

TEMWOOD HOLDINGS PTY LTD

SINGLETON

AMENDMENT TO THE METROPOLITAN REGION

SCHEME (AFFECTING PART OF

SYSTEM 6 AREA M107).

CONSULTATIVE ENVIRONMENTAL REVIEW

ALAN TINGAY & ASSOCIATES
&
WARREN F JOHNSON & CO

MAY 1992

REPORT NO: 91/29

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AN INVITATION TO COMMENT ON THIS CER

The Environmental Protection Authority (EPA) invites people to make a submission on this Consultative Environmental Review (CER).

Temwood Holdings Pty Ltd have proposed to develop a parcel of land to the north and east of the township of Singleton in the City of Rockingham. The proponent wishes to rezone this land and this is the subject of the CER. In accordance with the Environmental Protection Act 1986, a Consultative Environmental Review (CER) has been prepared which describes these proposals and their likely effects on the environment. The CER is available for public review for 4 weeks from Monday 25 May to Monday 22 June 1992.

Comments from Government Agencies and from the public will assist the EPA to prepare an Assessment Report in which it will make recommendations to Government.

Why write a submission?

A submission is a way to provide information, express your opinion and put forward your suggested course of action - including any alternative approach. It is useful if you indicate any suggestions you have to improve the proposal.

All submissions received by the EPA will be acknowledged. Submissions will be treated confidentially unless it is stated that they can be used publicly, then they may be quoted either in full or in part in each report.

Why not join a group?

If you prefer not to write your own comments, it may be worthwhile joining with a group or other groups interested in making a submission on similar issues. Joint submissions may help to reduce the workload for an individual or group, as well as increase the pool of ideas and information. If you form a small group (up to 10 people) please indicate all the names of the participants. If your group is larger, please indicate how many people your submission represents.

Developing a submission

You may agree or disagree with, or comment on, the general issues discussed in the CER or the specific proposals. It helps if you give reasons for your conclusions, supported by relevant data. You may make an important contribution by suggesting ways to make the proposal environmentally more acceptable.

When making comments on specific proposals in the CER:

- o clearly state your point of view;
- o indicate the source of your information or argument if this is applicable; and
- o suggest recommendations, safeguards or alternatives.

Points to keep in mind

By keeping the following points in mind, you will make it easier for your submission to be analysed:

- o attempt to list points so that the issues raised are clear. A summary of your submission is helpful;
- o refer each point to the appropriate section, chapter or recommendation in the CER;
- o if you discuss different sections of the CER, keep them distinct and separate, so there is no confusion as to which section you are considering;
- o attach any factual information you wish to provide and give details of the source. Make sure your information is accurate.

Remember to include:

- o your name;
- o address; and
- o date.

The closing date for submissions is:

Monday 22 June 1992

Submissions should be addressed to:

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

Attention: Ms J Boyer

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SUMMARY

1. Introduction

Background

The proponent Temwood Holdings Pty Ltd intends to develop land to the north and east of the township of Singleton within the City of Rockingham. This land is almost entirely zoned Urban Deferred and Temwood Holdings proposes to rezone the land to Urban. A section of the land is affected by part of the System 6 Area M107. The affect of the development on System 6 recommendations M107 is the subject of this Consultative Environmental Review.

2. The Existing Environment

Physical Features

On the surface, Safety Bay Sands have been formed into a series of dunes known as the Quindalup Dune System. These are; a series of parallel beach ridge dunes, a band of chaot dunes, an older series of beach ridge dunes, and a series of parabolic dunes.

Groundwater

A superficial or shallow unconfined aquifer occurs in the Safety Bay Sand at relatively shallow depth.

Vegetation

The vegetation at Singleton comprises a single complex as mapped in the Atlas of Natural Resources called the Quindalup Complex. The vegetation immediately along the coast consists of a *Spinifex hirsutus* Grassland. Further inland is an *Olearia axillaris* Shrubland. This association grades into a band of vegetation consisting of a *Spyridium globulosum*/*Acacia cyclops* Heath. The main vegetation unit on a series of chaot dunes is an *Acacia rostellifera* Closed Scrub. The dominant species over the eastern half of the property include *Jacksonia furcellata*, *Acacia saligna*, *Olearia axillaris* and *Spyridium globulosum* mostly scattered in a Shrubland formation. All of the vegetation units are common on Quindalup dunes between Mandurah to Rockingham.

Flora

A total of 80 species were recorded from Singleton which included 63 native species and 17 introduced species. The low number of species and the species composition is typical for areas dominated by Quindalup dune soil types. None of the species is listed as Declared Rare Flora or as an Endangered Species.

3. The Proposal

The proponent proposes to rezone land to the north and east of the township of Singleton to Urban and Parks and Recreation. A structure plan for Singleton has been developed and this proposes the following major land uses; residential, public open space, primary school, community centre, resort hotel, and retirement village.

The proponent proposes to provide a significantly expanded coastal reserve consisting of over 10ha of coastal land as an alternative to the area originally proposed in the System 6 recommendations relating to Area M107. Ordinarily a coastal reserve 100m back from the beach would be required to protect coastal features. Temwood Holdings propose an area as wide as 230m. The boundary of this additional area has been defined along a system of elevated dunes which run parallel to the beach. The coastal road will be the boundary between developed areas and the expanded coastal reserve.

4. Environmental Issues And Management

System 6 Area M107

The System 6 Area M107 comprises a series of narrow strips at Golden Bay, Singleton and Madora which extend from the coast to where they connect with a north to south strip of land which alongside and to the west of Mandurah Road. The north-south component between Golden Bay and Singleton has been zoned Special Rural and has been subdivided. This subdivision has been developed in a manner which provides for the protection of landscape values.

Text from the System 6 Report suggests that Area M107 was earmarked for open space with the planning objectives of separating the townships of Golden Bay, Singleton and Madora by greenbelts and providing for protection of landscape and recreation adjacent to Mandurah Road. The environmental values of the designated area are only referred to in a general sense and appear to be incidental.

Value of System 6 Area M107

In a contemporary planning context, the value of setting aside narrow greenbelts within the coastal urban corridor of Golden Bay, Singleton and Madora can be questioned. Apparently there is concern about the relatively low yield of future residential land within the South-West Corridor as a result of the amount of land allocated to Special Rural and Parks and Reserves purposes. Consolidation of these urban areas would assist in reducing the relatively high costs involved in providing services to these areas.

The landforms and vegetation on the property are typical of the Rockingham-Becher Plain in general and all are represented within present or future protected areas on the plain including areas at Port Kennedy, the Stakehill Suite wetlands, and a large area of remnant bushland near the Serpentine River (Paganoni's Reserve). In addition coastal reserves will extend from about 1km south of Pt Becher to the mouth of the Peel Inlet.

Given the above it would be difficult to conclude that the System 6 Area on the Singleton property has any important environmental values in a regional sense.

At the local level the System 6 Area could be considered to have aesthetic or landscape value. In our opinion this value is minimal and would be difficult to protect. Retention of the corridor will preserve part of the beach ridge plain and chaot dunes but these are not prominent. Requirements for access for the construction of services and the need for firebreaks and fences would further diminish environmental values of the reserve.

The recreational value of the corridor is now questionable given the recent development of the portion of the System 6 Area M107 that was to be used for recreation adjacent to Mandurah Road. This component next to Mandurah Road has been developed for special rural properties in a manner which preserves its landscape value, but negates recreational use by the general public.

Alternative to System 6 Area M107

The proponent proposes to provide a significantly expanded coastal reserve consisting of over 10ha of valuable coastal land as an alternative to the area originally recommended for preservation within the System 6 Area M107. This coastal reserve will contain areas of recreational, conservation and landscape value and will be more easily managed than the originally proposed part of the System 6 Area M107.

The proponent considers this area has a greater recreational value than the proposed System 6 Area as it is adjacent to the coastline. The proposed extension of the coastal reserve will include foredunes and the more recent beach-ridge plain. The vegetation within this area is predominantly *Spinifex hirsutus* Grassland, *Olearia axillaris* Shrubland and at the foot of the elevated chaot dunes, *Spiridium* and *Acacia* Open Heathland. The additional open space along the coast will enhance the views from the coastal road and hide the road from beach users. Houses within the development will be mostly out of site from the beach as a result of the extra width of the reserve.

Coastal Protection

The proponent proposes an expanded reserve well in excess of the normal requirement for protection of coastal features as required by planning authorities. This issue and others will be addressed in a Management Plan to be submitted to DPUD and the City of Rockingham.

Groundwater and Drainage

Available information on the aquifer beneath the development site indicates that there should be sufficient groundwater available for domestic use and that this extraction will not result in any net reduction in the depth to groundwater. It is proposed that urban runoff from the development will be managed so that none leaves the development site and all is directed to infiltration into the ground.

5. Conclusions

The analysis of environmental issues posed by the proposal to rezone the subject land at Singleton illustrates that the environmental impact of development will be typical of other recent subdivisions within Perth's north-west and south-west corridors. Importantly, substantial areas of regional open space are proposed by Planning authorities within the region and these will incorporate the major land forms and vegetation types which occur at Singleton. As a result the development at Singleton will be part of the balance struck between the requirements for conservation and the need to supply Perth's growing population with affordable urban land within the region. It is concluded therefore that the development has no significant environmental implications with regard to conservation issues.

The proponent has recognised the importance of the System 6 recommendations for Area M107 and has evaluated these and a number of alternatives with regard to the landscape and recreational values of the land. It is considered that the primary objective of the EPA in allocating part of System 6 Area M107 within Singleton was to protect recreation and landscape values. Subsequent developments in the area have depreciated the value of allocating the System 6 Area M107 land to parks and recreation and subsequently the proponent believes that the community of Singleton will be better served by the alternative proposed in this PER, that is a considerably expanded coastal reserve. This coastal reserve will contain areas of recreational, conservation and landscape value and will be more easily managed than the area originally proposed as part of System 6 Area M107.

1. INTRODUCTION

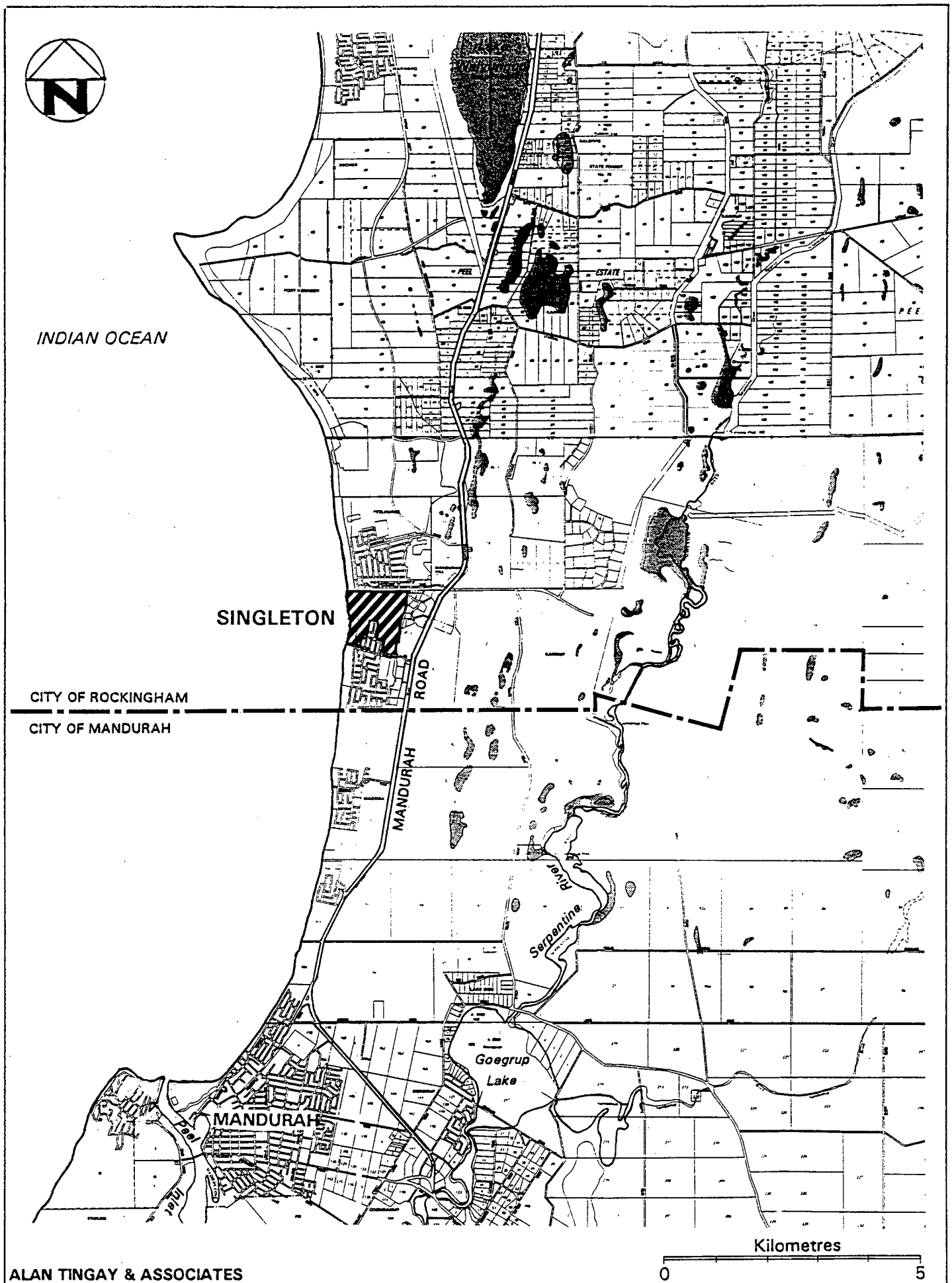
1.1 Background

Temwood Holdings Pty Ltd owns and intends to develop land to the north and east of the township of Singleton within the City of Rockingham (Figure 1). This land is almost entirely zoned Urban Deferred and Temwood Holdings Pty Ltd proposes to rezone the land to Urban as the first step in the development process.

A section of the proposed development is affected by part of the System 6 Area M107. In 1983 the Environmental Protection Authority (EPA) recommended that "ways and means of protecting the recreational and landscape values" of this area be developed. Since 1983 some parts of the System 6 Area next to and north of Singleton have been developed for Special Rural use in a manner that provides protection for the landscape values of the land. This development along with the proposed reservation of large areas of land in the immediate region for conservation, recreation and landscape purposes has greatly reduced the need to set aside the portion of System 6 Area M107 within the proposed Singleton development. As an alternative to setting aside the System 6 Area within Singleton the proponent proposes to allocate a significant area of high value coastal land for recreation and conservation purposes.

System 6 Area M107 recommendations also affect properties to the north of Singleton at Golden Bay and to the south at Madora. Owners of these properties propose to develop other portions of the System 6 Area M107. The owners of the Golden Bay land, H&B Developments have recently released a Public Environmental Review on the proposed rezoning of the System 6 land for public review. In this document H&B Developments Pty Ltd propose an expanded Coastal Reserve as an alternative to the reservation of the portion of System 6 for Parks and Recreation. Landowners at Madora have yet to refer any firm proposals to planning or environmental authorities regarding development of System 6 Areas M107 land within their boundaries. However, it is known that they would prefer to develop this area. It is important to note that the proposal by Temwood Holdings Pty Ltd is independent of the proposals put forward for neighbouring areas despite those proposals affecting the same System 6 Area.

