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City of Geraldton-Greenough Town Planning Scheme No. 1A Amendment 4 – Brand Highway, Cape Burney

City of Geraldton-Greenough

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

**Environmental Protection Authority
Perth, Western Australia
Report 1326
May 2009**

Environmental Impact Assessment Process Timeline for Amendment 4

Date	Progress stages	Time (weeks)
13 April 2005	Level of Assessment set	2
21 June 2005	Instructions issued	10
5 January 2009	Environmental Review Document Released for Public Comment	184
16 February 2009	Public Comment Period Closed	6
31 March 2009	Final Responsible Authority response to the issues raised	6
25 May 2009	EPA report to the Minister for the Environment	8

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Assessment No. 1561

Summary and recommendations

The City of Geraldton-Greenough Town Planning Scheme (TPS) No. 1A Amendment 4 proposes to rezone Lots 1945, 5843, 1268, 1358, 1, 1925, 2453, 4201, 6852, 708, 3, 4200, 4201, Victoria Location 11939, and the portion of Lot 2466 contained within TPS 1A from numerous local scheme reserves ('Dune Preservation', 'Parks and Recreation' and 'Public Use') and zones ('Residential', 'Residential Development', 'Resort Development', 'Commercial' and 'General Farming') to 'Development' zone.

The location of the amendment is shown in Figure 1.

This report provides the Environmental Protection Authority's (EPA's) advice to the Minister for Environment on the environmental factors relevant to Amendment 4. The EPA also provides advice on other environmental matters related to Amendment 4 in Section 4 Other Advice.

Section 48D of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for Environment on the key environmental factors for the proposed scheme amendment and on the conditions and procedures to which the proposed scheme amendment should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

The EPA is also required to have regard for the principles set out in section 4A of the *Environmental Protection Act 1986*.

Key environmental factors and principles

A number of environmental factors were considered by the EPA in the assessment. It is the EPA's opinion that the following are the key environmental factors for the proposed scheme amendment, which require detailed evaluation in the report:

- (a) Coastal Processes;
- (b) Foreshore Reserve; and
- (c) Native Vegetation.

The EPA has also provided advice in relation to Aboriginal Heritage and other factors in Section 4.

The following principles were considered by the EPA in relation to the proposed scheme amendment:

- (a) The precautionary principle;
- (b) The principles of conservation of biological diversity and ecological integrity; and
- (c) The principle of intergenerational equity.

Conclusion

The area of the amendment is bound by the Greenough River to the south and abuts the coast. It contains cleared farmland, remnant native vegetation and the Southgate Dune, a large mobile dune.

The Southgate Dune is currently acting as a sediment source to the beaches north of the development, outside of the amendment area. This is a significant issue as stabilisation of the Southgate Dunes, as part of the proposed development, will stop or significantly reduce this

sand feed and may result in erosion of the beaches to the north. The EPA is concerned that there is a considerable variation in the estimates of the contribution of sand to littoral drift from the Southgate Dune. The Environmental Review (ER) document estimates the contribution at 10 000 cubic metres per year (m^3/yr) while earlier estimates provide by the Department for Planning and Infrastructure (DPI) indicate 34 000 m^3/yr . The EPA has concluded that there is considerable uncertainty about the knowledge of the contribution of sand from the Southgate dune and it has not been demonstrated with sufficient confidence that erosion of the beaches to the north of the development area will not occur.

The DPI has advised the EPA that the coastal setback assessment completed for the ER was on balance generally considered reasonable to allow for protection of the coast under current policy. However, the assessment was not undertaken in accordance with State Coastal Planning Policy (SPP) 2.6 (Western Australian Planning Commission, 2003). The EPA is aware that when undertaking the coastal setback assessment, the sea level rise predictions were undertaken using the current sea level rise figures from SPP 2.6 which recommends a possible sea level rise in the coming 100 years of 0.38 metres (m), which the EPA understands is under review. The EPA expects that coastal setbacks and coastal processes should have regard for alternate predictions of sea level rise in consultation with the DPI. The EPA has concluded that there is not sufficient confidence in the calculation of coastal setbacks for the Foreshore Reserve which would allow for protection of the coast from possible sea level rise over the coming years.

The potential impacts on poorly represented vegetation associations within the subject area have not been adequately addressed in the ER. The removal of vegetation from the subject area through development has the potential to fragment this remnant vegetation further. The ER was deficient in identifying regionally significant vegetation and it has not been demonstrated which areas of vegetation are to be retained nor have mechanisms been established to show how these areas will be protected into the future.

In summary, although it is argued that development would address the stabilisation of the dune system, it has not been demonstrated that this would not have significant consequential impacts outside of the amendment area, in particular on the beaches to the north. Until such time as further information on the contribution of the Southgate Dune to coastal processes is available and there is confidence in the predictions regarding the stability of the coast and sea level rise predictions the EPA has recommended against the development of the dune system. The EPA would also expect that any subsequent amendment would address reservation of regionally significant vegetation.

