

The Sanctuary, Pelican Point, Bunbury

Pelican Point Pty Ltd

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

**Environmental Protection Authority
of Perth, Western Australia
Bulletin 616
March 1992**

THE PURPOSE OF THIS REPORT

This report contains the Environmental Protection Authority's environmental assessment and recommendations to the Minister for the Environment on the environmental acceptability of the proposal.

Immediately following the release of the report there is a 14-day period when anyone may appeal to the Minister against the Environmental Protection Authority's recommendations.

After the appeal period, and determination of any appeals, the Minister consults with the other relevant ministers and agencies and then issues his decision about whether the proposal may or may not proceed. The Minister also announces the legally binding environmental conditions which might apply to any approval.

APPEALS

If you disagree with any of the assessment report recommendations you may appeal in writing to the Minister for the Environment outlining the environmental reasons for your concern and enclosing the appeal fee of \$10.

It is important that you clearly indicate the part of the report you disagree with and the reasons for your concern so that the grounds of your appeal can be properly considered by the Minister for the Environment.

ADDRESS

Hon Minister for the Environment
18th Floor, Allendale Square
77 St George's Terrace
PERTH WA 6000
CLOSING DATE

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

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Summary and recommendations

Pelican Point Pty Ltd proposes to construct tourist and recreational facilities on 134ha of unused or agricultural land near the Leschenault Inlet at Bunbury. The proposed development would consist of a hotel, short-stay tourist and residential accommodation around either a canal, a small boat marina or landscaped lakes, an 18-hole golf course and foreshore reserves.

The proposal covers two sites. The Pelican Point site (Lot 26) is located on the southern part of the Collie River Delta on the Leschenault Inlet. It lies next to the management area of the Leschenault Inlet Management Authority. The land is low lying, and its wetlands are seasonally or tidally inundated. The vegetation is heterogeneous, and a wide range of native and introduced species typical of saline and freshwater environments is present. The area has been modified extensively by previous developments.

The Lot 100 site is bounded by Old Coast Road to the west, Australind Bypass to the east, and the railway to the south. It is owned by the Industrial Lands Development Authority, and is under contract of sale to the proponent. Much of the land is low lying, and contains an expansive salt marsh, and a large area of Paperbark and Peppermint pastured woodland which is used for grazing. The land rises to a dunal ridge 18 metres AHD at the south-eastern section of the site, and contains pastured woodland of Peppermint, Marri and Jarrah.

A Public Environmental Review was prepared by the proponent and released for an eight-week public review period concluding in October 1991. Fifteen public submissions were received from State and local government authorities, conservation groups and members of the public.

The following are the major issues raised in public submissions:

- project history and alternative options;
- flood plain management;
- groundwater use;
- value of the area for conservation;
- landscape protection;
- Collie River foreshore and public access;
- foreshore management;
- mosquito breeding;
- value of the wetlands as waterbird habitat;
- nutrient management and maintenance of water quality; and
- monitoring and maintenance of the water bodies, structures and on-going management.

Other issues were raised which have not been dealt with during the assessment process because they are not environmental issues, namely:

- project viability;
- Leschenault Inlet Management Authority policy on residential use and canals;
- housing density and the appropriate mix of residential/short-term stay accommodation; and
- the need for a golf course.

The Authority has assessed the major environmental impacts of the proposal, as described in the Public Environmental Review, and in response to submissions.

The Authority considers that the following issues may be managed as set out in the original proposal, or by commitments made by the proponent during the assessment.

Regional issues

- loss of remnant vegetation:
 - retention of samphire around part of Lot 26 wetland;
 - retention of samphire in 250 metre flood way;
 - design amendments to increase retention of existing vegetation; and
 - variations to the Collie River foreshore reserve boundary to retain vegetation;
- landscape protection:
 - increased planting of indigenous vegetation along Vittoria Bay foreshore to screen the development from the Estuary; and
 - retention of part of samphire area on Lot 100 for Egret habitat.

Site specific issues

- loss of estuarine wetlands:
 - replacement with components of existing wetlands;
- waterbird habitat:
 - increase the carrying capacity of the site for waterfowl by provision of drought and predator refuges;
- mosquito breeding:
 - opening of existing Lot 26 wetland to the Collie River and dredging it to reduce mosquito breeding habitat;
 - proposed artificial wetlands would be designed to be too deep for mosquito breeding;
- width and continuity of Collie River foreshore:
 - tennis courts to be removed from foreshore reserve.

The following issues are addressed by the Authority's recommendations:

Regional issues

- loss of remnant vegetation:
 - variations in width of Collie River foreshore to increase retention of vegetation;
- waterbird habitat:
 - restoration of the area north of Buffalo Road, at the northern end of the Inlet; and
 - design of wetlands as waterbird habitat.

Site specific issues

- width and continuity of Collie River foreshore:
 - foreshore reserve to average 50 metres; and
 - boardwalk to have a reasonable area of public land behind it dedicated in perpetuity;
- mosquito breeding:
 - Lot 26 wetland to be opened to the Collie River;
 - clients to be informed about mosquito problem;
 - chemical mosquito control to utilize adulticides rather than larvicides; and
 - applications to be timed so as not to coincide with wildlife feeding;
- maintenance of canal, marina and non-navigable waterway;
- nutrient management and an environmental management programme.

The following issue arose during the course of the assessment, and can not be resolved within this process. However, the Authority considers that it is an important issue, and wishes to draw it to the attention of Government:

- the potential for future land use conflict between the residential land use at Pelican Point and the future expansion of port industry, especially from noise and risks and hazards.

In its deliberations regarding this proposal, the Environmental Protection Authority has taken into account the following considerations: that Lot 26 is in private ownership, that there is a Special Uses (Resort Development) zoning approved by the City of Bunbury for the site, and that in 1986 the Authority recommended approval of a tourist resort for the site. The history of development proposals, the ownership and management of the land and the residential development nearby at Eaton have reduced the range of reasonable options available to the Authority. Under the circumstances, the major thrust of the Authority is to ensure that the development is compatible with reasonable environmental standards.

The previous (1986) report considered the Pelican Point site only, but the Authority has also considered this assessment in the context of the Environmental Protection (Swan Coastal Plain Wetlands) Regulations, and in the context of additional information received on the regional values of the remnant vegetation and waterbird habitat. The Authority notes that, although the Pelican Point site is currently degraded, it has a regional conservation value, which would be enhanced if the land were to be rehabilitated for that purpose. Therefore, the Authority considers that further opportunities to conserve or replace remnant vegetation should be made on the site, particularly wetland vegetation associations and the estuarine forest.

Although all the existing wetland functions cannot be retained or replaced, the Environmental Protection Authority finds the proposal to alter the Pelican Point wetlands environmentally acceptable; firstly, because some of the functions of the existing wetlands have been lost already, due to the need to control mosquitoes close to Eaton and Australind; secondly, because the Authority considers that it is possible to gain an improvement in the regional situation through an alteration to the water regime of the waterbird habitat north of Buffalo Road at the northern end of the Inlet; and thirdly, because the new wetland functions to be provided although different, offer an increased range of functions due to the provision of drought and predator refuges for waterbirds.

The Environmental Protection Authority has chosen the best option available at this time, which is that whilst some of the wetland values may be replaced on the site, there are opportunities for others to be replaced outside the site, (for example rehabilitating the area north of Buffalo Road). The Authority wishes to stress that this recommendation is not to be seen as setting a precedent for the assessment of future proposals affecting wetlands.

Accordingly, the Environmental Protection Authority considers that, as it does not recommend the replacement of the full suite of existing functions in the artificial wetlands, all environmental impacts currently associated with the Pelican Point proposal as identified in this assessment report are manageable, subject to the recommendations made in this report, and the commitments provided by the proponent.

Recommendation 1

The Environmental Protection Authority has concluded that the Pelican Point proposal, as outlined in the Public Environmental Review, and as modified during the process of interaction between the proponent, the Environmental Protection Authority and government agencies, and those members of the public who responded, is environmentally acceptable.

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

Regional issues:

- loss of remnant vegetation; and
- landscape protection.

Site specific issues:

- impacts on wetland function and habitat, particularly waterbird habitat;
- mosquito breeding;
- width and continuity of foreshore areas;
- maintenance of canal, marina and lakes water quality;
- nutrient management; and
- environmental management.

The Environmental Protection Authority considers that these issues have been addressed and are manageable, either by changes to the proposal made by the proponent during the assessment, by the environmental management commitments given by the proponent, or by the Environmental Protection Authority's recommendations in this report.

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

As a result of the Waterways Commission report, the regional values of the estuarine fringing vegetation are understood better, and the Authority became concerned about the condition of the wetland area north of Buffalo Road, at the north of the Inlet.

Recommendation 2

The Environmental Protection Authority recommends that the area north of Buffalo Road should be maintained and managed as waterbird habitat.

The proponent wants to fill or excavate parts of the wetlands on Lot 26 and on Lot 100, which are protected by the Environmental Protection (Swan Coastal Plain Wetlands) Regulation, and create new wetlands instead.

Recommendation 3

The Environmental Protection Authority recommends that:

- (i) artificial wetlands on Lot 100 may be substituted for some of the existing wetlands on Lot 26 and Lot 100;
- (ii) if the Environmental Protection (Swan Coastal Plain Wetlands) Regulation is in place at the time the proposal is implemented, an exemption be granted by the Minister for the Environment to permit the filling or excavation of parts of the Lot 26 wetland and parts of the Lot 100 wetland.

The new wetlands should provide a range of waterbird habitat.

Recommendation 4

The Environmental Protection Authority recommends that the design of the artificial wetlands as waterbird habitat should be to the satisfaction of the Environmental Protection Authority, on the advice of the Leschenault Inlet Management Authority and the Department of Conservation and Land Management.

The existing wetlands provide waterbird feeding habitat, but are also recognised mosquito breeding sites close to residential areas at Eaton and Australind.

Recommendation 5

The Environmental Protection Authority recommends that:

- (i) the part of Lot 26 wetland protected by the Environmental Protection (Swan Coastal Plain Wetland) Regulation as shown in Figure 7, may be opened to the Collie River to reduce the breeding of salt water mosquitoes;
- (ii) management of mosquito breeding in the remaining or new wetlands should include:
 - giving potential clients of the development information about the mosquito problem;
 - the application of adulticides only, but not at the waterbird feeding habitat;
 - any chemical control measures to be timed so as to minimize conflict with bird feeding;
- (iii) if management of mosquitoes is transferred to the City of Bunbury, this recommendation should still apply.

The proponent wants to vary the width of the Collie River foreshore reserve, which the Authority recommended in the assessment of the previous proposal, should be 50 metres wide.

Recommendation 6

The Environmental Protection Authority recommends that:

- (i) the Collie River foreshore reserve should average 50 metres in width from the high water mark;
- (ii) public access around the hotel via a boardwalk over the river, should be backed by a land based publicly owned foreshore reserve of reasonable size, (with the potential to be leased back to the proponent for maintenance), to the satisfaction of the Environmental Protection Authority on the advice of the Department of Planning and Urban Development;
- (iii) the boundary of the foreshore reserve should be to the satisfaction of the Minister for the Environment, on advice from the Leschenault Inlet Management Authority.

The Authority considers that the canal, the marina and the non-navigable waterway should be kept in good condition.

Recommendation 7

The Environmental Protection Authority recommends that monitoring and management of the canal, the marina and the non navigable waterbody should be addressed to the satisfaction of the Environmental Protection Authority on the advice of the Leschenault Inlet Management Authority for Part A and the City of Bunbury for Part B.

Part A:

- water quality; and
- accumulation of nutrients in the sediments.

Part B:

- navigable depths, including the connection of the canal to the Collie River, and maintenance dredging if required;
- the canal retaining walls, the foreshore walls and other structures;
- strategies for dealing with accidental spillages; and
- the management of oil and fuel, wastes from boats, rubbish and suspended solids.

The Authority considers that long term management of the canal, the marina and the non-navigable waterway should be agreed to prior to sale of the land adjoining these waterbodies.