A Structure Plan for Singleton has been prepared which shows the proposed rezoning and provides a broad description of the future urban development. The proposed rezoning is currently under consideration by the Department of Planning & Urban Development (DPUD) and has been referred to the EPA as required under the provisions of the Environmental Protection Act, 1986. The EPA decided that since the rezoning would affect a System 6 Area, the proposal should be subject to formal assessment to provide the opportunity for comments from interested members of the public. A Consultative Environmental Review has been required for this purpose and the present (CER) document has been prepared in accordance with the EPA Guidelines to meet this requirement. The guidelines are included in this document as Appendix 1. This CER describes the proposal in detail, discusses potential environmental impacts, and puts forward management proposals to avoid or ameliorate these potential impacts.



REGIONAL LOCATION OF SINGLETON

FIGURE 1

1.2 CER Process

The Western Australian environmental impact assessment process is outlined in the Guide to the Environmental Protection Act (Environmental Protection Authority, 1987) and is illustrated in Figure 2. Essentially, the proponent is required to notify the EPA of the proposal. The EPA then determines the need for a more detailed document such as a Consultative Environmental Review (CER) and provides the proponent with a set of Guidelines for the preparation of that document. The Guidelines for the present CER are provided in Appendix 1.

After the CER has been prepared, it is reviewed by the EPA to ensure that it provides sufficient detail and a comprehensive coverage of issues. When this has been established, the CER is released for the public review period. At the end of this, a summary of submissions is supplied to the proponent and a response is sought. The EPA then undertakes to assess the development proposal.

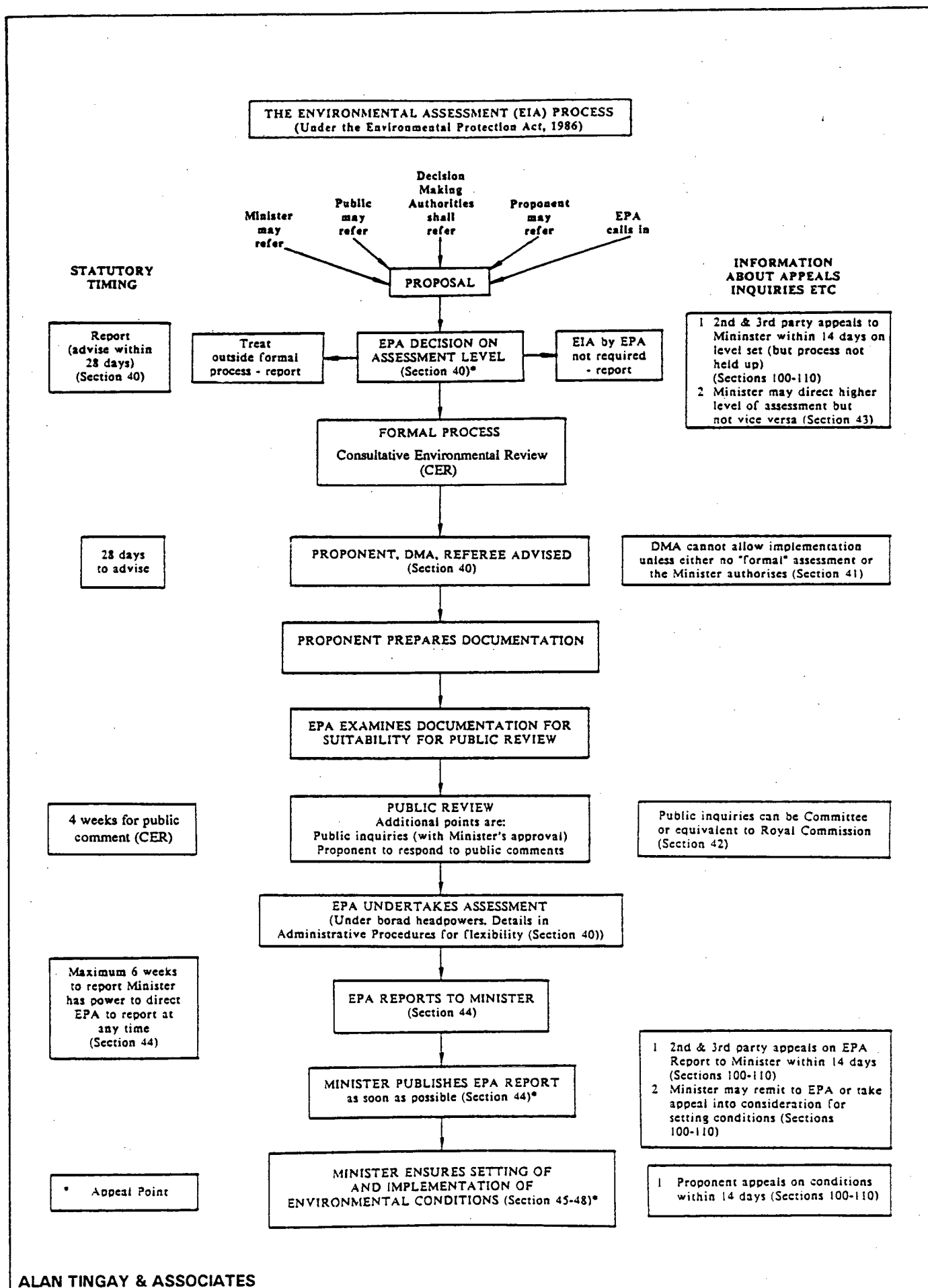
The results of the assessment are published in the form of an Assessment Report which includes recommendations made to the Minister for Environment. Interested parties can appeal against the level of assessment set by the EPA, and against the content of the EPA Assessment Report, or any of its recommendations. Ultimately the Minister for the Environment decides whether the proposal is acceptable and what conditions will be imposed upon it.

The environmental assessment process is designed to enable State authorities to consider in detail the environmental and social implications of development proposals. These considerations are based on technical assessments of the nature and extent of changes to the existing natural and social environments, on proposed management strategies to control or limit adverse changes, and on monitoring programmes designed to document and analyse the effectiveness of such strategies.

The environmental assessment process also enables members of the public to obtain details of the proposal and to formally comment on any matters of interest to them. These inputs are required within specified public review periods and are considered together with the technical assessments. The public is encouraged to provide written comments to the EPA as part of the environmental review process. Details of the public review period and advice on how to make a submission are provided at the start of this CER.

1.3 The Proponent

The proponent is Temwood Holdings Pty Ltd of PO Box 253, Midland Western Australia, 6056.



THE CONSULTATIVE ENVIRONMENTAL REVIEW (CER) PROCESS

FIGURE 2

1.4 Location and Land Holdings

The locality affected by this proposal is in the City of Rockingham adjacent to the existing subdivision of Singleton. The property comprises Lot 1001 on Plan 17791 and is the whole of the land in Certificate Title Volume 1888 Fol. 372 and has a total area of 105.9552ha. The property extends to the high water line on the coast.

1.5 Existing Development at Singleton

Subdivision at Singleton began in 1958 and most of the existing lots were created before 1963 but there were other subdivisions until 1978. The total number of existing lots is 872 (with 156 lots north and 716 lots to the south of Singleton Beach Road). There are currently 408 dwellings in the settlement (86 to the north and 322 to the south of Singleton Beach Road).

1.6 Zoning

Metropolitan Region Scheme

Most of the land involved in this proposal is currently zoned urban deferred under the 1963 Metropolitan Region Scheme. An area along the coastline, however, is zoned for parks and recreation and is part of a continuous coastal reserve from Rockingham to Mandurah.

City of Rockingham Town Planning Scheme

The City of Rockingham Town Planning Scheme No. 1 was gazetted on 24 July, 1975. In this Scheme Lot 1001 is zoned rural.

Draft Structure Plan for the South-West Corridor

The Department of Planning & Urban Development (DPUD) has advised that the zonings of the Metropolitan Region Scheme of 1963 will be retained in the Draft Structure Plan for the South-West Corridor to be published in 1992.

1.7 Need for Development at Singleton

The need for urban development in the coastal strip between Rockingham and Mandurah has been emphasised in recent publications of the Department of Planning and Urban Development (DPUD). In February, 1990 DPUD released a report entitled "Planning for the 1990's: New Directions for the Perth Metropolitan Region". This report emphasised the potential future population growth within the Perth Metropolitan Region and stated that the projected population by the late 1990's would be 1.4 million and by the year 2020 would be approximately 2 million. There is an obvious need for

significant areas of land to be allocated within the Metropolitan Region and to be developed progressively in order to accommodate this projected growth.

The report also indicated that the South-West Corridor would be a major focus for population growth in the short term future and would provide particularly for first home buyers. Within the South-West Corridor, Rockingham is considered to be the most important regional commercial centre and is expected to be the focus for urban expansion.

It also recognised that the overall availability of urban land in the South-West Corridor is significantly limited due to the amount of rural and special rural land and the need to provide for major important environmental features. These features include a section of the Rockingham-Becher Plain at Port Kennedy, the Rockingham Lakes, the Stakehill Suite of wetlands and a reserve for Banksia Woodland near the Serpentine River.

The need for relevant development at Singleton must be considered in terms of the planning issues outlined above. Considerable growth is currently occurring in the South-West Corridor immediately to the south of Rockingham and rapid growth is also occurring at Mandurah. There is clear evidence, therefore, that the predictions of population growth are being fulfilled and that there is a strong demand for new housing in this region and particularly near the coast. In response to this demand, the State Government as well as DPUD and the City of Rockingham are keen to have new urban estates developed and are encouraging early subdivision of Secret Harbour, Golden Bay, Singleton and other properties.

2. THE EXISTING ENVIRONMENT

2.1 Physical Features

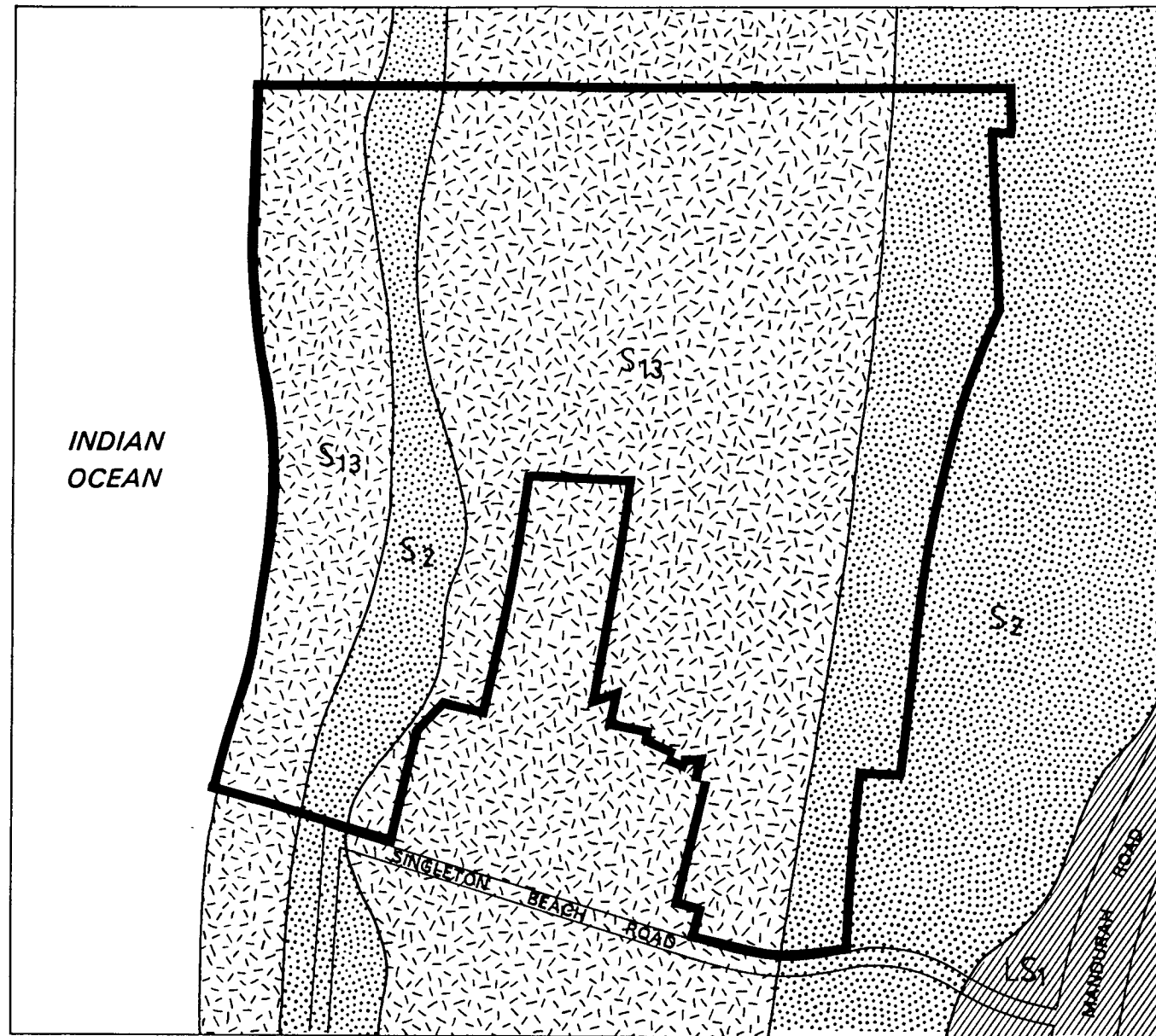
The surface geology of the Singleton property comprises a single unit known as the Safety Bay Sand (Figure 3). This is a cream calcareous quartz sand with a significant proportion of shell fragments which may be 20-25m thick near the coast.

On the surface these sands have been formed by wind and other processes into various types of dunes which are known collectively as the Quindalup Dune System. Four types of Quindalup Dune occurs at Singleton. These dunes are illustrated in Figure 3 and in a cross-section through the property (Figure 4). From the coast inland these dunal landforms are as follows:

- o A recent series of shore parallel beach ridge dunes with peak elevations from 4m to 6m on the ridges. These dunes form a unit about 75m in width (west to east) and are continuing to be actively formed by coastal processes behind the present beach. Aerial photography of this part of the coast indicates that the coastline has expanded westwards by over 100m in the 37 years between 1942 and 1979.
- o A band of chaot dunes with peak elevations of about 6m to 10m. These dunes form a unit which varies in width between 125m and 250m and which extends from Secret Harbour to Singleton. The unit was formed during a period of local increased sand deposition about 1000 years BP (before present).
- o An older series of beach ridge dunes with peak elevations of 6m to 8m. This unit is about 650m wide and is part of the extensive beach ridge dune area known as the Rockingham-Becher Plain. At Singleton the dunes date from about 2500 to 1000 years BP.
- o A series of parabolic dunes which are superimposed onto a Spearwood Dune ridge along the eastern boundary of the property. These dunes have peak elevations of about 20m and are a part of a system which extends east to Mandurah Road. Most of this system is outside of the Singleton property.

