elsewhere on the Swan Coastal Plain.

Submissions on the proposal indicated the presence of the rare and endangered species Southern Brown Bandicoot (*Isodon obesulus*). The Authority requested that the proponent undertake a trapping program to establish the presence and likely size of the Bandicoot population at Golden Bay. This programme resulted in the capture of nine Bandicoots, four of which were captured twice, which suggested that the population probably numbers between twenty and thirty individuals (Alan Tingay & Associates, 1992b). The expanded coastal reserve may provide a safe habitat for a section of the Bandicoot population if it is managed properly. However, it is likely that the remainder of the population would need to be trapped and relocated elsewhere. The regional implications of doing this are unknown and in order to effectively protect the species, this information will be required.

The protection of fauna, particularly species which are gazetted under the Wildlife Conservation Act 1950, is the legislative responsibility of the Department of Conservation and Land Management. The Authority therefore considers that the Department of Conservation and Land Management should be closely involved in the management of this issue both in the local and regional sense.

#### *Groundwater*

Concerns were raised about the potential impact of the development on the quality and quantity of the area's groundwater resource. Submitters were particularly concerned about this issue because many of the existing residents draw on the resource as their only supply of potable water.

Consultation with the Water Authority of Western Australia has revealed that there should be no significant impact by the development on the groundwater.

#### *Conclusion and recommendations*

Following consideration of the Public Environmental Review, submissions from the public and Government agencies, and the proponent's response to them, the Authority has determined that the proponent has addressed the relevant issues associated with the proposal to urbanise Part Lot 12 Golden Bay and its affect on the System 6 Recommendation M107 in particular.

#### **Recommendation 1**

**The Environmental Protection Authority has concluded that the proposed urban development at Golden Bay, as modified during the process of interaction between the proponent, the Environmental Protection Authority, the public, and the Government agencies that were consulted is environmentally acceptable.**

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

- **implications for System 6 Recommendation M107; and**
- **protection of Peelhurst wetlands, fauna, and coastal stability.**

**The Environmental Protection Authority considers that these environmental factors have been addressed adequately by either environmental management commitments given by the proponent or by the Environmental Protection Authority's recommendations in this report.**

**Accordingly, the Environmental Protection Authority recommends that the project could proceed subject to the Environmental Protection Authority's recommendations in this report and the proponent's commitments to environmental management (Appendix 1).**

#### **Recommendation 2**

**The Environmental Protection Authority recommends that prior to the commencement of development, the proponent modify the proposed foreshore reserve which is required for conservation and recreation purposes, to meet the requirements of the Minister for the Environment on the advice of the Environmental Protection Authority. In particular, the foreshore reserve should include the Peelhurst wetlands.**

#### **Recommendation 3**

**The Environmental Protection Authority recommends that prior to commencement of development, the proponent liaise with the Department of Planning and Urban Development and the City of Rockingham to put in place planning measures which recognise the landscape value of the parabolic dune ridge on the eastern edge of Golden Bay to meet the requirements of the Minister for the Environment and the Minister for Planning.**

#### **Recommendation 4**

**The Environmental Protection Authority recommends that the proponent liaise with and meet the requirements of the Department of Conservation and Land Management with regard to establishing the regional implications of disturbing the population of the Southern Brown Bandicoot (*Isodon obesulus*) at Golden Bay, and providing for the adequate protection of the population at Golden Bay, prior to the commencement of development.**





# **1. Introduction**

A proposal to develop land at Golden Bay was first referred to the Environmental Protection Authority in May 1991, at which time the Authority required that a Public Environmental Review of the proposal be undertaken. The Authority provided guidelines to assist the proponent, H & B Developments Pty Ltd, in the preparation of the necessary documentation. The Public Environmental Review document was made available for an eight week public review period which ended on 29 June 1992.

This proposal is one of two proposals currently before the Environmental Protection Authority which has implications for System Six Study Area M107 (refer Section 5.2). The System Six Study was undertaken to identify areas of recreation, conservation and landscape value to be protected, and the recommendations made by this Study were published in 1983 (Environmental Protection Authority, 1983). As such, the Authority considered that it was necessary to formally examine the impact of both this proposal and others on System Six Recommendation M107. It was required that a Public Environmental Review of the impacts of this proposal on the relevant section of Recommendation M107 be undertaken, and that the document prepared include a discussion of the implications of the proposal for Recommendation M107 in its entirety.

# **2. Description of proposal**

The proponent proposes to develop for Urban purposes 163.6 hectares of land to the north and east of the existing township of Golden Bay (Refer figure 1). The land is currently mostly zoned Urban Deferred. A structure plan prepared for the proposal indicates that the major land uses proposed are; residential, Regional Open Space, Local Open Space, primary school, roads, neighbourhood centre, community uses, tourist uses, and a service station (Alan Tingay & Associates, 1992). The Authority understands that this is not the final structure plan for the development, and therefore the assessment is based on broad land use allocations rather than specific details.

# **3. Planning context**

The Department of Planning and Urban Development is responsible for the planning of the Perth Metropolitan Region, that is, it is responsible for managing the city's growth, and for planning for the accommodation of the population's needs for employment, education, transport, recreation and housing. The Department releases strategies and structure plans which discuss these issues, though its principal statutory instrument for planning is the Metropolitan Region Scheme. The Metropolitan Region Scheme allocates zones to land which indicate the type of uses allowed in a particular area, and therefore, can be viewed as the blueprint for development in the Perth Metropolitan Region.

The area of land proposed for rezoning at Golden Bay has mostly been zoned Urban Deferred in the Metropolitan Region Scheme since 1981. This signifies that most of Golden Bay has been identified for future urban development since that time. The Golden Bay land has also been subject to System Six Recommendation M107 since 1983 (Refer Section 5.2).

All planning studies to date have identified the Golden Bay area as part of the urban expansion programme for the metropolitan region. Recognition has not been given in planning documents to the existence of System Six Recommendation M107, either in terms of its specific location or in accommodation of its intent.

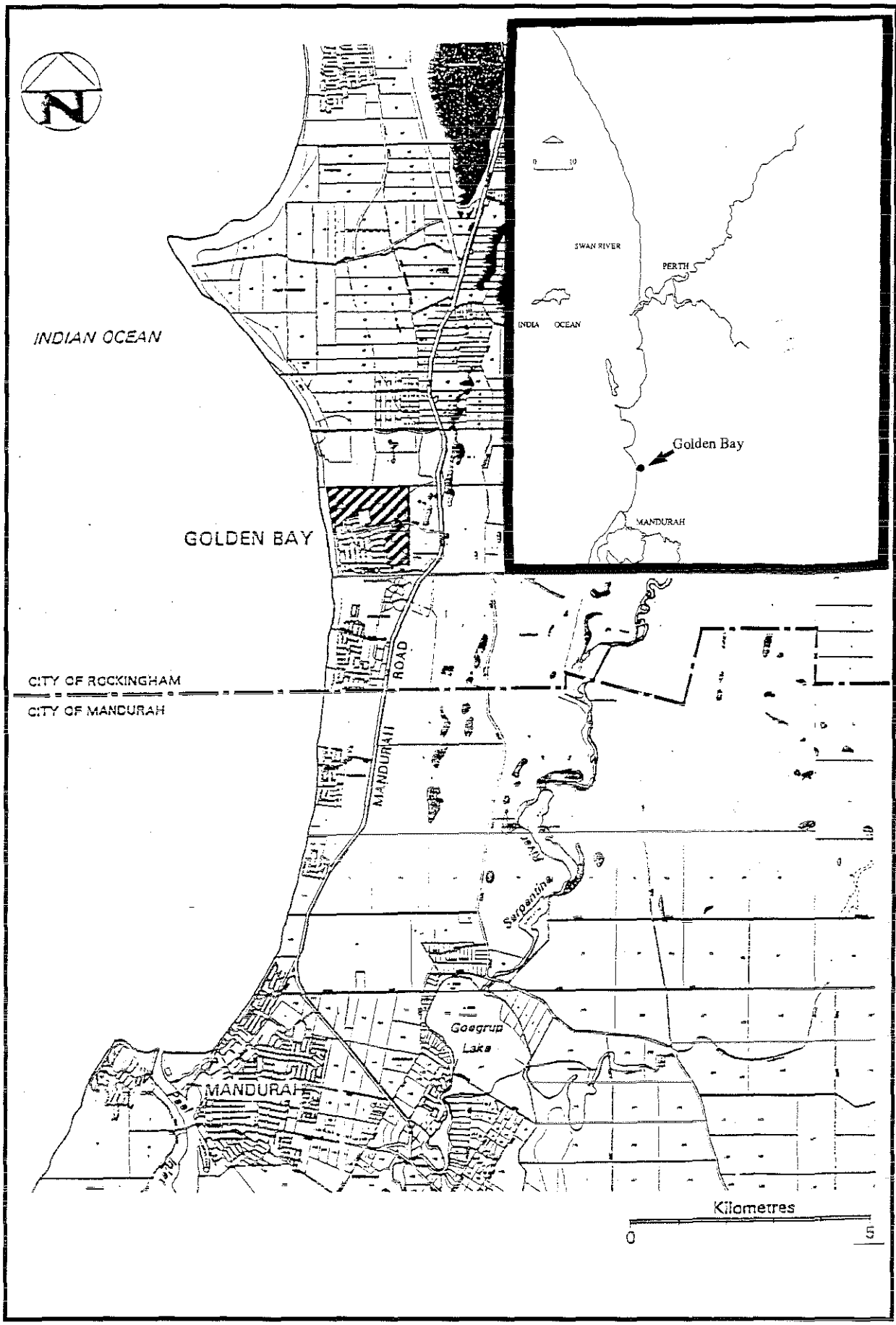


Figure 1. Golden Bay location.