The EPA has also provided advice in relation to Aboriginal Heritage, and the need for an interim strategy to stabilise the dune system to protect the Brand Highway, the residences likely to be impacted by windblown sand, and native vegetation that is being smothered by the northward movement of the dune. The EPA would also encourage coastal studies being undertaken at a regional scale to provide an understanding of the contribution of the dune system to coastal processes and coastal dynamics in this region.

The EPA would be prepared to support an amendment being initiated for existing cleared areas subject to it meeting environmental and planning requirements.

The EPA has concluded that Amendment 4 to the City of Geraldton-Greenough TPS No. 1A as proposed is environmentally unacceptable as it has not been demonstrated that it can be managed to meet the EPA's objectives in relation to Coastal Processes, Foreshore Reserve and Native Vegetation.

Recommendations

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister considers the report on the key environmental factors and principles as set out in Section 3.
2. That the Minister notes that the EPA has concluded that the proposed scheme amendment cannot meet the EPA's environmental objectives for Coastal Processes, Foreshore Reserve and Native Vegetation.
3. That the Minister notes that the EPA has not included in this report "conditions and procedures to which the proposed scheme amendment should be subject, if implemented" because the EPA holds the view that the proposed scheme amendment should not be implemented.
4. That the Minister not issue a statement that the proposed scheme amendment may be implemented.
5. That the Minister notes the EPA's Other Advice presented in Section 4 in relation to Aboriginal Heritage and the need for an interim strategy to stabilise the dune system to protect the Brand Highway, the residences likely to be impacted by windblown sand and native vegetation that is being smothered by the northward movement of the dune. The EPA has included advice that it would encourage coastal studies being undertaken at a regional scale to provide an understanding of the contribution of the dune system to coastal processes and coastal dynamics in this region. The EPA has also included additional advice that it would support an amendment being initiated for cleared areas subject to it meeting environmental and planning requirements.

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1. Introduction

The City of Geraldton-Greenough proposes to rezone Lots 1945, 5843, 1268, 1358, 1, 1925, 2453, 4201, 6852, 708, 3, 4200, 4201, Victoria Location 11939, and the portion of Lot 2466 contained within Town Planning Scheme (TPS) No. 1A from numerous local scheme reserves ('Dune Preservation', 'Parks and Recreation' and 'Public Use') and zones ('Residential', 'Residential Development', 'Resort Development', 'Commercial' and 'General Farming') to 'Development' zone (Shire of Greenough, 2005).

Amendment 4 to the City of Geraldton TPS No. 1A was referred to the Environmental Protection Authority (EPA) by the then Shire of Greenough on 29 March 2005. On 13 April 2005 the EPA set level of assessment as 'Scheme Assessed – Environmental Review'. The Environmental Review Instructions were issued by the EPA on 27 May 2005. No appeals were received, and these Instructions were then finalised on 21 June 2005. Following the finalisation of the Instructions, the landowners' environmental consultant prepared an Environmental Review (ER) document, which was advertised concurrently with the Amendment from 5 January 2009 to 16 February 2009.

The area of the amendment is bound by the Greenough River to the South and abuts the coast. It contains cleared farmland, remnant native vegetation and the Southgate Dune a large mobile dune (Figure 1). The area also contains registered Aboriginal heritage sites.

In compiling this report, the EPA has considered the key environmental factors and principles associated with the proposed scheme amendment, issues raised in public submissions, specialist advice from the Department of Environment and Conservation (DEC) and other government agencies, the Responsible Authority's response to submissions and the EPA's own expertise.

Further details of the proposed scheme amendment are presented in Section 2 of this report while Section 3 discusses key environmental factors and principles for the proposed scheme amendment. Section 4 provides the EPA's Other Advice, Section 5 presents the EPA's Conclusions and Section 6, the EPA's Recommendations.

A list of people and organisations that made submissions is included in Appendix 1. References are listed in Appendix 2, and the identification of key environmental factors and principles are provided in Appendix 3.

Appendix 4 contains a summary of the public submissions and Appendix 5, the response to submissions on behalf of the Responsible Authority. The summary of public submissions and the Responsible Authority's responses is included as a matter of information only and does not form part of the EPA's report and recommendations. The EPA has considered issues raised in public submissions when identifying and assessing key environmental factors and principles.

2. The proposed scheme amendment

Lots 1945, 5843, 1268, 1358 1, 1925, 2453, 4201, 6852, 708, 3, 4200, 4201, Victoria Location 11939, and the portion of Lot 2466 contained within TPS 1A, the subject of Amendment 4 to the City of Geraldton Greenough's TPS No. 1A, are located approximately 6 kilometres (km) south of Geraldton. They are bounded by Brand Highway to the east, the Greenough River to the south and the Indian Ocean to the west in the locality of Cape Burney

(Figure 1). The amendment area, shown in Figure 1 has an area of approximately 779 hectares (ha).

The north of the site is affected by a large parabolic dune referred to as Southgate Dune which has been moving progressively north-east towards Geraldton (Figure 2). Southgate Dune has an area of approximately 200 ha, the majority of which is located on Victoria Location 11939.

