

**Urban development in System 6 recommended
areas M2 and M6, Pt Lot 2 between Marmion
Avenue and Indian Ocean, Burns Beach**

Burns Beach Property Trust

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

**Environmental Protection Authority
Perth, Western Australia
Bulletin 880
January 1998**

ISBN. 0 7309 8072 3
ISSN. 1030 - 0120

Summary and recommendations

This report is to provide the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment, about the proposal to locate urban development partly within System 6 recommended areas M2 and M6 on Pt Lot 2 between Marmion Avenue and Indian Ocean at Burns Beach. The report is based on the environmental factors relevant to the proposal.

The proponent, Burns Beach Property Trust, proposes to develop approximately 290 Ha of land, comprising the western cell of the 600 Ha Burns Beach Lot 2 division, for residential purposes. The proposal is directly adjacent to the Indian Ocean and contains vegetation associations and dune landforms of regional conservation value.

Relevant environmental factors

Although a number of environmental factors were considered by the EPA in the assessment, it is the EPA's opinion that the following are the environmental factors relevant to the proposal which require detailed evaluation in this report:

- (a) Vegetation communities - loss of conservation value of regional significance;
- (b) Terrestrial fauna - loss of habitat and fauna corridor;
- (c) Dunal systems - loss of significant landform, and;
- (d) Regional Park - retention of area for conservation purposes.

Conclusions

The EPA has concluded that the preferred proposal by Burns Beach Property Trust to locate urban development on Pt Lot 2 Burns Beach as shown in Figure 1 cannot be managed to meet the EPA's objectives. Advice from the DEP indicates that Pt Lot 2 contains regionally significant vegetation and landforms which is the best and only opportunity available to provide a diverse and representative conservation coastal area in the north-west corridor of the metropolitan area. If the proposal were modified so as to restrict development to the area not considered to be of regional significance, as shown in Figure 3, the proposal would meet EPA's objectives provided that the conditions recommended in Section 4, and set out in formal detail in Appendix 3, are imposed. The EPA has provided additional advice on Aboriginal heritage and culture.

Conditions and Procedures

In the EPA's opinion, the proposal should be subject to the following conditions (Section 4):

- (a) proposal being modified so as to protect areas of highest conservation values as identified by the DEP;
- (b) the proponent's commitments should be made enforceable; and
- (c) the proponent should be required to put an environmental management system in place;
- (d) the proponent shall prepare and implement Environmental Management Plans, to the requirements of the Environmental Protection Authority.

The plans shall address:

1. Minimising of clearing of vegetation and disposal of vegetation cleared;
2. Protection of Rare flora;

3. Protection of Rare fauna;
4. Prevention of weed spread;
5. Landform management;
6. Management of drainage;
7. Management of dust;
8. Control of noise and vibration.

The proponent shall make the Environmental Management Plans publicly available prior to commencement of earthworks.

- (e) the proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit programme prepared by the Department of Environmental Protection in consultation with the proponent.
- (f) if the proponent has not substantially commenced the development within five years then the approval to implement the proposal will lapse and be void.
- (g) changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

In addition to the conditions, the following procedure is to be implemented:

- The preparation of a revised development plan which restricts development to the area outside of that determined to be of regional conservation significance by the EPA.

Recommendations

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

1. That the Minister considers the report on the relevant environmental factors of vegetation communities, terrestrial fauna, dunal systems and the regional park.
2. That the Minister note that the preferred proposal by Burns Beach Property Trust to locate urban development on Pt Lot 2 Burns Beach cannot be managed to meet the EPA's objectives.
3. That the Minister consider the EPA's advice that, if the conditions and procedures in Section 4 of this report are put in place which confines the proposal to the area shown in Figure 3, the proposal can be managed to meet the EPA's environmental objectives.
4. That the Minister for the Environment imposes the conditions and procedures consistent with Section 4 of this report if Recommendation 3 is adopted.

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1. Introduction and background

This report is to provide the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the environmental factors relevant to the proposal by Burns Beach Property Trust to locate urban development partially within System 6 recommended areas M2 and M6 Pt Lot 2 between Marmion Avenue and the Indian Ocean, Burns Beach.

The proposal for urban development was referred to the EPA in November 1994. The EPA considered the potential impacts of the proposal and set the level of assessment at Consultative Environmental Review (CER). Appeals were upheld on the level of assessment and it was upgraded to Public Environmental Review (PER).

The PER report Proposed Residential Development of the Western Cell, Lot 2 Burns Beach, referred to here as the PER, was made available for public review between 30 October 1995 and 27 December 1995.

One hundred and forty three submissions were received by the Department of Environmental Protection (DEP). The major issues raised in the submissions were:

- impacts on the significant remnant vegetation
- impacts on fauna habitat
- loss of significant dunal systems
- loss of wildlife corridor from Neerabup National Park to the coast
- continuation of urban sprawl
- loss of areas identified in System 6

In compiling this report, the EPA has considered:

- (a) information provided in the PER and further information submitted at DEP's request;
- (b) issues raised by the public and government agencies in their submissions on the PER;
- (c) the proponent's response to submissions; and
- (d) information provided by the DEP as well as other expert agencies.

Further description of the proposal is presented in Section 2 of this report. Section 3 discusses environmental factors relevant to the proposal. Conditions and procedures to which the proposal should be subject if the Minister determines it may be implemented are set out in Section 4. Section 5 presents the EPA's conclusion and Section 6 the EPA's recommendations.

Appendix 1 contains a list of people and organisations that made submissions. Published information is listed in Appendix 2 and Recommended Environmental Conditions and Proponent Commitments are included as Appendix 3.

The DEP's summary of submissions and the proponent's response to those submissions has been published separately and are available in conjunction with this report.

2. The proposal

The scope of this environmental impact assessment is limited to the proposal to undertake urban development on the western cell of Pt Lot 2 Burns Beach as described by the proponent in the PER document titled Proposed Residential Development of the Western Cell, Lot 2 Burns Beach by Halpern Glick Maunsell, October 1995. The proposal is located approximately 28 km north of central Perth and incorporates plans to develop approximately 290 Ha of land for residential purposes.

Four options of development were proposed in the PER documentation with the relative areas to be conserved and developed varying in each case. A preferred option was specified in the PER and this proposal is shown as Figure 1.

The proposal is directly adjacent to the Indian Ocean and contains vegetation associations and dune landforms of significant conservation value. Several Crown Reserves abut the area on the western boundary and System 6 Recommended areas M2 and M6 extend into the subject land as shown in Figure 2. M2 covers the coastal strip from Two Rocks to Burns Beach and affects the western part of Pt lot 2, and M6, which includes Neerabup National Park, extends into the north-east corner of the cell.

The subject land is currently zoned 'Rural' under the Metropolitan Region Scheme (MRS) and the City of Wanneroo's Town Planning Scheme. The Western Australian Planning Commission however has recently initiated an amendment to the MRS for the North-west corridor of the metropolitan region which includes a proposal to rezone a substantial section of the land subject to this assessment to 'Urban'. The area proposed to be rezoned is, however, smaller than the area proposed for development in the PER.

A detailed description of the proposed project is provided in Section 4 of the Proposed Residential Development of the Western Cell, Lot 2 Burns Beach PER report (Halpern Glick Maunsell, 1995).

The proposal is summarised in Table 1 shown overleaf.

Table 1. Proposal characteristics - preferred option

Element	Description
Total site area (Pt Lot 2)	290 Ha
Estimated number of dwellings	2500
Area of residential development	252 Ha
Area of Pt lot 2 to be managed for conservation	38 Ha
Area of Pt lot 2 within System 6 recommended areas M2 and M6	105 Ha
Area of System 6 areas to be developed in preferred development plan	67 Ha
Area to be developed within proposed regional significant recommendation by DEP	197 Ha
Adjacent land uses	Residential development Tamala Park Landfill facility Limestone quarry Crown Reserves

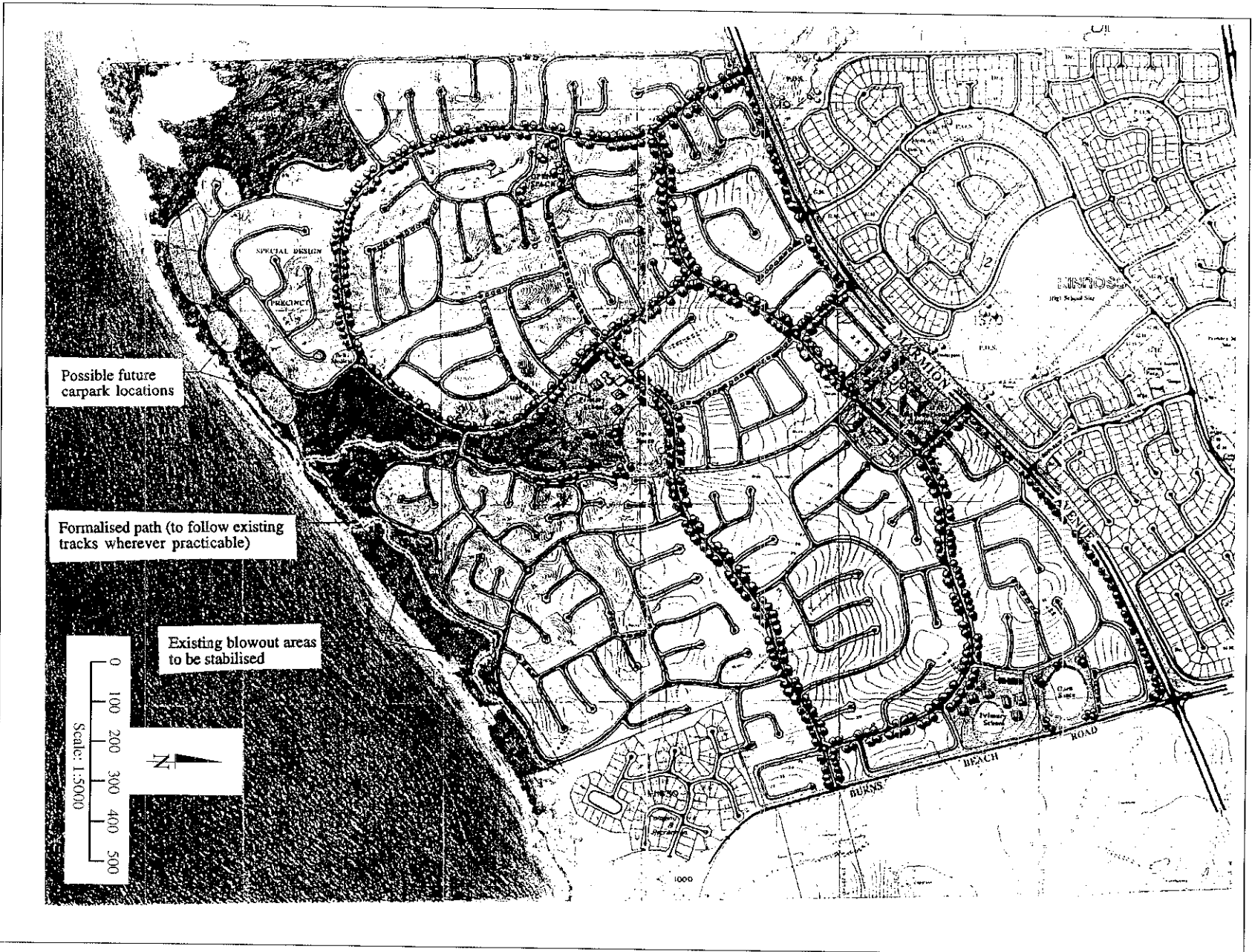


Figure 1. Proposed Structure Plan for the Western Cell.