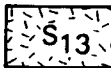


2.2 Groundwater

No specific on-site assessment of the groundwater at Singleton has been made but some information is available from an assessment of Secret Harbour which was prepared by Rockwater Pty Ltd (1981). This indicates that a superficial or shallow unconfined aquifer occurs in the Safety Bay Sand at relatively shallow depth. Indicative contours of the water table during winter (July 1980) and summer (January 1981) are shown in Figure 5. At Singleton, the groundwater contours in both seasons are virtually identical and the direction of groundwater flow is effectively due west towards the ocean. The maximum groundwater levels, which occur during winter, are



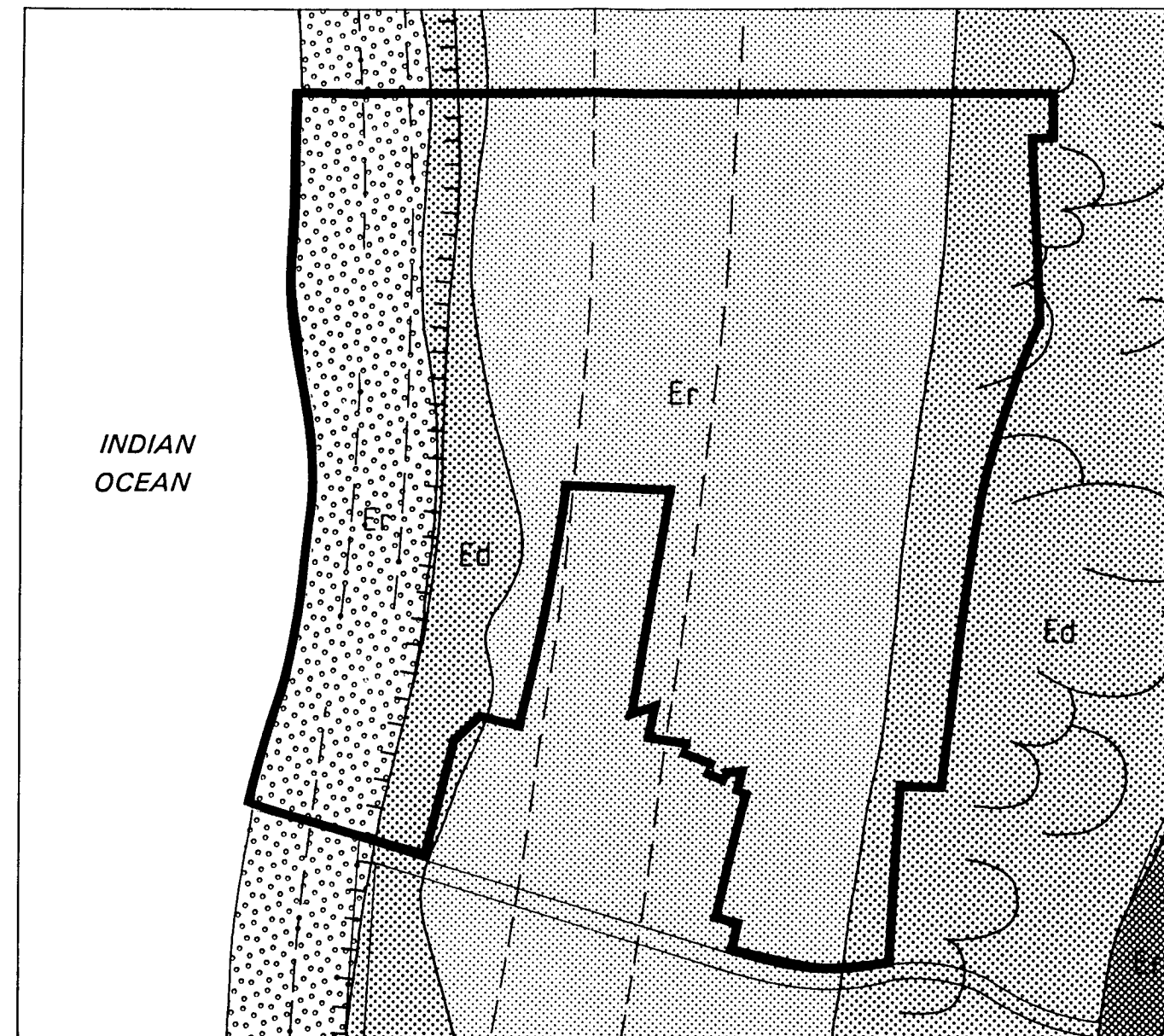
ENVIRONMENTAL GEOLOGY

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-  S₁₃ Calcareous Sand (relic foredunes)
-  S₂ Calcareous Sand (steep dunes)
-  LS₁ Tamala Limestone

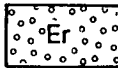







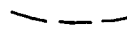
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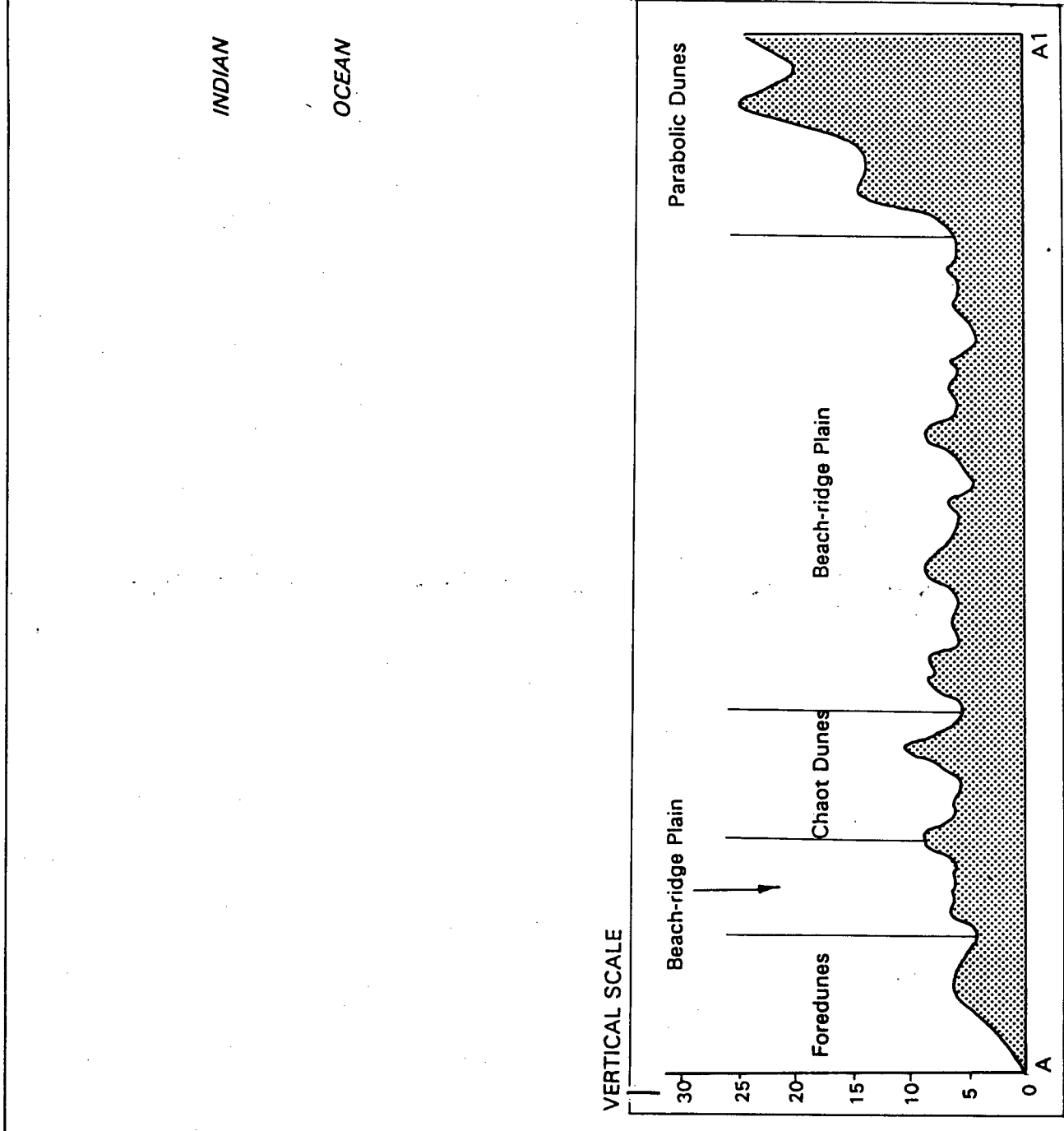
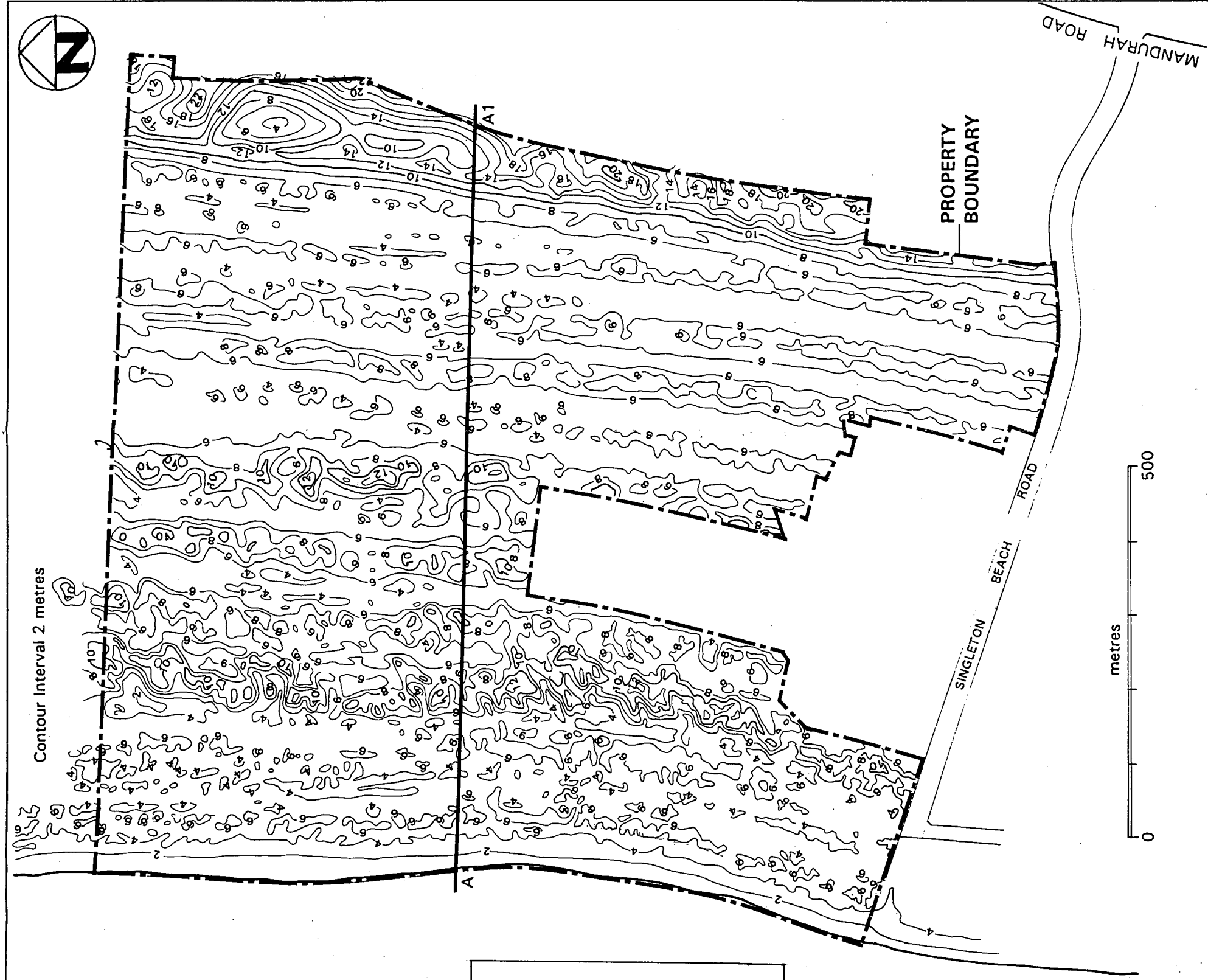