Recommendation 8

The Environmental Protection Authority recommends that the determination of a long-term Waterways Manager should be resolved by the proponent, prior to canal zoning being permitted under the Bunbury Town Planning Scheme, to the satisfaction of the Minister for the Environment and the Minister for Planning, on the advice of the City of Bunbury, the Department of Planning and Urban Development, and the Department of Marine and Harbours.

The Authority considers that the management of nutrients from the development site is important, in order to keep the waters of the Collie River and the Leschenault Inlet in good condition.

Recommendation 9

The Environmental Protection Authority recommends that:

- (i) nutrients shall be monitored and managed to the satisfaction of the Environmental Protection Authority, on the advice of the Leschenault Inlet Management Authority;
- (ii) should nutrients from the development have any adverse effects on the environment, the proponent will be required to put in place ameliorative measures, to the satisfaction of the Environmental Protection Authority on the advice of the Leschenault Inlet Management Authority.

The Authority considers that the above environmental issues should be drawn together and managed in an environmental management programme.

Recommendation 10

The Environmental Protection Authority recommends that the proponent prepares an environmental management programme, which draws together the proponent's initial and subsequent commitments and the previous recommendations in this report, to the satisfaction of the Minister for the Environment, on the advice of the Environmental Protection Authority, the Leschenault Inlet Management Authority, the City of Bunbury and the Department of Conservation and Land Management.

The programme should contain, but not necessarily be limited to, the following elements:

- **remnant vegetation management during and after construction;**
- **foreshore management during and after construction;**
- **monitoring and management of waterbird habitat during and after construction;**
- **mosquito breeding management;**
- **nutrient management;**
- **monitoring and management of all waterbodies, including wetlands; and**
- **management commitments made in all the proponent's documents and in correspondence.**

The environmental management programme (EMP) should be prepared into two stages. The first stage (the pre-construction EMP) should address the management of those parts of the environment requiring protection during construction, and should be approved prior to the commencement of site works to the satisfaction of the Minister for the Environment.

The second stage (pre-commissioning EMP) should address the management of the other issues, and should be approved prior to completion of Stage 1 of the site works to the satisfaction of the Minister for the Environment.

The implementation of the approved environmental management programmes (Stages 1 and 2), and on-going investigation and reporting requirements should be to the satisfaction of the Environmental Protection Authority.

An additional issue

Noise, and/or risks and hazards may become issues in the future when the port expands.

The Environmental Protection Authority notes that the establishment of residential development at Pelican Point puts some long term constraints on port development and on use of the port access corridor, and draws this issue to the attention of the Government.

1. Introduction

There is a long history to the attempts to develop the Pelican Point site. A previous proposal was given environmental approval in 1986, but this proposal did not proceed. The current proposal was initially referred to the Environmental Protection Authority for comment in 1989, and a draft document was sent to the Environmental Protection Authority in October 1990. The level of assessment was set as a Public Environmental Review because it was a new and more intensive development, containing a canal. The Public Environmental Review document was finalised in July 1991, and released for public comment on 7 August 1991. Public submissions closed in October, 1991.

2. The proposal

2.1 Project description

The proposed Pelican Point development would contain the following components, which are illustrated in Figure 1.

- An 18 hole golf course set in landscaped native parkland.
- Permanent waterfowl and wildlife refuges established within the golf course.
- A golf resort.
- Several areas of landscaped public open space within the development and adjacent to the foreshores.
- Public facilities such as parking areas, toilets and boat launching ramp.
- A resort hotel and function centre.
- A range of tourist and managed residential accommodation set around artificial wetlands and waterways.
- Tourist accommodation adjacent to the Vittoria Bay foreshore and floodway reserve.
- A residential golf estate.
- A commercial centre to service the development.

The proposed development has been designed to accommodate the planning guidelines for the site and its surrounds, and to resolve the environmental constraints which apply to the site.

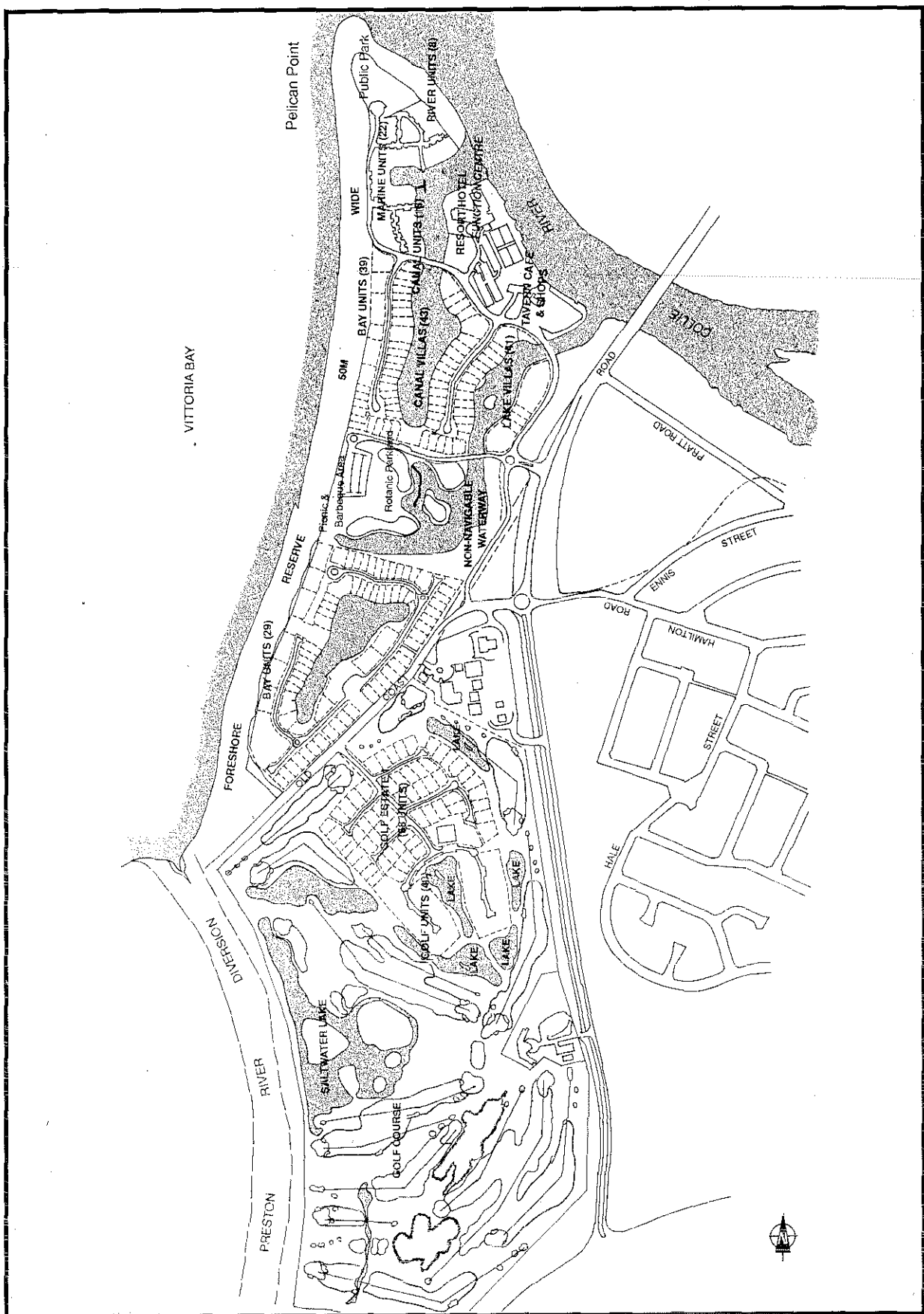
The major design constraints are:

- the requirement to comply with the Collie River flood strategy;
- the requirement for a 50m foreshore reserve and public access to that reserve;
- the need to maintain or enhance the existing wetland values of the site;
- the need to control mosquito breeding and odour problems in wetlands on the site;
- the need to establish an adequate water supply for irrigation requirements;
- the need to make the project economically viable in the long term; and
- the requirement for a buffer between residential and industrial land.

(Public Environmental Review, 1990 p.xvi and xvii.)

2.2 Project history

There have been numerous attempts to develop the land at Pelican Point, shown in Figure 2. An earlier proposal involved the development of a holiday resort and sporting complex, which



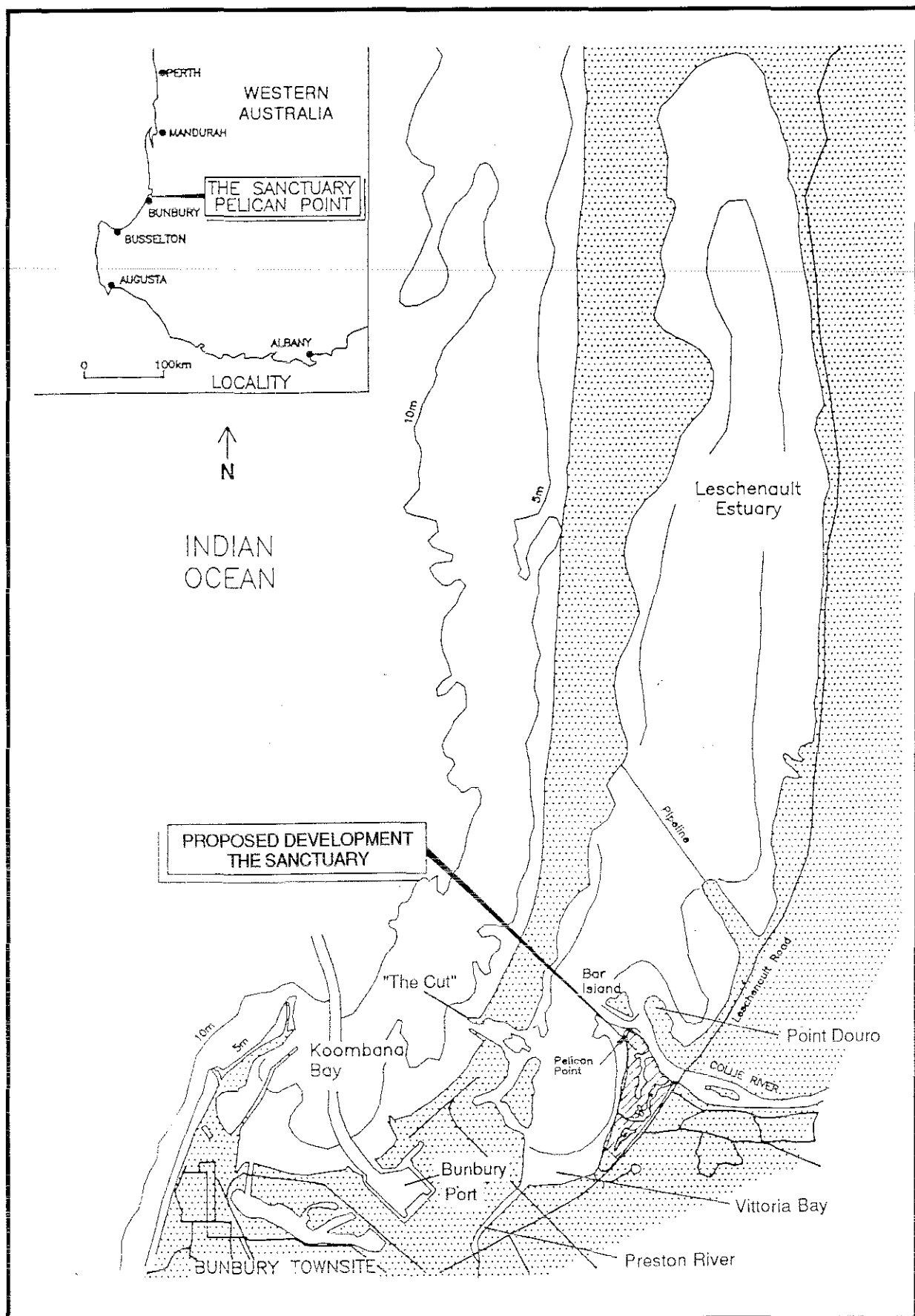


Figure 2. Site location

incorporated a nine-hole golf course and small boat haven. The earlier proposal was assessed jointly in 1986 by the Environmental Protection Authority and the Leschenault Inlet Management Authority, and it was concluded that the proposal would be environmentally acceptable, subject to recommendations addressing the following:

- compliance with existing flood management requirements;
- provision of a 50m wide foreshore reserve on Vittoria Bay and along the Collie River;
- continuous public access throughout all foreshore areas, and a public access way linking the public car park with the Vittoria Bay foreshore;
- Lot 26 and Lot 100 to be treated as a single land unit in order to provide an 18-hole golf course, and retention of the wetlands of the land unit to incorporate the natural conservation values of the whole area;
- any modifications to Lot 26 including provision of the relief flood way, to be undertaken in such a way that its functions as waterbird/wading bird habitat and feeding grounds are maintained or enhanced;
- any mosquito control programme should be environmentally acceptable to both Authorities, and complement the regional mosquito control strategy; and
- development of the golf course was environmentally unacceptable, but could be environmentally acceptable if relocated to Lot 100, and modified to the satisfaction of both Authorities.