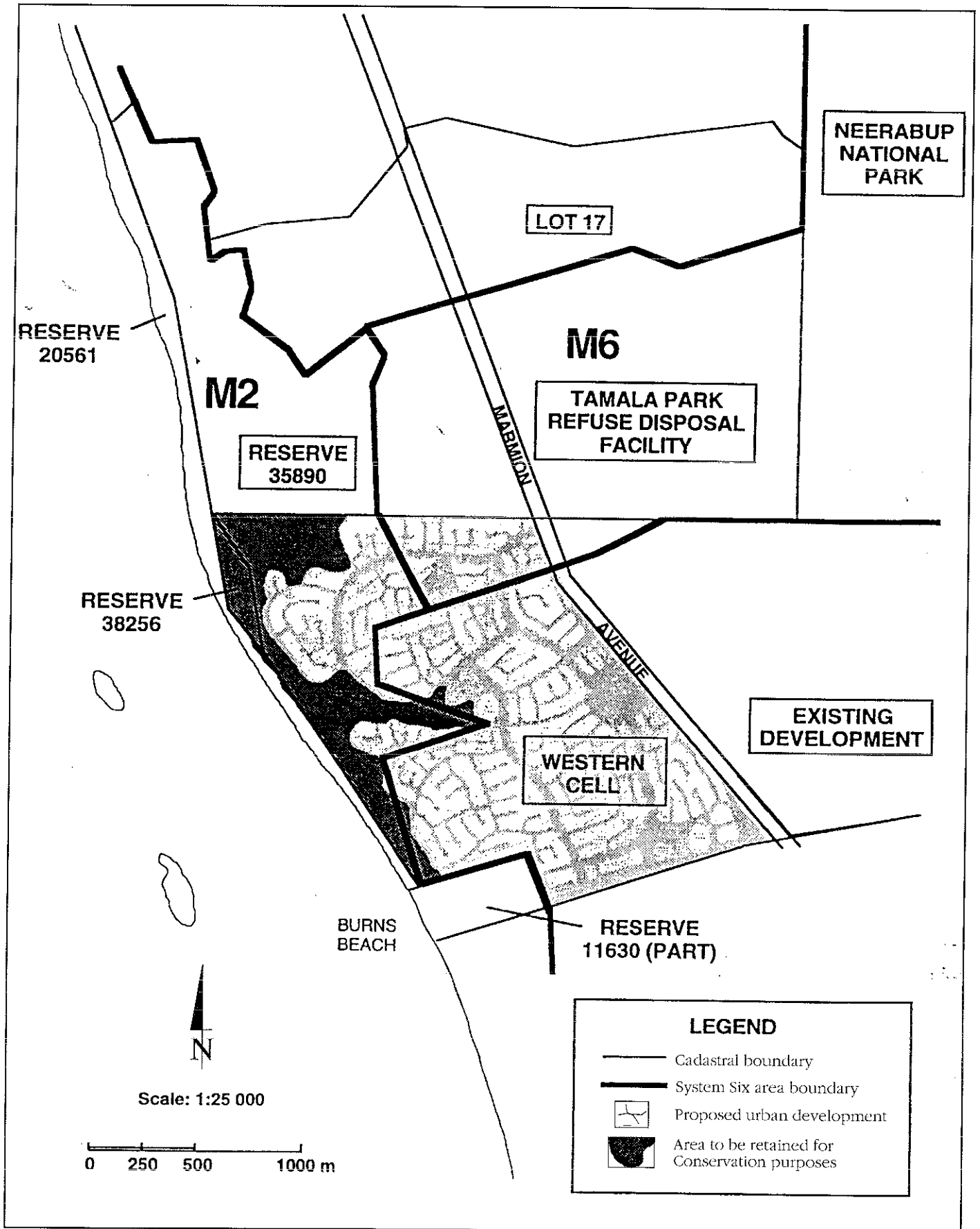


Figure 2. Proposed structure plan for the Western Cell, showing current System 6 boundaries, cadastral boundaries and areas to be retained for conservation purposes.

3. Relevant environmental factors

Section 44 of the Environmental Protection Act 1986 requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

Having considered public and government submissions (Appendix 1) and appropriate references (Appendix 2), in the EPA's opinion the following are the environmental factors relevant to the proposal:

- (a) Vegetation communities - loss of conservation value of regional significance;
- (b) Terrestrial fauna - loss of habitat and wildlife corridor;
- (c) Dunal systems - loss of significant landform, and;
- (d) Regional Park - retention of area for conservation purposes.

The above relevant factors were identified from the EPA's consideration and review of all environmental factors (preliminary factors) generated from the PER document and the submissions received, in conjunction with the proposal's characteristics (including significance of potential impacts), the adequacy of the proponent's response and commitment's, and effectiveness of current management. On this basis, the EPA considers that the Declared Rare and Priority Flora, Foreshore (Beach), Buffer (landfill facility), Particulates/Dust, Groundwater quality, Marine Water quality, Noise, Amenity, Recreation and Aboriginal Culture and Heritage factors and other issues raised in the submissions do not require further evaluation by the EPA. The identification process is summarised in Table 2.

The relevant environmental factors and their assessment are discussed in Sections 3.1 and 3.2 of this report. Usually the environmental factors relevant to the proposal are separated into sections and discussed individually. With this proposal it is the inter-relationship between the four factors rather than the individual factors on their own that has determined the EPA's assessment, therefore this report has combined the discussion and assessment of the four factors.

Section 3.1 contains the discussion which will show why the factors are relevant to the proposal and how they will be affected by the proposal. The assessment detailed in Section 3.2 is where the EPA decides whether the proposal meets the environmental objective set for the factors.

3.1 Description

Vegetation communities

The proposal for urban development will affect an area of remnant vegetation which is considered to be regionally significant, which covers an area larger than the current System 6 area boundaries.

The proposal area was subject to an intense bushfire prior to the preparation of the PER document which meant that a *in situ* flora survey was not undertaken as part of this assessment. Information in the PER was based on existing information available on the community types present prior to the fire.

Following consideration of all the available information the DEP is of the view that there is a strong technical case for the protection of a large area of Pt Lot 2 (approximately 235 Ha) as the

Table 2. Identification of relevant environmental factors

Preliminary Factor	Proposal characteristics	Government Agency and Public comments	Identification of Relevant Environmental factors
BIOPHYSICAL			
Vegetation Communities	<p>No vegetation survey was conducted for the PER as the site was burnt by a bushfire.</p> <p>Studies that had been conducted on the site prior to this time note that the site contains the diversity of the Quindalup Dune Systems adjacent to Spearwood surfaces in the Northern Metropolitan Area.</p> <p>Proposal area contains approximately 105 Ha of land recommended for protection by the EPA under System 6 (areas M2 and M6) in 1983. The DEP considers that approximately 197 Ha of the proposal area contains regionally significant vegetation. Approximately 38 Ha of the 290 Ha site is proposed to be managed for conservation, under the preferred development option.</p>	<p>Government:</p> <p>The City of Wanneroo (COW) position is the PER does not present sufficient justification to demonstrate the acceptability of the boundaries being sought. The City considers that the proposals in the PER should be rejected and System 6 recommendations should be implemented.</p> <p>The Department of Conservation and Land Management (CALM) believe the Northwest Corridor Structure Plan development option represents absolute minimum area required for conservation, the preferred option by the developer does not protect habitat.</p> <p>Public:</p> <p>The Conservation Council of WA (CCWA) believes that the PER is designed to maximise development without regard to the significant bushland present and is environmentally unacceptable. Nature conservation should not just focus on rare/ endangered flora and fauna, but should also consider poorly protected and diminishing area of bushland habitat on coastal plain. Common species may become rare.</p> <p>The Wildflower Society of WA (WSWA) notes that several studies indicate that the vegetation is of regional significance. The assessment of the flora in the PER was limited to dominants, rare and priority species which ignores species diversity and endemism. Should complete an in situ flora survey.</p> <p>The Urban Bushland Council of WA (UBCWA) and Coalition for Wanneroo's Environment (CFWE) states that urban development threatens Perth's Bushland Heritage. UBCWA also state that there is significant coastal bushland inside and out of S6 area on Pt Lot 2.</p> <p>The Quinns Rocks Environmental Group (QREG) state that the area contains a juxtaposition of vegetation of the Quindalup and Spearwood dunal systems. The interface between these soil and dune systems is poorly reserved.</p> <p>The Blackwood Environmental Society (BES) note that connections to other reserves are vital in the form of wide, well vegetated corridors from a substantial coastal reserve to Neerabup National Park.</p> <p>The proposal is inconsistent with long-standing core area recommended for conservation and open space in System 6 recommendations.</p> <p>The PER showed a lack of scientific validity and discounted the value of the dunes and bushland of Burns Beach.</p>	<p>Considered to be a relevant factor.</p>