## **4. Review of public submissions**

The Public Environmental Review document prepared for the proposal was available for an eight week public submission period which closed on 29 June 1992. Comments were sought on the proposal from the public, community groups and local and State Government agencies. There were 54 individual and 256 pro forma (12 types) submissions received. A petition was also received. The submissions raised a number of issues relating mainly to:

- impact of the proposal on System Six Recommendation M107;
- coastal stability and foreshore protection;
- impact on coastal landform on south eastern edge of property;
- impact on flora;
- impact on fauna, particularly the Southern Brown Bandicoot;
- impact on groundwater quality and quantity;
- need for the development;
- relationship of proposal to the South West Corridor Structure Plan; and
- affect on existing lifestyle.

A detailed list of issues raised in submissions and the proponent's response to these issues is incorporated in Appendix 2 of this report. Many of the issues are also specifically discussed in the following section of this report, however, the last two issues listed above are planning issues which should be dealt with by the Department of Planning and Urban Development under planning procedures.

## **5. Environmental impacts and their management**

### **5.1 General**

The Authority considered a number of issues in relation to this proposal and concluded that the main environmental impacts included impact of the proposal on System Six Recommendation M107, Peelhurst wetlands, coastal stability and coastal landform, flora and fauna, and groundwater quality and quantity. The following is a discussion on how the Authority dealt with each of these issues.

### **5.2 System Six Recommendation M107**

In 1972, the Environmental Protection Authority established the Conservation Through Reserves Committee to make recommendations with respect to National Parks and Nature Reserves of the State. Western Australia was divided into 12 different Systems each representing a natural and demographic entity. The Perth metropolitan area was included within the Darling System, that is System Six. System Six covers the most intensively used part of the State where land values are high and where competition for differing land uses is often intense. The study attempted to define those parts of the region which should be kept mainly natural so as to preserve certain conservation, recreation and landscape values. The key issue to be addressed in this assessment is the effect of this proposal on System Six Recommendation M107, and whether the intent of this recommendation can be maintained through alternative means.

The Recommendation M107 area comprises a north - south strip of land along Mandurah Road, and four east - west strips between Mandurah Road and the coast. These strips are located in Golden Bay (1), Singleton (1) and Madora (2) (Figure 2). This specific proposal affects only one east - west strip component of Recommendation M107.

SOURCE: ENVIRONMENTAL PROTECTION AUTHORITY, 1983

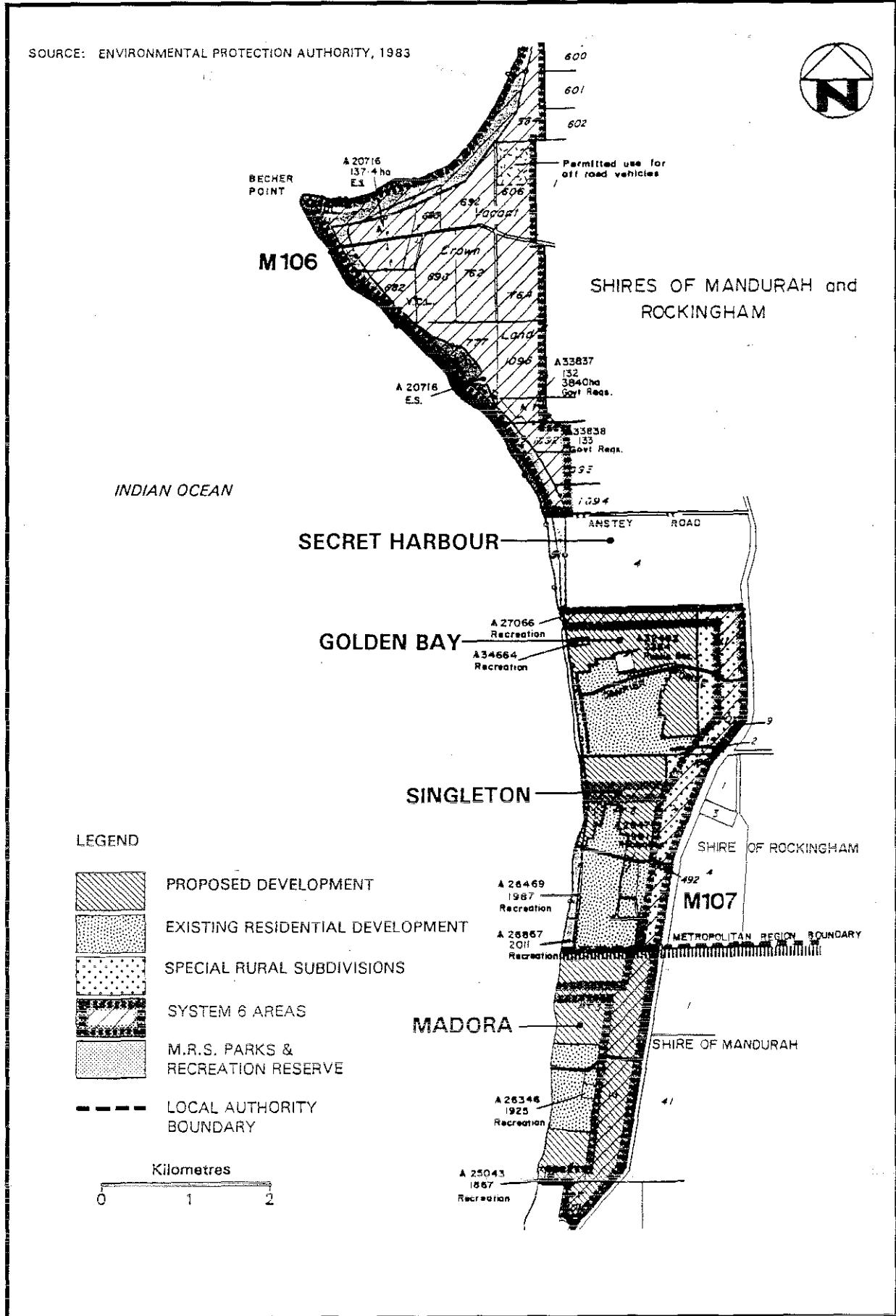


Figure 2. System Six Recommendation M107.

The System Six report (Environmental Protection Authority, 1983) describes the M107 area as having extensive coastal dunes which are very valuable for their coastal vegetation and for recreation and aesthetic reasons, and specifically states that buffer zones of uncleared land should be left to preserve some segments of scenery and vegetation near Mandurah Road and the coast. The actual recommendation states that:

"ways and means of protecting the area's recreational and landscape values be sought through planning procedures to be developed as recommended in Recommendation 14, Chapter 4."

Recommendation 14 states:

"The Government should establish an investigation into legislative means of achieving, through public planning procedures, the protection of the conservation and public amenity values of designated privately owned areas, without necessitating public acquisition of the land affected." (Environmental Protection Authority, 1983b)

The Authority has not been successful in implementing the recommendation through the planning process as the Department of Planning and Urban Development considers that all of the east - west links of System Six Recommendation M107 should be removed to make way for continuous urban development so as to achieve the best lot yield for the area, and to effectively provide infrastructure. Consequently, no provision has been made for their retention in any of the planning strategies or rezonings which have taken place to date (Metropolitan Region Planning Authority, 1980 & Department of Planning and Urban Development, 1991).

As it has not been possible to achieve the implementation of Recommendation M107 through the planning process as recommended, and because of the ecological management difficulties inherent in the conserving the east - west links particularly once surrounded by urban development, it was decided by the Authority to consider alternatives which would preserve the intent of the original recommendation, that is, to provide for retention of landscape and recreation values.

As previously discussed, the Authority did not want to consider each of the different segments in a piecemeal fashion through individual proposals such as this one, therefore it required that a discussion paper be prepared which discussed Recommendation M107 as a whole, and which put forward alternatives to the recommendation as proposed in the System Six Report. This discussion paper was included as an appendix to the Public Environmental Review document which was released for public review.

A range of alternatives were put forward in the discussion paper in relation to the east - west links. These included:

- acquisition for Parks and Recreation. The Department of Planning and Urban Development could reserve and acquire the east - west links for Parks and Recreation. However, this would need to be done with consideration to other priorities for acquisition in the metropolitan area, and would involve management difficulties for the east - west links because of their narrow linear nature and the fact that they would be surrounded by urban development;
- extra wide foreshore reserves. This alternative involves the provision of a foreshore reserve of greater width than that which would be required under the Department of Planning and Urban Development's Coastal Planning Policy. The boundary of the reserve would be based on landform features and would provide for the protection of a range of flora species;
- provision of Open Space reserves in other areas. This option involves approval of residential use for the System Six area, but would provide for the protection of other areas with identified landscape or vegetation values such as Mandurah Hill in Golden Bay;
- partial residential development and partial retention of the System 6 area for landscape protection and vegetation retention. This option is similar to the one discussed above except that the areas retained would be parts of the proposed M107 areas rather than alternative areas; and

- complete residential development. It was argued that the east - west links would not have to be retained in any form because contemporary planning requirements are more important than the values identified by the System Six Study. This conclusion was reached in the context of regional planning which allocates areas for Parks and Recreation elsewhere in the region, such as Port Kennedy and Anstey Swamp. Therefore, if this option were adopted, no additional allocation of land for Open Space would occur other than what is normally required by planning authorities (Alan Tingay & Associates, 1992).