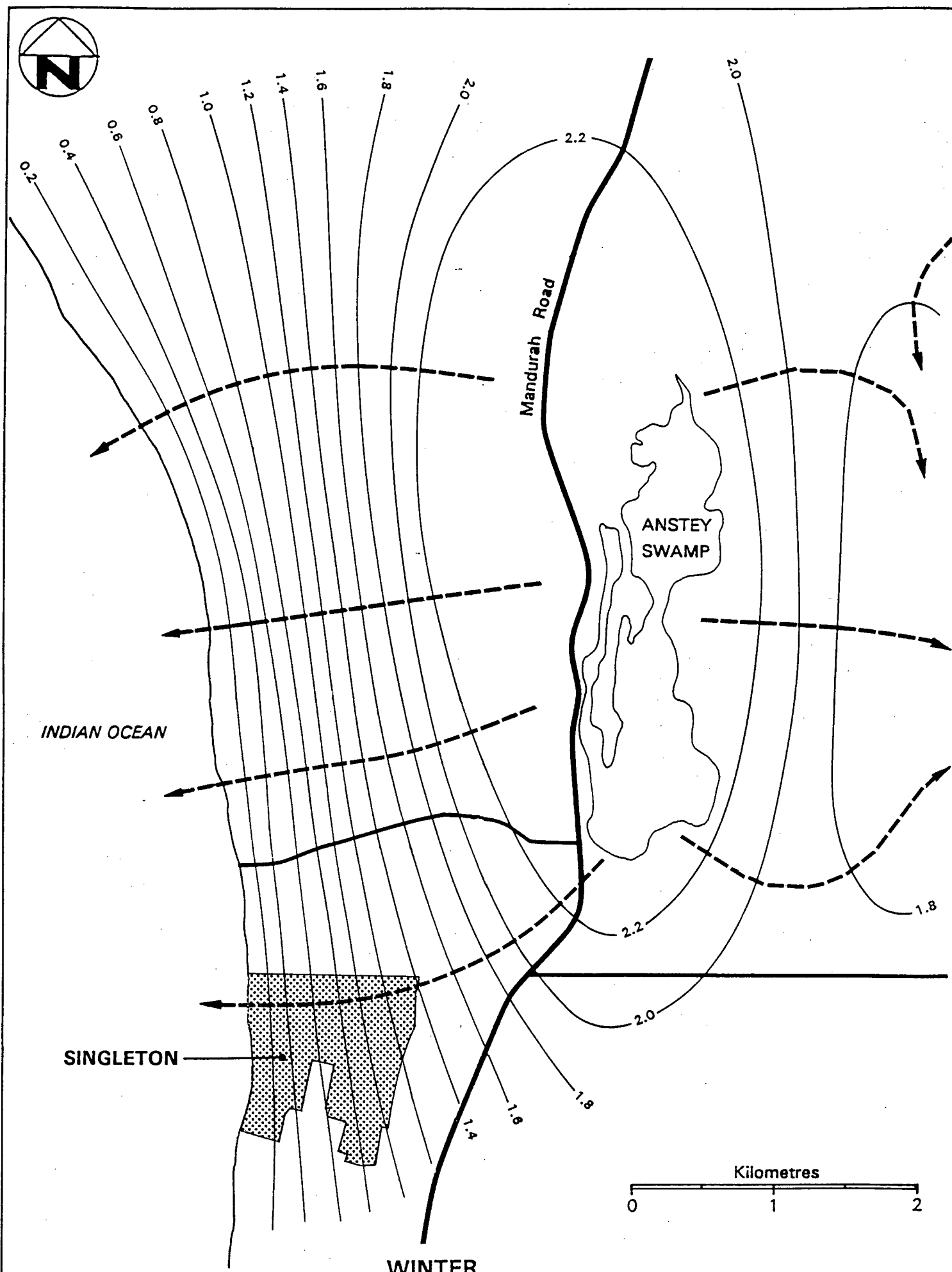
GEOMORPHOLOGY

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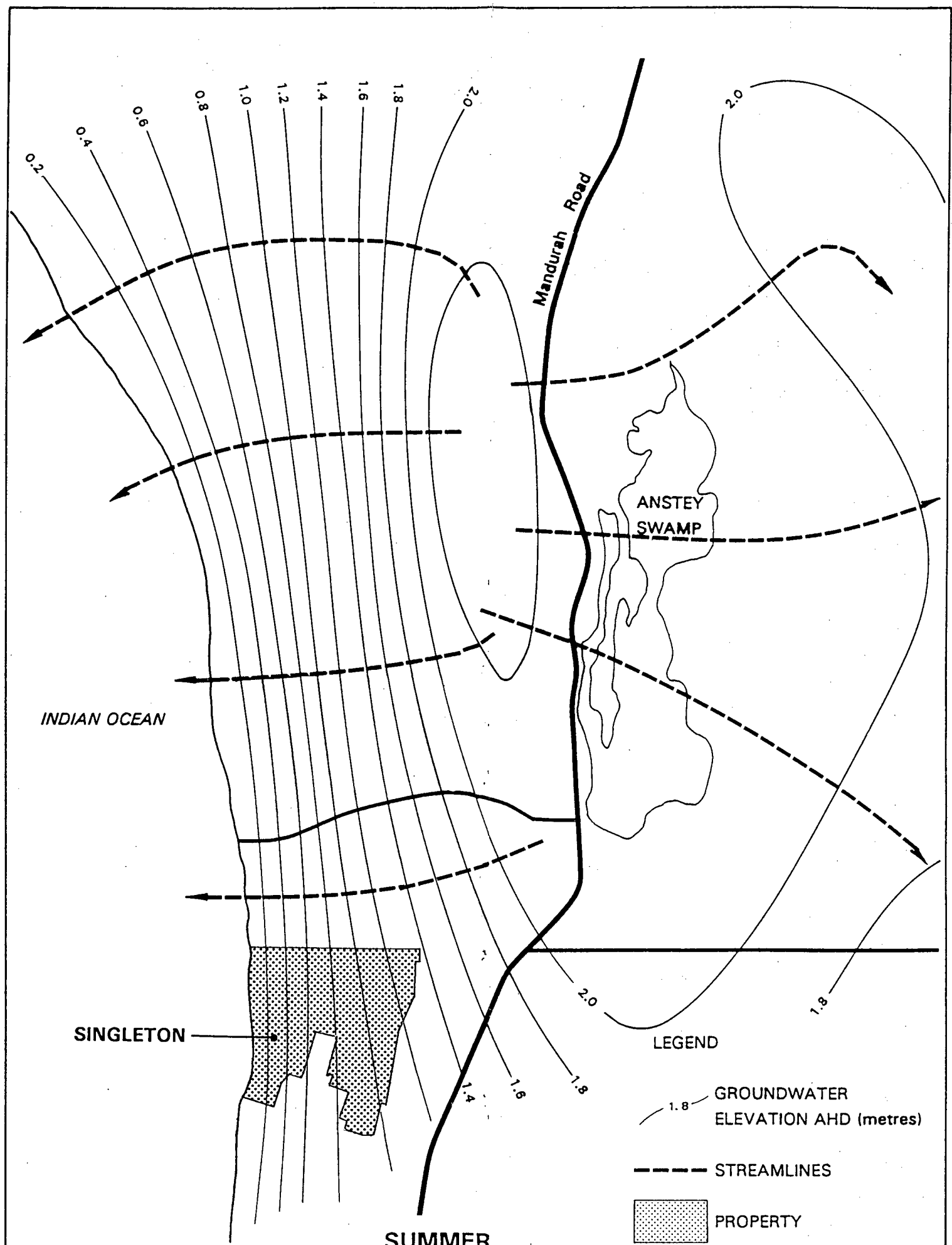
-  Er Relic foredune plain, low level, Holocene
-  Er Relic foredune plain, high level Holocene
-  Er Relic foredune plain, Pleistocene/ Holocene
-  Ed Parabolic & nested parabolic dunes Quindalup Dunes

-  Prominent ridge
-  Relic foredune trend lines
-  Erosional scarp





SOURCE : ROCKWATER PTY LTD, 1981
ALAN TINGAY & ASSOCIATES



SINGLETON GROUNDWATER LEVELS FIGURE 5

approximately 1.2mAHD in the eastern sector of the property to 0.2mAHD near the western boundary.

The superficial aquifer is recharged by rainfall with about 10% of annual rainfall entering groundwater storage. The salinity of the groundwater is about 360mm/L TDS and the rate of groundwater flow is estimated to be about 20m/day.

2.3 Vegetation

A detailed survey of the vegetation of Singleton was made as part of the present assessment. This survey was designed to provide a map of the vegetation associations. The survey involved extensive ground transects with direct mapping of vegetation types onto contemporary aerial photographs. A set of 10m x 10m quadrats was also surveyed in each vegetation type to determine the characteristic species for each association. Vegetation associations were described according to the dominant species in the tallest stratum, their height and percentage cover. The system of Specht (1981) was used to define the vegetation structural formations.

The vegetation at Singleton comprises a single complex as mapped in the Atlas of Natural Resources (Conservation and Land Management, 1980). This is appropriately called the Quindalup Complex as it is associated with the Quindalup Dunes System which occurs along the coast of the Swan Coastal Plain between Lancelin and Bunbury. Within this complex there is an array of vegetation associations related to different soil types and geomorphology. The distribution of these associations is shown on the vegetation map (Figure 6).

The vegetation immediately inland from the bare sand along the coast consists of a *Spinifex hirsutus* Grassland located on low primary dunes. This strip of stabilised dunes is currently about 20m wide and is being gradually moving westward as the shoreline aggrades. Other species present in this association include *Spinifex longifolius*, *Tetragonia decumbens* and *Cakile maritima*.

Further inland another band of low beach ridge dunes (about 30m wide) parallel with the coast and behind the *Spinifex* foredunes supports *Olearia axillaris* Shrubland. The species richness of this unit is low and contains a high proportion of introduced species such as *Pelargonium capitatum*, *Trachyandra divaricata*, *Bromus diandrus*, *Crassula glomerata*, *Sonchus oleraceus*, *Lagurus ovatus* and *Hypochaeris glabra*.

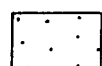
This association grades into a band of more dense vegetation consisting of a *Spyridium globulosum*/*Acacia cyclops* Heath. This is a common unit of interdunal swales and low dunes behind the second or third stabilised dune. It contains elements of the *Olearia axillaris* Shrubland abutting it to the west as well as several other characteristic species including *Alyxia buxifolia*, *Lepidosperma gladiatum* and *Myoporum insulare*.

A series of chaot dunes up to 10m AHD lie east of the near-coastal low dunes. The main vegetation unit on the crests and slopes of these chaot dunes is an *Acacia rostellifera* Closed Scrub. The *Acacia rostellifera* Shrubs form a dense impenetrable



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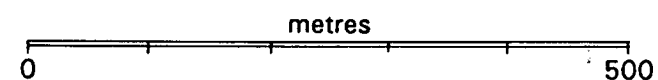
- A *Spinifex hirsutus* Grassland
- B *Olearia axillaris* Shrubland
- C *Spiridium globulosum*, *Acacia cyclops* Open Heathland
- F *Lepidosperma gladiatum* Sedgeland
- H *Acacia rostellifera* Closed Scrub
- L *Jacksonia furcellata*, *Spyridium globulosum*, *Acacia saligna*, *Olearia axillaris* Open Heathland to Shrubland
- S *Melaleuca acerosa* Open Heathland
- W *Allocasuarina humilis* Heathland



Beach



Existing Residential Areas



INDIAN OCEAN



layer, often compounded by the presence of the woody creeper *Hardenbergia comptoniana*. Other shrubs are common in more open stands, including *Diplolaena dampieri* and *Spyridium globulosum*. The Sword Sedge *Lepidosperma gladiatum* is common in the swales. *Scaevola crassifolia* and *Pelargonium capitatum* also occur in some swales and openings in this unit.

Vegetation typical of the Rockingham-Becher Plain is located over the eastern half of the property on the beach ridge dune system. The vegetation contains a mixture of dominant shrubs about 1.5-2m tall scattered over a low shrub and herb layer (less than 0-5m tall). The dominant species include *Jacksonia furcellata*, *Acacia saligna*, *Olearia axillaris* and *Spyridium globulosum* sometimes dense in a Heath but mostly scattered in a Shrubland formation. Common sub-shrubs include *Leucopogon parviflorus*, *Hemiandra pungens*, and *Acacia lasiocarpa*. In the north-south tending swales there is often an abundance of *Stipa flavescens* and *Conostylis candicans*. Patches of *Acacia rostellifera* Scrub with 70-100% coverage occur throughout the Rockingham-Becher Plain unit. One isolated patch of *Lepidosperma gladiatum* occurs in a rounded depression in the northern section.

All of the vegetation units are common on Quindalup dunes between Mandurah to Rockingham.

2.4 Flora

A survey of the flora of the Singleton property was made to determine a list of species for the area and to determine the location of any rare or endangered plant species.

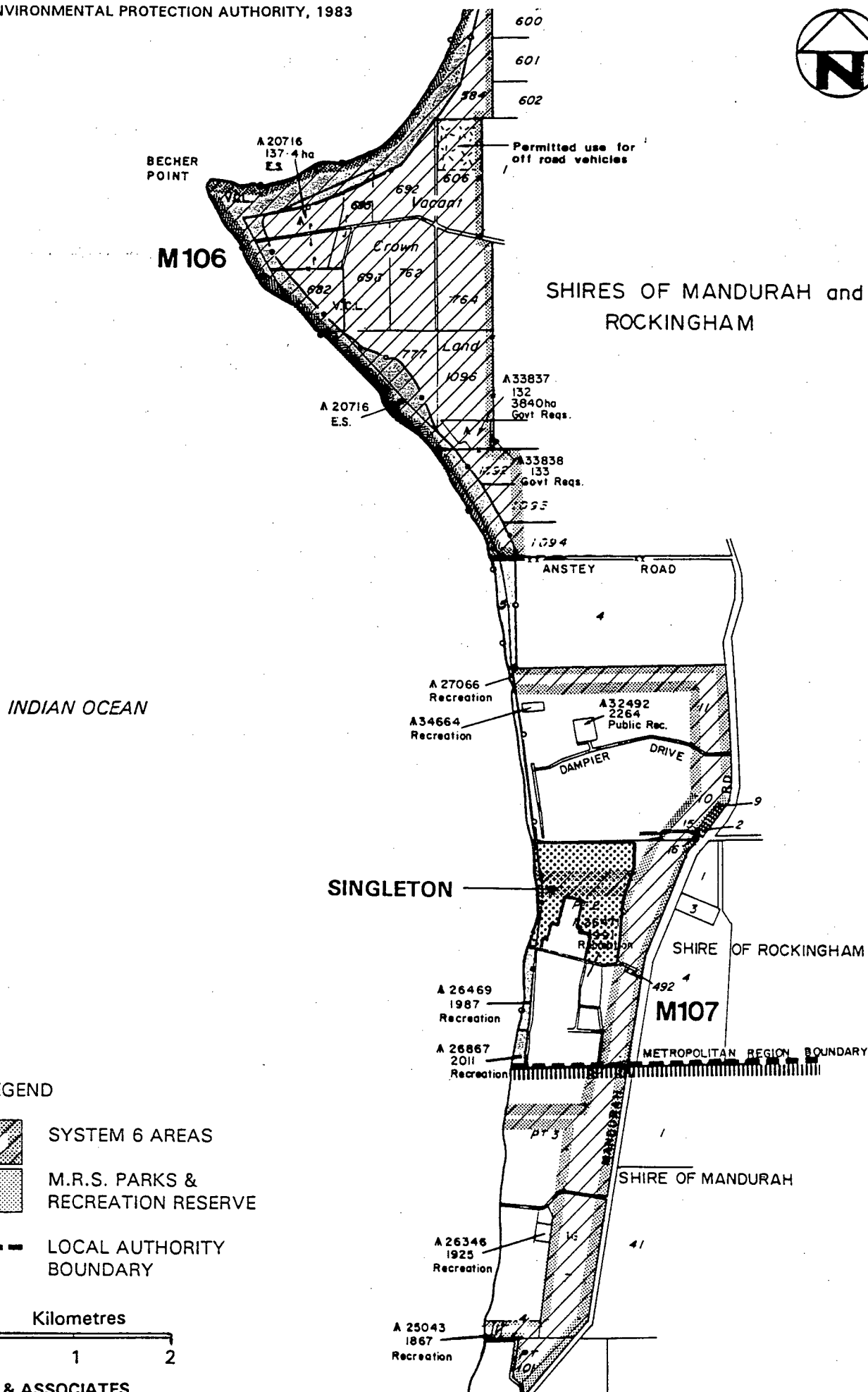
A total of 80 species were recorded from Singleton which included 63 native species and 17 introduced species (21% of the total). The most represented families were the Poaceae (12 species, including 5 introduced), Asteraceae (7 species, 2 introduced) and the Cyperaceae and Papilionaceae with 5 native species each. The low number of species and the species composition is typical for areas dominated by Quindalup dune soil types. The complete absence of any Proteaceae species reflects the absence of Spearwood Dune soils (limestone and sand over limestone).

The high proportion of introduced species is a result of disturbance due to fire, vehicle and pedestrian traffic and the proximity of urban areas to the north and south. Although there are a large number of weeds the vegetation could be considered in good condition.

None of the species is listed as Declared Rare Flora or as an Endangered Species.

2.5 The System 6 Area M107

The section of the System 6 Area M107 on the Singleton property (Figure 7) includes segments of the various major landforms and vegetation units from west to east. The transect through the property shown in Figure 4 is located within the System 6 Area



SINGLETON PROPERTY & SYSTEM 6 AREA M107

FIGURE 7

and illustrates the landforms. The vegetation includes from west to east *Spinifex hirsutus* Grassland, *Olearia axillaris* Shrubland, *Spyridium globulosum*/*Acacia cyclops* Open Heathland, *Acacia rostellifera* Closed Scrub, *Jacksonia furcellata*/*Spyridium globulosum*/*Acacia saligna*/*Olearia axillaris* Open Heathland to Shrubland, and *Melaleuca acerosa* Open Heathland.