This assessment recognized the existing policy statement and zoning under the Bunbury Town Planning Scheme No 6 (1984). Lot 26 is zoned Special Use (Resort Development), and Lot 100 is reserved Public Open Space and Drainage. Lot 100 was intended to act as a buffer zone to the port access corridor and port industry, and a golf course was considered to be a land use compatible with this zoning. The scheme map also shows provision of a 50 metre wide foreshore reserve along the Vittoria Bay and Collie River foreshores, for which the designated purpose is "Parks, Recreation and Drainage".

This proposal did not proceed, because, amongst other things, the proponent considered that the provision of a golf course was an essential part of the resort complex. The proponent then sought access to Lot 100, and after receiving approval for the Department of Planning to rezone the land for residential subdivision in November 1989, was granted conditional approval to purchase the land in May 1990.

Once access to Lot 100 was confirmed, the proponent submitted a new design to the Environmental Protection Authority for comment, and to re-activate the environmental assessment process. The Authority confirmed that Bulletin 267 recommendations were still applicable, stressed the need for appropriate treatment of all wetlands, both natural and artificial, and advised the proponent to consult with officers of the Waterways Commission.

The level of assessment was set initially at a Consultative Environmental Review, but this level of assessment was raised subsequently to a Public Environmental Review, as a result of the incorporation of a canal into the project design.

A draft of the Public Environmental Review document was received in October 1990, and the Authority requested that additional work be carried out on the wetlands in terms of replacing function and habitat. Upon completion of this work, a final Public Environmental Review was received in July 1990, and released for public review on 7 August 1991. Public submissions closed in October 1991, and the proponent's response to submissions was received in February 1992.

3. Land use planning and management

There are five documents which have established policies relating to the area, and which provide a context within which this assessment has taken place. The five documents are:

- the Bunbury Region Plan (1985);
- the City of Bunbury Town Planning Scheme No 6 (1984);
- the Leschenault Inlet Management Programme Review (1990);
- the Report on Conservation Reserves for Western Australia - The Darling System - System 6, Part II, Recommendations for Specific Localities, 1983; and
- the Leschenault Estuary, Collie River, Preston River, Regional Flood Study, and the subsequent compromise Flood Strategy (1981).

3.1 The Bunbury Region Plan

The Bunbury Region Plan proposes regional policies for the area identified as the Leschenault Regional Park, which includes Pelican Point, and Lot 26 and Lot 100. The report states:

- "(a) Any management plan for land uses within the Leschenault Regional Park should be consistent with the recommendations and objectives expressed in the System 6 Report, and the Leschenault Inlet Management Authority's stated objectives, namely:
- the primary management objectives should be conservation and recreation;
 - conservation of the water bird and fish habitats, including the northern wetland and the Laporte Egret swamp;
 - managing recreation and resort activity and development within the framework of the more important preceding objectives;
- (b) the northern end of the Inlet should be retained for passive recreation and natural environment uses, whilst the southern end including the foreshores at Australind, Samphire Bay and Pelican Point should be used for more active recreation and resort activities;
- (c) provision should be made for the floodways of the lower Preston and Collie Rivers within the management plans of the southern or Vittoria Bay end of the Inlet."

The report clearly emphasises the importance of the area for both conservation and recreation. Consequently, any recreation or resort developments within the Leschenault Region Park would need to recognise and incorporate the natural conservation values of the area, and seek to maintain and enhance those values. The Bunbury Region Plan also reflects the foreshore reserve around Pelican Point designated by the City of Bunbury's TPS No 6 (Bulletin 267, 1986, p 8).

The Region Plan report also recommended the adoption of industrial buffer zones based on the minimum distance which a particular class of industry should be from existing or proposed residential zones. The boundaries of such buffers have come to be referred to as "Rigden Lines", and are shown in Figure 3.

The residential boundary adopted under the Rigden Line concept allows for the rounding out of the Eton townsite and the development of Pelican Point, as shown in the two district zoning schemes for Dardanup and Bunbury. As a result of the adoption of this boundary, the northern part of Lot 100 is included in the existing and future residential precinct, whilst the southern part is included in a light industry buffer zone (PER p 6).

3.2 Bunbury Town Planning Scheme No 6

The Bunbury Town Planning Scheme divides the scheme into a number of policy areas, which are subject to policy statements relating to their predominant use, and to the proposed development for each policy area.

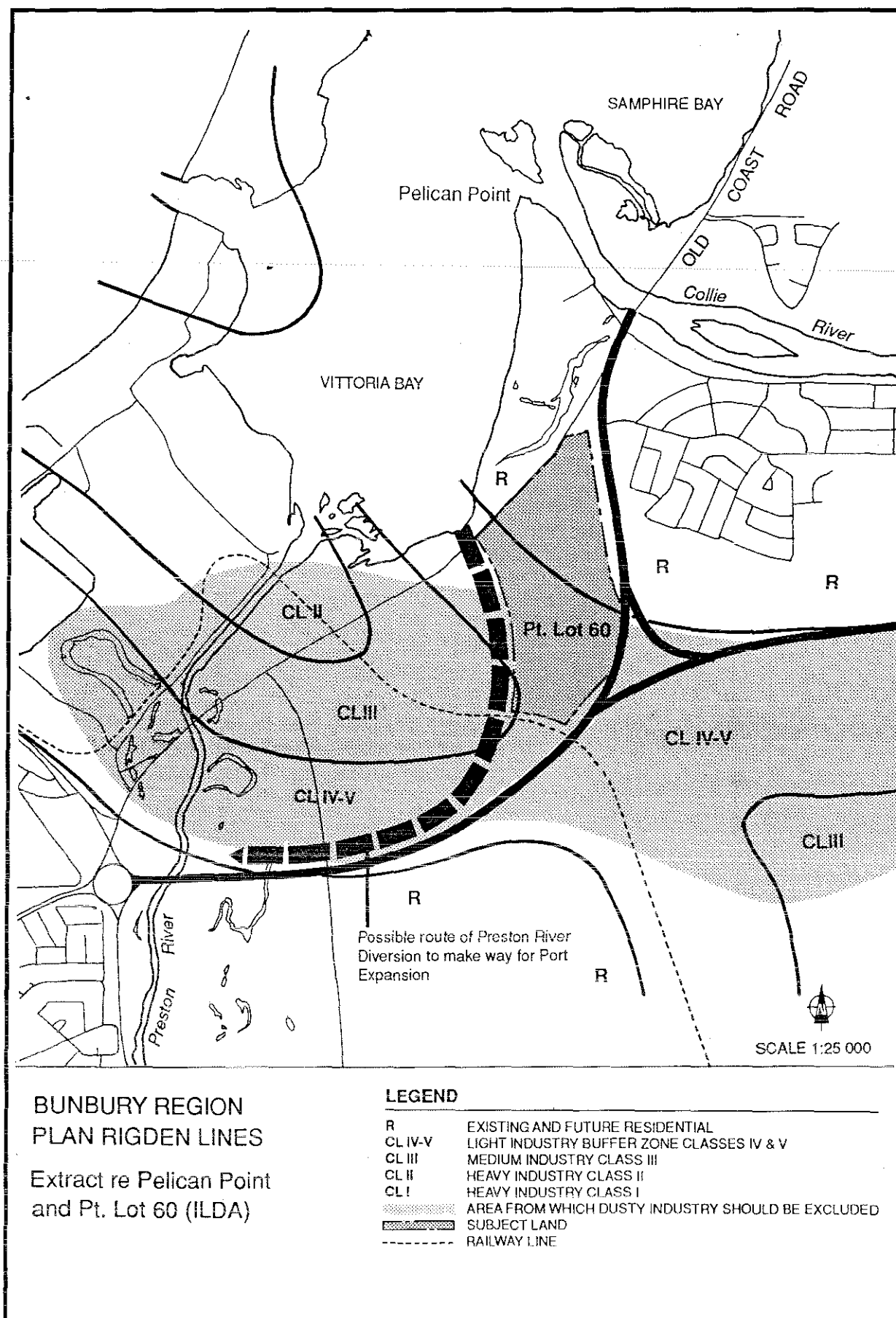


Figure 3. Rigden lines (PER 1991)

The following is quoted from the published scheme for Pelican Point:

- "9. Pelican Point: Whereas the area adjoins the Collie River and the Leschenault Inlet foreshore and whereas the land is low lying, and whereas some of the present uses are chalets, boating and foreshore recreation, and whereas the foreshores, mud flats and river delta are significant feeding grounds for fish and waterbirds, the following planning policy shall apply:
- (a) the foreshores of both the Collie River and the Leschenault Inlet shall be set aside and protected from development and the pressures of human habitation;
 - (b) resort development with associated uses may be permitted in a limited form after due recognition of the physical characteristics of the locality, and completion of engineering and other necessary investigations in consultation with the relevant Government Departments;
 - (c) development of the southern portion of Location 26 shall not be permitted until the development options as referred to in the Public Works Department Regional Flood Study have been resolved."

(Bulletin 267 p 7 quoting from WA Government Gazette, 6 April 1984).

3.3 Leschenault Inlet Management Programme Review

Recommendations in the Leschenault Inlet Management Programme Review cover the Collie River mouth upstream for approximately four kilometres, and recognize that demand for use of this section of the River are likely to increase as the population of Bunbury grows.

The following recommendations cover the Pelican Point area:

- A15 Redevelop the Shoalhaven recreation area as a part of Pelican Point redevelopment plan;
- A16 Develop continuous foreshore walkway;
- A17 Undertake foreshore erosion works; and
- A18 Establish fishing facilities to discourage indiscriminate access to the foreshore.

3.4 Conservation reserves for Western Australia — The Darling System, System 6, Pt II Recommendations for Specific Localities

Recommendation C67 covers parts of the Brunswick and Wellesley Rivers, and the Collie River from its mouth in the Leschenault Inlet, to approximately 4km upstream. The rivers are lined with Flooded Gum, and provide very peaceful surroundings for passive recreation. Demand for use of the rivers is likely to increase as the population of Bunbury grows and riverside footpaths and picnic areas would be most suitable in catering for this.

The recommended area contributes to a larger area of open space of regional significance, which includes the Leschenault Inlet and the upper and middle reaches of the Collie River. Not all land under the various tenures within this area has conservation and recreation as primary management objectives; and to enhance these values the management structure requires co-ordination. Important management considerations include the preservation of the local indigenous flora and natural features, and allowing only passive recreation.

Recommendation C67 states that the general recommendations on planning and management of Regional Parks should be applied to this area.