In this instance, it was considered that the expanded coastal foreshore reserve (in modified form) would provide the best alternative to the System 6 east-west link for Golden Bay because it preserved a landscape of significance to the area, that is, part of the coastal landform and its associated flora, and would provide for recreation, thereby satisfying the System Six objectives. It would also have the advantage of linking in to the Singleton proposal to the south of Golden Bay, providing for a continuous expanded foreshore reserve. This option could also apply to Madora if and when a proposal for that land comes forward, unless the planning process can accommodate the recommendation in its original or slightly modified form through the South West Corridor Structure Plan or any other appropriate planning tool.

Whilst the modified expanded foreshore reserve will cater for protection of a section of the coastal landform, it was considered that the parabolic dunes on the eastern edge of the Golden Bay property bounded by Crystaluna and Dampier Drives also have particular landscape value for the area. The protection of this landform was a major concern raised in submissions. The protection of this landform and its flora will not be achieved by the foreshore reserve, however, it may be possible to protect these values through application of appropriate planning mechanisms such as reduced lot densities or appropriate lot design, and planning controls for landscape and vegetation protection.

### **5.3 National Heritage listing and Peelhurst wetlands**

An area of approximately 2000 hectares which generally extends from the northern extent of Port Kennedy to the northern extent of Golden Bay and east to Warnbro Sound Avenue has been entered on the interim list of the Register of the National Estate. The *Australian Heritage Commission Act 1975*, under which the register was established, provides that Commonwealth Ministers and agencies must not take any action which would adversely affect any place on the register unless; there is no feasible or prudent alternative, all action is taken to minimise damage, and the Australian Heritage Commission is given time to comment. The Act is not directed at the actions of State Government, Local Government, private land owners or institutions. It does not imply that the Australian Heritage Commission holds any particular position with regard to the ownership, management or use of the place. Registration of a natural area does not, for example, mean that the Commission or the Commonwealth Government holds a view that the area should be a national park or public reserve. The register is used as a basis for the development of programmes to protect, improve and present properties and places forming part of the National Estate.

The Port Kennedy area has been listed because of its geomorphic values, because it contains the three Quindalup Dune wetland suites, that is the Coo loongup, Becher and Peelhurst wetland suites and because it provides habitat for the rare and endangered Southern Brown Bandicoot (refer Section 5.5) and has three unusual vegetation associations.

The northern part of the Golden Bay property, which is subject to the National Estate listing contains Peelhurst wetlands. It has been stated that the wetlands of the Peelhurst Suite are a type that are rare elsewhere on the Swan Coastal Plain, and that they record a stratigraphy, soil system, chronology and vegetation, and changes in climate and soils over a period of one thousand years in a way unparalleled and not offered by other more prominent wetlands of the Swan Coastal Plain. They offer a large research potential, and in terms of local dune landscape fauna, they provide a local node for feeding, nesting, and roosting avifauna. They also provide an important local habitat, feeding site, and productivity node for other fauna, particularly the Southern Brown Bandicoot (V & C Semeniuk Research Group, 1991).

The Authority considers it important to protect these wetlands as far as possible, and therefore has recommended that the proposed coastal reserve be widened further to facilitate this.

## 5.4 Coastal stability

The stability of the coastline at Golden Bay and the impact of this proposal on it was raised as an issue.

Examination of the information available has indicated that the coastline is not eroding, and is in fact accreting. In this sense, a coastal reserve of 100m from the vegetation line, as given in the Department of Planning and Urban Development's coastal planning policy would be sufficient. As has been discussed in the preceding section, the proponent has proposed a coastal reserve with a width of 150 - 300 metres which would be adequate for dealing with the issue of coastal stability. This should still be the case if groynes are constructed further south in Comet Bay, although any proposal to construct groynes would have to be carefully evaluated and issues such as impact on coastal stability to the north will need to be addressed by the proponent of any such proposal.

## 5.5 Flora and fauna

Whilst the coastal reserve would provide for the protection of flora within it, there are two species on the Department of Conservation and Land Management's Declared Rare and Priority Flora list which are not within the coastal reserve. The species are *Jacksonia sericea* (Priority 3) and *Conostylis pauciflora* subspecies *pauciflora* (Priority 4). Priority 3 species are poorly known taxa which are known from several populations, at least some of which are not believed to be endangered and Priority 4 taxa are considered to be rare but not currently threatened by identifiable factors (Alan Tingay and Associates, 1992). The Authority considers that as it has been reported that the population of *Conostylis pauciflora* subspecies *pauciflora* at Golden Bay is not viable, and as both of these species are known to occur within reserves on the Swan Coastal Plain, their protection has been adequately catered for elsewhere (Alan Tingay and Associates, 1992).

The main issue with regard to impact on fauna is the potential presence of the species Southern Brown Bandicoot (*Isoodon obesulus*). This species is listed in Schedule 1 of the Wildlife Conservation Act 1950 as "fauna that is likely to become extinct, or is rare". To establish whether Bandicoots were present, the Authority requested that the proponent carry out a trapping programme. This programme resulted in the capture of nine bandicoots, four of which were captured twice. Four individuals were trapped in Closed Scrub and Heathlands within the proposed coastal reserve, two individuals were trapped in *Acacia rostellifera* Closed Scrub and *Lepidosperma gladiatum* Sedgeland within the dune complex immediately east of the proposed Coastal reserve, and three individuals were captured in *Acacia rostellifera* Closed Scrub and *Hakea trifucata* Closed Heathland in the eastern sector of the property north of Dampier Drive. There were no Bandicoots caught in traps sited on the beach ridge plain where the vegetation is Open Heathland to Shrubland. It is considered that the local population probably numbers between 20 and 30 individuals (Tingay & Associates, 1992b).

The regional implications of disturbing this population are not known as studies are required to establish this. However, it may be possible to relocate the existing population though studies will be needed to identify a suitable area, and the population will need to be monitored to establish whether relocation is successful. If managed properly, the coastal reserve would provide a relatively safe habitat for a section of the Bandicoot population, however, it is likely that the remainder of the population would have to be relocated to ensure survival.

The protection of fauna, particularly species which are gazetted under the Wildlife Conservation Act 1950, is the legislative responsibility of the Department of Conservation and Land Management. The Authority therefore considers that the Department of Conservation and Land Management should be closely involved in the resolution of this issue both in the local and regional sense, and has recommended accordingly.



## **5.6 Groundwater**

The issue of potential affect on groundwater by the proposal was raised as a major issue of concern by submissions.

The concerns related to potential impact of increased urban development at Golden Bay on the quality and quantity of the groundwater of the area, particularly as many of the existing residents currently draw on the groundwater resource as their only source of potable water.

The Environmental Protection Authority has consulted the Water Authority of Western Australia on this issue and has been advised that the groundwater resource of the area should not suffer any unacceptable impact. This is based on the fact that although the proposed development could lead to greater draw on the groundwater, this should be compensated by increased run off from roofs and paved areas, and by the watering of gardens with imported scheme water, therefore it is probable that the net impact will be a small rise in water level.

The new development will result in more gardens and therefore more nutrient input. However, it will be connected to reticulated sewerage and will be experiencing greater recharge, therefore, it is likely that there should only be a small net deterioration in groundwater quality. The groundwater should still be potable.

## **6. Conclusion and recommendations**

Following consideration of the Public Environmental Review, submissions from the public and Government agencies, and the proponent's response to them, the Authority has determined that the proponent and this report has addressed the relevant issues associated with the proposal to urbanise the remaining Golden Bay area and its affect on the System Six Recommendation M107 in particular.

### **Recommendation 1**

**The Environmental Protection Authority has concluded that the proposed urban development at Golden Bay, as modified during the process of interaction between the proponent, the Environmental Protection Authority, the public, and the Government agencies that were consulted is environmentally acceptable.**

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

- **implications for System 6 Recommendation M107; and**
- **protection of Peelhurst wetlands, fauna, and coastal stability.**

**The Environmental Protection Authority considers that these environmental factors have been addressed adequately by either environmental management commitments given by the proponent or by the Environmental Protection Authority's recommendations in this report.**

**Accordingly, the Environmental Protection Authority recommends that the project could proceed subject to the Environmental Protection Authority's recommendations in this report and the proponent's commitments to environmental management (Appendix 1).**

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

### **Recommendation 2**

**The Environmental Protection Authority recommends that prior to the commencement of development, the proponent modify the proposed foreshore reserve which is required for conservation and recreation purposes, to meet the requirements of the Minister for the Environment on the advice of the Environmental Protection Authority. In particular, the foreshore reserve should include the Peelhurst wetlands.**

### **Recommendation 3**

**The Environmental Protection Authority recommends that prior to commencement of development, the proponent liaise with the Department of Planning and Urban Development and the City of Rockingham to put in place planning measures which recognise the landscape value of the parabolic dune ridge on the eastern edge of Golden Bay to meet the requirements of the Minister for the Environment and the Minister for Planning.**

### **Recommendation 4**

**The Environmental Protection Authority recommends that the proponent liaise with and meet the requirements of the Department of Conservation and Land Management with regard to establishing the regional implications of disturbing the population of the Southern Brown Bandicoot (*Isoodon obesulus*) at Golden Bay, and providing for the adequate protection of the population at Golden Bay, prior to the commencement of development.**

## **7. References**

- Alan Tingay & Associates & Martin Goff & Associates (1992), Golden Bay Amendment to the Metropolitan Region Scheme (affecting part of System 6 area M107), Public Environment Review, Report number 91/19, Western Australia.
- Alan Tingay & Associates (1992b), Report on survey for Southern Brown Bandicoots at Golden Bay, Western Australia.
- Department of Planning and Urban Development (1991), A Review of the South-West Corridor Structure Plan 1990 - 1991 (Between Rockingham and Mandurah), Western Australia.
- Environmental Protection Authority (1983) Conservation Reserves for Western Australia as recommended by the Environmental Protection Authority, the Darling System - System 6. Part II: Recommendations for Specific Localities.
- Environmental Protection Authority (1983b) Conservation Reserves for Western Australia as recommended by the Environmental Protection Authority, the Darling System - System 6. Part I: General Principles and Recommendations.
- Metropolitan Region Planning Authority (1980), Planning Strategy for the South-West Corridor, Western Australia.
- V & C Semeniuk Research Group (1991), Environmental and Landscape Audit Stage 2 Interim Report: The Southwest Corridor Study - a report to the Department of Planning and Urban Development, Western Australia.