The south of the site has been largely cleared for grazing and agricultural purposes. Areas of native vegetation in good condition are found on the lots.

The proposed zoning for Amendment 4 is 'Development' zone. In accordance with the City of Geraldton-Greenough TPS 1A, this zoning would permit the subject land to be subdivided into land uses for a residential estate (residential, commercial, community and reserves). This zoning requires the subsequent preparation of a Subdivision Guide Plan (SGP) showing lot layout, reserves and roads. A draft Subdivision Guide Plan has been prepared which indicates the extent of development proposed through the amendment. The EPA's consideration of the amendment has had regard for the draft SGP noting that it requires subsequent approval and is subject to modification.

The draft SGP (Figure 3) proposes to subdivide the lots to allow for approximately 6600 dwellings, six schools, a district centre, tourist nodes, and the retention of vegetation in public open space and foreshore reserves (Chappell Lambert Everett, 2008).

The main characteristics of the proposed scheme amendment are summarised in Table 1 below. A detailed description of the proposed scheme amendment is provided in Section 3 of the ER (ATA Environmental, 2008).

Table 1 - Key characteristics of proposed scheme amendment

Element	Description
Rezoning various lots to 'Development' zone	Draft SGP proposes 6600 dwellings, six schools, a district centre, tourist nodes, and the retention of vegetation in public open space and foreshore reserves.
Stabilisation of Southgate Dune	Re-grading of the subject land to final development levels, spreading of loamy soils across the site and seeding with cereal rye. Long term stabilisation will be through urbanisation of the subject land.
Preserve native vegetation	Preparation for a Vegetation Management Plan at the Structure Planning Stage to include rehabilitation of degraded areas and the provision of Public Open Space.
Minimise coastal impacts	Draft SGP proposes a Foreshore Reserve. Provision for a Foreshore Management Plan at the Structure Planning Stage to include coastal rehabilitation in degraded areas.

The potential impacts of the proposed scheme amendment initially predicted by the City of Geraldton-Greenough and their proposed management are summarised in Table 1 of the ER document (ATA Environmental, 2008).