Preliminary Factor	Proposal characteristics	Government Agency and Public comments	Identification of Relevant Environmental factors
Declared Rare and Priority Flora	<p>No vegetation survey was conducted for the PER as the study area was burnt by a bushfire.</p> <p>Four Priority taxa have been recorded in the study area in previous surveys.</p>	<p>Government: CALM state that CALM's rare flora database do not necessarily represent a comprehensive listing of the rare flora of the area. The organisation should employ a botanist to undertake a study of the area under consideration. It is possible that undescribed and poorly known taxa occur in the area.</p> <p>Public: QREG notes that an appraisal by Trudgen (1990) notes the potential for the site for the conservation of species of flora which are uncommon or have a limited distribution.</p>	<p>These issues are considered further as the relevant factor 'Vegetation communities'.</p>
Regional Park	<p>The proposal area contains approximately 105 Ha of land recommended for protection by the EPA under System 6 (areas M2 and M6) in 1983 as Regional Park. The DEP considers that approximately 197 Ha of the proposal area contains regionally significant vegetation worthy of conservation.</p> <p>Approximately 38 Ha of the 290 Ha site is proposed to be reserved.</p>	<p>Government: The COW considers that the proposals in the PER should be rejected and System 6 recommendations should be implemented. ECU believes the area should be incorporated into large reserve which includes reserves to the north, east, Tamala Park and Neerabup National Park. Small isolated areas of bushland difficult to manage, preferable to incorporate into larger reserves.</p> <p>Public: The QREG believe that development within System 6 areas is unacceptable. The PER did not consider the option of retaining the whole of Pt Lot 2 for conservation. This should be evaluated given the conservation value of the existing environment and its strategic importance locally and regionally. The Tree Society (TS) believe that there is an inadequate reserve of geomorphic, habitat and vegetation systems. There is a need for reserves in Quindalup dunes based on landform, scientific interest, representativeness, vegetation and amount of disturbance. Recommend that the previous calls for the conservation of Pt Lot 2 be finally heeded instead of ignored, and the area be managed as a conservation reserve. The proposal is inconsistent with long-standing core area recommended for conservation in System 6 recommendations and planning documents. The site should be retained for conservation purposes. System 6 areas have been compromised by Marmion Avenue and the refuse facility of Tamala Park.</p>	<p>Considered to be a relevant factor.</p>

Preliminary Factor	Proposal characteristics	Government Agency and Public comments	Identification of Relevant Environmental factors
Terrestrial fauna	<p>The proposal area contains a juxtaposition of Quindalup and Spearwood dunal systems which provides a range of habitat types for fauna.</p> <p>Approximately 38 Ha of the 290 Ha site is proposed to be managed for conservation.</p>	<p>Government: The WA Museum's (WAM) examination of faunal assemblages in habitats on the Quindalup dune landform has indicated that this has different assemblages from the Spearwood landform. A more detailed assessment of faunal values in the area should be undertaken. CALM state that the WAM's records for fauna do not reflect abundance. Several interesting and increasingly less common species such as the Honey Possum, Brush Wallaby, and Goanna <i>Varanus gouldii</i> were recorded to the direct north of Pt Lot 2 and so are likely to occur within the proponent's land.</p> <p>Public: The UBCWA state that corridors have a significant role in maintaining flora and fauna and allowing movement/ genetic exchange between remnant populations. This makes the M6 proposal even more important. The continued clearing of bushland is not consistent with government statements about protection of biological diversity. System 6 recommendations should be implemented. The ECU state that the fauna habitat is relatively intact and the reason for not conducting the survey flawed. The QREG state that the area would contain significant reptile, bird and mammal species which are threatened, uncommon or geographically restricted. Studies to the direct north of Pt lot 2 found three species which are noted as scarce or rare on the Swan Coastal Plain (<i>Delma grayii</i>, <i>Pygopus lepidopus</i>, <i>Varanus gouldii</i>). The PER does not address invertebrate fauna nor the significance of the site to birds (6 of 52 species of bird recorded at Mindarie are species recognised as scarce to rare on the Swan Coastal Plain). The WA Society of Amateur Herpetologists Inc strongly oppose the plans to develop Pt Lot 2. The area is very rich herpetologically containing 38 species found on an amateur survey. The survey found two species of snake that are under pressure from removal of habitat close to Perth. These are the black-striped snake which has a restricted distribution and the carpet python which is a designated Schedule 2 species. The area has high conservation value. The Tree Society (TS) state that all the banksia woodland would be lost under the preferred proposal which will remove the food supply for small native mammals such as the Honey Possum and restricts severely bushland wildlife corridors. The development would result in the loss of the wildlife corridor from Neerabup National Park to the coast and significant habitat on the Quindalup and Spearwood dune systems.</p>	Considered to be a relevant factor.

Preliminary Factor	Proposal characteristics	Government Agency and Public comments	Identification of Relevant Environmental factors
Dunal Systems	Site has the Spearwood and Quindalup dunal systems in close proximity and is one of the few examples of this association in the northern metropolitan region Proposal will affect 252 Ha of the dunal systems.	<p>Government: The Western Australian Museum (WAM) states that the site contains a significant proportion of a major Quindalup dune intrusion associated with a minor section of a parabolic dune. This landform is poorly represented in reserve areas for open space and conservation areas in the Perth metropolitan area.</p> <p>Public: The CCWA notes that the evolutionary coastal process will be terminated by the development. The Quinns Rock Environmental Group (QREG) state that the dunes are important as they exhibit a diversity in range and style, shows complex coastal development, are poorly represented in reserves, and is unique. The Tree Society state that there is no other complete cusped foreland with this amount of habitats left intact and it should be protected. ECU state that the development will destroy the cusped dune system and the Quindalup dunes are poorly represented in reserves (2-3% reserved between Lancelin and Mandurah). The proposed loss of dunes would affect function of remaining dunes.</p>	Considered to be a relevant factor.
Foreshore (Beach)	The proposal area lies directly adjacent to the Indian Ocean and coastal reserve.	<p>Public: Concerns regarding the management of the foreshore areas to avoid degradation and erosion of foreshore areas. Access to the beach needs to be addressed.</p>	The proponent is committed to a Coastal Management Plan being prepared to the requirements of the Ministry for Planning prior to subdivision preceding. Factor does not require further EPA Evaluation.
POLLUTION MANAGEMENT			
Buffer (landfill facility)	The Tamala Park Landfill facility lies to the north - east of the proposal area.	<p>Government: The COW commented that in view of the limited significance of the proposal to development of the north-west corridor housing demand and the regional importance of the Tamala Park Landfill facility, it is considered unsatisfactory for the PER to deal so dismissively with the requirement for buffer around the Tamala Park landfill. This would not be an issue if System 6 is implemented.</p>	Urban encroachment into buffer areas of a land use producing off-site impacts is normally dealt with by the planning agencies within the context of the Statement of Planning Policy No 4. Factor does not require further EPA Evaluation.

Preliminary Factor	Proposal characteristics	Government Agency and Public comments	Identification of Relevant Environmental factors
Particulates/ Dust	The preferred proposal would result in the clearing of a large area (approximately 252 Ha) of remnant vegetation.	<p>Public: The QREG are concerned that commitment 11.5 does not address smoke from burning of cleared vegetation. The publication of the DEP's Smoke Control Guidelines have not been effective in reducing the problem. They also comment that the PER states that dust suppression techniques will be consistent with current earthmoving practices. This is not satisfactory and the DEP's Dust Control Guidelines have not been effective in reducing the problem.</p> <p>Concerns regarding the total clearance of vegetation due to the potential for dust problems</p>	<p>The proponent has committed to an Environmental Management Plan which will among other things aim to minimise dust impacts.</p> <p>Factor does not require further EPA Evaluation.</p>
Groundwater quality	The Tamala Park Landfill facility lies to the north - east of the proposal area.	<p>Public: The TS and ECU raised concern regarding the potential contamination of groundwater under the proposal from leachate from Tamala Park landfill facility and the use of bores within the proposed subdivision.</p>	<p>Contamination of groundwater from existing potentially polluting operations and bore applications is normally dealt with by the Water and Rivers Commission and Water Corporation.</p> <p>Factor does not require further EPA Evaluation.</p>
Marine Water quality	The proposal area lies directly adjacent to Marmion Marine Park.	<p>Government: CALM stated that more information was needed on the potential impacts on Marmion Marine Park, especially of leached nutrients from garden fertilisers.</p> <p>Public: Fertilisers from gardens will cause problems for marine life.</p>	<p>This is an issue for urban development throughout the north-west corridor of the Perth Metropolitan Area and needs to be considered at a regional level.</p> <p>Factor does not require further EPA Evaluation.</p>
Noise	Existing residential areas occur adjacent to the site to the east and within the Burns Beach townsite.	<p>Public: Noise generated during the construction may impact on nearby residents.</p>	<p>The proponent is committed to preparing an Environmental Management Plan which addresses among other things impacts of noise. This impact can also be managed under Part V of the Environmental Protection Act 1986.</p> <p>Factor does not require further EPA Evaluation.</p>

Preliminary Factor	Proposal characteristics	Government Agency and Public comments	Identification of Relevant Environmental factors
SOCIAL SURROUNDINGS			
Amenity	The proposal area currently contains remnant vegetation and dunal systems and is adjacent to a major road.	<p>Government: The COW state that the interface between the proposed reserve and development does not effectively meld with the landforms resulting in appreciable cut faces and batters. Such development is likely to dominate the coastal reserve to the detriment of landscape and amenity issues.</p> <p>Public: The CC and CFWE believe the site is strategically important as a relief in the urban sprawl. The PER makes no reference to the effects of the proposal on the local community (ie social impacts). The majority of the general public that responded value this bushland very highly.</p>	Amenity is normally dealt with through the planning system at rezoning at the Metropolitan Region Scheme and Town Planning scheme levels. Rezoning of the subject area has not yet occurred. Factor does not require further EPA Evaluation.
Recreation	The proposal area currently contains remnant vegetation and dunal systems.	<p>Public: Many submitters mentioned that they use the subject land for passive recreation purposes ie walking, birdwatching, education, photography, research. Some believe the site could become a tourist attraction.</p>	These issues are part of the consideration of the relevant factor 'Regional Park'. Factor does not require separate EPA Evaluation outside of the factor 'Regional Park'.
Aboriginal Culture and Heritage	The PER identifies that there is an ethnographic site on the north-east corner of the site. A notice has been made and issued to the proponent under Section 18 of the Aboriginal Heritage Act allowing permission for the area to be disturbed by the proposed development.	<p>Public: The Nyungah Community of the Swan Valley and Swan Coastal Plain say that this bushland has to be preserved due to the importance and significance of the Aboriginal beliefs in that area. The CFWE states that the Section 18 notice given for the site states consultation with relevant aboriginal groups, yet elected group of Aboriginal elders (Nyungah circle of elders) not consulted. The QREG noted that no details on the Section 18 notice were provided in the PER. This information is necessary in the light of earlier Aboriginal involvement in protecting the rim of the parabolic dune in the area to the direct north of Pt Lot 2 as this extends into Pt Lot 2.</p>	The proponent has committed to cease activities should any archeological sites be identified during construction and recognise their obligations under the Aboriginal Heritage Act 1972. Factor does require further EPA Evaluation.

best and only opportunity available to provide a diverse and representative conservation coastal area in the north-west corridor of the metropolitan area. Figure 3 illustrates the area of the site determined by DEP to be regionally significant for conservation.