# **Appendix 1**

## **Proponent's commitments**



## **CONSOLIDATED LIST OF COMMITMENTS FOR GOLDEN BAY**

1. The proponent will provide, in exchange for the development of the currently proposed System 6 Area M107, additional Regional and Public Open Space adjacent to the Coastal Reserve as shown in the Structure Plan, in excess to that which would normally be required by DPUD. This will be done to the satisfaction of the EPA, DPUD and the Local Authority at the rezoning stage.
2. The proponent will prepare a Management Plan for the Coastal Reserve at Golden Bay prior to development commencing. This will be done to the satisfaction of DPUD and the Local Authority.
3. The proponent will include an historic aboriginal camping site within the proposed Public Open Space for the development. This will be done to the satisfaction of the Local Authority.
4. The proponent will continue to provide and maintain a network of firebreaks and access tracks to protect against bushfire until the Local Authority takes on this responsibility. This will be done to the satisfaction of the Local Authority.
5. The proponent will provide reticulated sewerage and will design the development so that stormwater drainage is disposed of on site. This will be done during the installation of services within the development to the satisfaction of DPUD and the Local Authority.
6. The proponent will liaise with CALM regarding the presence of bandicoots at Golden Bay and if required by CALM will examine the feasibility of relocating the bandicoots to an appropriate location elsewhere. This will be done prior to any disturbance of the vegetation at Golden Bay and will be done to the satisfaction of both CALM and the EPA.



## **Appendix 2**

**Proponent's response to issues raised by submissions**





## **GOLDEN BAY**

### **PER RESPONSES**

#### **System 6, Landform and Habitat Modification Issues**

1. The stated objectives of System 6 are wholly supported as an impediment to featureless urban sprawl, that is, buffer zones would restrict housing to the west of the dune ridge, and provide east-west links of vegetation between Mandurah Road and the coast. These objectives are just as relevant in the 1990's as they were in 1983. In fact, it is even more important today given the extensive development taking place in the South-West Corridor, including the developments at Secret Harbour and Port Kennedy which have just been approved, and which will effectively destroy huge areas of coastal dunes, heathland and wetlands, more protection, not less, should be considered to ensure that at least a fragment of the coastal environment is kept for conservation purposes. To claim recent Special Rural subdivisions which make provision for landscape protection as a precedent for residential R15 land use which seeks to obliterate existing landscape is incredible. The Golden Bay and Singleton areas are the last areas of valuable coastal dunes and heathlands in the metropolitan area, and as such are worthy of greater measures to ensure that this fragment of the coastal heritage is kept for conservation purposes.
- 1a. The proponent disagrees that the proposed development at Golden Bay would lead to urban sprawl. In fact, the proposals for Secret Harbour, Golden Bay and Singleton all include more than the normal requirement for Open Space elsewhere in the Perth Metropolitan Region. Collectively these developments will provide a coastal residential zone with considerable green areas in the form of reserves, parklands and recreation areas.

The proponent also contests the claim that extensive development is proposed for the South-West Corridor. In fact, the initial draft Structure Plans for the Corridor produced by the Department of Planning & Urban Development (DPUD) indicate that a much larger area will be allocated to reserves, Open Space, and Special Rural and Rural purposes than to Urban purposes. It is true that the residential development in the corridor will focus on the coastal zone but urban consolidation is necessary to meet the high cost of infrastructure and services such as water supply, sewerage, and transport services such as light rail. Nevertheless, even in the coastal zone large areas will be set aside as Regional Open Space south of Port Kennedy and within the Coastal Reserve.

It is not claimed that the Special Rural subdivisions near Mandurah Road establish a precedent for residential development on the System 6 component at Golden Bay. It is claimed that the reference to landscape protection in the System 6 Study report refers primarily, if not wholly, to the large dune landscape parallel to Mandurah Road and not to the east-west components linking Mandurah Road to the coast. It is suggested that these narrow east-west

links have little landscape value because of their limited size and the landforms which they contain. Only a small area of tall dunes near the coast at Golden Bay are actually within the System 6 Area, most of the dunes are not.

It is also suggested that there is no need to establish a precedent for residential use of the System 6 Area as it is already zoned Urban deferred. This means it has been designed for eventual urban development for some time.

The claim that the Golden Bay and Singleton areas are the last areas of valuable coastal dunes and heathlands in the Metropolitan area is simply not correct. There are extensive dunes and heathlands in the Port Kennedy area which will be protected within Regional Open Space and there are extensive parabolic dunes in the North-West Corridor with a wide range of vegetation including heathlands which are either protected or are likely to be protected as an outcome of the North-West Corridor Structure Planning process. Furthermore there has never been any official suggestion that all of the Golden Bay property should be allocated to conservation purposes. The System 6 Area is only a relatively small component of the property which is located along the northern boundary. This area does not include most of the taller dunes in the north-west and eastern parts of the property.

This question is addressed further in Response 3a below.

2. System 6 is presently under review. It is therefore important not to pre-empt this review, and certainly not to consider a land exchange. The development should not be considered until the review is completed.
- 2a. The proponent understands that a review of System 6 Areas is planned in the future but has not commenced as yet. The proponent suggests that the PER process provides an opportunity for more detailed consideration of the proposal than might be the case in a general review.
3. It is of considerable concern that System 6 areas continue to be negotiable and that vague proposals for substitute land can be considered as acceptable. It is not acceptable to consider any of these proposals in isolation. The adequacy of Conservation Reserves (including Coastal Reserves) needs to be viewed in a regional context, and this current ad hoc development approach will only result in division and conflict in the community.
- 3a. The proponents consider that they are not presenting their proposal in isolation. In fact, a key component of their case for removal of the System 6 Area is that existing and proposed conservation reserves and other protected areas in the South-West Corridor are extensive and that the need for the small area at Golden Bay is now redundant.

Conservation in a regional context will be served by the preservation of land at Secret Harbour, and Port Kennedy and the Stakehill Suite of wetlands and an area of Banksia Woodland north of Mandurah. Environmental features equivalent to or better than those present at Golden Bay will be preserved in these reserves.

The proponent would point out that most of these new conservation and Open Space areas were not identified by the System 6 Study report in 1983. This fact exemplifies the proponent's argument that the System 6 Areas were adopted without a detailed appraisal of the regional environmental resources. Since 1983 considerably more information has been collected and the conservation priorities have changed. This is particularly the case for System 6 Area M107 which was never identified as having a major conservation significance but rather was seen to have landscape and recreation values.

The planning approach to the Corridor now has changed radically and DPUD has been a prime mover in the assessment of the environmental features and values of the Corridor and in the establishment of a representative reserve system.

The proponent is now asking the EPA to reconsider its position of 1983 in the light of the contemporary environmental knowledge and planning context.

4. The concept of buffer zones of green belts as a general principle put forward by System 6 recommendation M107 is supported. Specifically, there should be a coastal foreshore reserve with a width of at least 100m, Public Open Space is to be a minimum of 10% of usable land and should be vested with local government, and a buffer zone of at least 100m width should be provided on the northern, southern, and eastern townsite boundaries.
- 4a. The proposal involves a coastal foreshore reserve with a width of 150 to 300m and Public Open Space comprising more than 10% of usable land. These provisions for conservation and public areas are considerably more than would normally be required for a subdivision of this nature. Further requirements for buffer zones would significantly reduce the viability of the proposed development given the relatively high costs of site preparation and servicing. Other difficulties with the maintenance of buffer zones are described in response 5a.
5. The proposal to provide a foreshore reserve with a width of 150 to 300m is applauded, however, it is felt that this should not be provided at the expense of the area of land protected by System 6.
- 5a. The proponent considers that the provision of land as buffers between Golden Bay and Secret Harbour and between Golden Bay and Singleton, would be of limited value. The reasons for this are outlined in detail in the PER in

Section 4. These reasons include the unwillingness of the Local Authority to take responsibility for such land, the difficulty of managing narrow linear pieces of bushland, and the inability of the narrow pieces of land to preserve topographic features since the proposed buffer would cut across the dominant geomorphic features. Finally, in order to provide affordable services, roads, power, water and other amenities would need to cross the buffers further diminishing their value. These difficulties would also apply to a buffer on the eastern boundary of the Golden Bay property as suggested in Question 5.