3. THE PROPOSAL

3.1 Introduction

The proponent proposes to rezone land to the north and east of the township of Singleton to Urban and Parks and Recreation. At this stage a conceptual Structure Plan for the development has been prepared to help achieve planning approvals for the subdivision. This plan is presented as Figure 8 and shows the notional land uses within the subdivision.

The provision of Open Space within the subdivision is an important issue given System 6 recommendations M107 that apply to a portion of the Singleton land. The proponent recognises these recommendations but proposes an alternative allocation of land for landscape and recreational purposes adjacent to the Coastal Reserve. A full discussion of the System 6 recommendations and the proposed alternative is given in Section 4. Appendix 2 of the PER discusses the System 6 Area M107 in its entirety and describes the options considered regarding the System 6 Area and the allocations of alternative open space.

3.2 Development Areas

The Structure Plan for Singleton is shown in Figure 8. Major land uses and land allocations excluding Regional Open Space are as follows:

o	Residential (R15)	43.55 ha
o	Residential (R5)	6.46 ha
o	Residential (R40)	4.07 ha
o	Public Open Space	5.45 ha
o	Important Regional Road	3.36 ha
o	Primary School	4.03 ha
o	Community Centre	3.7 ha
o	Retirement Village	2.6 ha
o	Resort Hotel Site	2.5 ha

3.3 Open Space Provisions

Open Space at Singleton will be of two types, Regional Open Space (ROS) and Public Open Space (POS). ROS typically is important in a regional context and may contain features such as coastlines and waterbodies. The management of these areas is usually the responsibility of DPUD and the Local Authority. POS is typically of local significance and is used mostly for passive and active recreation. Management of these areas is the responsibility of the Local Authority. The proposed open space at Singleton is shown in Figure 9.



LOT 1001 - SUBJECT LAND - 106 ha

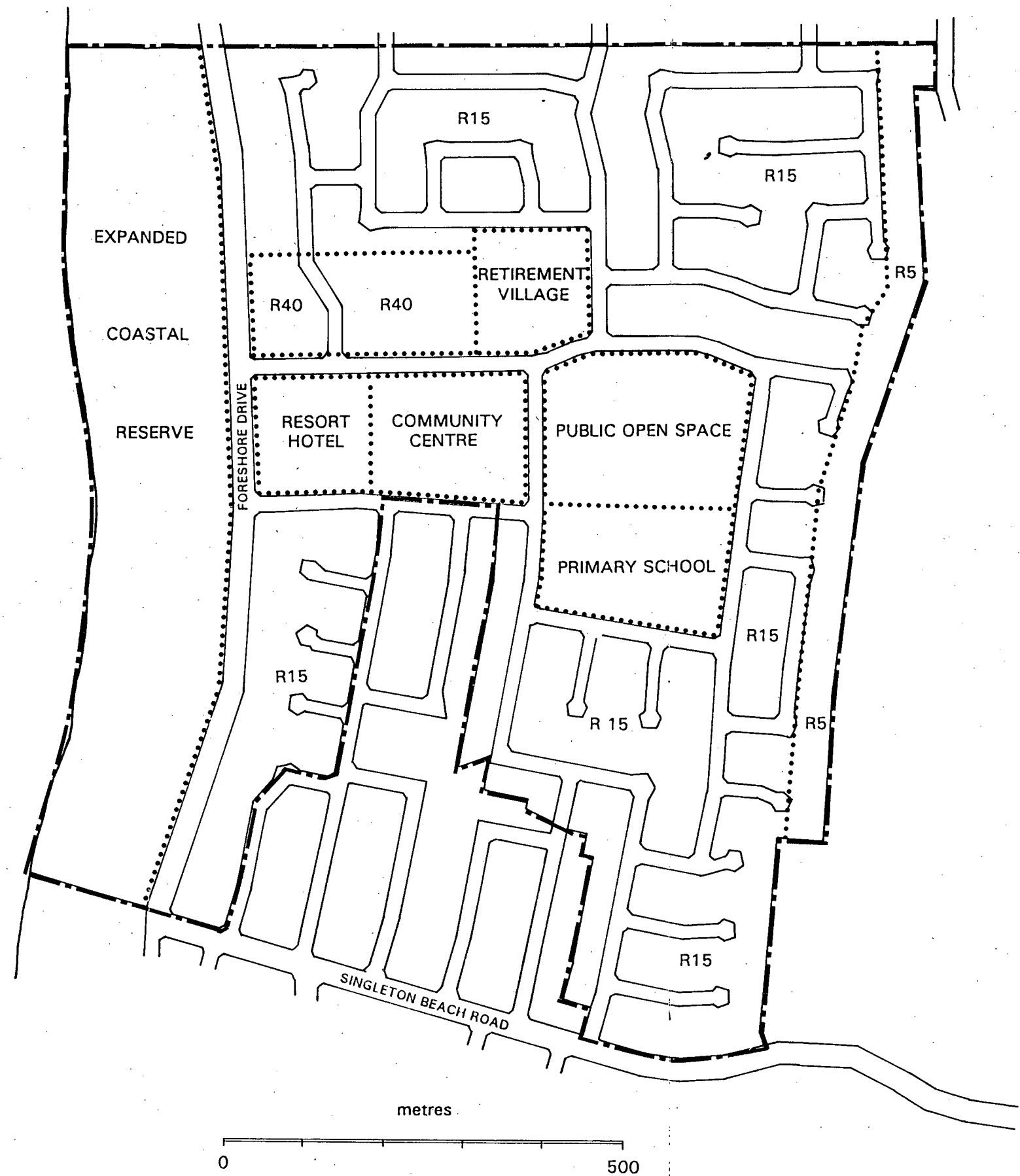
RESIDENTIAL R15	43.5 ha
RESIDENTIAL R5	6.5 ha
RESIDENTIAL R40	4.1 ha

PRIMARY SCHOOL	4.0 ha
RETIREMENT VILLAGE	2.6 ha
COAST ROAD	3.4 ha
COMMUNITY CENTRE	3.7 ha
RESORT HOTEL	2.5 ha

EXPANDED COASTAL RESERVE	21.8 ha
PUBLIC OPEN SPACE	5.5 ha

..... Boundary for Land Use

--- Property Boundary



SINGLETON PROPOSED STRUCTURE PLAN

FIGURE 8



INDIAN OCEAN

COASTAL RESERVE REQUIRED
BY DPUD
(100m width)

ADDITIONAL ROS AS ALTERNATIVE
TO PART SYSTEM 6 AREA M107

COASTAL ROAD

DEVELOPMENT AREAS

HIGH WATER MARK

metres

0 100 200 300

o Regional Open Space

ROS is provided at Golden Bay through the Coastal Reserve. DPUD policy for coastal protection in the Perth Metropolitan Regions requires that the Coastal Reserve be 100m wide from the vegetation line behind the beach when the coastal landforms are stable, which is the case at Singleton. The proponent proposes an expanded Coastal Reserve as an alternative to reserving the area recommended as System 6 Area M107 within the Singleton property (Figure 9). This additional land will be adjacent to the Coastal Reserve required by DPUD and will have an area of 10.6ha and when combined by the required ROS will result in an expanded Coastal Reserve of 21.8ha. The eastern boundary of this additional area of ROS has been defined to include a landform unit which consists of a system of beach-ridge dunes which run parallel and back from the beach. It is proposed that a coastal road connecting Singleton to Golden Bay will be located along the boundary between the developed areas and the expanded Coastal Reserve. This boundary has been defined along the base of a series of elevated chaot dunes to the east.

o Public Open Space

An area equivalent to 10% of a proposed subdivision is typically required to be set aside as POS. In the case of Singleton, this includes the established township. POS is provided adjacent to the school site for community uses, and passive and active recreation and comprises 5.45ha. The additional POS required within existing township of Singleton.

4. ENVIRONMENTAL ISSUES AND MANAGEMENT

4.1 Introduction

This section provides an analysis of the environmental issues associated with the rezoning of land at Singleton from urban deferred to urban and the allocation of an expanded coastal reserve for regional open space as an alternative to areas recommended in System 6 Area M107. A full discussion of the options considered with regard to the whole of System 6 Area M107 and development is presented in Appendix 2. Other issues such as drainage and coastal protection are also considered.

As with any normal residential development rezoning will result in the alteration of the existing natural environment to a substantially built, urban environment. Development will include the removal of much of the remaining natural vegetation and the modification of landforms to suit the construction of dwellings and roads.

The acceptability of the rezoning and ultimately the development can be evaluated by considering the conservation, landscape, and recreational values of the property on two levels, a regional level and a local level. At a regional level the environmental features of the property can be compared to those contained within large areas allocated for parks and recreation in the region. If the environmental features found on the property are well represented within established or proposed parklands it can be concluded that development of the land for urban uses will not pose an unacceptable environmental impact. Conversely if no existing or planned reserves exist in the region then the environmental implications of development may be considered important.

At the local level consideration of environmental features such as interesting land forms, locally important landscape features or popular recreational features should be taken into consideration during the allocation of open space within the development. The proper allocation of open space, given the environmental features of the property, will ensure that future residents are best served with regard to areas for passive recreation and the protection of landscape features.

4.2 System 6 Area M107

4.2.1 Location and EPA Recommendations

Part of the Singleton property is the subject of recommendations by the EPA in its System 6 Study report (Department of Conservation and Environment, 1983). This study was designed by the EPA to identify areas of the Swan Coastal Plain and the adjacent Darling Range which were considered to have environmental significance and which should be retained by reservation and/or appropriate management. The study concentrated mainly on existing Government reserves but also included a few areas of privately owned land. The latter were generally areas considered to be significant as future Greenbelts in planning reports current at the time of preparation of the System 6 Study. The System 6 Area M107 which occurs at Singleton is one of this category.

The boundaries of System 6 Area M107 are shown in Figure 8. It comprises a series of narrow strips on land at Golden Bay, Singleton and Madora which extend from the coast inland where they connect with a further north to south strip of land which runs parallel to and on the west side of Mandurah Road. The component of Area M107 between Golden Bay and Mandurah Road and between Singleton and Mandurah Road have been zoned Special Rural within the past few years and have been subdivided. This subdivision has been developed in a manner which recognises and provides for the protection of landscape values however it would appear that the recreation value of the land at the time of development was no longer considered relevant. The component of Area M107 adjacent to Mandurah Road at Madora at present is part of a larger property which surrounds the small coastal township of Madora.

At Singleton the east-west corridor component of Area M107 is nominally 150m in width (north to south) and 1km long and has an area of 15ha. It is located immediately to the north of the existing township of Singleton and effectively separates the township from the bulk of land which is the subject of the present report.

The location of the corridor suggests that it was considered at the time that Golden Bay/Crystaluna would expand southwards onto the Singleton property rather than that the township of Singleton property would expand northwards to the limit of the Singleton property. Alternatively the four west to east corridors may simply have been located equidistant from one another without any consideration of property boundaries and ownership.

No part of the component of Area M107 which is adjacent to Mandurah Road is located on the Singleton property.

The actual text of the System 6 Report for Area M107 and the recommendations pertaining to that Area are given below:

o M107 Peelhurst, Singleton and Madora

The recommended area is situated on the coast about 10km north of Mandurah, and comprises Reserve C25043, for Recreation, and part of Reserve C27066, for Recreation, both not vested; lots 2 to 9, 15 and 16 (Mandurah Road subdivision), lots 1, 7, 492 and 688 and parts of lots 2, 3, 4, 10 to 12 and 101 (Cockburn Location 16), all privately owned freehold land. A small part of the area is "reserved" for Parks and Recreation under the Metropolitan Region Scheme.

The eastern section is within an area for possible unconfined groundwater extraction. Groundwater extraction in the future may affect water levels and could involve the introduction of Catchment Zone regulations to restrict public access. The area will be slightly affected by widening requirements on the west side of Mandurah Road.

The MRPA's South-West Corridor Planning Structure advocated that the Peelhurst, Singleton and Madora townsites should become one urban settlement and the development of the strip on the west side of Mandurah Road for private recreation is considered a priority for implementation. The Mandurah Shire Council has

recommended that the proposed east-west link between Singleton and Madora should be relocated further north to coincide with the Rockingham-Mandurah Shire boundary.

The area has extensive coastal dunes which are very valuable for their coastal vegetation and for recreational and aesthetic reasons. Their appearance and stability have been affected by nearby housing developments. Buffer zones of uncleared land should be left to preserve some segments of the scenery and vegetation near the main Mandurah Road and between areas of housing. These buffer zones would restrict housing to west of the dune ridge, and provide east-west links of vegetation between Mandurah Road and the coast. The present practice of excluding housing from a strip adjacent to the shore should be continued. It is considered that these proposals would be to the benefit of all parties, as an enhanced residential environment has greater monetary as well as aesthetic value. In principle, public access to the reserved land would be unrestricted but, in practice, some advisory body would have to undertake development and maintenance of paths to avoid dune erosion. The onus would fall initially on the relevant local authority but might later devolve on a Residents Association. Important management considerations include: the provision and maintenance of pathways; the prevention of dune erosion; the involvement of local residents in the management of the dunes; and the prohibition of active recreation activities which might disturb and inconvenience residents.

Recommendations:

M107.1 That reserve C25043 be vested in the Shire of Mandurah.

M107.2 That reserve C27066 be vested in the Shire of Rockingham.

M107.3 That ways and means of protecting the area's recreational and landscape values be sought through planning procedures to be developed.

4.2.2 Discussion of the Recommendations

The above text suggests that Area M107 was included in the System 6 Report because it conformed with planning objectives at the time. The fact that area M107 is almost entirely located on private land rather than on an existing reserve like most other System 6 Areas supports this conclusion.

These planning objectives were to separate the developing townships of Golden Bay, Singleton and Madora by greenbelts or buffer zones and to provide for landscape protection adjacent to Mandurah Road. The environmental values of the designated area are only referred to in a general sense and appear to be incidental to the primary purpose of separating the various urban cells.

In the contemporary planning context of 1992, the value of setting aside narrow greenbelts within the near coastal urban corridor of Golden Bay, Singleton and Madora can be questioned. At the regional planning level the emphasis for protection of environmental features has focused on Port Kennedy, the Stakehill Suite of wetlands and a large area of remnant bushland near the Serpentine River (Paganoni's Reserve). It is understood that all of these areas will be suggested for reservation in the forthcoming Draft South-West Corridor Structure Plan. However, none of these areas

except for parts of Port Kennedy were considered by the System 6 Report for reservation at that time.

It is understood that the forthcoming Draft Structure Plan for the South-West Corridor will not retain the concept of Area M107, and that the east-west components of the area will be deleted in that plan. This suggests that DPUD no longer considers there is any requirement for buffer zones between future developments at Golden Bay, Singleton and Madora. Apparently there is concern about the relatively low yield of future residential land within the South-West Corridor as a result of the amount of land allocated to Special Rural and Parks and Reserves purposes and therefore it is proposed that the urban areas near the coast be consolidated. Such consolidation would assist in reducing the relatively high costs involved in providing infrastructure and services to these areas including the possible provision of a light rail connection to Perth.