It is proposed to develop approximately 258 Ha of Pt Lot 2 for residential purposes which will result in a loss of 67 Ha of vegetation currently recommended for protection under System 6 areas M2 and M6 and approximately 197 Ha of the area identified as being regionally significant by the DEP.

In addition to the DEP advice, there have been a number of studies which found the site to have significant conservation value.

Heddle *et al.* (1980) mapped two vegetation complexes in the study area:

“Quindalup Complex - Coastal dune complex consisting mainly of two alliances - the strand and fore dune alliance and the mobile and stable dune alliance. Local variations include the low closed forest of *M. lanceolata* - *Callitris preissii* and the closed scrub of *Acacia rostellifera*;

Cottesloe Complex - Central and South: Mosaic of woodland of Tuart (*Eucalyptus gomphocephala*) and open forest of Tuart - Jarrah - Marri (*E. calophylla*) closed heath on the limestone outcrops” (Heddle *et al.* 1980).

The Perth Environmental Project has mapped the area remaining of the Complexes within the Perth Metropolitan Area (J. Dixon *et al.* 1994) and found that 49% of the Quindalup Complex and 36% of the Cottesloe Complex - Central and South, remains. The study area contains a significant area of each these complexes and the interface between them.

Trudgen (1990) described factors which would be used to determine conservation significance and concluded that the Burns Beach area would have conservation value because:

- it included Quindalup Dune vegetation which is poorly reserved (particularly in the middle of its distribution), as are near coastal variants of the vegetation of the Spearwood;
- it would probably include species of particular interest (e.g. restricted taxa, uncommon species and new undescribed species) found at Alkimos;
- it has conservation values for landforms.

Griffin, 1993 studied the flora of the Quindalup Dunes based on an analysis of 545 releves (sites) from Dongara to Perth. The study found:

"The floristic composition of these sites varied considerably. Numerical classification showed some quite distinct communities and others which seemed to be part of a multidimensional continuum. Several factors appear to be instrumental in the variation in composition. Landforms (incipient foredunes, dunes or plains) were a major factor. So too were proximity to the coast, age (time since colonisation), geology and soil types" (Griffin, 1993 p2).

The Burns Beach area lies in the 'South of Lancelin' Sector identified by Griffin. Twenty three releves were sampled at the Burns Beach site. Based on this sampling and his assessment of the adequacy of the conservation estate (meaning reserves) Griffin recommended:

"The Public Recreation reserve at Mindarie (35890) should be enlarged to the east and south by the acquisition of privately owned land and be declared a reserve for the Conservation of Flora and Recreation and vested in the Wanneroo City Council." (Griffin, 1993 p5)

Reserve 35890 lies directly adjacent to Pt Lot 2 to the north, however the recommendation did not suggest by how much of the reserve should be enlarged.

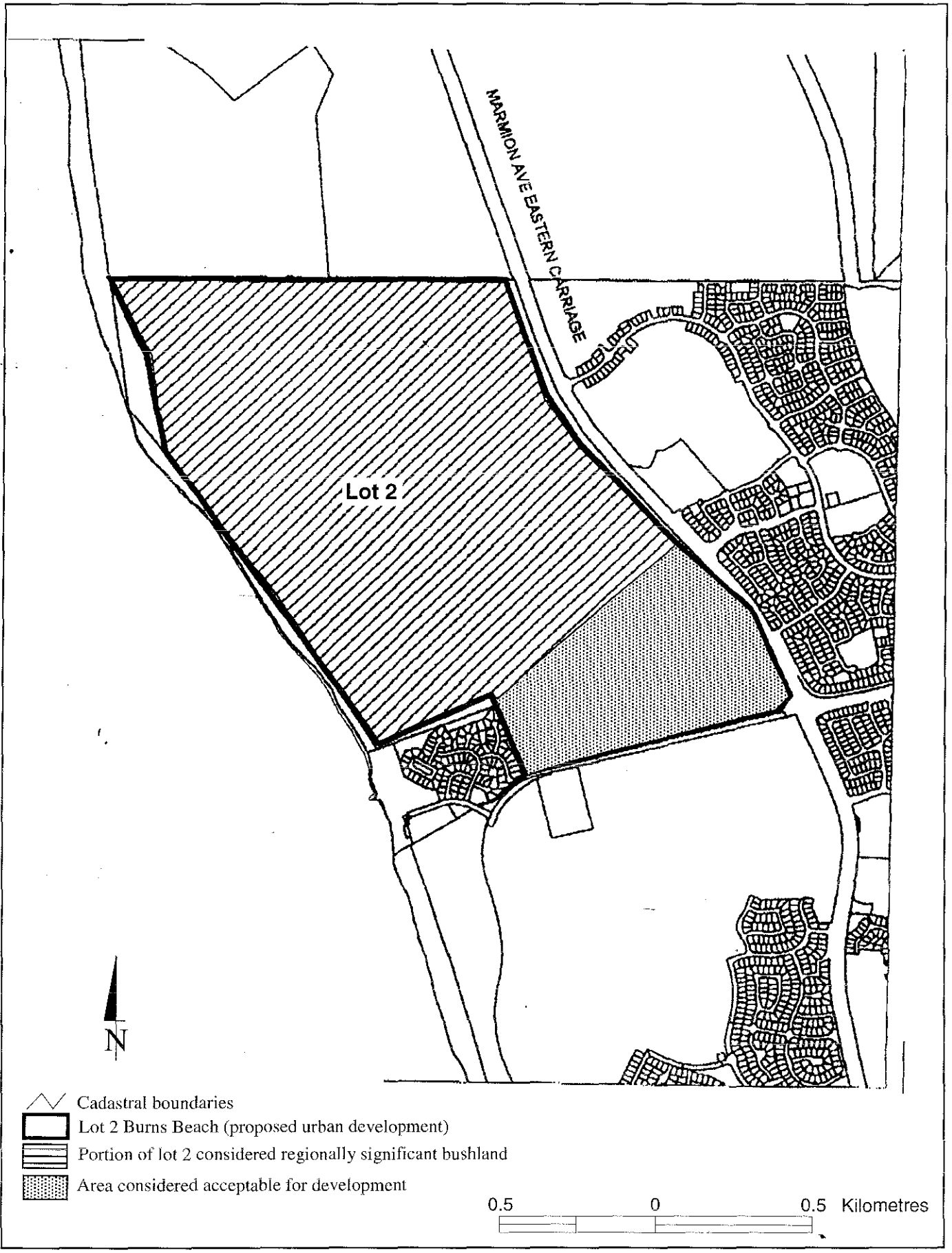


Figure 3. Regionally significant bushland at Part Lot 2 Western Cell Burns Beach.

In 1994 Griffin and Trudgen examined variation in the floristic composition of vegetation between Whitfords and Lancelin and made recommendations to conserve the variation present. This study was based on detailed analysis of a total of 248 vegetation stands. Forty of these stands were on the land subject to this environmental impact assessment.

The general conclusion by Griffin and Trudgen was that all the Quindalup dunes in the Mindarie Reserve and the Burns Beach Property (except the badly degraded area in south west corner) merit being conserved.

While there has been no comprehensive survey of the flora of the study area it is expected from survey of a larger area (Keighery 1991), of which the study area was part, that there would be in excess of 150 native taxa in the study area.

A series of significant species have been recorded in the study area (Griffin and Trudgen 1994; Halpern Glick Maunsell 1995; Keighery 1991; Max Margetts and Associates and Halpern Glick Maunsell 1991). Four of these taxa are listed as 'priority taxa' (Atkins 1996) by the Department of Conservation and Land Management and are under consideration for determination as Declared Rare Flora. These are:

Jacksonia sericea - This prostrate shrub is a priority species (Priority 3) confined to the Perth area between Golden Bay and Neerabup National Park.

Conostylis pauciflora subsp. *euryrhipis* - This tufted herb is a priority species (Priority 3) found on coastal dunes from Cervantes to Yancheep. Other restricted *Conostylis* taxa may occur in the study area (Griffin and Trudgen 1994)

Hibbertia spicata subsp. *leptotheca* - This is one of the taxa characteristic of and endemic to Tamala limestone ridges, growing from Yalgorup to Wedge Island. This taxon has a several forms; the typical form grows in Neerabup National Park. Another form occurs at Burns Beach (Keighery 1991) which has a low, almost prostrate growth form, shiny, short succulent leaves and small pale yellow flowers with reflexed petals. This is priority species (Priority 3).

Stylidium maritima ms (Stylidiaceae) - This species is related to *Stylidium affine* but occurs in near coastal locations on calcareous soils and limestone on the coastal plain from Cliff Head to Yalgorup. Although it can be common over small areas, populations are not common and much of its habitat between Cliff Head and Yalgorup has been cleared or degraded and it should be considered uncommon. This is a priority taxon (Priority 3).

Another species of particular interest is *Sonchus megalocarpa* (Keighery 1991). *Sonchus megalocarpa* is an unusual native thistle that occurs on ridgelines of large blowouts in the study area (Keighery 1991). This is the first record on the mainland record in the Perth to Bunbury region and the closest known population is on Garden Island.

In summary the proposal area has very significant potential as a regional conservation area as it contains:

- significant areas of the Quindalup and Cottesloe Vegetation Complexes;
- significant areas of the regional floristic community types in excellent to good condition, typical of the Quindalup and Spearwood Dunes and their interface;
- a sufficiently large area of communities in combination to allow natural processes to occur;
- representative area of the Quinns Rocks to Whitfords sector identified by Griffin and Trudgen (1994).

Together with the area to the north (Mindarie after Griffin and Trudgen 1994) this area is of exceedingly high conservation value, representing a diverse area of coastal land near Perth, which conserves a range of typical and unusual coastal plants and communities. This larger area forms a bushland link between conservation reserves or proposed conservation reserves to the north and south via the coastal reserves and the west through the Tamala Tip area to Neerabup National Park. Another comparable area is not available in the Perth Metropolitan Area. Previous determinations of the total area's significance by Griffin and Trudgen (1994); Keighery (1991), Trudgen (1996) and V & C Semeniuk Research Group (1992) are supported.