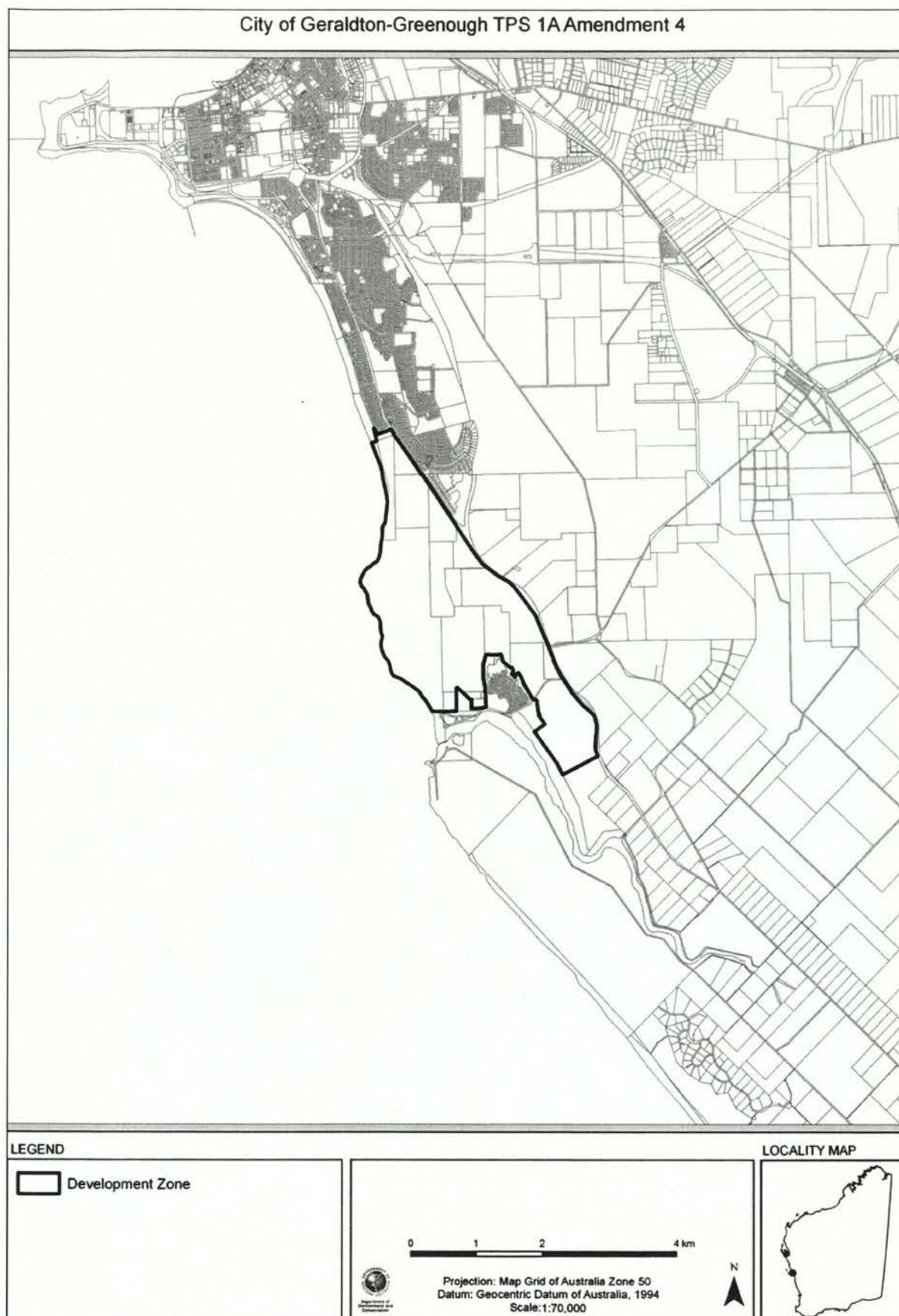


Figure 1: Location of Amendment 4 to the City of Geraldton-Greenough TPS 1A.

City of Geraldton-Greenough TPS 1A Amendment 4



LEGEND

 Development Zone

Image Source: Geraldton (2006)

0 0.75 1.5 3 km



Projection: Map Grid of Australia Zone 50
Datum: Geocentric Datum of Australia, 1994
Scale: 1:40,000



LOCALITY MAP



Figure 2: Southgate Dune within the Amendment area.

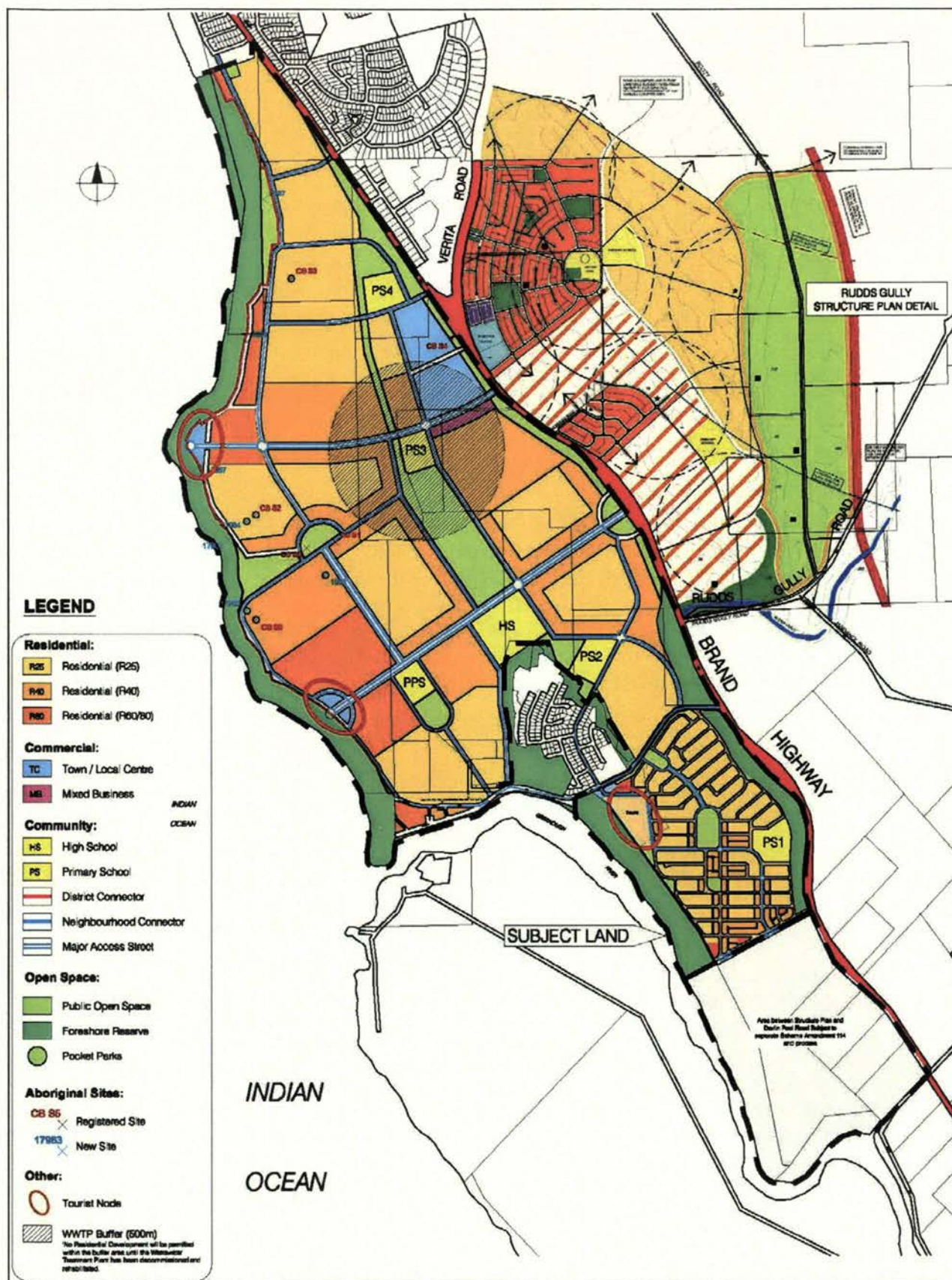


Figure 3: Proposed Draft Subdivision Guide Plan.