6. The proponent is falsely claiming that he is generously surrendering a large portion of foreshore land in exchange for development the M107 area lateral east-west strip. Much of this foreshore land is already reserved for Parks and Recreation and does not belong to the proponent.
- 6a. An explanation of the Open Space allocation is provided in the answer to Question 48.
7. The suggestion by the developers to provide an extra 50m of Open Space along the coast line is a very poor compensation for the extensive clearing they plan to do east of Golden Bay and will not help to cover the damage the development will cause.
- 7a. The provision of an expanded foreshore reserve is proposed as an alternative to the System 6 Area M107 which affects the Golden Bay land on its northern boundary. It is not proposed as compensation for the impacts that would eventuate from the development of the land currently zoned Urban Deferred to the east of the present township.
8. It is considered that the Mandurah Road Section of Madora (System 6 M107) be either purchased by DPUD for Parks and Recreation or preferably that a golf course complex with R50 Tourist/Residential Accommodation be encouraged which would provide for the retention of the landscape values and provide for a relatively dense dwelling component within the corridor.
- 8a. This matter is outside the scope of the PER. The proposal in the PER involves the removal of part of the System 6 Area on land owned by H&B Developments at Golden Bay and its replacement with an expanded foreshore reserve. The Discussion Paper included in the PER considers the Madora section of System 6 M107 adjacent to Mandurah Road. However, no firm proposal for the development of this land has been referred to the EPA. One of the potential uses for the land is a golf course.
9. The rural zoned land (approximately 15ha) and surrounding land on the eastern side of the development should be given in exchange for M107 instead of extra

Coastal Reserve. This land is delicate, supports valuable flora and fauna and is a natural landscape that is worthy of retention in its natural condition.

- 9a. The land adjacent to the coast is considered to be most suitable for reservation as it will best protect the recreational and visual amenities of the area. The proposal is considered to be more practical and achievable than System 6 Area M107. Nevertheless the proponent would be prepared to consider setting aside land on the eastern side of the development as an alternative to the expanded Coastal Reserve. However, the proponent believes that this land does not offer the same conservation value as the coastal land.
10. The 45ha of land bounded by Dampier Drive, Crystaluna Drive and Minderoo Crescent contains many high dunes surrounded by an undulating landscape that is the habitat of fauna such as kangaroos, bandicoots, and the native birds, and flora identified as being on the Declared Rare and Priority Flora List. Development will result in complete destruction of the existing landform and associated flora and fauna, although it should be noted that the developer makes no mention of the major earthworks which will be required in this area. The land is not conducive to urban development and should never have been zoned Urban Deferred in 1981. The error in judgement in allocating the area in the east of Golden Bay for Urban should be corrected not perpetuated by this development.
- 10a. It is agreed that the flora and fauna of the land to be developed will be largely removed as a result of urbanisation in the area. The landforms will also be modified although the general elevations will be maintained. This is an unfortunate consequence of the need to provide inexpensive, well serviced housing for the rapidly expanding population in the South-West Corridor. However, flora and fauna will be retained in the expanded Coastal Reserve. In addition, at the regional level wildlife will be preserved in a series of large secure reserves. These areas include the Stakehill Suite of wetlands, flood plains adjacent to the Serpentine River, a Regional Park at Port Kennedy and a large area of Banksia Woodland north of Mandurah.
11. If landform elevation is to be maintained on the Quindalup Dune system south of Dampier Drive, road grades would be generally steeper than 1 in 6. It is feared that the statement "elevations of these landforms will be maintained as far as is consistent with levelling requirements" means removal of dunes peaks to fill in depressions. The full impact on the proposed landform cannot be assessed without a detailed earthworks design.
- 11a. It is correct that the proponent will need to reduce the gradients of elevated areas by removing the peaks of dunes and by filling dune depressions. This will provide suitable areas for housing. However, the general elevation of these areas will be maintained.

The proponent concedes that it is difficult to assess the implications of necessary earthworks without a detailed design. However, it would be an expensive exercise to prepare detailed plans before in principle approval for the Structure Plan has been achieved. As an alternative, the proponent has stated that earthworks will be kept to the minimum necessary for the supply of services and roads. This will inevitably involve some areas of cut and fill but there will not be large scale re-shaping of the topography. In fact the owners want to retain the elevation and general shape of the eastern dunes.

The proponents will do all within their power to ascertain that minimal disturbance of the landscape takes place in the development of the land on the eastern ridge into R15 lots. Discussions have been held with the City of Rockingham to this effect. The owners are experienced in dealing with this aspect of the development and have been advised by the City of Rockingham of their resolve to have the land rezoned to Urban.

12. The landform east of Minderoo Crescent is the only small area of land in the municipality of Rockingham that contains high dunes. From the top of these dunes one can clearly see beyond Pinjarra, Alcoa Refinery, views of the coastline from Mandurah to Fremantle, the municipality and, on a clear day with the aid of binoculars, the R&I Tower in Perth. This development will destroy the high dunes and therefore the uniqueness of this area which provides an asset not only for Golden Bay and Singleton but also for the region.
- 12a. The development proposes the retention of Mandurah Hill, the tallest peak in the dune system. The values described will therefore be retained.
13. The dunes on the eastern side of Golden Bay provide a natural and aesthetically lovely buffer between the settlement of Golden Bay and Mandurah Road. Residents settled here because of it or partly because of it and will suffer an immense loss if the peacefulness and tranquillity of that buffer is replaced by flattened hills, roads, and houses. It would also add to the degradation creep evident in the dune belt between Rockingham and Mandurah, where Port Kennedy and Secret Harbour have already been earmarked for development. With Mandurah Hill and land to the east Golden Bay could become the South-West Corridor "Kings Park" with appropriate walk trails etc, safe guarding the land for future generations with its flora and fauna habitats.
- 13a. Much of the dunes mentioned in the above question are outside the Golden Bay property or are outside the System 6 Area on the property. The proponent considered the eastern dunes on its Golden Bay property as an alternative to the expanded Coastal Reserve, but decided that these did not have as much value as an expanded Coastal Reserve. The impacts mentioned above are considered to be the normal consequences of urban development. It should be noted however, that the proponent proposes to retain Mandurah Hill, the highest point of the dune system within Public Open Space.

14. The development should not encroach on either the eastern or western dunal systems. Ideally the development should nestle between the ridges in conjunction with a buffer zone to the north and south. The most significant landmarks, Mandurah Hill and Northern Hill are the highest points in the district and should be preserved.
- 14a. The question of buffers has been addressed in the answer to Question 5. It is proposed that Mandurah Hill will be retained within Public Open Space.
15. The proposed development would see the destruction of a large amount of the Peelhurst wetlands. These areas are important despite not being inundated all year. The absence of a fauna survey in the PER means that wetland organisms remain unidentified.
- 15a. Representatives of the Peelhurst Suite of Wetlands are to be preserved within the expanded Coastal Reserve and further north in the Port Kennedy Regional Open Space and at Secret Harbour. Destruction of some of the Peelhurst Suite of wetlands is considered to be an unavoidable impact of the development. These isolated and small dampland areas are not within the System 6 Area M107.
16. The present rate of coastal development represents an adverse impact on coastal heathlands in general. Urgent analysis of the cumulative effect of coastal development along the Rockingham-Mandurah coast needs to be addressed. The total environmental impact of these combined developments should have priority over individual developments when assessments are being made.
- 16a. The combined implications of necessary near-coastal residential development between Rockingham and Mandurah has been considered by DPUD. The Department has recognised the need to protect a section of the coastal heathland in this area and has indicated that it intends to establish a large area of Regional Open Space for this purpose at Port Kennedy. The Port Kennedy area has been selected because it provides an opportunity to protect a cross-section of the Rockingham-Becher Plain containing the oldest to the youngest dune formations and associated wetlands as well as a wide diversity of the major vegetation types and fauna habitats.
17. The developments at Palm Lakes and Palm Springs clearly show the sort of environmental destruction which can result, and the lack of control which seems to be exercised.
- 17a. Urban development results in the replacement of the natural environment with a built environment. The proponents would suggest that while some people may see this as a negative result, future residents generally consider it to be positive, or at least necessary, and there is usually an overall social benefit.



The proponent recognises, however, that it is necessary to take steps to protect important environmental features and have suggested an expanded coastal reserve at Golden Bay for this purpose. The proponent is also prepared to limit vegetation removal to the minimum necessary for site development and lot creation purposes. This will leave future residents, and the City of Rockingham which is responsible for Open Space, with the option of retaining some natural vegetation on their properties.

18. The guidelines for the PER indicate that there should be a fauna study done, and this appears to be missing. These valuable coastal heathlands contain an abundance of birds, mammals and reptiles, including the bandicoot which is on the endangered species list. Destruction of these heathlands will effectively destroy many of these species.
- 18a. It is not usual for fauna assessments to be conducted on land proposed for residential development in the Metropolitan Region. The System 6 recommendations that are relevant to the Golden Bay property relate entirely to perceived landscape and vegetation values. No mention is made of the fauna or flora of the land or the need for its conservation. However, it is recognised that fauna inhabits the area and that the fauna habitat will be partially removed. However, habitat will be retained within the expanded Coastal Reserve.

At a regional level fauna conservation will be provided for by the large reserves in the South-West Corridor.

The proponents have noted the concern over the presence of bandicoots on the Golden Bay property and in response have carried out a live trapping program. The program was designed to sample all of the major vegetation habitats in order to establish whether bandicoots occur on the property and in which types of habitat. This involved the setting of 60 cage and box traps over 4 nights.

A total of 9 Southern Brown Bandicoots were trapped during the program and 4 of these animals were trapped twice. Four individuals were trapped in Closed Scrub and Heathlands within the proposed Coastal Reserve, 2 individuals were trapped in *Acacia rostellifera* Closed Scrub and *Lepidosperma gladiatum* Sedgeland within the dune complex immediately east of the proposed Coastal Reserve, and 3 individuals were captured in *Acacia rostellifera* Closed Scrub and *Hakea trifucata* Closed Heathland in the eastern sector of the property north of Dampier Drive. No animals were caught in traps sited on the beach ridge plain where the vegetation is Open Heathland to Shrubland. These results are similar to those of a recent survey conducted at Singleton which found that the bandicoots were restricted to dense vegetation types.