Terrestrial fauna

The proposal area is significant to terrestrial fauna for two reasons. Firstly the vegetation on Pt Lot 2 maintains an east/west wildlife corridor linkage from the coastal reserves to Neerabup National Park and beyond to the State Forest/Conservation areas on the Gnangara Mound. This is illustrated in Figure 4. This link has been weakened by a series of land uses in the linkage corridor, including the Tamala Park Refuse Disposal Facility and the future extension of the Mitchell Freeway and railway, but still remains the best option available. The proposal will result in the clearing of fauna habitat on Pt Lot 2 and will compromise the east/west wildlife corridor linkage.

Secondly, the proposal area contains a vegetated transition between the Quindalup and Spearwood dunes which provides particularly important feeding habitat for a range of fauna. This transition adds to the viability of this site by providing seasonal diversity of flowering times to support populations of resident nectivorous pollinators that may not otherwise be sustained. The need to retain the interface between the Quindalup and the Spearwood dunes is extremely important. This is important for some species of fauna which rely on both these land unit types for food, particularly in the summer months when there are fewer flowering plants on the Quindalup's. During the summer months a number of *Banksia* species on the Spearwood dunes are flowering (eg *Banksia attenuata* and *Banksia menziesii*).

As the site had been severely burnt prior to the PER being prepared the proponent was unable to undertake a fauna survey which would have been representative. The PER identified that the *Falco peregrinus* (Peregrine Falcon) and the *Morelia spilota imbricata* (Carpet Python), which are both Schedule Four species protected under the Wildlife Conservation Act 1950 may occur in the study area.

Faunal surveys of bushland habitats of the different dune systems of the Swan Coastal Plain have shown the Quindalup dunes to have markedly different faunal assemblages for some groups compared to the other dune systems. There is also a marked latitudinal change within the fauna of the Quindalup dunes with the lizards and arachnids of the southern sites such as Woodman Point having different assemblages to northern sites of Quindalup dunes of the Bold Park and Trigg areas (J Dell, personal communication).

In zoogeographic terms the Quindalup/Spearwood dune system has a richer bird and reptile fauna than other dune systems on the Swan Coastal Plain. The main population centres for some reptiles including some skink lizards and burrowing snakes are on these recent coastal dunes. Some of the habitat specialist/dietary specialist bird species that have declined across the Coastal Plain still have populations in these areas. Additionally, the natural distribution of some bird species, for example the Variegated and White-winged Fairy-wrens, on the Swan Coastal Plain are restricted to the Quindalup/Spearwood dune system (J Dell, personal communication).

In summary large areas of intact bushland in good condition like that represented on Pt Lot 2 Western Cell, offer important refuge for many species whose habitat is being lost as

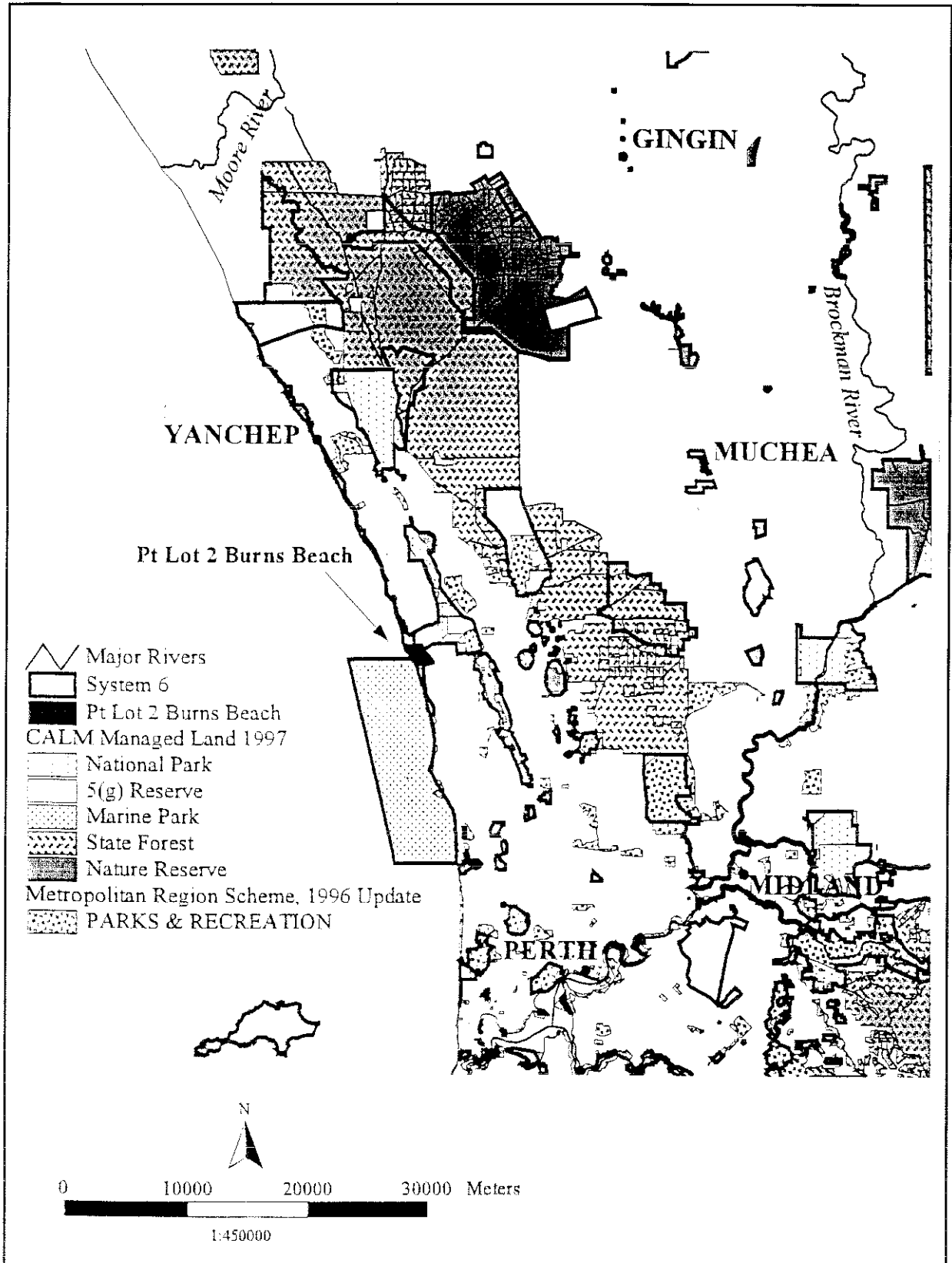


Figure 4. Green belts in the north-west corridor of the Perth Metropolitan Area.

urbanisation occurs in the north west corridor of the metropolitan area. The connection of Pt Lot 2 with Neerabup National Park and the coastal reserve increase the value of the area for fauna as it enhances its refuge and corridor linkage value.

Dunal systems

The proposal will also affect a dunal system of high conservation value containing Quindalup and Spearwood dunes of varying age, overlaying a layer of Tamala limestone (see Figure 4, Halpern, Glick & Maunsell 1995). Approximately 252 Ha of the site is proposed to be developed for residential purposes which contains a section of a cusped foreland (which includes blowouts and a variety of parabolic dune forms). 107 Ha of the 470 Ha Quindalup dunefield will be removed.

McArthur and Bartle (1980) studied a 50 km section of the coast from Whitfords to Guilderton and defined 12 mapping units based on geology, landform and soils to be used as a basis for predicting response of the land to urban and associated development. It was noted that problems in landscape stability are in the near coast zone and mainly associated with the fourth or youngest phase of Quindalup Dunes. It was recommended that unless adequate finance is available for stabilisation, no development should be permitted on these areas. It was also recommended that in both the third and fourth phases access by people and vehicles should be controlled. These units are shown as Q4 and Q3 respectively on Figure 6.1 of the proponent's PER.

McArthur and Bartle further recommended that *"In the Quindalup Dunes an example of the different ages of parabolic dunes should be preserved. These systems are of geomorphological interest and provide some record of past climatic conditions. We have already recommended that all of the youngest phase (Q4) and unstable areas (Qu) be conserved. This may well be the best and cheapest form of management"*.

Semeniuk *et al* 1989 studied Quindalup Dunes from Geographe Bay to Dongara and developed a consistent terminology for geomorphic units in order to compare tracts of Quindalup Dunes. The area at Burns Beach falls within the Whitfords to Lancelin sector, which is dominated by parabolic dunes, chaots and blowouts. Semeniuk analysed the distribution of reserves for flora and fauna within the Quindalup Dunes and found that the regional variety of landforms and habitats were not adequately represented.

The V & C Semeniuk Research Group, 1989 undertook an environmental and landscape audit of the Northwest Corridor from Whitfords to Two Rocks. The Group state that they used an internationally recognised approach to determine conservation significance of natural systems in the North West Corridor.

In considering reservation of landforms (as per McArthur, 1980 and V & C Semeniuk Research Group, 1989) they concluded that:

- Quindalup Q1 to Q4, Qu and Qp landforms had a restricted distribution on the Swan Coastal Plain, and with the exception of Q4 were not conserved in National Parks or System 6 areas;
- the Qs landform was widespread but not conserved; and
- The Kls and Ky landforms were widespread and conserved in Neerabup National Park and Yanchep National Park.

In considering geomorphic features (as per Semeniuk *et al.*, 1989), they stated that:

- the cusped foreland with parabolic dunes and chaots geomorphic feature had a restricted distribution on the Swan Coastal Plain and no areas were reserved in National Parks or System 6 areas; and
- mobile parabolic dunes and blowouts have a very restricted distribution on the Swan Coastal Plain and only a minor area was reserved at Burns Beach.

The area subject of this environmental impact assessment was identified as 'South Mindarie' by the V & C Semeniuk Research Group.

The areas of upland recommended for conservation, listed in order of significance were Burns Beach - Southern Ridge area, Hepburn Heights, South Mindarie, Alkimos, South Yanchep, Eglington, Jindalee and Butler and Neerabup National Park.