The recent Special Rural subdivisions in Area M107 adjacent to Golden Bay and Singleton suggests that DPUD, the City of Rockingham and the EPA no longer consider that these areas have future recreational potential as was originally discussed in the System 6 Report.

The City of Rockingham has indicated that it is reluctant to accept management responsibility for the east-west components of Area M107 at both Golden Bay and Singleton if these were to be acquired for Parks and Reserve purposes.

4.2.3 Environmental Values of Area M107

The segment of the System 6 Area M107 at Singleton contains a representative cross-section of the landforms and vegetation on the property as described in Section 2. These landforms and vegetation types are typical of the Rockingham-Becher Plain in general and all are represented within present or future protected areas on the plain.

The beach ridge plain closest to the coast extends from about 1km south of Point Becher to the mouth of the Peel Inlet at Mandurah and is almost entirely within existing and future coastal reserves along the coastline.

Chaot dunes which occur adjacent to the recent beach ridge plain at Singleton also occur south of Point Becher and in the northern section of Secret Harbour but much more extensively. Virtually all of this type of landform and the associated *Acacia rostellifera* vegetation at Point Becher and Secret Harbour will be protected within Coastal Reserves and Regional Open Space.

The older beach ridge plain which is the dominant feature of the Rockingham-Becher Plain, extends from the Kwinana Industrial Area to Mandurah. This plain is widest and least disturbed immediately south of Point Becher. The beach ridges in the Point Becher area date from 7000 BP to the present and have considerable significance for studies of coastal history and sea level. As a result DPUD and the EPA have taken steps to protect a complete cross-section of the plain at Point Becher within Regional Open Space. This area has also been recommended by the Western Australian

Government to the Australian Heritage Commission for listing on the Register of the National Estate.

In contrast to the beach ridge plain at Point Becher, the beach ridge plain at Singleton is relatively narrow west-east, has a relatively restricted age span (2000 BP to present) and has relatively little diversity in the vegetation.

The inland parabolic dunes at Singleton cover a limited area along the eastern boundary and this landform is considerably more extensive in the adjacent property to the east. It is also present along the west side of Mandurah Road adjacent to Golden Bay and at Madora and Secret Harbour. Measures to protect this landform and its associated vegetation adjacent to Singleton and Golden Bay (within System 6 Area M107) have been taken by Special Rural zoning and various land use requirements including clearing restrictions imposed by the City of Rockingham.

Given the extent of the typical landforms and vegetation of the Rockingham-Becher Plain which are in existing or future reserves and Special Rural zones, it would be difficult to conclude that the System 6 Area on the Singleton property has any important environmental values in a regional sense. At the local level the System 6 Area could be considered to have aesthetic or landscape value, however in our opinion this value is minimal and would be difficult to protect within a developed urban context.

The corridor also has very limited, landscape values. Retention of the corridor will preserve part of the beach ridge plain and chaots but these would not be a prominent feature of the local landscape for the majority of future residents nearby nor would it prevent those residents from seeing houses at Golden Bay or vice versa.

Each of the landforms within the System 6 Area of Singleton is a component of a larger geomorphic unit which is aligned north-south, that is in the opposite direction to the alignment of Area M107. In the case of those landforms which are in the Coastal Reserve, this is of no consequence as the reserve is aligned parallel to the coast and includes the larger geomorphic unit. However, on the chaot dunes, the older beach ridge plain and the eastern parabolic dunes, development would ultimately occur along the boundaries of the System 6 Area if it were to be set aside as a reserve.

Development is likely to involve clearing of much of the vegetation and earthworks associated with site levelling for houses and road construction. Invariably this would impact on any neighbouring area reserved for parks and recreation. There is likely to be a requirement for access through the reserve for the construction of services such as roads, water supply, sewerage systems and electricity between the urban areas to the north and south. If the area were to be preserved in its present form it would be necessary to fence it and to permit limited access on established pathways as the landforms are prone to erosion and the vegetation can be easily damaged by even foot traffic. A firebreak around the perimeter of the area and probably at intervals across its length would also be required. Given these requirements it is considered that the aesthetic and landscape values of the area would be significantly diminished.

The recreational value of the corridor is questionable given recent development of the Mandurah Road portion of the System 6 Area M107. The intended recreational link in the System 6 Report was between that component of Area M107 adjacent to Mandurah Road (where recreational activities were to be promoted) and the coast which is the primary focus of recreation in the region. However, the component of Area M107 next to Mandurah Road adjacent to Singleton has been developed for special rural properties. These developments are intended to generally preserve the landscape adjacent to the road while at the same time allowing development, however they negate recreational use by the general public.

4.2.4 Alternative to System 6 Area M107

The proponent proposes to provide a significantly expanded coastal reserve consisting of over 10ha of valuable coastal land as an alternative to the area originally recommended for preservation by the System 6 recommendations relating to Area M107.

Ordinarily a coastal reserve 100m from the first line of vegetation back from the beach would be required to protect the coastal features of the land. This is discussed fully in Section 4.4. Temwood Holdings propose that this area be extended back to a line of elevated dunes as far back as about 230m from the vegetation line. It is considered that this area has a greater recreational value than the proposed System 6 Area as it provides land adjacent to the most valuable recreational asset of the region, the coastline. The proposed area also provides a continuation of open space along the coast that links up to existing or proposed open space north and south of the development.

The proposed extension of the coastal reserve will include foredunes behind the beach and the more recent beach-ridge plain. The vegetation in the reserve is predominantly *Spinifex hirsutus* Grassland, *Olearia axillaris* Shrubland and at the foot of the elevated chaot dunes, *Spyridium* and *Acacia* Open Heathland. The coastal road running north-south will be at the base of the chaot dunes and serve as the boundary for the reserve.

The additional open space along the coast will enhance the views from the coastal road and hide the road from beach users. Houses within the development will be mostly out of site from the beach as a result of the extra width of the reserve.

4.3 Coastal Protection

Coastal protection procedures appropriate for the Perth Metropolitan Region are described in the Draft Statement of Planning Policy No. 2 published by the State Planning Commission (1988). The reserve for Singleton, according to DPUD policy, should have a minimum width of 100m from the vegetation line immediately behind the beach. As discussed previously the proponent proposes an expanded reserve in addition to the required 100m.

The proposed additional area together with the required area will be managed in accordance with the Draft Statement of Planning Policy. This Draft Policy has three objectives:

- o To ensure the development on and adjacent to the coast is located, designed and sited to compliment and be visually compatible with the coastal landscape.
- o To ensure the development on and adjacent to the coast is compatible with protection of coastal resources.
- o To maintain public access to the coast consistent with the protection of coastal resources.

A number of recommendations relating to the objectives are also included in the draft policy. These recommendations in particular cover the protection of visual character of the coastal zone, restrictions on building heights, land use priorities, set backs for developments to ensure coastal stability, retention of natural vegetation, soil conservation measures, drainage and water quality management, coastal development and coastal management plans and vehicular and pedestrian access.

Development proposals at Singleton will not effect the natural vegetation within this coastal reserve except for the provision of carparks, footpaths and other beach access facilities, nor will it involve soil disturbance or alterations to the drainage and water quality. All carparks and ablution facilities will be located on the eastern side of dune systems so that they are not visible from the beach and access to the beach will be provided by narrow pathways located and designed as to minimise erosion. The guidelines of the Draft Policy relating to the design and siting of the carparks and pedestrian access will be adhered to and no building within the coastal area will exceed the recommended 12m in height.

Plans for the facilities within the expanded Coastal Reserve will be incorporated in a specific Management Plan which will be submitted to DPUD and the City of Rockingham for approval.

4.4 Landscape Protection

The urban development of the Singleton land will result in extensive modification of the existing natural environment and will involve the clearing of vegetation and the alteration of the topography of the site to suit housing. This will be an unavoidable consequence of the need to develop the south-west corridor for residential purposes.

As a result topography and landscape protection measures the developed property will not be visible from Mandurah Road or the beach. Views from Mandurah Road will be protected by the landscape buffer zone to the east of the Singleton property between Mandurah Road and the property. This buffer zone includes part of an elevated system of parabolic dunes which provides an excellent visual barrier. The western most part of this dune system is within the property and this section will contain large blocks

(R5) designed to protect landscape values and particularly views from the development area eastwards.

Views from the beach will be protected to a large extent by the expanded coastal reserve. However it is expected that some houses and associated earthworks will be visible from the beach as some will be on elevated chaot dunes overlooking the reserve.

4.5 Groundwater and Drainage

Water will be supplied to the new development by the WA Water Authority but it is expected that some householders may also wish to use local groundwater resources.

Available information on the aquifer beneath the development site indicates that there should be sufficient groundwater available for domestic use within the development and that this extraction will not result in any net reduction in the depth to groundwater. It is expected that groundwater levels will rise due to increased recharge from urban runoff and decreased utilisation by vegetation due to clearing. This rise should be partially counteracted by groundwater extraction.

Nutrient levels in the superficial aquifer are expected to increase as a result of urbanisation however this will be minimal given that the proponent intends to provide reticulated sewerage to the development .

It is proposed that urban runoff from the development will be managed so that no runoff leaves the development site and all is directed to infiltration into the ground.

4.6 Local Residents

The proposed development at Singleton represents an expansion of the existing townsite and as such some residents may consider that their quality of lifestyle will be diminished as a result of population growth. The proponent believes that this is a planning matter and that correspondingly it is the responsibility of the City of Rockingham and DPUD which must ultimately approve the subdivision. Residents will have opportunity to make submissions to the City of Rockingham regarding the proposal to rezone the land as the rezoning proceeds.

5. CONCLUSIONS

The analysis of environmental issues posed by the proposal to rezone the subject land at Singleton illustrates that the environmental impact of development will be typical of other recent subdivisions within the north-west and south-west corridors of the Perth Metropolitan Region. Importantly, substantial areas of regional open space are proposed by Planning authorities within the region and these will incorporate the major land forms and vegetation types which also occur at Singleton. As a result the development at Singleton will be part of the balance struck between the requirements for conservation and the need to supply Perth's growing population with affordable urban land within the region. It is concluded therefore that the development has no significant environmental implications with regard to conservation issues.

The proponent has recognised the importance of the System 6 recommendations for Area M107 and has evaluated these and a number of alternatives with regard to the landscape and recreational values of the land. It is considered that the primary objective of the EPA in allocating part of System 6 Area M107 within Singleton was to protect recreation and landscape values. Subsequent developments in the area have depreciated the value of allocating the System 6 Area M107 land to parks and recreation and consequently the proponent believes that the community of Singleton will be better served by the alternative proposed in this CER of a considerably expanded coastal reserve. This coastal reserve will contain areas of recreational, conservation and landscape value and will be more easily managed than the area originally proposed as part of System 6 Area M107.

6. COMMITMENTS

Commitments represent the proponents solutions to potential environmental problems posed by the development. Temwood Holdings Pty Ltd will implement the following commitments with respect to the Singleton project.

1. The proponent will provide, in exchange for the development of the part of the currently proposed System 6 Area M107 within Singleton, additional Regional 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 Singleton prior to the completion of development of the urban area. This will be done to the satisfaction of DPUD and the Local Authority.
3. The proponent will provide reticulated sewerage and stormwater drainage designed to infiltrate stormwater into the soil within the development site. This will be done during the provision of services within the development to the satisfaction of DPUD and the Local Authority.

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APPENDICES

APPENDIX 1

EPA GUIDELINES FOR PROPOSAL

REZONING OF LAND FROM URBAN DEFERRED TO URBAN (AFFECTING PART OF SYSTEM 6 AREA M107), SINGLETON

GUIDELINES FOR THE CONSULTATIVE ENVIRONMENTAL REVIEW

In Western Australia, the environmental assessment process is about protecting the environment. The fundamental requirement is for the proponent to describe the proposal in some detail, to discuss the environmental impacts and potential environmental impacts of the proposal, and then to describe how those environmental impacts are going to be avoided, ameliorated or managed so that the environment is protected.

Throughout the process, it is the aim of the Environmental Protection Authority (EPA) to advise and assist the proponent to improve or modify the proposal in such a way that the environment is protected. However, it is the responsibility of the proponent to design and implement proposals which protect the environment, and to present the design proposals for review.

These guidelines have been prepared to assist the proponent in identifying issues which should be addressed within the Consultative Environmental Review (CER) for the Urban rezoning at Singleton. They are not intended to be exhaustive and the proponent may consider that other issues should also be included in the document.

The CER should facilitate a review of the key environmental issues. The purpose of the CER should be explained, and the contents should be concise and accurate as well as being readily understood. Specialist information and technical description should be included only where it assists the understanding of the the proposal. Where specific information has been requested by a Government Department or the Local Authority this should be included in the document.

It is not intended that the document be unduly lengthy. Rather it is intended that all relevant material should be succinctly presented in order that the key environmental issues may be assessed.

The principal function of the CER is to place this project in the context of the regional environment and progressive developments, including the cumulative impact of this development. It seeks to explain why this project is being proposed in the way it is, at this place and at this time. It should also set out the environmental impacts the project will have, and what management steps the proponent intends to use to avoid, ameliorate or mitigate any negative environmental impacts.

A copy of these guidelines should appear in the CER document.

PROJECT DESCRIPTION

It is important to include a description of the proposal itself, including specifically what is proposed, how it is to be carried out, the timing of the project, and what measures will be taken to ameliorate possible negative effects.

Detailed plans of the site should be included showing:

- existing land uses and land status;
- adjacent land uses;
- infrastructure;
- proposed land uses;
- System 6 M107 area boundaries;

These plans may be included in the text, or included as appendices to the report. In addition, fauna and flora surveys of the M107 area should be included to facilitate assessment and planning

ENVIRONMENTAL IMPACTS AND MANAGEMENT

Predicted environmental impacts and proposed measures to overcome or minimise these problems should be discussed in sufficient detail so as to allow an adequate assessment to be made.

The specific environmental concern with the regard to the Urban rezoning at Singleton centres on System Six Recommendation M107. The CER should discuss the System Six recommendation in full, what it was intended to achieve, and its relevance to the rezoning proposal. The implications for the M107 area as a result of the rezoning proposal should be fully discussed, and if the intention is to not adhere to the area as recommended, a full rationale for doing this should be put forward, and an environmentally acceptable alternative offered. The intended management of the System Six area (whether it remains as proposed or is altered) should be fully discussed particularly in relation to landscape protection and provision of recreation facilities.

The discussion on System Six Recommendation M107 should not be limited to the particular section within the cadastral boundaries of the Singleton project area, but rather should cover the recommendation in its entirety. In this regard, a strategy paper which deals with M107 as a whole will need to be included as an appendix to the CER.

COMMITMENTS

Specific commitments should be given to all components of the management programme. Where appropriate, the commitments should include

- a) who is responsible for the commitment and who will do the work,
- b) what is the nature of the work
- c) when and where the work will be carried out and
- d) to whose satisfaction will the work be carried out.

A summary of commitments in numbered form should be given. A set of well written concise commitments covering the key issues of the proposal and its effects will help to expedite assessment of the proposal.