3.5 Collie River Flood Strategy

The following information is drawn from Bulletin 267, which reported on the earlier Pelican Point proposal. The Public Works Department released a Regional Flood Study for the Leschenault Estuary, Collie River, and Preston Rivers in 1981. This Study was subsequently followed by an amended Flood Strategy, which would allow some development in flood prone land whilst protecting existing development. The Strategy provides a limit of flood plain encroachment, which would protect existing and future development in the event of a 100 year flood in the Collie River. The recommended limit of flood plain encroachment for Pelican Point is shown on the plan PWDA No 552387 14-1, and is shown in Figure 4 of this report. The purpose of the flood way is to direct river overflow into an area traversing Lot 26. This allows for the development of other parts of Lot 26 without transferring flooding to other land.

4. Public consultation

The proponent prepared a Public Environmental Review document, which was released for public comment in August 1990. Comments were sought from the public community groups, conservation groups, and local and State Government Authorities. Seven Government submissions, two conservation group submissions, and six private submissions were received by the Authority.

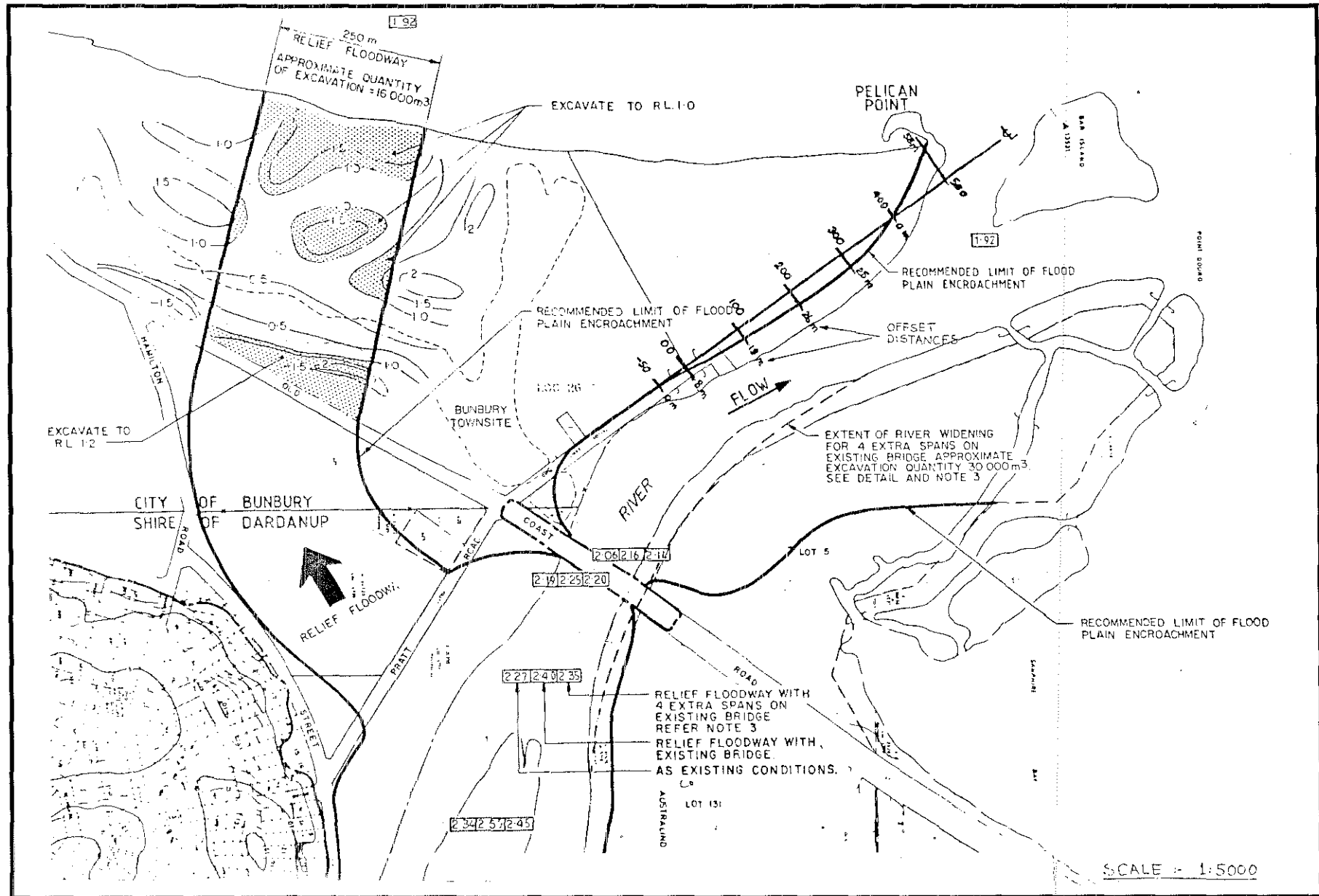
The submissions raised numerous issues, the major ones being:

- flood plain management;
- groundwater use;
- landscape protection;
- value of the area for conservation;
- Collie River foreshore and public access;
- foreshore management;
- mosquito breeding;
- value of the wetlands as waterbird habitat ;
- monitoring and maintenance of water quality and nutrient management;
- maintenance of the water bodies; and
- project history and alternative options.

Other issues were raised which it was not considered appropriate to deal with in the environmental assessment process, namely:

- project viability;
- conflicts with Leschenault Inlet Management Authority policy on residential use and canals;
- housing density and mix of residential/short term stay accommodation; and
- need for a golf course.

Details of the issues raised and the proponent's response to these issues are included in Appendix 2 of this report.



5. Existing environment

The following description of the physical and biological environment is drawn from the Pelican Point Public Environmental Review, and from the Nutrient and Water Balance document. The proposal covers two sites. The Pelican Point site (Lot 26) is located on the southern portion of the Collie River Delta on the Leschenault Inlet. Lot 100 is bounded by the Old Coast Road to the west, Australind Bypass to the east, and the proposed Preston River diversion to the south.

Lot 26 land is low lying, and parts of it are seasonally or tidally inundated. Soils of the low-lying areas are typically grey-black medium grained sands with some shell fragments. Silty sands are found generally at depths of between two and four metres. The amount of organic matter in the soils varies, and gives rise to changes in colour from white to black.

A wide range of native and introduced species typical of saline and freshwater environments is present. The mosaic of vegetation associations includes samphire and sedge wetlands, remnant Paperbarks, Eucalyptus woodland, and Jacksonia shrubland. The Public Environmental Review states that no rare or endangered species of flora were found in the study area.

The low-lying areas of Lot 100 support mainly samphire beds, with Paperbark trees and sedges on the higher boundaries of the samphire. The land rises to a dunal ridge 18 metres AHD at the south-eastern section of the site, and is covered by Peppermint, Marri and Jarrah with a pasture understorey.

The soils of the ridge are typically medium-coarse grained quartz sands, becoming yellow at depth. Soils on the slope grade between those of the ridge and those of the lowland.

The Leschenault Inlet foreshore is a sandy beach partly lined by sedges. It also supports a grassy area with couch, weeds and scattered shrubs above high tide level. The Collie River foreshore is a narrow bank which support rushes at its edge, and She-oak, Flooded Gum and Paperbarks on the bank.

Groundwater salinity is high over the low lying parts of the site. Fresh groundwater occurs beneath the ridge, and seeps out at its base during spring. During summer much of the site is dry, and the groundwater lies at about 1m below the surface. In winter, the groundwater rises and forms pools in low-lying areas.

The waters of the Inlet and the Collie River are tidal next to the site, but of small range (0.3m). For most of the year the waters are clear and saline. During winter, river flows reduce water salinity and clarity, and also raise the level of nutrients. Waters discharges from the Inlet through an artificial opening cut into the Leschenault Peninsula. "The Cut" has improved flushing and water exchange in the Inlet, and changed the lower part of the Collie River to a tidally dominated system. Wind waves are now the dominant force flushing the Leschenault Inlet.

During winter and spring the wetlands provide feeding grounds for ducks, swans and members of the heron, egret and spoonbill group of wading birds. In summer and autumn the wetlands dry up, and are little used. During this period, the Inlet is used by migratory waders, some of which use the intertidal flats at Vittoria Bay.

The Public Environmental Review states that seven of the species of shorebird recorded on these flats, are protected by international treaty. One species, the Great Egret, uses the samphire wetlands on the site for feeding. Further information on the waterbirds is contained in Section 8.2 Waterbird habitat.

The site is known to support rabbits and probably rats, mice, foxes, and cats. No rare fauna was recorded on the site.

6. Environmental impacts and their management

6.1 General

The Environmental Protection Authority considers that any decision about Pelican Point must be viewed in its planning context, which is that the Lot 26 is in private ownership, that there is a Special Uses (Resort Development) zoning approved by the City of Bunbury for the site, and that in 1986 the Authority recommended approval of a tourist resort for the site. The history of development proposals, the ownership and management of the land, and the residential development nearby at Eaton have reduced the range of reasonable options available to the Authority. Under these circumstances, the major thrust of the Authority is to ensure that the development is compatible with reasonable environmental standards.

The previous (1986) report considered the Pelican Point site only, but the Authority has considered this assessment also in the context of the Environmental Protection (Swan Coastal Plain Wetlands) Regulations, and in a regional context based on additional information received on the regional values of the remnant vegetation and waterbird habitat. With respect to the Pelican Point development, the Authority notes that although the site is currently degraded, it has conservation value, which would be enhanced if the land were to be rehabilitated for that purpose. Therefore, the Authority considers that opportunities to conserve or replace remnant vegetation should be made on the site, particularly wetland vegetation associations and the estuarine forest.

Although all existing wetland functions cannot be retained or replaced, the Environmental Protection Authority finds Pelican Point environmentally acceptable; firstly, because some of the functions of the existing wetlands have been lost, due to the need to control mosquitoes close to Eaton and Australind; secondly, because the Authority considers that it is possible to gain an improvement in the regional situation through an alteration to the water regime of the waterbird habitat north of Buffalo Road, at the northern end of the Inlet; and thirdly, because the new wetland functions to be provided, although different, offer an increased range of functions due to the provision of drought and predator refuges.

Accordingly, the Environmental Protection Authority considers that, as it does not recommend the replacement of the full suite of existing functions in the artificial wetlands, all environmental impacts currently associated with the Pelican Point proposal as identified in this assessment report are manageable, subject to the recommendations made in this report, and the commitments provided by the proponent.

This environmental management can be achieved by a combination of the proponent's original commitments, and supplementary commitments made after discussions with the Authority, as shown in Appendix 1, and the Authority's recommendations.

Recommendation 1

The Environmental Protection Authority has concluded that the Pelican Point proposal, as outlined in the Public Environmental Review, and as modified during the process of interaction between the proponent, the Environmental Protection Authority and government agencies, and those members of the public who responded, is environmentally acceptable.

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

Regional issues:

- loss of remnant vegetation; and
- landscape protection.

Site specific issues:

- impacts on wetland function and habitat, particularly waterbird habitat;
- mosquito breeding;

- width and continuity of foreshore areas;
- maintenance of canal, marina and lakes water quality;
- nutrient management; and
- environmental management.

The Environmental Protection Authority considers that these issues have been addressed and are manageable, either by changes to the proposal made by the proponent during the assessment, by the environmental management commitments given by the proponent, or by the Environmental Protection Authority's recommendations in this report.

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

The Authority believes that any approval for the proposal based on this assessment should be limited to five years. Accordingly, if the proposal has not been substantially commenced within five years of the date of the report, then any such approval could lapse. After that time, further consideration of the proposal should occur only following a new referral to the Authority.

The Authority notes that during the detailed implementation of proposals, it is often necessary or desirable to make minor and non-substantial changes to the designs and specification which have been examined as part of the Authority's assessment. The Authority believes that subsequent statutory approvals for this proposal could make provision for such changes, where it can be shown that the changes are not likely to have a significant effect on the environment.

7. Regional environmental impacts and their management

7.1 Remnant vegetation

This regional perspective is drawn from a report on fringing estuarine vegetation of the Leschenault Estuary, to be published shortly by the Waterways Commission. (Waterways Commission, unpublished report, Fringing Estuarine Vegetation of the Leschenault Estuary, 1992).