3. Environmental factors and principles

3.1 Key environmental factors

Section 48D of the *Environmental Protection Act 1986* (EP Act) requires the EPA to report to the Minister for Environment on the key environmental factors for the proposed scheme amendment and the conditions and procedures to which the proposed scheme amendment should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

It is the EPA's opinion that the following are the key environmental factors for the proposed scheme amendment, which require detailed evaluation in this report:

- (a) Coastal Processes;
- (b) Foreshore Reserve; and
- (c) Native Vegetation.

The above key environmental factors were identified from the EPA's consideration and review of all environmental factors (preliminary factors) generated from the ER document and the submissions received, in conjunction with the proposed scheme amendment characteristics and alternative approvals processes which ensure that the factors will be appropriately managed. On this basis, the EPA considers that the preliminary factors and other issues raised in the submissions do not require further evaluation by the EPA. The identification process is summarised in Appendix 3.

The land subject to this proposed scheme amendment is within the area affected by the Amendment 4 to the City of Geraldton-Greenough TPS 1A.

The key environmental factors are discussed in Sections 3.2 to 3.4 of this report and are summarised in Appendix 3 Table 2.

3.2 Coastal Processes

Description

The Southgate Dune System within the Amendment area is identified as an area of bare mobile sand which forms part of the Quindalup Dune System (ATA Environmental, 2008). Spanning across Victoria Location 11939, Lot 2453 and Lot 1925, the dune is approximately 3 km long and 1.2 km wide at its widest point, covering approximately 200 ha (Figure 2). The Southgate Dune is known to be source of sand entering the marine environment and contributes, through littoral drift, to the beaches north of the amendment area. The ER describes that the Southgate Dune is contributing around 10 000 cubic metres per year (m^3/yr) of sand to the littoral drift each year. It is also estimated that the beaches north of the amendment area are accreting at around 40 000 m^3/yr . The ER describes that available data makes it difficult to predict whether the beaches to the north of the amendment would remain stable or erode if the supply of sand was removed as a result of stabilising the dune by developing it for residential and commercial land uses.

Submissions

The submissions raised the environmental values and functions of the dune system as a replenishing source of sand for the beaches north of the dune system.

Assessment

The area considered for assessment of this factor is Lots 1945, 5843, 1268, 1358, 1, 1925, 2453, 4201, 6852, 708, 3, 4200, 4201, Victoria Location 11939, and the portion of Lot 2466 contained within TPS 1A, Brand Highway, Cape Burney.

The EPA's environmental objective for this factor is to maintain ecological functions of the dune system.

The DPI advised the EPA that, as outlined in the Batavia Coast Strategy (Landvision, 2001), the Southgate Dune System is located in the larger Tarcoola Embayment sediment cell. A clear understanding of the sediment dynamics and budget within this cell, and the role of the Southgate Dune as a sediment source and sink is essential to understanding the coastal impacts of the proposed development. The ER document outlines that the beaches north of the Southgate Dune have been accreting at 40,000m³/yr. The DPI advised that it is understood that the original estimates of the contribution of sand from the Southgate Dune to the Tarcoola Embayment were undertaken by the then Department of Planning and Urban Development in 1990, identifying 34,000 m³/yr. The ER used a similar photogrammic assessment to review this estimate and determined the contribution to be between 4,000-23,000 m³/yr, with a 'most likely' estimate of 10,000 m³/yr. This 10,000 m³/yr estimate has been used in the subsequent work for the ER. It is the view of the DPI that the impact of the development on the Tarcoola Embayment sediment cell has not been adequately addressed.

The EPA notes that the Southgate Dune are currently acting as a sediment source to the beaches north of the development, outside of the amendment area. This is a significant issue as stabilisation of the Southgate Dune, as part of the proposed development, will stop or significantly reduce this sand feed and this may result in erosion of the beaches to the north. The EPA is concerned that there is such a substantial difference in the estimates of the contribution of sand to littoral drift from the Southgate Dune.

The EPA has concluded that there is considerable uncertainty about the knowledge of the contribution of sand from the Southgate Dune and it has not been demonstrated with sufficient confidence that erosion of the beaches to the north of the development area will not occur.

Summary

Having particular regard to:

- (a) the development proposed in the Environmental Review would result in stabilisation of the Southgate Dune;
- (b) the Southgate Dune is a source of sand to the Tarcoola Embayment;
- (c) there is considerable variation in the estimates of the contribution of sand from the Southgate Dune to littoral drift; and
- (d) potential offsite impacts to the northern beaches outside of the amendment area,

it is the EPA's opinion that it has not been demonstrated that the amendment can meet the EPA's objective for Coastal Processes.