APPENDIX 2

**SYSTEM 6 AREA M107
DISCUSSION PAPER**

ALAN TINGAY & ASSOCIATES

FEBRUARY 1992

REPORT NO. 92/6

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1. INTRODUCTION

System 6 Area M107 is located close to the coast in the City of Rockingham and the City of Mandurah. It is entirely located on private property and consists of (1) a strip of land adjacent to and on the western side of Mandurah Road and (2) a series of east-west sections which connect this road strip to the coast.

Implementation of the recommendations relating to this area have not proceeded possibly because of the complexities presented by its private ownership, configuration, and lack of specific information relating to its environmental features. However, development of some of the properties on which area M107 is located is now proposed and the owners have independently asked the Environmental Protection Authority (EPA) to review the status of the area.

These owners have suggested that such a review should take into account the configuration of the area, the origins of the System 6 recommendations, contemporary planning and management considerations and the environmental features of the area. In response, the EPA has indicated that any such review will include a detailed evaluation of the implications of all future use options ranging from retention of the area in its present form to partial or complete residential, special rural, or other development.

This discussion paper has been prepared by Alan Tingay & Associates on behalf of the owners to provide a comprehensive description and discussion of Area M107 which it is hoped will assist the EPA in its future consideration of the area. It includes a description of:

- o the location of the area,
- o the System 6 Study text (text and recommendations of the System 6 Study Report),
- o origins of the area,
- o current status/ownership,
- o environmental features,
- o the contemporary planning context,
- o management considerations
- o options for future status and use, and
- o preferred position of the various owners.

2. LOCATION

The location of System 6 Area M107 is shown in Figure 1. This figure is from the original System 6 Study Report and indicates the boundaries and dimensions only in an indicative sense. The figure does not show any landholdings and does not provide any dimensions (apart from a small scale line) and it is difficult to precisely locate some of the boundaries. The text of the System 6 Study Report also does not provide any clear indications of the location of the boundaries (see Section 3).

Only three of the boundaries can be located with precision. These are:

- o the eastern boundary of the entire area which has a common alignment with property boundaries along Mandurah Road,
- o the northernmost boundary which is located on the boundaries between the property of Secret Harbour (to the north of the area) and those of Golden Bay and Special Rural properties adjacent to Golden Bay in the south, and
- o the southern boundary which coincides with a property boundary at Madora.

The location of some other parts of the area, however can be inferred as follows:

- o the south boundary of the east-west section at Singleton appears to coincide with the limit of residential development,
- o the western boundary of the road section at Singleton appears to coincide with property boundaries, and
- o the western boundary of the road section at Madora is straight and is aligned with a boundary of Reserve 26346.

The remaining boundaries can be determined approximately by transferring the System 6 figure to cadastral plans with appropriate adjustment of scale.

The lack of precision with respect to the boundaries of Area M107 possibly indicates that the EPA was more concerned in this case with the intent of its recommendations for the area rather than with precise features. This appears to be supported by the text of the System 6 Study Report for the area.

3. THE SYSTEM 6 STUDY REPORT AND RECOMMENDATIONS

3.1 Text of the System 6 Report

The full text of the System 6 Area Study Report relating to Area M107 is given below:

o M107 Peelhurst, Singleton and Madora

The recommended area is situated on the coast about 10km north of Mandurah, and comprises Reserve C25043, for Recreation, and part of Reserve C27066, for Recreation, both not vested; lots 2 to 9, 15 and 16 (Mandurah Road subdivision), lots 1, 7, 492 and 688 and parts of lots 2, 3, 4, 10 to 12 and 101 (Cockburn Location 16), all privately owned freehold land. A small part of the area is "reserved" for Parks and Recreation under the Metropolitan Region Scheme.

The eastern section is within an area for possible unconfined groundwater extraction. Groundwater extraction in the future may affect water levels and could involve the introduction of Catchment Zone regulations to restrict public access. The area will be slightly affected by widening requirements on the west side of Mandurah Road.

The MRPA's South-West Corridor Planning Structure advocated that the Peelhurst, Singleton and Madora townsites should become one urban settlement and the development of the strip on the west side of Mandurah Road for private recreation is considered a priority for implementation. The Mandurah Shire Council has recommended that the proposed east-west link between Singleton and Madora should be relocated further north to coincide with the Rockingham-Mandurah Shire boundary.

The area has extensive coastal dunes which are very valuable for their coastal vegetation and for recreational and aesthetic reasons. Their appearance and stability have been affected by nearby housing developments. Buffer zones of uncleared land should be left to preserve some segments of the scenery and vegetation near the main Mandurah Road and between areas of housing. These buffer zones would restrict housing to west of the dune ridge, and provide east-west links of vegetation between Mandurah Road and the coast. The present practice of excluding housing from a strip adjacent to the shore should be continued. It is considered that these proposals would be to the benefit of all parties, as an enhanced residential environment has greater monetary as well as aesthetic value. In principle, public access to the reserved land would be unrestricted but, in practice, some advisory body would have to undertake development and maintenance of paths to avoid dune erosion. The onus would fall initially on the relevant local authority but might later devolve on a Residents Association. Important management considerations include: the provision and maintenance of pathways; the prevention of dune erosion; the involvement of local residents in the management of the dunes; and the

prohibition of active recreation activities which might disturb and inconvenience residents.

Recommendations:

- M107.1 That reserve C25043 be vested in the Shire of Mandurah.
- M107.2 That reserve C27066 be vested in the Shire of Rockingham.
- M107.3 That ways and means of protecting the area's recreational and landscape values be sought through planning procedures to be developed.

3.2 Discussion of the Recommendations

The most significant of the EPA recommendations relating to Area M107 is No. 3 above which states that planning procedures should be developed to generally protect the area's recreation and landscape values. It is noteworthy that the emphasis is on planning procedures and on recreation and landscape values. There are no specific recommendations for reservation for conservation purposes or for the protection of vegetation of flora except as part of the landscape. However, the supporting text refers to important coastal vegetation on the extensive coastal dunes of the area.

The text also refers to the various sections of Area M107 being buffer zones of uncleared land which are intended to preserve some segments of the local scenery and vegetation. Public access to these buffer zones was intended to be unrestricted but only for passive recreation purposes.

It would appear therefore, that the primary intended purpose of Area M107 was to preserve small areas of landscape or vegetation within a future urban corridor principally for planning reasons.

It was suggested that housing should be restricted to the west of the ridgeline which parallels Mandurah Road as a landscape protection measure. This has not occurred, however, as Special Rural subdivision has been approved in those sections of Area M107 near Golden Bay and Madora. Development will, however, include vegetation retention designed to minimise the impact on landscape values. Near Singleton there is more opportunity for concealment of houses in the Special Rural area due to variable topography. At Madora also a house has recently been constructed on the ridgeline on a residential block of the Madora townsite and in a prominent location where it is visible from Mandurah Road.

4. PLANNING PROPOSALS FOR THE AREA

4.1 Current Zoning

The northern section of Area M107 is within the Perth Metropolitan Region and the City of Rockingham. The southern section is in the City of Mandurah.

Current planning of the South-West Corridor of the Perth Metropolitan Region currently extends to Mandurah so effectively Area M107 and the adjacent landholdings can be considered to be part of the South-West Corridor.

The Metropolitan Region Scheme of 1963 showed the northern section of Area M107 and adjacent landholdings as Rural notwithstanding the subdivision and housing development which was taking place at Golden Bay and Singleton. This situation was corrected by the Omnibus Amendment to the Region Scheme which was gazetted in November 1975 and which zoned the existing sub-divided area Urban.

In 1974, TS Martin & Associates completed the South-West Corridor Study and recommended Urban zoning generally south of Dampier Drive at Golden Bay. The Metropolitan Region Planning Authority (MRPA) reviewed these recommendations and published "A Planning Strategy for the South-West Corridor" in April 1980. This proposed a belt of urban land south of Port Kennedy to Mandurah including on the lateral west-east sections of Area M107.

Amendment 310/33 to the Metropolitan Region Scheme (MRS) rezoned land between Secret Harbour to Singleton (including the west-east components of Area M107 at these locations) from Rural to Urban Deferred and was gazetted on 8 May 1981. Those parts of Area M107 adjacent to Mandurah Road near Golden Bay and Singleton remained in Rural zoning in 1981 but subsequently were rezoned to Special Rural and have been subdivided.

At Madora all of the land surrounding the existing townsite is zoned Rural including all of those parts of Area M107 which are in the City of Mandurah. However, the Peel Regional Plan (July 1990) shows the Rural area to be future Urban land with the exception of the System 6 Area which is shown for Rural Conservation and Rural Residential Use.

An area along the entire coastline from Golden Bay to Madora is zoned for Parks and Recreation and this includes small sections of each of the west-east lateral sections of Area M107.

4.2 Regional Planning Considerations

The System 6 Study Report states that one of the objectives of Area M107 is to provide buffer strips between the urban cells at Golden Bay, Singleton and Madora. This objective is contrary to those of planning studies which have generally recommended linking the three townships as a continuous urban area. The planning perspective is

based on consideration of infrastructure costs and the integration of other community services including a road network, schools and recreation facilities.

More recently, the DPUD has indicated concern over the relatively small amount of residential land potentially available in the South-West Corridor and the implications that this will have for the provision of a cost effective public transport system. The lack of residential land arises from a significant proposed allocation of land in the South-West Corridor for Parks and Recreation purposes (including an area of Regional Open Space at Port Kennedy, reservation at the Stakehill Suite of wetlands and the establishment of Paganoni's Reserve) and for Special Rural purposes (such as Area M107 adjacent to Mandurah Road at Golden Bay and Singleton). The System 6 Study recommendations were made at the time when most of this regional allocation of land for Parks and Recreation was not being considered.

4.3 Current Status/Ownership

System 6 Area M107 has multiple ownership as follows:

- o Golden Bay - H&B Developments Pty Ltd owns most of the land to the north and east of the existing township of Golden Bay including most of the northern lateral wedge section of Area M107. However, the easternmost section of the lateral wedge and all of the sections adjacent to Mandurah Road near Golden Bay has been subdivided for Special Rural purposes and is in multiple small lot ownership.
- o Singleton - Temwood Holdings Pty Ltd have an option to purchase land immediately to the north of the existing township of Singleton. This includes the lateral wedge section of Area M107 at this location. The section of Area M107 adjacent to Mandurah Road near Singleton has been subdivided into Special Rural lots and is in multiple ownership.
- o Madora - all of the land surrounding the existing township of Madora including all of Area M107 in this location is owned by HB & JN Perry Pty Ltd.

4.4 Future Ownership

If System 6 Area M107 is to be retained exclusively for recreation and landscape protection purposes as suggested by the EPA recommendations, then it will eventually have to be acquired or restrictions will have to be placed on private use. The opportunity to achieve public ownership of the Mandurah Road sections of Area M107 near Golden Bay and Singleton has passed as these sections have been subdivided into Special Rural blocks.

Acquisition of the remaining sections would presumably have to be by purchase (probably by DPUD with funds from the Metropolitan Region Improvement Fund) or by designating the sections Public Open Space in development proposals.

The official attitude of DPUD to purchasing these sections is not known. However, officers of DPUD have stated to Alan Tingay & Associates that acquisition would have a very low priority in the Metropolitan Region and South-West Corridor due to the number and size of other very important areas which the Department believes are necessary to acquire for Regional Open Space and conservation purposes (e.g. Paganoni's Reserve and the Stakehill Suite of Wetlands). Various officers of DPUD have also stated that it would be preferable to allow residential development on all of Area M107 for the purpose of urban consolidation in the South-West Corridor.

The designation of those sections of Area M107 in the City of Rockingham as Open Space (apart from the two Special Rural sections) would also appear to present problems. The City currently requires major landowners such as H&B Developments Pty Ltd at Golden Bay and Temwood Holdings Pty Ltd at Singleton to allocate approximately 10% of their landholdings to Open Space in any development proposal. This Open Space is considered to be necessary primarily for playing fields and other developed community facilities. Such facilities would be incompatible with the objective of protecting the System 6 Area and therefore that area would either have to be additional Open Space or the requirement for community facilities would have to be significantly reduced. If the System 6 Area was additional Open Space then the City would be expected to compensate the owners accordingly. The City of Rockingham, however, is opposed to such acquisition and believes that the west-east sections of Area M107 within the City's boundaries should be developed for residential purposes.

The position of the City of Mandurah with respect to acquisition of those sections of Area M107 at Madora is not known.

The three owners of coastal property at Golden Bay, Singleton and Madora are also required to allocate relatively large areas of land as Regional Open Space for the normal Coastal Reserve in addition to the usual Open Space requirements for community needs.

5. ENVIRONMENTAL FEATURES

5.1 Physical Features

System 6 Area M107 comprises various types of Quindalup Dunes associated with the Rockingham-Becher Plain. The major dune sections of the area from the coast inland are as follows:

- o a relatively recent beach-ridge plain which begins immediately behind the present beach along the entire length of the coast,
- o irregular relatively tall chaot dunes which are located behind the beach-ridge plain at Golden Bay and Singleton,
- o an older beach-ridge plain (the Rockingham-Becher Plain) which is the major section of the lateral wedges, and which is bounded to the east by,
- o tall fretted parabolic dunes which terminate just to the west of Mandurah Road.

At Singleton and Madora there is also a further beach ridge plain to the east of the tall parabolic dunes which extends to Mandurah Road. This plain is part of the Spearwood Dune System which comprises the Tamala Limestone geological unit. A large number of small limestone rocks occur on the surface of this plain.

Areas of Tamala Limestone also occur within the tall parabolic dune system at Golden Bay. This reflects the fact that the dune system is superimposed onto a Spearwood Dune ridgeline.

5.2 Coastal Processes

The recent beach ridge dune system behind the present beach is apparently being actively formed by coastal processes along this coastline. Information obtained from Public Works Department plans indicate that the coastline north of Golden Bay has expanded (accreted) westwards by over 100m in the 37 years between 1942 and 1979. This means that the coastal reserve in the area is likely to expand westwards in the future and that the residential areas will become gradually more distant from the beach.

5.3 Wetlands

Several small examples of the Peelhurst Suite of wetlands occur at Golden Bay in a linear depression approximately 200 to 300m from the coast.

5.4 Vegetation

The vegetation of Area M107 closely corresponds with the major geomorphic units (i.e. landforms).

The recent beach-ridge dunes along the coastline support a narrow band of *Spinifex hirsutus* Grassland immediately behind the beach and further inland, various heath and shrubland associations usually dominated by *Olearia axillaris*. The adjacent high relief chaot dunes support either an *Acacia rostellifera* Closed Scrub or a *Spyridium globulosum* Closed Scrub.

The older beach-ridge dunes of the Rockingham-Becher Plain support a mosaic shrubland dominated by *Jacksonia furcellata*, *Spyridium globulosum*, *Acacia saligna* and *Olearia axillaris*.

The tall parabolic Quindalup Dunes at Golden Bay support a vegetation which is similar to the high relief chaot dunes closer to the coast with the dominance of *Acacia rostellifera* over a large part. Amongst this vegetation are areas of *Melaleuca acerosa* Open Heathland. The road component of Area M107 at Golden Bay supports a relatively large tract of Tuart Woodland (*Eucalyptus gomphocephala*).

At Singleton, the tall parabolic dunes support mostly *Melaleuca acerosa* Open Heathland with relatively small areas of *Acacia rostellifera*.