The geomorphic and landform aspects of the justification or rationale for selection of the South Mindarie outlined by the V & C Semeniuk Research Group are reproduced below:

1. *Cusped forelands are an important representative feature of the Whitfords-Lancelin coastal sector. Several well defined cusped forelands are located in the Northwest Corridor region, however the largest and best developed examples of this landform type located at Whitford and Quinns Rock have largely been destroyed and/or urbanised. South Mindarie now represents the most well defined remaining cusped foreland and its associated range of medium to small scale dune landforms and vegetation habitats in this coastal sector.*
2. *The dune landforms exhibit a range of geomorphic features associated with cusped forelands in this coastal sector. They are the surface expression of cusp development.*
4. *The cusped foreland is a discrete medium scale geomorphic unit which is of scientific interest to students of biology, geomorphology, climatology, sedimentology and oceanography.*
5. *An alternative site to South Mindarie is the cusped foreland at Alkimos. Generally the cusps north of Alkimos and up to Lancelin are smaller and less well developed than South Mindarie. Also the climate and oceanographic wave patterns begin to change as one progresses further north and gradually the cusps change character from the Whitford-Lancelin type to the Wedge Island-Dongara type. (V& C Semeniuk Research Group, 1989, p15)*

The coastal margin of the Plain is formed by the Quindalup Dune System and Tamala Limestone surfaces which are overlain to varying degrees by the Quindalup and/or Spearwood Dunes. Over the past thirty years a series of regional studies of the coastal margin have been undertaken. The studies detailed aspects of the coastal geomorphology (for example: McArthur and Bartle 1980, Searle *et al.* 1988, Semeniuk *et al.* 1989), flora and vegetation (for example Griffin 1993, Griffin and Trudgen 1994) and fauna (How *et al.* 1996). As a consequence a series of specific criteria can be identified that should be taken into account in selecting conservation areas in the Quindalup Dunes in the Perth Metropolitan Area. These six criteria are described in Table 3.

While there is a considerable area of Quindalup Dunes within the Perth metropolitan area with some protection, much of this area is within 500m of the coastline. These long narrow reserves meet few of the six criteria, which are illustrated in Table 3. The study area, often together with the area to the north (Mindarie after Griffin and Trudgen 1994), meets the six specific coastal reserve criteria identified. This is illustrated in Table 3.

Table 3. Evaluation of Pt Lot 2 and existing coastal reserves against the Coastal Reserve Criteria

Subject	Criteria	Evaluation of existing coastal reserves	Evaluation of Pt Lot 2 Burns Beach
Quindalup Dune Types	Inclusion of a series of Quindalup dune types related to distance from the coastline, age and formation process	Generally only contain the youngest dunes	“South Mindarie now represents the most well defined remaining cusped foreland and its associated range of medium to small scale (Quindalup) dune landforms and vegetated habitats in this coastal sector (Whitfords to Lancelin)” (V and C Semeniuk Research Group 1992) Contains different stages of development and habitat evolution
Continuing natural processes	Sufficient area to allow for natural processes to continue	Boundaries generally truncate youngest dunes and consequently natural processes	Quindalup Dunes that with adjacent areas extend to five kms inland (to link to Neerabup National Park)
Coastal type	Soft (ie sandy shore of Quindalup Dune System) and/or hard (ie limestone platform of Tamala Limestone)	Generally present in narrow bands backed by an alienated landscape	Sandy (soft) shoreline and overlies Tamala limestone backed by vegetation in relatively undisturbed state
Linkage	Include Quindalup, Spearwood and Bassendean Dune Systems	Rarely link Quindalup and Spearwood Dune Systems, never to Bassendean Dune System	Contains Quindalup/ Spearwood Dunes interface and links to larger area of Spearwood’s in Neerabup National Park
Vegetation	Variety of typical associations in good condition that encompass the north - south variation found predominantly in the vegetation of the older Quindalup Dunes and the Tamala Limestones	Limited to near coastal association also due to incursions of carparks, tracks for beach access and large edge to area ratio very prone to weed invasion resulting in degrading of the vegetation.	Vegetation is variable and typifies the range of habitat types within a cusp setting and interface with Tamala Limestone surfaces and Spearwood Dunes
Habitats	A variety of adjacent habitats in sufficient area to provide for the diverse reptilian and bird fauna of the coastal dunes	Limited variety of adjacent habitats in insufficient area for many species	Varied habitats adjacent to each other with sufficient area for many species

In summary the area contains an area of relatively undisturbed distinct large-scale coastal landform, with a complex internal assemblage of smaller scale landforms and habitats, and associated vegetation assemblages, not represented elsewhere within this coastal sector (Semeniuk pers comm). As this sector is incomparable with other sectors within south-west Western Australia the landform is determined to be of regional significance.

Regional Park

Several Crown Reserves about Pt Lot 2 on the western boundary and System 6 Recommended areas M2 and M6 extend into the subject land as shown in Figure 2. M2 covers the coastal strip from Two Rocks to Burns Beach and affects the western part of Pt Lot 2, and M6 which includes Neerabup National Park extends into the north-east corner of the cell forming an important wildlife corridor from the park to the coast.

The Darling System Western Australia Proposals for Parks and Reserves - The System 6 Study Report to the Environmental Protection Authority (1981) by the then Department of Conservation and Environment clarified the concept of Regional Park. The report specified that they have three basic functions: to provide for recreation, conservation of the natural environment, and conservation of attractive man-made landscapes. M6 was identified in the report as being suitable for a Regional Park with conservation of the natural environment the prime function.

The Darling System - System 6 Part 1 - General Principles and Recommendations report (1983) by the then Department of Conservation and Environment as a government response to the earlier report specifies that the concept of Regional Open Space was intended to provide for the protection of open space of regional significance. It states:

Open space of regional significance consists of a great deal more than land formally set aside for the purpose. In a functional sense it can include land in a wide range of tenure and condition. Vacant Crown land, State Forest, Land Act Reserves with various purposes, and freehold land, whether privately or publicly owned may all contribute (Dept of Conservation and Environment, 1983 p8).

The report contains a figure which gives an indication of the potential for Regional Parks in System 6. The figure indicates a coastal linkage from Neerabup National Park to the coast in the Burns Beach area as proposed under M6 which together with M2 would be a potential Regional Park. The proposal to develop the land at Pt Lot 2 Burns Beach would compromise the ability of the planning process to create a regional park in this area as recommended in these reports.

General information

145 submissions were received during the advertising period on the proposal including two submissions with a total of 1119 signatures. In addition there were several hundred proforma submissions received before and following the close of the advertising period, including some as recent as March 1997. The vast majority of the submissions were not in favour of the proposal as it would result in the loss of significant coastal bushland and would jeopardise the corridor between the Neerabup National Park and the coast. A number of submissions believed the PER had not provided adequate information on the vegetation and fauna of the site due to the majority of the study area being burnt prior to the preparation of the PER document.

Concerns were also expressed in the public submissions on the loss of habitat for a variety of fauna. Many of the submissions stated sightings of various species not noted in the PER, either by amateur surveys or literature references in coastal areas in the north-west metropolitan area. The Western Australian Museum and the Department of Conservation and Land

Management submissions also highlighted the need to have an evaluation of the fauna *in situ* rather than relying on the museums database.

A number of comments were made in the submissions regarding the value of the geomorphology and landform features present at Burns Beach and raised concern about the poor representation of these features in conservation areas.

A large number of the public submissions received on the PER raised concern on the continuing loss of areas of conservation significance, particularly areas already identified under System 6, and called for the protection of the area in a conservation reserve.

The management of lands containing rare flora are subject to the provisions of the Wildlife Conservation Act 1950. Laws covering dust management are included in Part V of the Environmental Protection Act 1986 and the Mining Act 1978. Protected Invertebrate fauna and Specially Protected fauna are subject of the provisions of the Wildlife Conservation Act 1950. There is no existing policy framework for protection of geomorphological/landform features.

3.2 Assessment

The area considered for assessment of this environmental factor is the Swan Coastal Plain.

The EPA's environmental objectives in regard to the four environmental factors relevant to the proposal are to:

- Maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities;
- Maintain the abundance, species diversity and geographic distribution of terrestrial fauna;
- Maintain the integrity, function and environmental value of the dune system;
- Maintain the integrity, function and environmental values of System 6 recommended areas and the potential regional park.

Taking all factors and objectives into account the proposal cannot be managed to meet the EPA's overall objectives for conservation. In particular, the proposal:

- (a) will result in the significant loss of vegetation and landform features which represents in a single contiguous block, much of the physical and biological diversity of the Quindalup Dune Systems adjacent to the Spearwood surfaces in the Northern metropolitan area which has been identified by DEP as being of regional significance;
- (b) will affect the functioning of the remaining dunal systems ;
- (c) compromise the best opportunity to create an east-west bushland corridor from a substantial coastal reserve to Neerabup National Park and beyond to the State Forest/ Conservation Reserves on the Gnangara Mound;
- (d) is inconsistent with long-standing core area recommended for conservation and Regional open space in System 6 recommendations;

unless the proposal is modified to exclude that area considered to be of regional conservation value by the EPA.

The EPA notes that any impacts on rare flora will be subject to the provisions of the Wildlife Conservation Act 1950 and notes that clearing of the habitat of specially protected fauna will be subject to the provisions of the Wildlife Conservation Act 1950. The EPA is also aware that there is no existing policy framework for protection of geomorphological/landform features.

The proponent has made a commitment to set aside 38 Ha as consolidated Public Open Space for the purposes of conservation of remnant vegetation, landform features and fauna habitat to the requirements of CALM. They have also committed to preparing an Environmental Management Plan, Coastal Management Plan and an Urban Bushland Management Plan to the requirements of the EPA prior to any construction occurring within the site.

Following the consideration of public submissions, the proponent added a commitment to the previous list specified in the PER. The proponent has committed to a fauna survey involving a trapping programme will be conducted on the site prior to any clearing activities commencing. If any fauna species regarded by CALM as rare or endangered are encountered, then translocation to suitable habitat would be undertaken.

Having particular regard to:

- (a) the advice of the DEP on the importance of the area;
- (b) previous studies on the significance of the vegetation complexes, geomorphology and landform features at Burns Beach;
- (c) the System 6 recommendations and the opportunity for a wide fauna corridor from Neerabup National Park to the coast;
- (d) the proposed development area shown in the PER known as the preferred structure plan;

it is the EPA's opinion that the proposal by Burns Beach Property Trust can only be managed to meet the EPA's objectives if it is modified so as to protect areas of highest conservation values. The EPA believes that Pt Lot 2 is of regional conservation significance because of the vegetation and landforms present and its linkage from the coast to Neerabup National Park.

The EPA considers that a portion of the proposal area could be developed for residential purposes without compromising the regional conservation significance of the remainder and could be managed to meet the EPA's objectives.

4. Conditions and procedures

4.1 Conditions

Section 44 of the Environmental Protection Act 1986 requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

In developing recommended conditions for each project, the EPA's preferred course of action is to have the proponent provide an array of commitments to ameliorate the impacts of the proposal on the environment. The commitments are considered by the EPA as part of its assessment of the proposal, and following discussion with the proponent the EPA may seek additional commitments.