3.3 Foreshore Reserve

Description

The ER describes a physical coastal processes setback line between the coast and development to allow for coastal processes naturally occurring along the coast over time. The ER included, as a technical appendix, a report describing the basis for recommending the coastal setback (M P Rogers and Associates 2006). This coastal setback is depicted as the Foreshore Reserve in the draft SGP which ranges from 176m to 74m in width and spans approximately 4.7 km of coast (Figure 3).

Submissions

Submissions raised issues regarding the adequacy of the coastal foreshore reserve.

Assessment

The area considered for assessment of this factor is Lots 1945, 5843, 1268, 1385, 1, 1925, 2453, 4201, 6852, 708, 3, 4200, 4201, Victoria Location 11939, and the portion of Lot 2466 contained within TPS 1A, Brand Highway, Cape Burney.

The EPA's environmental objective for this factor is to maintain landscape and landform integrity, ecological functions and environmental values.

The DPI has advised the EPA that the coastal setback assessment completed for the ER was on balance generally considered reasonable to allow for protection of the coast under current policy. However, the assessment was not undertaken in accordance with State Coastal Planning Policy (SPP) 2.6 (Western Australian Planning Commission, 2003). The EPA is aware that when undertaking the coastal setback assessment, the sea level rise predictions were undertaken using the current sea level rise figures from SPP 2.6 which recommends a possible sea level rise in the coming 100 years of 0.38m, which the EPA understands is under review. The EPA expects that coastal setbacks and coastal processes should have regard for alternate predictions of sea level rise in consultation with DPI.

The DPI has also advised that it would expect the Foreshore Reserve to follow a practical line rather than an alignment that so closely follows the calculated line of setback as depicted in the SGP. In effect this would result in a smoothing of the line to achieve a practical and manageable foreshore reserve boundary. The EPA notes that the adequacy of the foreshore reserve is ultimately determined by the DPI as part of subsequent implementation of the Amendment. The DPI would require, as part of this process, that it be demonstrated how the coastal setback complies with the SPP 2.6 and policy relating to sea level rise that prevails at the time of determining the coastal setback and subsequent foreshore reserve.

The EPA has concluded that there is not sufficient confidence in the calculation of coastal setbacks for the Foreshore Reserve which would allow for protection of the coast from possible sea level rise over the coming years.

Summary

Having particular regard to the:

- (a) physical Coastal Processes Setback Line provided in the Environmental Review;
- (b) Foreshore Reserve proposed in the draft Subdivision Guide Plan; and
- (c) supplementary information provided by the DPI,

it is the EPA's opinion that it has not been demonstrated that the amendment can meet the EPA's objective for Foreshore Reserve.

3.4 Native Vegetation

Description

The amendment area contains remnant vegetation.

Two vegetation associations are described in the ER as present within the amendment area, mapped by Beard (1976) as Association 129, 431. Association 129, described as 'Bare areas; drift sand' is associated with the mobile dune system. Association 431, described as 'Shrublands; *Acacia rostellifera* open scrub' is associated with the remnant vegetation present on the site.

According to the ER, the subject area contains vegetation ranging in condition from 'Degraded' to 'Very Good'.

Submissions

Submissions focused on issues regarding Geraldton losing increased amounts of coastal vegetation, and the threat that the development places on the remaining coastal vegetation. Submissions also focused on the point that there are already cleared areas within the Amendment area and Geraldton which could be utilised for development.

The DPI in consultation with DEC is currently undertaking the Geraldton Region Flora and Vegetation Survey (GRFVS). Preliminary information derived from the survey has identified a Mallee dominated community (*Eucalyptus obtusiflora* subsp. *dongarraensis*) within the Amendment area which would be impacted by development.

The DEC advised that preliminary information from the GRFVS has found remnant vegetation in the northern most area of the site which is mapped as 'Excellent' condition. The DEC also advised that there is an additional vegetation Association 371 present within the amendment area as mapped by Beard, which is described as 'Low forest; *Acacia rostellifera*'. This association was not identified in the ER. The DEC uses the Comprehensive Adequate and Representative (CAR) analysis as a means of managing lands of conservation interest. The CAR Report for 2007 calculates the pre-European extent of Association 129 as 63.57% remaining in WA, and Association 431 has 73.76%. Association 371 has 10.1% of the pre-European extent remaining.

Assessment

The area considered for assessment of this factor is Lots 1945, 5843, 1268, 1358, 1, 1925, 2453, 4201, 6852, 708, 3, 4200, 4201, Victoria Location 11939, and the portion of Lot 2466 contained within TPS 1A, Brand Highway, Cape Burney.

The EPA's environmental objective for this factor is to maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.