Between 1941 and 1989, 346 hectares, that is about 50% of the fringing estuarine vegetation around the Estuary has been lost, as shown in Figure 5. For pristine vegetation the loss is even greater, and includes a large component of estuarine wetlands.

The Waterways Commission report states that an extensive loss of estuarine wetland has occurred in the last three years in the northern part of the Inlet. The water exchange to the samphire flats north of Buffalo Road has been cut off, resulting in severe degradation of the vegetation, and loss of waterbird habitat. Future losses of estuarine wetlands will continue. Bunbury Port expansion will cause another 5-10% loss and the Preston River diversion another 5%. A conservative calculation of the total losses to date is 65%.

Pelican Point contains the last substantial representation of fringing estuarine freshwater vegetation on the Inlet. If Pelican Point is developed, there will be only a narrow fringe of estuarine vegetation left around the Inlet.

Pelican Point has extremely heterogeneous vegetation associations, but the area is degraded by human use, fire, filling of parts of the site, and alterations to the flushing regime. However, most of the species one would expect to find on this site are still there. There are areas showing signs of regeneration, and, if the disturbances were removed, some of the vegetation would return to reasonable condition.

There are two regionally significant areas. One area on Lot 26 contains four species of samphire, which is more species in one area than seen anywhere else on the Swan or on the

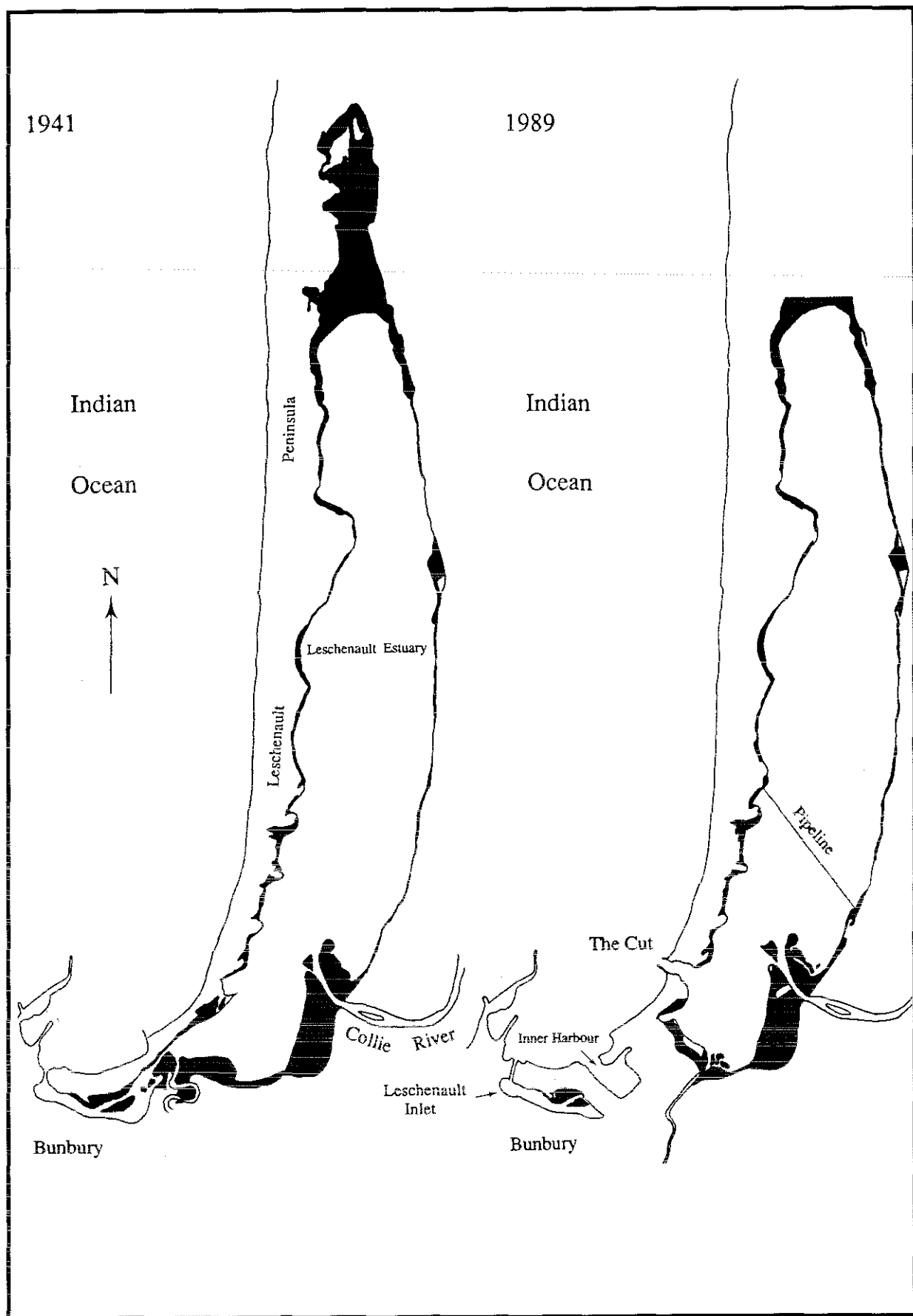


Figure 5. Loss of fringing estuarine vegetation (Waterways Commission unpublished report)

Leschenault Estuary. The entire Leschenault population of the saltmarsh species *Sarcornia blackiana* is virtually restricted to this site and to the Bunbury Port saltmarsh. The Port population will be lost due to reclamation of low lying areas as a consequence of Port expansion.

Lot 100 is significant because it contains the last example of broad area salt marsh on the southern half of the Leschenault Estuary. It is used as a foraging habitat by waterbirds in winter. This part of the site is degraded due to grazing, weed infestation and alterations to the drainage.

The proponent considers that much of the vegetation could not be viewed as even locally significant (PER Volume 1 p 24). Because of Water Authority requirements on flood levels, most of the site will be cleared and filled. Mature trees and fringing shoreline vegetation will be retained where practicable, and indigenous vegetation species, including a high proportion of flowering shrubs will be planted.

As a result of the Waterways Commission report, the ecological values of the fringing estuarine vegetation of both the region and of the Pelican Point site are now better understood, and the Authority considers that additional opportunities to conserve or replace vegetation should be made on the site, particularly wetland vegetation associations and the estuarine forest.

Such recommendations would be consistent with the Bunbury Region Plan's planning policy statements for the area, which emphasise conservation and recreation as management priorities, and the System 6 recommendation which also recognizes the Collie River foreshore's dual use for conservation and recreation.

Following discussions with the Authority on the value of the remnant vegetation, the proponent has made additional commitments to retain the samphire and other wetland vegetation which occurs within the 250 metre floodway and around the part of the Lot 26 wetland to be retained, and to amend the detail design, including the foreshore reserve boundary, to retain a greater proportion of remnant vegetation on the site. The proponent will also ensure that remnant vegetation is protected during construction. The Environmental Protection Authority has accepted these amendments to the proposal, and considers that the retention of remnant vegetation on the site has been addressed adequately.

During the course of this assessment, the Authority also became aware of the severe deterioration of the estuarine wetland north of Buffalo Road. The Authority is extremely concerned at its condition, and considers that this area is much too valuable to allow it to be destroyed. The Authority considers that tidal exchange should be restored to the area, so that the samphire and waterbird habitat could be rehabilitated, and recommends accordingly.

Recommendation 2

The Environmental Protection Authority recommends that the area north of Buffalo Road should be maintained and managed as waterbird habitat.

7.2 Landscape protection

In the Public Environmental Review guidelines, the Authority requested that landscape issues be discussed in a local and a regional context, and particularly in relation to similar developments proposed in the area. Currently a continuous belt of fringing vegetation exists from Point Douro to the Preston River, and birds and animals can move freely between the various habitat types. The placement of medium density housing and a resort development along the foreshores will create a major break in the continuity of foreshore habitat and landscape, because the taller background vegetation will be removed, and a dense cluster of buildings will be placed between two areas of fairly low vegetation.

In its assessment of a tourist development on the opposite side of the Collie River at Point Douro, the Authority considered that structures should be designed to be compatible with the existing environment (Bulletin 375, p 8). In its informal advice on proposed subdivisions to the east of the Estuary, the Authority also recognised landscape protection as a key issue.

The Leschenault Inlet Management Authority objected to the proposed development because of its visual impact on the natural landscapes of the Estuary. As a consequence, the Authority suggested to the proponent that modifications to the planting design should be made to place much greater emphasis on appropriate plant species, their location and density in order to provide better habitat, and to make the proposal more compatible with the landscape.

A landscape master plan will be prepared for the development including the golf course and areas of public open space. Following discussions with the Authority, the proponent has made an additional commitment to amend the plan, and to plant fringing vegetation along the Leschenault Inlet foreshore to screen the development from the Estuary, thus protecting the existing landscape values.

8. Site specific environmental impacts and management

8.1. Impacts on wetland function and habitat

8.1.1 The current proposal

The proponent proposes to fill or excavate the existing wetlands on both Lot 26 and Lot 100, and to create new wetlands as substitute habitat, as shown in Figure 6.

The impact of the proposal on the existing wetlands is as follows:

- Part of the main wetland on Lot 26 would remain, but it would be deepened, and opened to the River, changing it from an ephemeral wetland to a permanent water body.
- The southern arm of the Lot 26 wetland would be retained in the 250m floodway.
- The northern arm of the Lot 26 wetland would be excavated in part to create an artificial lake, and filled in part to provide land for housing. The proponents have put forward a proposal for permanent lakes on Lot 100 as compensation for the loss of this seasonal wetland.
- The southern end of the Lot 26 wetland would be excavated in part, and filled in part, to become an enclosed water body surrounded by dwellings. Compensatory lakes are proposed on Lot 100.
- The small wetland protected by the Wetlands Regulation on Lot 100 would be modified.

8.1.2 Recommendations, policies, regulations and the status of the wetlands

The wetlands issue is also complicated by the Environmental Protection Authority's previous recommendations on the site's wetlands, and the implementation of new policies to protect wetlands since the last proposal was approved.

8.1.2.1 Previous recommendations

Bulletin 264 reported on a proposed Pelican Point Country Club and Resort in October 1986, and contained the following recommendations regarding wetlands:

- Recommendation 4 states that in designing a golf course as part of the project, Pt Loc 26 and the adjacent Industrial Lands Development Authority site should be treated as a single land unit to accommodate the objectives of provision of an 18-hole golf course, and the retention of the wetlands of the whole area.