The Southern Brown Bandicoot is gazetted as a rare and endangered species as defined by the Wildlife Conservation Act, 1950-1979. Under the provisions of this Act, it is an offence to take or disturb this species without the approval of the Minister for Conservation and Land Management. The proponents are also

required under the Act to notify the Minister of their proposal and the fact that the development will reduce the area of available habitat for the local bandicoot population. The proponents are in the process of preparing a report on the results of the survey in order to supply the necessary information to the Minister.

As a consequence of the confirmation of the presence of Southern Brown Bandicoots on the Golden Bay property, the proponent commits to the following:

- o The proponent will liaise with CALM regarding the presence of bandicoots at Golden Bay and if required by CALM will examine the feasibility of relocating the bandicoots to an appropriate location elsewhere. This will be done prior to any disturbance of the vegetation at Golden Bay and will be done to the satisfaction of both CALM and the EPA.

The proponent believes that the bandicoots within the proposed Coastal Reserve could continue to survive in that area after development provided that appropriate steps are taken to protect the dense vegetation there. These steps would involve the development of an appropriate fire control and fire management program, and other measures to protect the vegetation. The proponent is prepared to develop an appropriate Coastal Reserve Management Plan in association with the appropriate authorities including the City of Rockingham and CALM for this purpose.

19. Progressive urban development such as is proposed by this development is pushing all wildlife further and further away.
- 19a. The destruction of fauna and its habitat in the metropolitan areas is an unavoidable consequence of urban expansion associated with population growth and the need to provide housing. However, the expanded Coastal Reserve at Golden Bay, the Special Rural Zone to the east, and Coastal Reserve, Open Space and recreation proposals for Secret Harbour to the north, are all expected to ensure survival of fauna in the area in the long term.
20. The vegetation complexes within the dunal environs have been identified by Semeniuk as being of international importance.
- 20a. The proponent is not aware that Semeniuk has specifically identified the vegetation complexes which occur on the Golden Bay property as being of international importance. The proponent is aware that Semeniuk has made this claim for the Rockingham-Becher Plain in general and in particular for the Port Kennedy and Secret Harbour areas. However, no objective information or rationale has been presented in support of this claim nor has the meaning of the term "international importance" been defined. In fact, the vegetation and flora

of the Quindalup Dunes is reasonably consistent over large geographic areas when compared to that of the Spearwood Dunes further inland and the plant species which occur at Golden Bay generally have extensive distributions along the coastline of Western Australia.

21. The proponent attempts to justify the destruction of east Golden Bay by relating to areas in Secret Harbour. It would appear that Golden Bay would be sacrificed to justify a prestigious golf course estate to the north.
- 21a. No attempt has been made by the proponent to relate the development at Golden Bay to the proposed development at Secret Harbour to the north. The two properties have different owners and could be developed entirely independently. However, both owners will benefit through the provision of services such as water and sewerage to the area. In addition, the present and future residents of Golden Bay are likely to benefit from development at Secret Harbour such as the planned golf course. In effect, over time the two population centres will merge and share their community facilities.
22. The proposal should be rejected until the entire plan for the South-West Corridor has been completed, and all the conservation issues have been adequately addressed.
- 22a. The proponent contends that regional conservation will be provided for in the South-West Corridor Plan currently being prepared by DPUD. Drafts of this plan which are available, indicate that large areas of land will be set aside as reserves and Regional Open Space throughout the Corridor. These reserves and other non-Urban land will have a larger area than that allocated for Urban purposes.

The Golden Bay property is also predominantly zoned Urban Deferred already. As a consequence it is anticipated that the Structure Plan for the South-West Corridor will allocate it to Urban development. The Structure Plan can also be expected to relate areas not zoned for Urban development to the present zoning and infrastructure pattern.

The Metropolitan Development Programme 1991/92-1995/96 recently published by DPUD in 1991 is also relevant to the forthcoming South-West Corridor Structure Plan. This development programme clearly identifies the Golden Bay property for residential development and makes no provision for Open Space other than the Coastal Reserve at this locality. The Metropolitan Development Programme does not recognise the System 6 Area on the Golden Bay property.

### Coastal Management Issues

23. The coastline is unstable and a much larger than usual dune management zone should be provided.
- 23a. The proponent disputes the assertion that the coastline along Singleton and Golden Bay is unstable. This portion of the coast is actively accreting at a relatively rapid rate and therefore a wider than normal Coastal Reserve would not normally be required. Examination of aerial photographs dated 1942 and 1979 has shown that the coastline accreted by some 100m during this period. The State Planning Commission's Coastal Protection Policy states that such a coastline should have a Coastal Reserve of at least 100m. The proposed reserve is in the order of up to 300m wide.
24. The PER omits to take the whole of Comet Bay into account on the question of coastline erosion. No assessment has been made on the effects of the groynes which are to be built further south to San Remo and Watersun, which could have great impact on the rest of the Bay. General consensus (DPUD, Marine and Harbours and the City of Mandurah) indicate further coastal protection will be required to protect northern Mandurah beaches. The effects of constructing new groynes and allowance for the possible changes in climate (greenhouse effect) have not been considered in the proposal. These dynamics need to be addressed prior to development approval being granted.
- 24a. Although coastal protection in the form of groynes may be required for beaches north of Mandurah, this is not the case further north at Singleton and Golden Bay where the beach is accreting at a relatively rapid rate. As an indication the shoreline expanded westwards by more than 100m between 1942 and 1979. It is predicted that any new groynes to the south may act to limit the transport of beach sand along the coast and thus reduce or halt the growth of the coast westwards. In an extreme case the beach may start to erode since northerly sand transport would be blocked. It would then become the responsibility of the local authority to provide mechanisms to allow sands to bypass any future system of beach protection measures. It should be noted that this impact would occur whether or not the proposal proceeded since the installation of groynes to the south is beyond the control of the proponent.
- While it is true to say that the potential impact of a rise in sea level has not been considered in the CER it has been considered in the formulation of the DPUD coastal protection policy. The proposed expanded Coastal Reserve is larger than normally required by DPUD and thus is considered adequate.
25. As the coastal dunes and heathlands have been formed over millions of years, it is felt that the question of erosion should be addressed, as altering these natural buffers may affect wind directions and intensities.

- 25a. The proposed development will not be any different than that which has occurred already in the area and also along the rest of the Perth coastline on Quindalup Dunes. Extensive areas of Quindalup Dunes are currently being developed in the North-West Corridor. Temporary problems associated with wind blown sand may occur during the clearing of vegetation, however, experience has shown that long term erosion problems do not eventuate provided the area is sensibly managed.

Although they will be modified, the dunes will remain as elevated areas and it is expected that there will be little impact on wind directions and intensities.

26. The proposed Structure Plan for Golden Bay does not comply with all of the recommendations of Planning Policy No. 2, it merely seeks to exploit a suggested guideline. It should be pointed out that the area does suffer frequent and extended periods of high wind which dramatically erode any area which is stripped of vegetative cover.
- 26a. The issue of wind erosion is addressed in the answer to Question 25. Development along the coast of Golden Bay will not be any different than that which has occurred already in the area and along the rest of the Perth coastline on Quindalup Dunes. Temporary problems associated with wind blown sands may occur during the clearing of vegetation, however, experience has shown that long term erosion problems are not likely to eventuate provided the area is sensibly managed. Temporary management procedures are well established and proven, and include water sprays, mulching, seeding and barrier fences. Restricting the clearing of vegetation to the minimum necessary for siteworks and timing clearing to occur just prior to development are also effective means of dust control.
27. Extra strain will be placed on the beaches, which at present are fairly quiet and serene. It will also be extra pressure on the valuable nearshore marine nursery areas.
- 27a. The usage of beaches in the area will increase as a result of the enlargement of the urban area at Golden Bay and this is a consequence of population growth in the area. It is not considered that near-shore marine nursery areas will be adversely affected by increased recreational activities other than fishing which already occurs intensively along this part of the coast. Net trawling in the area for prawns would also be more likely to impact on any near shore nursery areas.

### **Groundwater**

28. The hills to the east of existing development at Golden Bay constitute the main source of the water supply for almost all of the existing development. The aquifer would very rapidly become polluted by the proposed high density

development. Residents do not want to be forced to have scheme water connected at vast expense as they are more than happy with the existing bore water supply which is far superior in taste to chlorinated mains water. Residents cannot afford to pay the \$3000-\$4000 to be connected, and if this development goes ahead the bore water supply will be ruined. The PER states that "As the superficial aquifer is localised, the anticipated minor elevation in nutrient levels is not considered to warrant any specific management response". This is an arrogant dismissal of resident's right to fresh water. The statement does not even have any basis in a proper study of groundwater and potential impacts. At urban densities of development, responsible management practises with regard to gardens and consequent impacts on groundwater cannot be relied upon.

- 28a. The proponent is of the opinion that specific information regarding groundwater at Golden Bay is not required given the assessments made on properties to the north which are on the same aquifer. This together with research on the impact of residential development on groundwater on the Swan Coastal Plain is sufficient to assess any potential impacts on groundwater at the site.

Research performed by CSIRO (Gerritse, R.G., Barber, C., Adeney, J.A. (1990) - The Impact of Residential Urban Areas on the Quality of Groundwater in the Swan Coastal Plain Western Australia. CSIRO Division of Water Resources, Series No.3) provides information on the potential impact of urbanisation on groundwater quality on the Swan Coastal Plain. This research found that concentrations of nutrients (e.g. nitrates and phosphates from garden fertilisers, etc.) in groundwater from studied urbanised areas in Perth are well below maximum levels set for drinking water. These studies included established residential areas at Embleton and North Bayswater.