The ER states that representative vegetation types to be retained will be identified at the Structure Plan stage including the vegetation unit *Melaleuca huegii* / *Acacia rostellifera*. The draft SGP provides for Public Open Space (POS) but it is unknown which areas of POS will be allocated for the conservation of vegetation or for recreational purposes. The ER also estimates that there is approximately 250 ha worth of remnant vegetation in the subject area,

however it also states that 250 ha of remnant vegetation will be impacted as a result of development.

The ER failed to identify the *Eucalyptus obtusiflora* subsp. *dongarraensis* (Mallee) community which was identified as part of the GRFVS. The DEC has advised the EPA that the Mallee community has not been found to occur anywhere else in the Geraldton region. The location of this community and the extent of vegetation Association 371 is shown in Figure 4. In addition, the ER did not list all of the Beard vegetation Associations within the amendment area despite the fact that Association 371 is poorly represented with only 10.1% pre-European extent remaining in Western Australia. The DEC has advised that none of this association is protected in the conservation estate. The GRFVS also rated the condition of remnant vegetation in the northern most area of the site as 'Excellent', while it was rated as 'Very Good' in the ER.

The EPA has concluded that the potential impacts on poorly represented vegetation associations within the subject area have not been adequately addressed. The removal of vegetation from the subject area through development has the potential to fragment this remnant vegetation further. The Amendment has not demonstrated which areas of vegetation are to be retained nor has it established mechanisms to demonstrate how these areas will be protected into the future. The EPA is of the view that the areas of regionally significant vegetation should be established as part of developing the Amendment including recommending appropriate reservations. While the EPA could make recommendations regarding areas to be retained, the developable area relating to this Amendment is already in question as a result of uncertainties regarding coastal processes. It is not considered appropriate to make recommendations at this time regarding areas of vegetation to be retained until the fundamental question about the extent to which the dune can be developed is resolved. The EPA would expect any subsequent amendment to have regard for the information about regionally significant vegetation identified through the GRFVS.

Summary

Having particular regard to the:

- (a) potential impacts on poorly represented and poorly conserved vegetation associations and communities within the subject area have not been adequately addressed;
- (b) Amendment has not demonstrated which areas of vegetation are to be retained nor has it established mechanisms as to show how these areas will be protected into the future,

it is the EPA's opinion that the proposed scheme amendment, if implemented, has not demonstrated the EPA's environmental objective for Native Vegetation can be met.

3.4 Environmental principles

In preparing this report and recommendations, the EPA has had regard for the object and principles contained in s4A of the EP Act. Appendix 3 contains a summary of the EPA's consideration of the principles.

City of Geraldton - Greenough TPS 1A Amendment 4



LEGEND


 Extent of Significant Vegetation Associations Mallee Community

Image Source: Geraldton (2006)

0 250 500 1,000 m



Projection: Map Grid of Australia Zone 50
Datum: Geocentric Datum of Australia, 1994
Scale: 1:20,000



LOCALITY MAP



Figure 4: Extent of Mallee Community and Vegetation Association 371.

4. Other Advice

In addition to the above recommendations, the EPA provides the following advice on environmental matters related to the City of Geraldton-Greenough TPS No. 1A Amendment 4.

4.1 Development of cleared areas

Within the Amendment there are large areas of cleared agricultural land. The EPA supports development on cleared areas. The EPA would support an amendment being initiated for cleared areas subject to it meeting environmental and planning requirements.

4.2 Aboriginal Heritage

The submission from the Department of Indigenous Affairs (DIA) provided results of a search of the Register of Aboriginal Sites, which showed that there are 19 registered sites within the general area of Cape Burney.

The DIA stated that it is possible that there are sites which have not yet been entered on the Register of Aboriginal sites. The *Aboriginal Heritage Act 1972* protects all the Aboriginal sites in Western Australia whether they are known to the DIA or not. The EPA is aware that an archaeological survey was undertaken. However, the DIA advised that prior to any development or ground works, a suitably qualified consultant should be engaged to conduct ethnographic and archaeological surveys of the area so that no site is damaged or altered.

Such surveys should ensure that all Aboriginal interest groups are consulted so that all sites on the subject area are avoided or identified. These surveys should involve archival research, consultations and on the ground inspections. A survey should also ensure that the provisions of the *Aboriginal Heritage Act 1972* are met. In view that the EPA has concluded that the Amendment cannot be managed to be environmentally acceptable and should not be implemented, the EPA would expect this work to be done to the satisfaction of the DIA prior to any subsequent amendment being initiated.

4.3 Stabilisation of the dune system

The EPA acknowledges that the northern extension of the dune system is currently mobile and continues to present a future threat to the Brand Highway. It is also resulting in dust and wind blown sand impacts on residents. It has not been demonstrated that the current amendment can be managed to be environmentally acceptable. Notwithstanding this conclusion, active management of the Southgate Dune is still required and a strategy needs to be developed to protect the Brand Highway, the residences likely to be impacted by windblown sand and native vegetation that is being smothered by the northward movement of the dune.