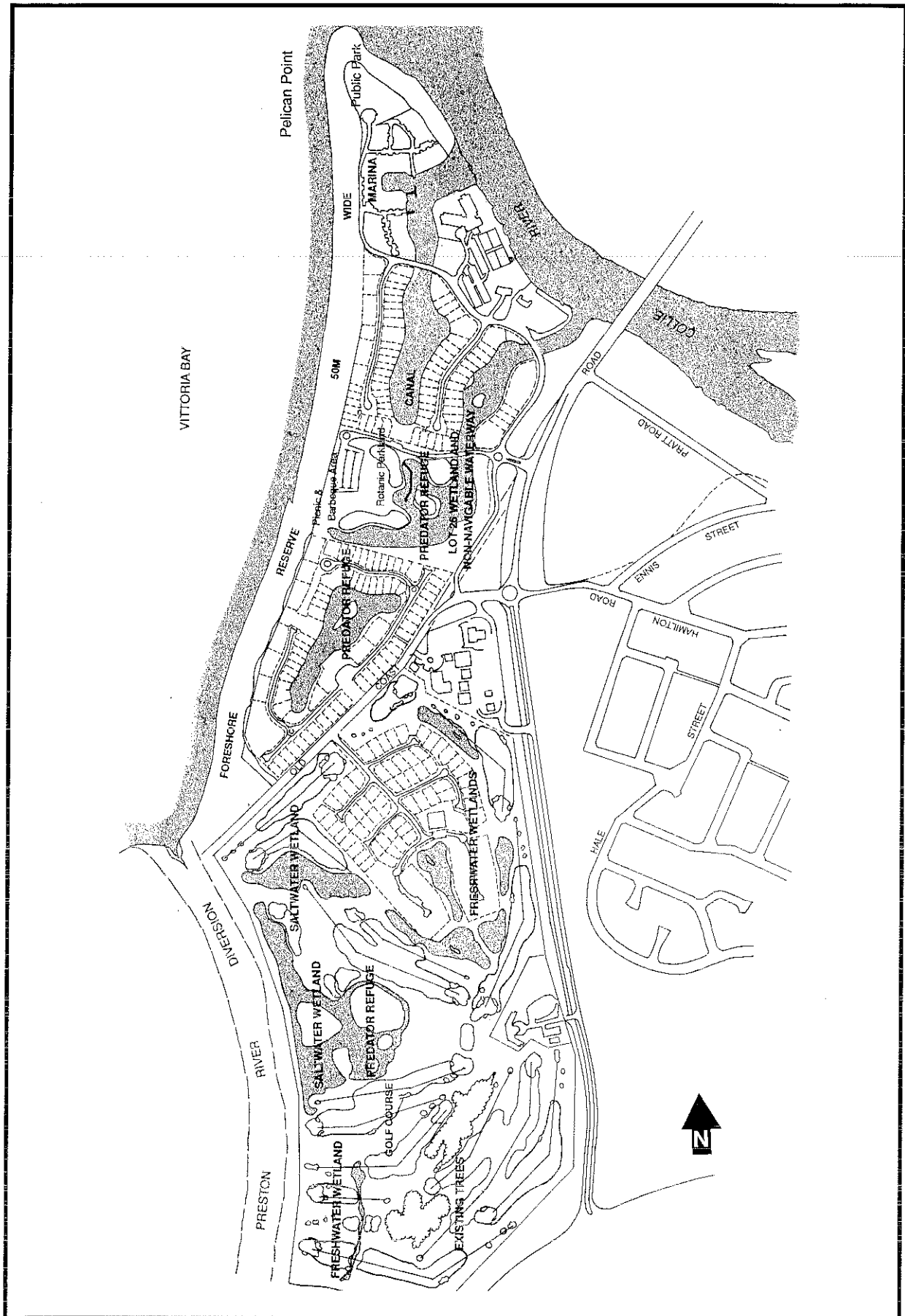


Figure 6. Proposed wetlands (PER 1991)

- Recommendation 5 states that as the retention of the wetland areas on Pt loc 26 is a matter of the highest priority, any modification to that land, including provision of the floodway, should be undertaken in such a way that its functions as waterbird/wading bird habitat and feeding grounds are maintained or enhanced.

8.1.2.2 Draft Environmental Protection (Swan Coastal Plain Wetlands) Policy

The draft Wetlands Environmental Protection Policy of 1991 identifies the Swan Coastal Plain wetlands as a part of the environment in need of protection. As a draft policy it has no legal status. However, the Environmental Protection (Swan Coastal Plain Wetlands) Regulations support the intent of this Policy, and protect those wetlands marked on Miscellaneous Plan 1700, until the Policy is finalised. The Regulations were gazetted on 28th March, 1991. Any proposal which affects wetlands protected by the Regulations, will require exemption under Section 6 of the Environmental Protection Act, before development can proceed.

Two Pelican Point wetlands are shown on Miscellaneous Plan 1700, one being the large wetland on Lot 26, and the other being the small wetland adjacent to a drainage line on Lot 100. A copy of the relevant part of Miscellaneous Plan 1700 is shown in Figure 7.

8.1.2.3 Environmental Protection (Swan Coastal Plain Lakes) Policy

The final Policy will be known as the Environmental Protection (Swan Coastal Plain Lakes) Policy, and will protect those wetlands which contained standing water of over 1000m² in early December 1991. The policy if and when approved, will supersede the draft Wetlands Policy and the Regulations.

The north-south section of the large wetland on Lot 26 contained over 1000m² of standing water in early December, and so will be included in the Environmental Protection (Swan Coastal Plain Lakes) Policy, but the two other arms of the wetland system or the surrounding wetland vegetation will not be included.

8.1.2.4 Bulletin 374 — A guide to wetland management in Perth

The Authority recognises that a large number of wetlands are not included in the Environmental Protection (Swan Coastal Plain Lakes) Policy. Development proposals which affect these wetlands should be assessed using Bulletin 374 as a framework. This Bulletin provides both a method for identifying wetlands' conservation and amenity value, and a means of managing to protect those values. It also assigns wetlands to categories with different management objectives. Bulletin 374 says that there are some categories of wetlands which must not be altered in any way, and that there are other categories of wetlands which may be altered, provided their functions are replaced.

The proponent was asked by the Authority to classify the wetlands on these sites according to Bulletin 374, and identify their existing functions and values. This additional information was incorporated into the Public Environmental Review, and formed part of the justification for the proponent's proposal to replace the existing wetlands with a different suite of values.

8.1.3 Impacts on the wetlands

The cumulative impacts of the regional loss of wetlands and their vegetation associations have not been addressed in the Public Environmental Review. The Waterways Commission unpublished report (Figure 5) shows that there have been a considerable loss of estuarine wetland in the northern part of the Inlet, north of Buffalo Road, due to changes in the water regime. In addition, the Leschenault Inlet Management Authority states that the Bunbury Port expansion will result in the loss of 20 hectares of water, samphire and low-lying areas, and that approval of this proposal would result in the loss of a further 24 hectares of wetlands and their vegetation associations.

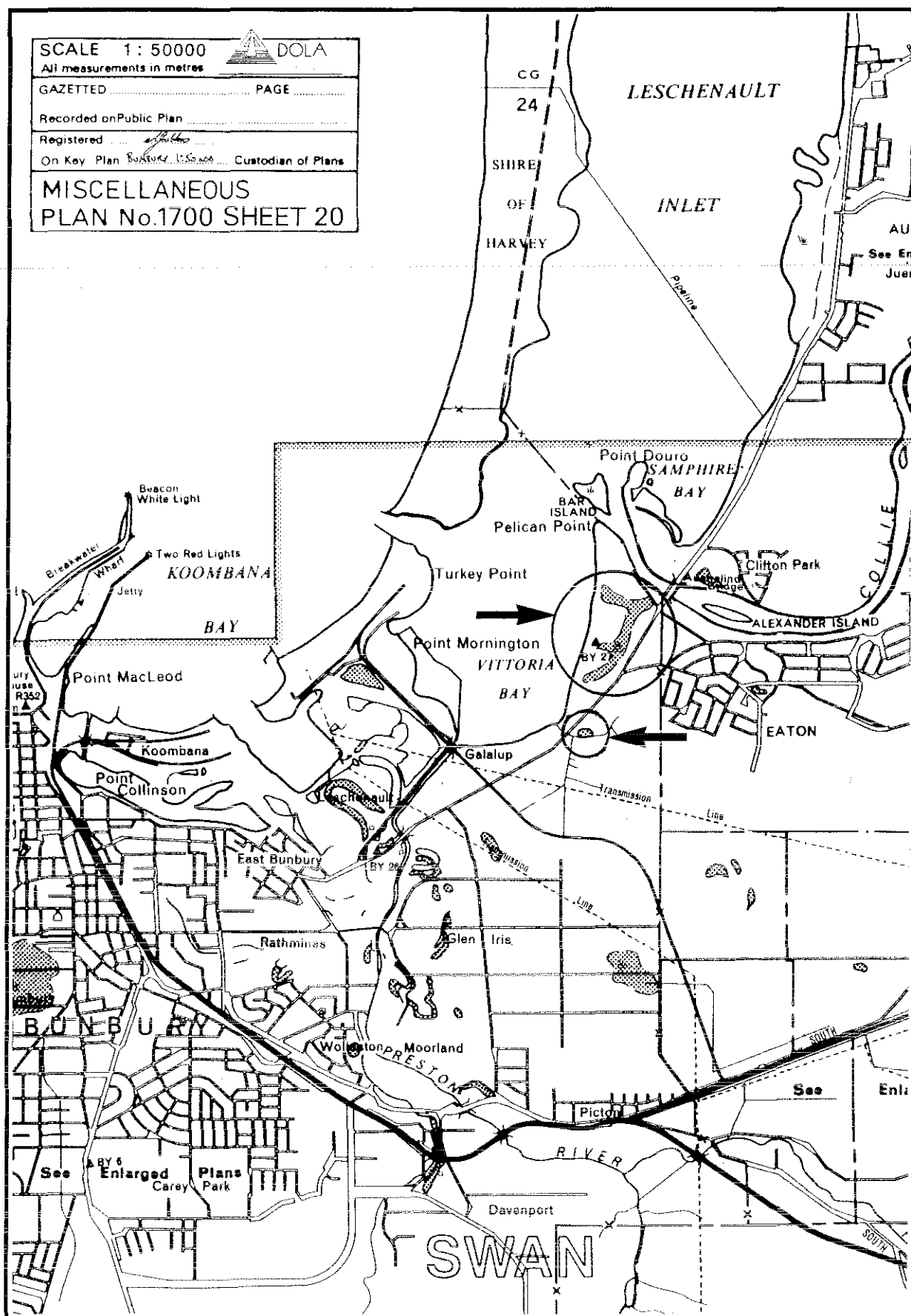


Figure 7. Wetlands protected by Regulation and shown on Miscellaneous Plan 1700

However, because the tidal inlets from the Collie River and Vittoria Bay have been blocked, there has been a change in the water regime of the Pelican Point wetland already, changing it from a tidally inundated wetland to a seasonal wetland, and resulting in a loss of some its original function and values. The wetland was important as water bird feeding habitat, because it provided ideal conditions for the breeding of mosquitoes, whose larvae are an important part of the food chain for some waterbirds.

The proponent says it is not possible to build this development and maintain the existing wetland ecosystem, because medium density housing is required to make the project viable. The proponent also says that the wetlands must be modified to reduce algae, mosquitoes, and to improve aesthetics, and therefore maintenance of their existing function is not possible.

The proponent has put forward a case for not re-creating or returning the full suite of wetland functions identified, but creating specialist niches for higher order predators, mainly water birds, and providing habitat in the form of drought and predator refuges. This means that a different suite of functions is proposed as compensation for the ephemeral saline wetlands.

Although all existing wetland functions cannot be retained or replaced, the Environmental Protection Authority finds the proposal to alter the Pelican Point wetlands environmentally acceptable; firstly, because some of the functions of the existing wetlands have been lost already, due to the need to control mosquitoes close to Eaton and Australind; secondly, because the Authority considers that it is possible to gain an improvement in the regional situation through an alteration to the water regime of the waterbird habitat north of Buffalo Road at the northern end of the Inlet; and thirdly, because the new wetland functions to be provided, although different because of the need to control mosquitoes, offer an increased range of functions due to the provision of drought and predator refuges for waterbirds.

The Environmental Protection Authority has chosen the best option available at this time, which is that whilst some of the wetland values may be replaced on the site, there are opportunities for others to be replaced outside the site, such as rehabilitating the area north of Buffalo Road. The Authority wishes to stress that this recommendation is not to be seen as setting a precedent for the assessment of future proposals affecting wetlands.

Accordingly, the Authority recognizes that if the development is to proceed in its proposed form, the Minister would need to grant the proponent an exemption from the Regulations under Section 6 of the Environmental Protection Act.

Recommendation 3

The Environmental Protection Authority recommends that:

- (i) artificial wetlands on Lot 100 may be substituted for some of the existing wetlands on Lot 26 and Lot 100;**
- (ii) if the Environmental Protection (Swan Coastal Plain Wetlands) Regulation is in place at the time the proposal is implemented, an exemption is granted by the Minister for the Environment to permit the filling or excavation of parts of the Lot 26 wetland, and parts of the Lot 100 wetland.**

The Environmental Protection Authority is concerned about the continuing loss of fringing estuarine vegetation around the Estuary, particularly the wetland vegetation associations. The proponent is aware of these concerns, and following discussions with the Authority, has made additional commitments to retain vegetation by maintaining the samphire and wetland fringing vegetation within the floodway reserve on Lot 26, by maintaining the samphire and wetland fringing vegetation around the part of the Lot 26 wetland which is to be retained, and by maintaining an additional area on Lot 100 as waterbird habitat. The latter commitment will be discussed in Section 8.2.