It is emphasised also that reticulated sewerage will be provided at Golden Bay. This complies with the Water Authority policy for the south-west groundwater area which includes Golden Bay. By having reticulated sewerage the residential development will comply with the safeguards required for a Priority 3 WAWA groundwater extraction area, that is an area used by WAWA to source drinking water. Existing septic tank systems within the established Golden Bay area are not in compliance with this policy and pose a greater threat to groundwater quality than the proposed residential development. However, the present proposal does not involve or imply compulsory connection of existing households to sewerage, water, or other services as suggested in Comment 28 above.

Investigations into the quantity of water available within the Safety Bay Sand/Tamala aquifer beneath Golden Bay have shown there to be a groundwater resource sufficient to supply residential development with reticulated water. Drilling to the north of Golden Bay showed an aquifer depth of 80m and that this aquifer had a seasonal fluctuation of 0.7-1.00m.

Recharge of the aquifer beneath the site occurs principally from the east and also from direct rainfall. Given the above and an estimated peak water requirement of 10m<sup>3</sup>/day/household on average (as not all households have a bore) it is highly improbable that the unconfined aquifer would be seriously depleted.

- 29. When the bulldozers move in, the contour of the land will be destroyed therefore affecting the water table.
- 29a. Very localised changes may occur as a result of land contouring associated with future development. This, however, is expected to be limited to the immediate area of earthmoving and involve very minor fluctuations in the groundwater table in relation to the existing land surface.
- 30. Both options of Appendix 2, Item 7.2, (iv) and (v), refer to golf course developments. The development lies within the Rockingham Groundwater Area where groundwater abstraction for private use must be approved prior to development. Minimal throughflow of groundwater is available and therefore, preliminary investigations would suggest that groundwater for this type of development would not be readily available.
- 30a. A golf course is not proposed as part of the Golden Bay Development. A golf course is mentioned in Appendix 2 of the PER as a possible development option for part of the Madora property south of Golden Bay but this has not been formally referred to the EPA for its consideration. Investigation of the groundwater requirements of a golf course and comparison with available quantities of groundwater would be a necessary part of gaining approval for groundwater extraction from WAWA.

### **Need for, and Alternatives to the Proposed Development**

- 31. The PER has not addressed the "no development" option.
- 31a. The demand for lots within the South-West Corridor is high as shown by the rapid expansion of Rockingham southwards towards Port Kennedy in recent years. Moreover, DPUD in its Metropolitan Development Programme 1991/92-1995/96 published in June 1991 identifies the Golden Bay property as a necessary component for development in the South-West Corridor to meet the expected demand for residential blocks.

Urban development throughout most of the coastal section in the South-West Corridor will also be an important consideration in determining the viability of public transport systems such as light rail which have been proposed to link the South-West Corridor to Mandurah.

The proponent considers that a "no development" option is not realistic given the above population and planning considerations. No development also implies that DPUD would purchase the property from the owners in order to allocate it and manage it for reserve purposes. This is also considered to be very unlikely.

32. In the short term there exists an over supply of land already subdivided for residential use within the region. In the Golden Bay and Crystaluna area there are approximately 800 lots of which only 498 have dwellings. In the medium term there is the prospect for residential land becoming available as a result of the development of Secret Harbour and Port Kennedy.
- 32a. The Metropolitan Development Programme 1991/92-1995/96 published by DPUD in June 1991 identifies a requirement for a total of approximately 5800 new residential lots within the City of Rockingham before the end of 1996. This projection, which is based on the estimated growth rate of the population of the Perth Metropolitan Region and of the City of Rockingham, defines the need for the proposed developments at Golden Bay, Secret Harbour, Singleton and elsewhere in the coastal zone. It is necessary to commence development planning well in advance of the actual demand for lots due to the long lead time required for development approvals and for site preparation.

The proponents also believe that the number of vacant blocks at Golden Bay and Crystaluna can be attributed in part to the lack of services, and in particular a reticulated water supply, and such standard community facilities as public transport, schools, etc. It is considered that many of the lots are likely to have been purchased for the purposes of investment with the expectation that when services are extended to the locality there will be a significant improvement in lot values.

33. If this development is necessary, why are there two land estates in the Golden Bay area which have been there for a number of years without any houses yet to be erected. Does this mean that the beautiful hills are to be bulldozed so people can invest in land with no intention of building for years to come?
- 33a. This question is answered in the response to question 32.
34. It is hoped that long term planning will reject the inevitability of endless urban sprawl with its inefficient infrastructure utilisation. It is not unreasonable to expect that demand for future accommodation needs will be met by increased densities in existing developed areas. If urban sprawl is thrust upon this community the refuge to the visual environment which is offered by the dune system and which is important as a significant landmark not only to the local community but to the broader community will be lost.



- 34a. Forecasts in the Metroplan report published by DPUD indicate that the Perth Metropolitan Region will have a population of about 1.4 million by 2001 and 2 million by 2021. In view of this potential rapid population increase, Metroplan recognised the need and opportunity for urban consolidation. Consolidation can be achieved to some extent in already established areas but Metroplan concluded that a maximum of only 80,000 homes could be provided in this way. This represents only 20% of the estimated 400,000 new homes which would be required to accommodate the population growth. The other 320,000 dwellings will have to be sited in new urban areas. In these new areas it is expected that housing densities will be somewhat higher than has traditionally been the case in order to achieve savings both in terms of the amount of land required and the cost of providing new services.

Nevertheless, more than 30,000ha of land is likely to be required for the new urban areas if the urban densities increase from the current 7 dwellings per hectare to 9 dwellings per hectare. Therefore, it is simply not the case that future accommodation needs will be met by increased density in existing developed areas as suggested in the question.

The issue of the dune systems is addressed in the answers to Questions 9 and 11.

35. The Australian Bureau of Statistics (ABS) figures quoted with regard to population growth are overstated. Present growth rate in Australia is 1-1.5%, the data is therefore over stated by 10-12%. It should also be noted that the cities of Rockingham, Mandurah and Kwinana have the highest unemployment rates in the State and there is a high level of supply of land. It is contended that the continued use of ABS data based on State figures in development proposals amount to "reductionism" and a test of their validity should be considered.
- 35a. None of the available census or population data suggests that the estimated population growth rate is overstated. In fact, between the 1986 and 1991 censuses, the population in the City of Rockingham grew by more than 5.6% annually.

DPUD in its Metropolitan Development Programme 1991/92-1995/96 anticipates that the recent rapid population expansion in the City of Rockingham and particularly in coastal areas south of the Rockingham townsite will continue. It expects that a total of nearly 5,800 new residential lots will be required within the city before the end of 1996.

36. There is no benefit to residents of Golden Bay, the City of Rockingham or even the citizens of Western Australia (other than the developer) which would not be far outweighed by the damage to the environment, expense to the residents, ratepayers, taxpayers and social disadvantages.

- 36a. The proponent contends that there will be real benefits as a result of the proposed development to the present and future residents of Golden Bay. These will derive from improved services and community facilities including a school and playing fields. There will also be a gazetted and properly managed Coastal Reserve in place of the present uncontrolled beach access which is a continuing source of environmental degradation.
37. The Golden Bay PER and requests for rezoning pre-empts the DPUD corridor structure study and should therefore not be considered at this present time.
- 37a. This question has been addressed in the answer to Question 22.

### **Services and Pollution Control Issues**

38. The PER does not address the questions of the impact of increased traffic flow on the existing sub standard roads in the Golden Bay settlement. More significantly it makes no reference to the costs which are likely to be incurred as a result of any upgrading of those sub standard roads.
- 38a. Strictly speaking, the roads of Golden Bay and their maintenance are an issue for the local authority to address. However, the proponent will be improving the local road network to the benefit of residents through the extension of Warnbro Sound Avenue which is the major regional road.
39. If the development is permitted, the developers should pay all connection costs for service for each existing block of land in Golden Bay, paying the money to a trust fund administered by the Golden Bay Progress Association and Rockingham Council before any road or earthworks start.
- 39a. The funding of services is not a subject that warrants discussion in an environmental assessment document. This issue is the responsibility of the local authority and the relevant State Government Authorities which provide services.
40. Stormwater runoff should be disposed of by soakage basins to help recharge the groundwater. Care must be taken to locate urban development to ensure that flooding does not occur during major storm events.
- 40a. The proponent agrees that stormwater runoff should be disposed by soakage into the ground to help recharge the groundwater.

The proponent will ensure that flooding does not occur within the proposed development or within any adjacent and existing residential areas. Special attention will be paid to stormwater disposal and wherever possible stormwaters will be disposed of into the ground, and if necessary, within soakage basins.

41. The development must be connected to reticulated sewerage.
- 41a. The proponent has recognised that any development at Golden Bay will need to be connected to the Water Authority's water supply and sewerage system.
42. There has been no assessment done on the impact of strong winds in the area of landform, particularly if some of the protecting dune formations are to be removed. This would also result in a rise in temperature in the area over the summer months as there would be nothing to stop the hot easterly winds.
- 42a. The western and eastern dune formations to some extent will need to be recontoured for development purposes but their general elevation will be maintained. Therefore, there will be little or no impact on wind directions or intensities. Further information on earthworks is provided in Response 11a.
43. The rezoning of Part Lot 12 to the north of the existing Golden Bay settlement should be deferred until the existing developed areas in Golden Bay and surrounding areas such as Palm Springs, Palm Meadows, Port Kennedy and Secret Harbour are more fully occupied. If this is not done, it is probable that much of any further development after clearing will remain vacant for many years. With vegetation removed, the bare sand will be liable to erosion, as can be witnessed at the developed vacant areas mentioned.
- 43a. Issues relating to demand for blocks are answered in response to Question 32 while the issue of erosion is considered in the answer to Questions 25 and 26.
44. There has been no assessment of the noise and dust pollution which would result during construction, and no management measures proposed.
- 44a. The proponent is bound by EPA regulations relating to noise and dust generation as are all land developers. The management of these potential issues will be in accordance with these regulations.
45. There is no discussion of the traffic pollution, particularly in regard to noise, which would result from the removal of the eastern dunes.
- 45a. The present proposal does not involve the removal of the eastern dunes (see Response 11a) and there will continue to be a substantial landform barrier to traffic noise from Mandurah Road.