4.4 Need for a regional coastal study

The EPA is not aware of any studies which have been undertaken with regards to the regional context of the Southgate Dune, and would support coastal studies being undertaken at a regional scale to provide an understanding of the contribution of the dune system to coastal processes and coastal dynamics in this region.

5. Conclusions

The area of the amendment is bound by the Greenough River to the South and abuts the coast. It contains cleared farmland, remnant native vegetation and the Southgate Dune, a large mobile dune.

The Southgate Dune is currently acting as a sediment source to the beaches north of the development, outside of the amendment area. This is a significant issue as stabilisation of the Southgate Dunes, as part of the proposed development, will stop or significantly reduce this sand feed and may result in erosion of the beaches to the north. The EPA is concerned that there is a considerable variation in the estimates of the contribution of sand to littoral drift from the Southgate Dune. The ER estimates the contribution at 10 000 cubic metres per year (m^3/yr) while earlier estimates provide by the DPI indicate 34 000 m^3/yr . The EPA has concluded that there is considerable uncertainty about the knowledge of the contribution of sand from the Southgate dune and it has not been demonstrated with sufficient confidence that erosion of the beaches to the north of the development area will not occur.

The DPI has advised the EPA that the coastal setback assessment completed for the ER was on balance generally considered reasonable to allow for protection of the coast under current policy. However, the assessment was not undertaken in accordance with State Coastal Planning Policy (SPP) 2.6 (Western Australian Planning Commission, 2003). The EPA is aware that when undertaking the coastal setback assessment, the sea level rise predictions were undertaken using the current sea level rise figures from SPP 2.6 which recommends a possible sea level rise in the coming 100 years of 0.38 metres (m), which the EPA understands is under review. The EPA expects that coastal setbacks and coastal processes should have regard for alternate predictions of sea level rise in consultation with DPI. The EPA has concluded that there is not sufficient confidence in the calculation of coastal setbacks for the Foreshore Reserve which would allow for protection of the coast from possible sea level rise over the coming years.

The potential impacts on poorly represented vegetation associations within the subject area have not been adequately addressed in the ER. The removal of vegetation from the subject area through development has the potential to fragment this remnant vegetation further. The ER was deficient in identifying regionally significant vegetation and it has not been demonstrated which areas of vegetation are to be retained nor have mechanisms been established to show how these areas will be protected into the future.

In summary, although it is argued that development would address the stabilisation of the dune system, it has not been demonstrated that this would not have significant consequential impacts outside of the amendment area, in particular on the beaches to the north. Until such time as further information on the contribution of the Southgate Dune to coastal processes is available and there is confidence in the predictions regarding the stability of the coast and sea level rise predictions the EPA has recommended against the development of the dune system. The EPA would also expect that any subsequent amendment would address reservation of regionally significant vegetation.

The EPA has also provided advice in relation to Aboriginal Heritage, and the need for an interim strategy to stabilise the dune system to protect the Brand Highway, the residences likely to be impacted by windblown sand, and native vegetation that is being smothered by the northward movement of the dune. The EPA would also encourage coastal studies being undertaken at a regional scale to provide an understanding of the contribution of the dune system to coastal processes and coastal dynamics in this region.

The EPA would be prepared to support an amendment being initiated for existing cleared areas subject to it meeting environmental and planning requirements.

The EPA has concluded that Amendment 4 to the City of Geraldton-Greenough TPS No. 1A as proposed is environmentally unacceptable as it has not been demonstrated that it can be managed to meet the EPA's objectives in relation to Coastal Processes, Foreshore Reserve and Native Vegetation.

6. Recommendations

Section 48D of the EP Act requires the EPA to report to the Minister for the Environment on the key environmental factors for the proposed scheme amendment and on the conditions and procedures to which the proposed scheme amendment should be subject, if implemented. The EPA is also required to have regard for the principles set out in section 4A of the EP Act. In addition, the EPA may make recommendations as it sees fit.

The EPA submits the following recommendations to the Minister for the Environment:

1. That the Minister considers the report on the key environmental factors and principles as set out in Section 3.
2. That the Minister notes that the EPA has concluded that the proposed scheme amendment cannot meet the EPA's environmental objectives for Coastal Processes, Foreshore Reserve and Native Vegetation.
3. That the Minister notes that the EPA has not included in this report "conditions and procedures to which the proposed scheme amendment should be subject, if implemented" because the EPA holds the view that the proposed scheme amendment should not be implemented.
4. That the Minister not issue a statement that the proposed scheme amendment may be implemented.
5. That the Minister notes the EPA's Other Advice presented in Section 4 in relation to Aboriginal Heritage and the need for an interim strategy to stabilise the dune system to protect the Brand Highway, the residences likely to be impacted by windblown sand and native vegetation that is being smothered by the northward movement of the dune. The EPA has included advice that it would encourage coastal studies being undertaken at a regional scale to provide an understanding of the contribution of the dune system to coastal processes and coastal dynamics in this region. The EPA has also included additional advice that it would support an amendment being initiated for cleared areas subject to it meeting environmental and planning requirements.