The Environmental Protection Authority considers that the wetlands' replacement is adequately addressed in the Public Environmental Review in terms of process, but that the likelihood of continued functioning can best be dealt with by an ongoing monitoring and maintenance programme for the life of the project. The proponent has made a commitment to this effect.

8.2 Waterbird habitat

Seven of the 18 species of waterbird protected by international agreements were found on the development site. The development area is of importance to two waterbird species in particular, the Great Egret and the Yellow-billed Spoonbill. Both of these birds rely on the area for feeding, specifically an area of inundated samphire on Lot 26 (PER p 20). However, this area is also classified as a high priority mosquito control site (Wright, 1986).

Researchers have collected data on aquatic invertebrates at six sites around Leschenault Inlet, which represent a selection of the biologically best areas. Pelican Point is as good as any of the other sampled sites except Point Duoro, and most of the Inlet has much lower value than any of the sampled sites. Many waterbird species require a range of habitats to complete their life cycles, that is, ephemeral as well as permanent water bodies. The seasonally or tidally inundated areas are important to waterbirds, because they provide breeding habitat, shelter during inclement weather and feeding habitat. Loss of these areas is highly significant because so little remains around Swan Coastal Plain wetlands.

The Lot 26 wetland is an important breeding habitat for Grey Teal, Pacific Black Ducks, and Australian Shelducks. They are also important as feeding habitat for Black-winged Stilts, Greenshanks, White-faced Herons and Great Egrets. The winter-wet or tidally flooded southern sector is also used for feeding by ducks, herons and egrets. The breeding colony of Great Egrets at Australind probably feeds entirely at Leschenault Inlet, and the long term success of the colony is partly dependent on maintenance of suitable feeding sites around the Inlet.

The loss of most of the marsh area at Bunbury Port increases the importance of Pelican Point as a feeding site for ducks, egrets, herons, stilts, and greenshanks, and as a roosting site for waders during storms and very high tides. The proponent suggests that the creation of new water bodies and landscaping will offset the consequences of wetland loss.

The proposed wetlands will not provide satisfactory habitat for the full range of species. However, the proponent considers it possible through modification or replacement of the wetlands to increase their carrying capacity for upper level predators, namely water birds, which can be seen as indicators of the productivity of the wetlands. The proponent will provide freshwater and salt water lakes as drought and predator refuges, which will not dry out in the summer. This should lead to an increase in abundance and diversity of waterfowl, although it will not provide replacement habitat.

The Authority considers that the replacement wetlands will provide adequate habitat for some of the waterbird species using Pelican Point, and has held discussions with the proponent about retaining some additional habitat for others. The proponent has made a commitment to retain the samphire and other wetland vegetation in the Floodway Reserve on Lot 26, and to keep a buffer of wetland vegetation around the part of the Lot 26 wetland to be retained.

The samphire flats used by the egrets on Lot 100 would be lost if the development proceeds in its current form. The flats are important for the Egret colony, because of the current poor condition of the estuarine wetland north of Buffalo Road. In response to the Authority's

concerns, the proponent has also made a commitment to retain an area of samphire and other wetland vegetation on Lot 100, sufficient to support the current levels of feeding by Egrets, with a moat to be dug around it to improve drainage and to control mosquito breeding.

The Leschenault Inlet Management Authority has requested that an area of Lot 100 be set aside as dedicated and secure waterbird habitat in the area shown in Figure 8, which would be close to the Preston River delta and Vittoria Bay. The Leschenault Inlet Management Authority has also offered to assist in the design of this area, and the design of the artificial wetlands, in conjunction with the Wildlife Centre, Department of Conservation and Land Management. The Environmental Protection Authority agrees that the issue of bird habitat warrants further consideration, and recommends accordingly.

Recommendation 4

The Environmental Protection Authority recommends that the design of the artificial wetlands as waterbird habitat should be to the satisfaction of the Environmental Protection Authority on the advice of the Leschenault Inlet Management Authority and the Department of Conservation and Land Management.

The Environmental Protection Authority considers that the replacement of waterbird habitat has been adequately addressed in terms of process, but the likelihood of continued functioning as adequate water bird habitat is best dealt with by an ongoing monitoring and maintenance programme for the life of the project, and the proponent has made a commitment to this effect.

8.3 Mosquito breeding

Bunbury has a severe mosquito problem, created because of the proximity of mosquito breeding areas to residential areas. Recently there has been increased concern, because Ross River virus is carried by mosquitoes, and both salt water and fresh water species have been implicated.

Many waterbirds feed on mosquito larvae, and hence control of larvae numbers through either physical or chemical intervention will have an effect on waterbird feeding. Placing housing and resort developments close to the Inlet will increase the pressure for mosquito control elsewhere around the Inlet, as well as at Pelican Point. This will lead to a reduction in the preferred prey items of the listed bird species, and presumably a decline in bird numbers around all of the Inlet.

The Leschenault Inlet Management Authority has recommended that any control measures be in line with the Bunbury Regional Mosquito Strategy. This strategy recognizes that it is better to prevent the need for mosquito control through land-use planning rather than to attempt to control the organism itself through chemical or physical intervention in the environment. However, given the existing zoning of the site, and the existing residential areas close by, controlling the problem through land use planning is not possible.

The Draft Leschenault Inlet Management Mosquito Strategy also identifies Pelican Point as a high priority site for mosquito control, as shown in Figure 9. Recommendation 6 of Bulletin 267, Pelican Point Country Club and Resort, states that mosquito control should be environmentally acceptable to both Authorities, and complementary to the regional mosquito control strategy.

The proponent wishes to increase water levels permanently in the existing wetlands to reduce mosquito breeding, as the mosquito larvae require less than 10cm of water for feeding. Opening the wetland to the river will also permit the access of predators to the larvae.

The Authority has agreed to this modification of the existing wetlands to control mosquito breeding, because of their proximity to the existing residential area at Eaton, and because modification of their function has already occurred with the blocking off tidal flushing by the City of Bunbury.