At Madora, these dunes support *Melaleuca acerosa* Open Heathland in the northern section and *Jacksonia furcellata*, *Acacia saligna* complex to the south of the entrance road.

The Tamala Limestone beach-ridge plain at the foot of the tall Quindalup Dunes adjacent to Mandurah Road at Singleton and Madora supports an *Allocasuarina humilis* Heathland.

The vegetation on the lateral wedge component of Area M107 at Golden Bay and Singleton is generally in good condition. The vegetation of the road components near Golden Bay and Singleton are also generally in good condition.

The vegetation of Madora ranges from good condition to poor. The area is currently being grazed by cattle which adversely affect areas of native vegetation by grazing, trampling, introduction and spread of weeds and nutrient enrichment. The most affected areas include the Rockingham-Becher Plain and the limestone areas adjacent to Mandurah Road. Frequent burning to encourage new shoots for grazing has also caused further degradation and weed invasion.

6. MANAGEMENT CONSIDERATIONS

If Area M107 is to fulfil a recreation and landscape potential into the future, there will be an increasing need for active management to protect the natural features of the area.

To some extent this has been achieved by the Special Rural subdivisions in the sections of Area M107 adjacent to Mandurah Road near Golden Bay and Singleton. The City of Rockingham has imposed various development conditions on the Lot owners in these subdivisions and these include a degree of tree and other vegetation retention and some restrictions on the location of building envelopes and roads.

In the other sections of Area M107 there is currently no active management for environmental purposes. The west-east sections of the area at Golden Bay and Singleton are not used at present, but most of the area at Madora is used for grazing cattle. There is also an active sand mining operation in the southern part of Area M107 adjacent to Mandurah Road at Madora.

Effective management of these sections of Area M107 can only occur if either the owners use of the land is controlled or if the sections are acquired for Open Space (see Section 4.4). If the west-east sections of Area M107 become Open Space, however, it is possible that there would be considerable difficulty in achieving effective management given that there is likely to be residential development immediately adjacent to both sides of these narrow strips.

These west-east sections contain a cross-section of the landforms of the Rockingham-Becher Plain from west to east. However, each of these landforms is a component of a larger geomorphic unit which is aligned north-south, i.e. in the opposite direction to the alignment of Area M107. The configuration of the west-east sections of Area M107 therefore is contradictory to reserve allocation principles which recommend that boundaries be defined according to prominent environmental features in order to avoid continuing management difficulties. This difference in alignment means that modification of the landforms by development immediately adjacent to Area M107 is likely to complicate protection of the landforms within the area. This is particularly the case for the relatively tall Quindalup Dunes in the western part of the east-west sections at Golden Bay and Singleton and for the tall parabolic dunes in the eastern part of the linear section at Golden Bay where the adjacent residential development will involve significant earthworks.

In addition, in order to achieve protection of the vegetation within these linear sections, it would almost certainly be necessary to fence the areas and to permit only limited access on established pathways particularly as the landforms are prone to erosion and the vegetation can be easily damaged. It will also be necessary to provide a firebreak around the perimeter of each of these sections. There will also be applications for road reserves across these sections in order to link the suburbs of Secret Harbour, Golden Bay and Singleton and for easements for sewage and water pipelines, and electricity. If roads and services are not permitted to be located across these areas then the development costs are likely to be prohibitive and there will be significant constraints to

the sharing of community facilities between the various populations centres. These facilities include shopping centres, schools, playing fields, etc.

It would appear that the section of Area M107 adjacent to Mandurah Road at Madora is the only section which is both sufficiently large and in an appropriate location for reasonably straightforward management if it were to be acquired for Open Space purposes. This area could also be managed through appropriate controls on development as has occurred in the sections to the north.

7. OPTIONS FOR FUTURE STATUS OF AREA M107 - MANDURAH ROAD SECTIONS

7.1 Sections Near Golden Bay and Singleton

The future status of those sections of Area M107 adjacent to Mandurah Road near Golden Bay and Singleton appears to have been determined by the relatively recent approval of special rural subdivisions at both locations. Effectively the subdivisions remove the potential for these two sections to be added to the public estate and suggests that there is really no, or at best very limited, scope for using these areas for recreation purposes. With due care by the individual land owners and some regulation by the City of Rockingham, however, these sections will continue to have landscape values. These values are a parkland estate view of Tuart Woodland from Mandurah Road near Golden Bay and a view of heath covered hills (the parabolic dunes) near Singleton.

7.2 Madora Section

A range of potential future uses are possible for the Mandurah Road section of Area M107 at Madora as all of the land is in one ownership. This land may be summarised as follows:

- o retention of the section in private ownership with present use,
- o acquisition for Parks and Recreation,
- o Special Rural subdivision,
- o development for active recreation,
- o residential/recreation development, and
- o full residential development.

These options are discussed briefly below.

- i) Private ownership with continuation of present use for grazing and sand extraction. This option would mean that the greater part of the section retained its present landscape value which is of vegetated hills (parabolic Quindalup Dunes) and areas of Tamala Limestone plain adjacent to Mandurah Road. Grazing has an impact on the vegetation in this section but does not necessarily reduce the overall landscape value. As the land is zoned Rural, this use could not be prohibited and there are no management provisions for landscape protection. Sand mining in the southern part of the section is having an impact on views from a short length of Mandurah Road and this visual impact may increase with time. There is also no potential for public recreational use.

In practical terms, however, the owners may claim that they are being denied the opportunity to develop the land for more worthwhile purposes. In this case the owners could reasonably request that the land be purchased for Parks and Recreation purposes.

- ii) Acquisition for Parks and Recreation. This option would provide for the retention of landscape values but the question of management responsibility and other compatible usage would need to be considered. It may be that DPUD or the City of Mandurah would be willing to have management responsibility. If this is not the case, however, there will be little benefit in acquisition as the reserve would be liable to deteriorate over time with increasing population pressures from surrounding developments.

In terms of other uses, we suggest that it is unlikely that there would ever be significant demand for passive recreation in the area in the sense intended by the System 6 Study Report (i.e. pathways only) even if such facilities were developed. There could be some use by Madora residents but the principal focus for recreation including walking in this area, will always be the coastline with its extensive beach. Similarly it seems unlikely that many users of Mandurah Road would stop their vehicles to use parts in this area as an alternative to going to the coast.

- iii) Special Rural Subdivision. Special Rural Subdivision of this section of Area M107 would be compatible with the existing Special Rural zoning of the other Sections of Area M107 along Mandurah Road to the north near Singleton and Golden Bay. This option would provide an opportunity for a degree of landscape protection provided that appropriate restrictions were imposed on owners by the City of Mandurah. However, there is very little opportunity for concealing houses within the landscape over much of this section because it consists of a plain of variable width which is backed by a prominent slope to a single ridgeline which roughly parallels the alignment of Mandurah Road. The houses and roads of any special rural subdivision therefore would have to be accepted as part of the landscape. It may be possible, however, to restrict housing on the prominent slope and to site it mainly on the plain by an appropriate Special Rural subdivision plan which specified the location of building envelopes. The houses could also be obscured by strategic tree planting along Mandurah Road.

This option would not provide for any recreation potential that the area may have.

- iv) Active recreation. The amount of flat land adjacent to Mandurah Road in this section of Area M107 provides the possibility of development for recreational use by retaining the prominent slope as an undeveloped background. The most appropriate recreation activity would appear to be a golf course.

This option obviously would enhance the recreational use of the area as there is a strong demand in all areas of Perth for golf facilities. A golf course would also complement the existing recreational potential at Madora which is focused on beach and ocean activities. It would also provide for the retention of landscape values albeit within a "developed" context and would provide for ongoing management.

- v) Residential/recreation development. This option is similar to (iv) above except that Special Residential development would be allowed on the slope of the ridgeline behind the golf course. The "natural" landscape values would be less than with Option (iv) but the recreational values would be similar. The financial return from the development (and therefore the incentive to finance the development) however, would be greater if some residential development was permitted.
- vi) Full residential development. This option would require a re-evaluation of this section of Area M107 by the EPA on the basis that residential development is more appropriate in the present planning context of the South-West Corridor than is the retention of the landscape in its present form. It has been suggested in Section 4.4 of this discussion paper that such a re-evaluation may be appropriate given the limited availability of future residential land in the South-West Corridor and the significant allocation of land to Parks and Recreation purposes.

If residential development were allowed, Madora would become the northern limit of Mandurah in a visual sense, as further north the land adjacent to Mandurah Road would continue to be Special Rural.

This option potentially would provide the maximum financial return to the owners.

8. OPTIONS FOR FUTURE STATUS OF THE WEST-EAST SECTIONS OF AREA M107

According to the System 6 Study Report, the west-east sections of Area M107 could provide vegetated buffer strips between the coastal residential centres of Madora, Singleton, Golden Bay and Secret Harbour. It is possible that the EPA also may have considered that the strips would provide a recreation link by a system of pathways from the coast to the Mandurah Road sections of Area M107 and vice versa although this was not actually stated in the System 6 Study Report.

In this paper it has been suggested, however, that if the objectives of the EPA are to be achieved, a number of difficult questions relating to acquisition, integration with adjacent development, easements across the sections, and future management will need to be resolved. A recreational link is also no longer a realistic option at Golden Bay and Singleton due to the Special Rural subdivisions in the Mandurah Road sections of Area M107 at these locations.

It has been suggested also that the east-west sections of Area M107 pose particular difficulties for integration of services and other facilities for the various coastal residential centres and would incur significant cost penalties and disincentives for the developers of adjacent land. At Singleton and Madora the west-east sections completely bisect the current property holdings and make it virtually impossible for the individual owners to integrate any future development.

Alternatives to retention of these sections of Area M107 may be summarised as follows:

- o for residential development except for those sections which coincide with the normal Coastal Reserve required by DPUD,
- o residential development but with other concessions to landscape protection and vegetation retention elsewhere, for example the expansion of the Coastal Reserve to an area larger than that which would normally be required, and
- o partial residential development and partial retention of the System 6 Area for landscape protection and vegetation retention.

These alternatives are discussed below.

- i) Residential development - If the EPA were to agree to residential development of the west-east sections of Area M107 at Golden Bay, Singleton and Madora they would be in agreement with current planning priorities for these areas. This agreement obviously would have to be based on a decision that contemporary planning requirements are more important than the values identified by the System 6 Study Report. Such a decision could be made in the context of regional planning and the allocation of areas for Parks and Recreation. Therefore no additional allocation of land for Open Space would occur other than what is normally required by planning authorities.

This option would mean that the townships of Secret Harbour, Golden Bay, Singleton and Madora would eventually coalesce as a coastal residential cell. This cell would be bounded to the north by Regional Open Space at Port Kennedy, to the west by a normal Coastal Reserve, to the east by a Special Rural land adjacent to Mandurah Road (at Golden Bay and Singleton), and would have only a narrow connection to the coastal parts of the City of Mandurah.

While there would be no buffer zones within this residential cell, typical landforms and the vegetation of the Rockingham-Becher Plain would be protected in the proposed Port Kennedy Regional Open Space, the Coastal Reserve and the Special Rural areas such as land adjacent to the Coastal Reserve.

- ii) Residential development with other concessions to landscape protection and vegetation retention - This option involves approval of residential use for the System 6 Area but would provide for the protection of other areas with identified landscape or vegetation values.

The selection of Area M107 does not appear to have been based on any systematic survey of the environmental values of the area. As a consequence, Area M107 does not provide for the protection of other sites which may have environmental value. At Golden Bay there would be value in expanding the width of the Coastal Reserve so that it included examples of the Peelhurst Suite of Wetlands. There is little potential for this at Golden Bay if Area M107 is also allocated for Open Space in addition to the usual requirements for Open Space for community facilities.

At Singleton, there are no landscape features of vegetation with identified significant values which may provide an alternative to the west-east section of Area M107. However, there would be benefit in establishing a relatively wide Coastal Reserve at this location so that the eastern boundary of that reserve would coincide with the limit of the recent beach-ridge plain behind the beach. Such a reserve, on average would, be from 150 to 200m wide instead of the conventional 100m.

At Madora, the owners could potentially provide concessions through Open Space in the Mandurah Road section of Area M107 or through additions to the Coastal Reserve.

- iii) Partial residential development and partial retention - Certain of the landscape features in vegetation in the east-west sections of Area M107 could be retained by partial allocation of those sections to Open Space. In effect this is similar to Option (ii) above except that the areas retained are not alternatives to the System 6 Area but are parts of that area. We suggest, however, that there is little logic in this approach unless the retained parts of the System 6 Area have particular significant values.

9. PREFERRED POSITION OF THE OWNERS

The views of the owners of the Special Rural blocks near Golden Bay and Singleton to the System 6 proposals are not known. The preferred positions of the other owners of land affected by Area M107 are as follows:

- o H&B Developments Pty Ltd (owners of part of the west-east section of Area M107 at Golden Bay) - would prefer approval to develop the section of Area M107 for residential purposes so as to enable full integration of services with those at Secret Harbour and thereby to optimise return on costs. In return for this the owners are prepared, however, to allocate Open Space for landscape purposes at Mandurah Hill and to significantly increase the width of the Coastal Reserve. This potential arrangement has been discussed with DPUD and the City of Rockingham which has agreed in principle.
- o Temwood Holdings Pty Ltd (option to purchase the west-east section of Area M107 and surrounding land at Singleton) - the System 6 Area divides the Singleton property and makes it very difficult for adjacent areas to be developed. The owners would therefore prefer to receive approval for development of this section of Area M107. They are prepared to allocate a considerably wider Coastal Reserve as an alternative.
- o HB & JN Perry Pty Ltd (owners of the two east-west sections and the Mandurah Road section of Area M107 at Madora) - would prefer approval to develop the east-west sections for residential purposes. They would prefer to develop the Mandurah Road section for either Special Rural, golf course, golf course/residential, or totally for residential purposes but would accept acquisition for Parks and Recreation provided that this occurred in the near future.

10. CONCLUSIONS

It is not the purpose of this discussion paper to present conclusions as to the best future use for System 6 Area M107. That decision rests with the EPA. The discussion presented, however, points out that Special Rural use of those sections of Area M107 adjacent to Mandurah Road near Golden Bay and Singleton, has been approved with the consent of the EPA subject to EPA advice regarding the maintenance of landscape values. It would therefore seem appropriate to consider allowing a similar use of the section of Area M107 adjacent to Mandurah Road at Madora. However, in this case a better result in terms of landscape protection and vegetation retention may potentially be achieved through approval of a golf course development or a golf course/residential development.

It has also been suggested that the west-east sections of Area M107 at Golden Bay, Singleton and Madora all present major difficulties for residential development in the coastal strip south of Port Kennedy to Mandurah. It could be maintained that these sections or buffer zones are no longer appropriate in the context of contemporary planning for the South-West Corridor. If the EPA were to support these suggestions the areas allocated for landscape protection and vegetation retention at Golden Bay, Singleton and Madora in exchange for development of the System 6 Area M107 would be as follows:

- o an expanded Coastal Reserve along the entire length of the coastline,
- o a Special Rural area along the length of Mandurah Road with potentially a golf course and perhaps some limited residential development at Madora, and
- o some discrete areas of Open Space for conservation purposes elsewhere in the region.

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