The EPA recognises that not all of the commitments are written in a form which makes them readily enforceable, but they do provide a clear statement of the action to be taken as part of the proponent's responsibility for and commitment to continuous improvement in environmental performance. The commitments then form part of the conditions to which the proposal should be subject if it is to be implemented. In this case, the proponent have revised their commitments at the request of the DEP to prevent duplication with the EPA's recommended conditions.

Having considered the proponent's commitments and the information provided in this report, the EPA has developed a set of conditions which the EPA recommends be imposed if the proposal by Burns Beach Property Trust for residential development of Pt lot 2 between Marmion Avenue and the Indian Ocean Burns Beach is approved for implementation. These conditions are presented in Appendix 3. Matters addressed in the conditions include confining the proposal to the area shown in Attachment 1 and the following:

- (a) the proponent shall fulfil the commitments set out in the Consolidated Commitments statement as an attachment to the recommended conditions in Appendix 3;
- (b) in order to manage the relevant environmental factors and EPA objectives contained in this bulletin, and subsequent environmental conditions and procedures authorised by the Minister for the Environment, the proponent shall be required to prepare, prior to implementation of the proposal, environmental management system documentation with components such as those adopted in Australian Standards AS/NZS ISO 14 000 series;
- (c) prior to commencement of construction for the earthworks, the proponent shall prepare and implement Environmental Management Plans, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection, Department of Conservation and Land Management and other agencies as relevant.

The plans shall address:

- 1 Minimising of clearing of vegetation and disposal of vegetation cleared;
- 2 Protection of Rare flora;
- 3 Protection of Rare fauna;
- 4 Prevention of weed spread;
- 5 Landform management;
- 6 Management of drainage;
- 7 Management of dust;
- 8 Control of noise and vibration.

The proponent shall make the Environmental Management Plans publicly available prior to commencement of earthworks;

- (d) the proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit programme prepared by the Department of Environmental Protection in consultation with the proponent;
- (e) if the proponent has not substantially commenced the development within five years then the approval to implement the proposal will lapse and be void;
- (f) changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

4.2 Procedures

In addition to the conditions, the following procedure is to be implemented:

The preparation of a revised development plan which restricts development to the area outside of the area determined to be of regional significance by the Environmental Protection Authority. The revised plan is to be forwarded to the EPA for assessment prior to lodgement with the Western Australian Planning Commission.

5. Other advice

During the public submission period it came to the EPA's attention that the Nyungah Community of the Swan Valley and Swan Coastal Plain had an interest in the bushland of Pt Lot 2 and requested the bushland to be preserved. The PER noted the occurrence of an ethnographic site in the north-west corner of the lot and the proponent has received a Section 18 Notice under the Aboriginal Heritage Act 1972 to enable the disturbance of the site for development. The proponent understood that the relevant groups had been consulted during the application for the Section 18.

The EPA recommends the proponent confirm that the ethnographic site referred to as S2471 in the Section 18 Notice occurs entirely within the regionally significant area recommended for conservation. The proponent should verify with the appropriate agency that relevant aboriginal groups, including the Nyungah Community of the Swan Valley and Swan Coastal Plain, had been consulted with regards to the application.

6. Conclusions

The EPA has concluded that the preferred proposal by Burns Beach Property Trust to locate urban development on Pt Lot 2 Burns Beach as shown in Figure 1 cannot be managed to meet the EPA's objectives. However, if the proposal were modified so as to restrict development to the area not considered to be of regional significance, as shown in Figure 3, the proposal would meet EPA's objectives provided that the conditions recommended in Section 4, and set out in formal detail in Appendix 3, are imposed.

7. Recommendations

Section 44 of the Environmental Protection Act requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. 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 relevant environmental factors of vegetation communities, terrestrial fauna, dunal systems and the regional park.
2. That the Minister note that the preferred proposal by Burns Beach Property Trust to locate urban development on Pt Lot 2 Burns Beach cannot be managed to meet the EPA's objectives.
3. That the Minister consider the EPA's advice that, if the conditions and procedures in Section 4 of this report are put in place which confines the proposal to the area shown in Figure 3, the proposal can be managed to meet the EPA's environmental objectives.
4. That the Minister for the Environment imposes the conditions and procedures consistent with Section 4 of this report if Recommendation 3 is adopted.

Table 4. Summary of assessment of relevant factors

Factor	Relevant Area	EPA Objectives	EPA's Assessment	EPA's Advice
Vegetation Communities	Swan Coastal Plain.	Maintain the abundance, species diversity, geographic distribution and productivity of vegetation communities.	<p>The EPA believes that a significant area of the proposal site is of regional conservation significance because it:</p> <p>(a) represents in a single contiguous block, much of the physical and biological diversity of the Quindalup Dune Systems adjacent to Spearwood surfaces in the Northern Metropolitan Area;</p> <p>(b) is contiguous with sand and limestone surfaces and vegetation communities representative of the Spearwood Dunes;</p> <p>(c) maintains an east/west bushland from a substantial coastal reserve to Neerabup National Park and beyond to the State Forest/Conservation Reserves on the Gnangara Mound;</p> <p>(d) is inconsistent with long-standing core area recommended for conservation and open space in System 6 recommendations and Planning documents.</p>	Proposal should be modified to allow development only on those areas not considered to be regionally significant.
Terrestrial fauna	North-west corridor of the Perth Metropolitan Area.	Maintain the abundance, species diversity and geographical distribution of terrestrial fauna.	<p>The site represents in a single contiguous block, much of the physical and biological diversity of the Quindalup Dune Systems adjacent to Spearwood surfaces in the Northern Metropolitan Area. It maintains an east/west wildlife corridor from a substantial coastal reserve to Neerabup National Park and beyond to the State Forest/Conservation Reserves on the Gnangara Mound.</p> <p>The development would result in the loss of the wildlife corridor and significant habitat on the Quindalup and Spearwood dune systems</p>	Proposal should be modified to allow development only on those areas not considered to be regionally significant.
Dunal Systems	The majority of Pt Lot 2.	Maintain the integrity, function and environmental values of the dune system	<p>Site has the Spearwood and Quindalup dunal systems in close proximity and is one of the few examples of this association in the northern metropolitan region. Includes a series of dune types at different stages of development and habitat evolution.</p> <p>The proposed loss of dunes would affect function of remaining dunes.</p>	Proposal should be modified to allow development only on those areas not considered to be regionally significant.

Table 4. Summary of assessment of relevant factors (cont)

Factor	Relevant Area	EPA Objectives	EPA's Assessment	EPA's Advice
Regional Park	Section of Pt Lot 2 illustrated in Figure 3.	Maintain the integrity, function and environmental values of System 6 recommended areas and the potential regional park.	The proposal is inconsistent with long-standing core area recommended for conservation in System 6 recommendations.	Proposal should be modified to allow development only on those areas not considered to be regionally significant.
Taking all factors into account	The majority of Pt Lot 2.	Taking all objectives into account.	The proposal cannot be managed to meet the EPA's overall objectives for conservation unless the proposal is modified to exclude that area considered to be of regional conservation value by the EPA.	Proposal should be modified to allow development only on those areas not considered to be regionally significant.

Appendix 1

List of submitters

State and local government agencies:

- Department of Conservation and Land Management
- Edith Cowan University
- City of Wanneroo (Office of Councillor)
- Western Australian Museum

Organisations:

- Conservation Council of Western Australia Inc
- Western Australian Society of Amateur Herpetologists Inc
- Coastal Heritage Assoc of WA (Inc)
- Urban Bushland Council (WA)
- Wildflower Society of Western Australia (Inc)
- Coalition for Wanneroo's Environment
- Blackwood Environment Society (Inc)
- Quinns Rock Environmental Group
- Burns Beach Property Trust
- The Tree Society
- Friends of Yellagonga Regional Park Inc
- Swan Valley Nyungah Community

Members of the Public:

- A Yueller
- Mr N Byrne
- Mr M S Reeves
- Mr & Mrs J Anthony
- Ms J Rouse
- Ms M Botteon

Members of the Public (cont):

- Ms S Pagani
- Mr J Thompson
- Ms M Miniello
- CJC Sultana

- Ms J Lewis
- Ms D Jones
- P Rakela
- Mr & Mrs K Scoby-Smith
- Ms J Alder
- Mr & Mrs M Kryzanowski
- J Darbyshire
- Mr & Mrs T Malone
- Ms J Thomas
- Mr J McMahan
- Dr J Lumley
- Ms R Murphy
- Mrs M E Campbell
- Mr T Smythe
- Mr P Shaw
- Ms M Barnett
- Mr & Mrs P Taylor
- Ms D Head
- Mr M Head
- Mr P Verburs
- Mr J Kemp
- N Atkinson
- Ms P Coventry-Cox
- Ms J Williams
- J&W Hargreaves
- Mr R Neath
- J Neath
- Mr T Mellow

Members of the Public (cont):

- Ms J Reeson
- S Bajada
- Mr W C Dakin
- Ms K C Edwards

- R K Hammond
- Mr G Diver
- Dr C Harrold
- Ms J Younge
- Mrs D Margaret Rose
- Ms K Wright
- D F James
- H F Harries
- Mr A Read
- Ms B F Annetts
- Mr C Reeves
- Mr J Hollywood
- D&L Bradley
- Mr D Wright
- J Baas
- Mr S Lang
- Mr & Mrs A Scampoli
- L Dillon-Bagrowski
- Ms C Drake
- V Richardson
- RK Lickford
- Mr K McLean
- Ms R Zelinova
- Ms B Jones
- Mr N Gerick
- Mr L Twomey
- Ms S Boyland
- Mrs M Culbertson

Members of the Public (cont):

- Ms C Heal
- Ms J Taylor
- Ms L Nield
- Ms M Topliss

- D Smith
- Mrs T Murphy
- Mrs A R Caporn
- J Heslin
- Ms E Parker
- Mr B J Garvey
- T F Barry
- Ms A P Corbett
- E F Townsend
- Ms S Hart
- Mr M Donnelly
- Peter T Carter J.P.
- J Stevens
- Y Patten
- Ms S Griffin
- Mr A Hine
- Ms S U Krouzecky
- Ms N Reeves
- Mr P Ross
- B&J Sutherland
- K Shaw
- W T Fleming
- J C Meakins
- LJ Peet
- Mr D Kennedy
- Ms T Castillo
- G J H Morris
- Mr B J Booth

Members of the Public (cont):

- Mr M Greenham
- Ms K Tullis
- Ms J Keelan
- Mr D Wake

- Mr J Anderton
- Ms S Boyland
- Mr A Brand
- Mr J Petrovich
- P J O'Brien
- Mr M Butterworth
- Ms N Petrovich
- J D & E A Ludhams
- Mr I Cannon
- Mr R Tauss
- J Cockman
- J Darbyshire
- Mr A Read
- Ms A Herlihy
- W Brogan
- Mr B J Bunny
- Mr M Donnelly
- Mr DF James
- Ms C Dixon
- Mrs V Cockman
- Mr J Hollywood

Appendix 2

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Appendix 3

List of recommended Ministerial Conditions and Proponent's Consolidated Commitments

**STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED
(PURSUANT TO THE PROVISIONS OF THE
ENVIRONMENTAL PROTECTION ACT 1986)**

URBAN DEVELOPMENT WITHIN SYSTEM 6
AREAS M2 AND M6 PT LOT 2 BETWEEN MARMION
AVENUE AND INDIAN OCEAN BURNS BEACH (919)

BURNS BEACH PROPERTY TRUST

Implementation of this proposal is to be confined to the area shown in Attachment 1, and is subject to the following conditions:

1 Proponent Commitments

- 1-1 The proponent shall implement the consolidated environmental management commitments documented in Attachment 2 of this statement, and subsequent environmental management commitments which the proponent makes as part of the fulfilment of conditions and procedures in this statement.