## Development Design/Management and Aesthetics

46. People have chosen to live in Golden Bay because of the surrounding unspoiled scenic beauty of the sand dunes and hills, and have hoped that it would not become ruined by land developers destroying the sand dunes and hills without thought of the environment and local residents, as has since happened all along the Mandurah/Fremantle Road areas of Rockingham and Warnbro. Those small dunes have been destroyed forever, and they were not as large or environmentally sensitive as those at Golden Bay. Whoever allowed the Rockingham dunes destruction to go ahead, should never again be allowed to make such a decision, causing the land to be flattened and all natural vegetation completely cleared. The dunes along the Mandurah/Fremantle road were flattened into unsightly ruined blocks of windblown sand, often making it dangerous to drive along the main road. Trees and blackboys which have taken hundreds of years to grow were unceremoniously knocked over and burnt, these cannot be replaced in our, or even our grandchildren's lifetimes.
- 46a. The proponent recognises that current residents of Golden Bay are likely to place high value on the surrounding land. However, the proponent would point out that this land is private property which has been zoned Urban Deferred for more than 10 years. Both of these circumstances should have indicated to residents that eventually the land would be developed for residential purposes to meet the demand from future residents who would also like to live at Golden Bay.
- The proposed development will eventually result in much of the property being converted to housing. However, the proponent believes that the township of Golden Bay will still be a special environment compared to other areas in the City of Rockingham because of the relatively large Coastal Reserve, the extensive Special Rural area to the east, and the amount of Open Space within the residential area itself.
47. The developer has allowed for small areas of Public Open Space in the PER but these are usually devoted to small child play areas or sporting recreation. No thought is given to passive recreation. This area east of Minderoo Crescent should be left in its natural state for this purpose.
- 47a. The coastline and expanded Coastal Reserve will provide for passive recreation in the area as will the Mandurah Hill Reserve. These areas are in addition to the areas of the Regional Open Space to be provided at Port Kennedy.
48. It appears that the development if taken in isolation does not fulfil the 10% Public Open Space obligation of 27.45ha. The normal requirement in residential areas is 10% of the gross subdivisible area be given up free of cost by the subdivider (Clause 3.11 SPC policy) and vested in the Crown under Section 20A of the Town Planning and Development Act. Under Clause 3.2 of the

State Planning Commission's Foreshore Reserves policy, Subclause 3.26, foreshore reserves "will not be included in the gross subdividable area on which the Public Open Space requirement is assessed and will be in addition to the land required for Public Open Space".

- 48a. The proponents purchased the undeveloped portion of Golden Bay as the balance of a partially completed subdivision with the intention of finalising the development. Public Open Space had been allocated as a result of the initial stage of development and these allocations apply to the entire locality. The continuation of the development by the proponent should not therefore be considered in isolation as a separate development. The additional Open Space allocation offered as part of the present development represents a substantial addition to that which would normally have been required for the locality. Moreover, the amount of Open Space in the locality when it is finally developed will conform with DPUD's Open Space Policy DC2.3 (Paragraph 3.1.1).
49. The development should be designed so that it is in keeping with existing development. That is, in small acreages, with restrictions put in place to ensure that a percentage of these blocks will be left in their natural state.
- 49a. Recent publications by DPUD such as Metroplan and the Metropolitan Development Programme 1991/92-1995/96 have indicated the need to achieve higher densities of residential blocks in urban areas to accommodate the rapidly expanding population of Perth. Such higher densities can achieve real benefits in terms of reducing the overall area of land required in the Metropolitan Region for residential purposes. DPUD predicts that more than 10,000ha of land could be saved in the next 20 years if the density were increased from the current 7 dwellings per hectare to 9 dwellings per hectare. The development of large lots at Golden Bay would not be consistent with this planning objective particularly as DPUD has identified most of the coastal strip between Rockingham and Mandurah as a necessary area for residential development.
50. The proponent fails to address the visual resource management in this area. In particular, protection of the eastern ridgeline.
- 50a. Not all of the eastern ridgeline is within the property owned by H&B Developments. The proponent did consider setting aside parts of the ridgeline within its property as Open Space but finally decided that an expanded Coastal Reserve would be a more valuable community asset. However, the importance of Mandurah Hill is recognised and this prominent landscape feature will be protected.

The general landforms in the eastern sector will also be retained in the development although earthworks will be required for the installation of services and roads and the preparation of some blocks (see Response 11a).

51. There is concern as to what development might take place on the site identified as "Aboriginal Heritage Site" especially as it represents a site larger than those proposed for Neighbourhood Centre, Community Shopping, Tourist and Service Station within the proposed Structure Plan.
- 51a. The future use of the Aboriginal Heritage Site will be determined by the City of Rockingham presumably in consultation with the appropriate authorities that are concerned with sites which have importance to the Aboriginal community. The proponent is not suggesting any particular use for the site.
52. The establishment of on-site drainage sumps should not be considered as part of the 10% Public Open Space requirement.
- 52a. The permissible uses for Public Open Space will be determined by the City of Rockingham and not by the proponent. The need for drainage sumps on Public Open Space has not been determined.
53. Areas for significant commercial or shopping use should not be included as the current areas zoned for Local Business in the existing Golden Bay Estate are considered more than sufficient to service the entire estate when fully developed.
- 53a. Currently Golden Bay provides only some 869m<sup>2</sup> of retail floorspace. The development has a potential to provide an additional 1300 homesites catering for between 4000 and 4500 persons. In addition there are some 300 lots remaining to be developed within Golden Bay and Crystaluna. These could house up to another 1000 people. In accordance with established standards, 5000 to 5500 persons would create sufficient demand for around 2,750m<sup>2</sup> of neighbourhood shopping floorspace. A site of 1.2ha for a neighbourhood centre is an appropriate allocation of land for these demands.

### **Lifestyle Issues**

54. The PER takes little or no account on the impact of the proposed developments on the existing Golden Bay residents, insofar as their pride in, love of, or peace and tranquillity derived from the subject land are concerned.
- 54a. The proponent recognises that current residents of Golden Bay are likely to place a high value on their present lifestyles. However, the proponent considers that all available private land in the coastal strip between Rockingham and Mandurah will inevitably be developed for residential purposes except for land specifically set aside as Coastal Reserve or as Regional Open Space and standard Public Open Space requirements. This is particularly the case for the Golden Bay property which has been zoned Urban Deferred for more than 10

years. Current residents therefore have had considerable prior warning that the area would eventually be developed for residential purposes.

55. There is no reason for residents to be financially and socially disadvantaged as a result of the proposal. The developers should be prepared to compensate residents for the devaluation of their property and lifestyle if given permission to proceed. There should also be an additional compensation fund for residents whose property is damaged and lifestyle disrupted during the construction phase.
- 55a. The proposal to develop the land at Golden Bay will result in the provision of services including scheme water, public transport, shops, and reticulated sewerage. All of these features are most likely to enhance the value of land held by existing owners.
56. This development would result in a loss of the separate identities of Golden Bay and Singleton.
- 56a. The proposed development is to the north of the present township of Golden Bay and not to the south near Singleton. Therefore, it is difficult to see how it would result in a loss of the separate identities of the townships as suggested. The proponent believes that Golden Bay and Singleton will continue to have separate identities the same as any other two suburbs in the metropolitan area. Each will have its own community facilities such as shops and schools and, most importantly, each will continue to identify with and use their local beach.
- It is noted however, that the Progress Associations of the two townships are considering merging. It is also apparent that a track through the dunes linking the two townships is extensively used by cars driving between the two as an alternative to driving out to Mandurah Road.
57. Many people have chosen to live in Golden Bay to get away from the very problems this type of development will bring, such as overcrowding, pollution and crime.
- 57a. The proponent contends that the proposed residential development at Golden Bay is relatively small in comparison to many others in the Perth Metropolitan Region. The scale and nature of the development is such that it will not lead to overcrowding or pollution. It is also not appropriate to suggest that crime rates may increase as a result of the development.

The proponent also points out that the Golden Bay property has been zoned Urban Deferred for more than 10 years. Current residents therefore have had considerable prior warning that the property would eventually be developed for urban purposes.

58. No survey of local land use has been carried out. The bush areas are used extensively for bushwalks, recreational and study purposes. This will be compromised if the development proceeds.
- 58a. The land involved in this proposal is private property which is zoned Urban Deferred. The owners have had a long term expectation that the property would eventually be developed for Urban purposes because of the zoning and they consider that the present proposal is also consistent with that zoning. They have had no objection to the area being used by local residents and visitors for recreational purposes but consider that it would be unreasonable for the community to expect them to maintain the land in an undeveloped state indefinitely. Regional and local planning provides for recreational needs through the provision of Public Open Space and areas such as the proposed expanded Coastal Reserve not through unreasonable imposition on private land holders. The owners have indicated in the PER, however, that they are prepared to give up a considerably larger area of land for conservation and recreational purposes than would normally be required for a development proposal of this nature. If any further land were required for community use, the proponents would expect that it be purchased at a valuation appropriate to its present zoning.