In the event of any inconsistency, the conditions and procedures shall prevail to the extent of the inconsistency.

The consolidated environmental management commitments in Attachment 2 form the basis for consideration by the Chief Executive Officer of the Department of Environmental Protection for auditing of this proposal in conjunction with the conditions and procedures contained in this statement.

2 Implementation

Changes to the proposal which are not substantial may be carried out with the approval of the Minister for the Environment.

- 2-1 Subject to these conditions, the manner of detailed implementation of the proposal, as modified during the assessment process conducted by the Environmental Protection Authority, shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the Environmental Management Plans prepared in accordance with Condition 5-1.

- 2-2 Where, in the course of the detailed implementation referred to in condition 2-1, the proponent seeks to change the designs, specifications, plans or other technical material submitted to the Environmental Protection Authority in any way that the Minister for the Environment determines, on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

3 Proponent

These conditions legally apply to the nominated proponent.

- 3-1 No transfer of ownership, control or management of the project which would give rise to a need for the replacement of the proponent shall take place until the Minister for the Environment has advised the proponent that approval has been given for the nomination of a replacement proponent. Any request for the exercise of that power of the Minister shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the project in accordance with the conditions and procedures set out in the statement.

4 Environmental Management System

The proponent should exercise care and diligence in accordance with best practice environmental management principles.

- 4-1 In order to manage the environmental impacts of the project, and to fulfil the requirements of the conditions and procedures in this statement, prior to construction, the proponent shall prepare environmental management system documentation with components such as those adopted in Australian Standards AS/NZS ISO 14000 series, in consultation with the Department of Environmental Protection.
- 4-2 The proponent shall implement the Environmental Management System referred to in condition 4-1.

5 Environmental Management Plans

- 5-1 Prior to ground-disturbing activities and the finalisation of the subdivision design, the proponent shall prepare Environmental Management Plans, to the requirements of the Environmental Protection Authority on advice of the Department of Environmental Protection and, where relevant, the Department of Conservation and Land Management.

The Plans shall address:

- 1 Management of dust during construction in accordance with the Department of Environmental Protection guidelines on "Land Development Sites and Impacts on Air Quality"(1996);
- 2 Minimising of clearing of vegetation, and disposal of vegetation cleared;
- 3 Control of construction noise in accordance with the Environmental Protection (Noise) Regulations 1997;
- 4 Prevention of weed spread;
- 5 Protection of rare flora, including:
 - (1) in consultation with the Department of Environmental Protection and the Department of Conservation and Land Management, undertaking of a Declared Rare and Priority Flora survey and a report on the survey findings; and

- (2) modification of the design of the development to protect significant areas of Declared Rare and Priority Flora, if such species are found in the above-mentioned survey;
- 6 Protection of rare fauna, including:
- (1) in consultation with the Department of Environmental Protection and the Department of Conservation and Land Management, the undertaking of a fauna survey and report on the survey findings; and
 - (2) the relocation of Specially Protected Fauna species, if such species are found in the conduct of the fauna survey;
- 7 Landform management, including:
- (1) the design of the boundary areas of the development to be in harmony with the adjacent dunal systems and landforms; and
 - (2) the design of the development to ensure the stability and sustainability of the surrounding landforms.
- 5-2 The proponent shall implement the Environmental Management Plans required by condition 5-1.
- 5-3 The proponent shall make the Environmental Management Plans required by condition 5-1 publicly available prior to commencement of ground-disturbing activities.

6 Commencement

The environmental approval for the substantial commencement of the proposal is limited.

- 6-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced.

Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period to the Minister for the Environment.

Where the proponent demonstrates to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding five years for the substantial commencement of the proposal.

7 Compliance Auditing

To help determine environmental performance and compliance with the conditions, periodic reports on the implementation of the proposal are required.

- 7-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit programme prepared by the Department of Environmental Protection in consultation with the proponent.

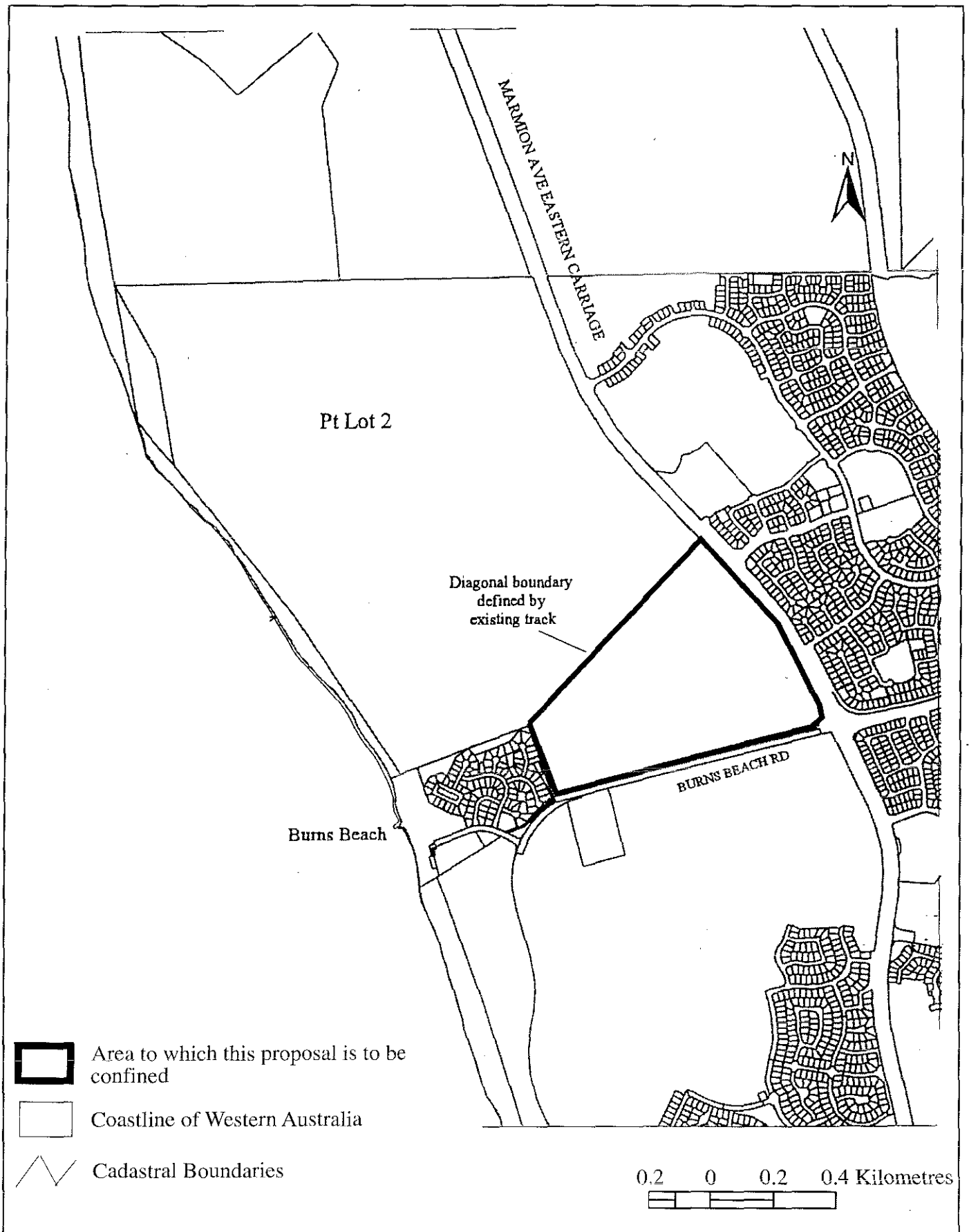
Procedure

- 1 Unless otherwise specified, the Department of Environmental Protection is responsible for assessing compliance with the conditions contained in this statement and for issuing formal clearance of conditions.
- 2 Where compliance with any condition is in dispute, the matter will be determined by the Minister for the Environment.

Note

- 1 The Environmental Protection Authority reported on the proposal in Environmental Protection Authority Bulletin 880 (January 1998).
- 2 This statement refers only to the portion of land shown in Attachment 1 and not to the larger area detailed in the Public Environmental Review entitled 'Proposed Residential Development of the Western Cell, Lot 2 Burns Beach' by Halpern Glick Maunsell (October 1995).

Attachment 1: Development area of Part Lot 2 Burns Beach.



Attachment 2 - Proponent's consolidated commitments

1. The proponent will employ deep sewerage in all areas of the subdivision, with all dwellings having deep sewerage connections.
2. All stormwater will be managed on site, in accordance with the principles of Water Sensitive Urban Design and will be adhered to by the proponent as part of the development, to the requirements of the Department of Environmental Protection on advice from the Water and Rivers Commission and the City of Wanneroo.
3. The proponent commits to undertake a 2% search of the part of the Western Cell that the Police Department have advised may contain Unexploded Ordinance, and to take appropriate remedial action should any UXO be discovered.
4. Should any archaeological sites be identified during construction activities the proponent recognises its obligations under the Aboriginal Heritage Act 1972 to cease activities that may impact upon the site and to initiate discussions with the Aboriginal Affairs Department on an appropriate course of action.