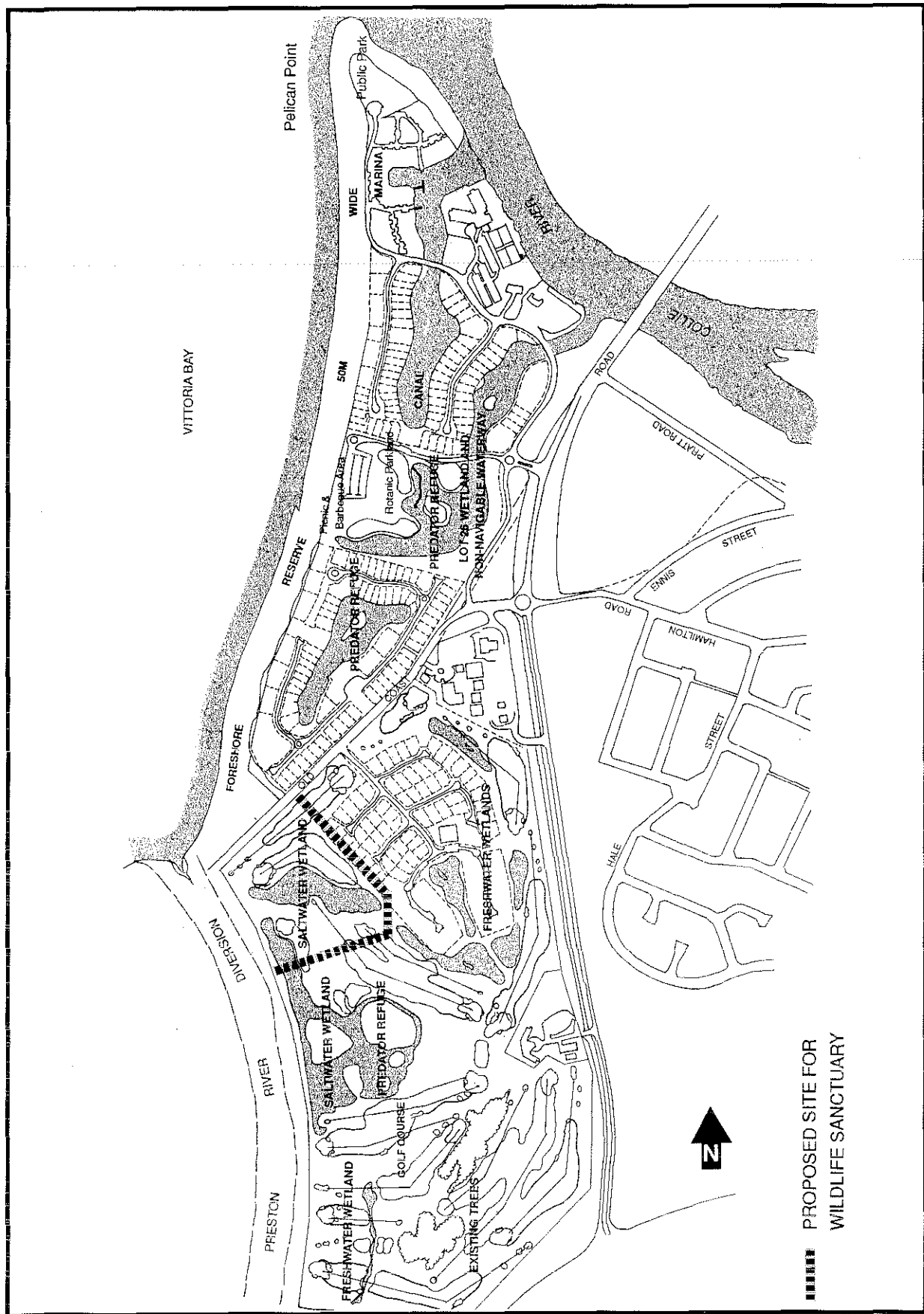


Figure 8. The Leschenault Inlet Management Authority proposal

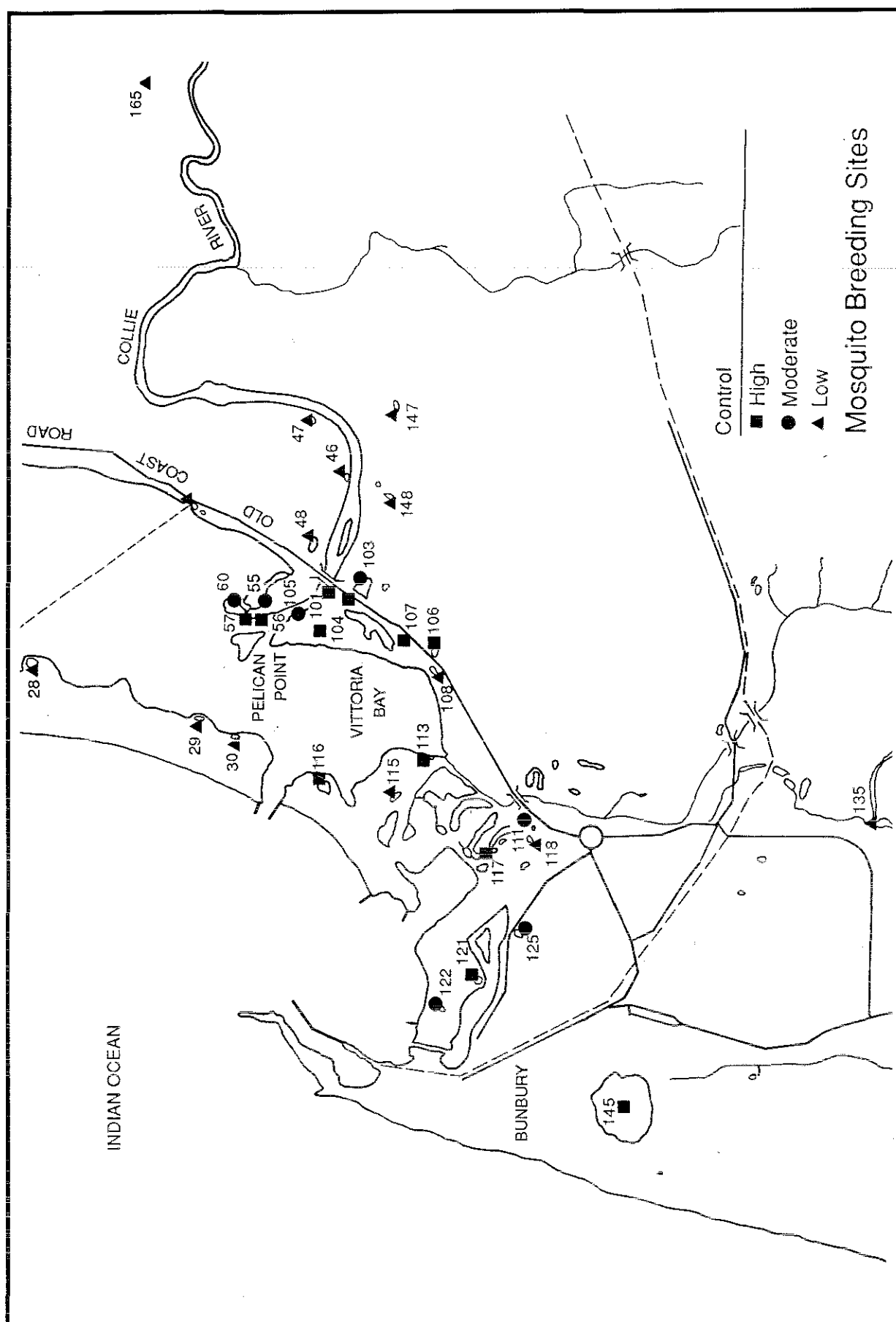


Figure 9. Mosquito breeding sites

Recommendation 5

The Environmental Protection Authority recommends that:

- (i) the part of Lot 26 wetland protected by the Environmental Protection (Swan Coastal Plain Wetland) Regulation as shown in Figure 7, may be opened to the Collie River to reduce the breeding of salt water mosquitoes.**
- (ii) management of mosquito breeding in the remaining or new wetlands should include:**
 - giving potential clients of the development information about the mosquito problem;**
 - the application of adulticides only, but not at the waterbird feeding habitat;**
 - any chemical control measures to be timed so as to minimize conflict with bird feeding;**
- (iii) if management of mosquitoes is transferred to the City of Bunbury, this recommendation should still apply.**

8.4 Foreshore reserves

Section 3 outlines the existing planning framework and policies on foreshore reservation and protection.

The Bunbury Region Plan's planning policy statements for the area emphasise conservation and recreation as management priorities. The City of Bunbury Town Planning Scheme No 6 reserves the Collie River and Vittoria Bay foreshores from development. Although the scheme text does not specify a dimension for this reserve, the scheme maps indicate a width of 50 metres.

System 6 recommendations also include this part of the Collie River foreshore in its general recommendations for Parks and Regional Reserves, recognizing its use for conservation and recreation.

Bulletin 267 Recommendation 2 states that the Water Authority Recommended Flood Limit should be observed, that is, no development should occur within this limit, and that the Collie River foreshore reserve should be 50 metres wide. Recommendation 3 of this Bulletin also states that continuous and ready public access should be made available throughout all foreshore areas.

The Collie River foreshore is currently used intensively for recreation, particularly swimming, boating and fishing. The Leschenault Inlet foreshore is currently used for horse riding, four wheel driving, fishing and crabbing.

The current proposal provides for a continuous reserve 50 metres wide along Vittoria Bay. The proposed foreshore reserve along the Collie River is not 50 metres wide along its length, as it narrows to a boardwalk near the hotel. It does not provide continuous access alongside the Collie River, as the access way diverts inland to use the road bridge across the canal. The proposal is not consistent therefore with Recommendations 2 and 3 of the previous Bulletin, nor with the maps of Town Planning Scheme No 6.

The proponent has agreed to place Pelican Point itself in public ownership, in exchange for locating the resort hotel on the edge of the river. The proponent has also offered to provide an additional width of reserve for a car park near Old Coast Road, in exchange for a narrower reserve closer to the Estuary. This is not entirely possible, as there is a separate lot, Lot 1, in the centre of the proposed carpark. Lot 1 is in private ownership, but not by the proponent.

The proponent plans to construct tennis courts in the foreshore reserve, which is not consistent with the previous recommendations which do not permit development in the flood way. The Water Authority of Western Australia and the Leschenault Inlet Management Authority have objected to the location of the tennis courts, and following discussions with the Authority, the proponent has made a commitment to relocate them.

The Environmental Protection Authority reaffirms its 1986 position on both the width of foreshore reserves and on continuity of access. The Environmental Protection Authority has decided that a varied width along the foreshore is acceptable, provided that the width averages 50 metres, and provided that the average does not include land owned by others. The Authority considers that this is acceptable because the proponent has offered land in exchange, and because the proponent will provide new access to Pelican Point by public road.

Public access is to be provided via a boardwalk from the Collie River around the hotel to the canal bridge. The Environmental Protection Authority believes in the principle of public ownership of foreshore areas, and of ensuring full though managed public access to the foreshore in perpetuity. The Authority has provided the same advice on previous proposals such as Mindarie Keys (1985), Port Kennedy Regional Recreation Centre (1989), and Port Geographe (1989). Whilst the proponent supports continued and even improved public access to the foreshore, the Authority does not find it acceptable to have some sections of the foreshore in private ownership, even though public access would be provided by the boardwalk. Therefore the Authority considers that any boardwalk along the river or waterways must be backed by a land-based publicly-owned foreshore reserve of reasonable size, which is to be determined in consultation with the Department of Planning and Urban Development. This reserve may be leased back to the proponent for maintenance.

As the Water Authority recommendations on flood levels will require filling of much of Lot 26, the Authority considers that priority must be given to maximizing the retention of remnant vegetation on the foreshore reserve. The Authority therefore considers that the boundary of the foreshore reserve should be determined in conjunction with the proponent's commitment to increase the retention of remnant vegetation on the site, including the areas of public open space. The proponent has made an additional commitment to this effect.

Management of the foreshore reserves should be included as part of the environmental management of the site, and should address the retention of remnant vegetation, nutrient management and the supervision of construction activities so that remnant vegetation is not damaged. The Authority considers that it may be appropriate for the foreshore to be managed jointly by the Leschenault Inlet Management Authority and the City of Bunbury, with management objectives consistent with the Authority's recommendations.

Recommendation 6

The Environmental Protection Authority recommends that:

- (i) the Collie River foreshore reserve should average 50 metres in width from the high water mark;**
- (ii) public access around the hotel via a boardwalk over the river, should be backed by a land based publicly owned foreshore reserve of reasonable size, (with the potential to be leased back to the proponent for maintenance), to the satisfaction of the Environmental Protection Authority on the advice of the Department of Planning and Urban Development;**
- (iii) the boundary of the foreshore reserve should be to the satisfaction of the Minister for the Environment on the advice of the Leschenault Inlet Management Authority.**

8.5 Maintenance of the canal and marina, and the non-navigable waterway

It is proposed to construct two waterbodies off the Collie River, a canal with an adjoining marina, and a non navigable waterway, which will be integrated with the wetland on Lot 26. The proponent has carried out an analysis of potential water exchange mechanisms and flushing rates within the proposed waterbodies.

The proponent has stated that the salinity and temperature variations in the Collie River associated with the tidal flow, will cause stratification, and generate significant density flows at most times. The predicted time for water exchange in the canal and marina is less than one day. Strong winds will result in an occasional breakdown of stratified flow, and under these conditions it is predicted that the establishment of wind induced currents will result in an exchange time of approximately two days. (Pelican Point Water Quality and Exchange p 14).

The Leschenault Inlet Management Authority states that the Collie River water quality upstream is frequently poor in the summer time, and they cannot guarantee that water quality in the river will not deteriorate in the future. They are concerned therefore, that the water quality in the river is not of sufficient standard for an artificial waterway to be connected to it. The Leschenault Inlet Management Authority has advised that it would not accept responsibility for any decline in the water quality which may require them to install pumps or undertake maintenance of the canal.

The proponent has provided a commitment to maintain water quality for five years to the criteria set down for Beneficial Use No 1 Direct Contact Recreation, Beneficial Use No 2 fishing, No 5 Passage of fish and other aquatic life, No 7 Maintenance and Preservation of Ecosystems, and Use No 16, Navigation and Shipping. The Authority considers that these criteria are suitable objectives for the maintenance of water quality.

The need for on-going water quality monitoring and management, following construction of the artificial waterways, has been identified. Initially, monitoring and management within the proposed waterways is the responsibility of the proponent.

However, the issue of long-term responsibility for water quality management following construction also needs to be addressed. This is considered important to ensure that water quality is maintained at an acceptable standard after construction has been completed, and land ownership has changed.

This issue has been of concern to the Department of Planning and Urban Development and to the Environmental Protection Authority in recent years, because the long-term management issue has not been resolved for similar developments at the time of construction.

In accordance with previous assessments of proposals of this nature, the Authority considers that a Waterways Manager should be clearly determined, prior to subdivision of land associated with the canal taking place. The Waterways Manager would be expected to take long term responsibility for the management of both the artificial waterways, and the foreshore reserves adjacent to the proposed development. This role would assume financial responsibility for the long-term funding of monitoring and management works. This determination should be made following consultation between the City of Bunbury, the Department of Marine and Harbours, the Department of Planning and Urban Development and the proponent.

Recommendation 7

The Environmental Protection Authority recommends that monitoring and management of the canal, the marina and the non navigable waterbody shall be addressed to the satisfaction of the Environmental Protection Authority on the advice of the Leschenault Inlet Management Authority for Part A and the City of Bunbury for Part B.

Part A:

- water quality; and
- accumulation of nutrients in the sediments.

Part B:

- navigable depths, including the connection of the canal to the Collie River, and maintenance dredging if required;
- the canal retaining walls, the foreshore walls and other structures;
- strategies for dealing with accidental spillages; and
- the management of oil and fuel, wastes from boats, rubbish and suspended solids.

Recommendation 8

The Environmental Protection Authority recommends that the determination of long-term Waterways Manager should be resolved by the proponent, prior to canal zoning being permitted under the Bunbury Town Planning Scheme, to the satisfaction of the Minister for the Environment and the Minister for Planning on the advice of the City of Bunbury, the Department of Planning and Urban Development, and the Department of Marine and Harbours.

8.6 Nutrient management

Most of the proposal, including all residential, commercial and tourist facilities, will be constructed on fill, and will be deep sewerage. The average residential lot size will be 580m². The golf course tees, fairways and greens located on low-lying areas will also be constructed on fill. All storm water disposal will be either by discharge to the perched lakes within the development, or by discharge to the residential canal or non-navigable lake.

The proponent states that fertilizer application will be confined to the grassed areas of the golf course, to the unit and private residential gardens, and to the immediate surrounds of the hotel, golf club, tourist and commercial facilities. The foreshores, conservation areas, and golf course rough areas will not be fertilized regularly.

During the assessment, the proponent was requested to supply a nutrient and water balance. The proponent states that a comparison between existing and predicted overall use indicates that the proposed development can be operated with a total fertilizer usage similar to the existing application rate of 562.5 kilograms of Phosphorus per year. However, the Authority considers that the application rates used in this report are conservative, compared with for example, the figures quoted for deep sewerage urban areas in Ballajura, Perth, for fairly similar lot sizes. (Gerritse et al, 1990, p 8).

There will be an impact on existing and proposed excess waterbird habitat if good water quality is not maintained. In addition, it would be undesirable for nutrients to be transported into the Inlet, given the work being carried out by the Leschenault Inlet Catchment Management Advisory Group to reduce nutrient transport from the upper reaches of the catchment.

The Environmental Protection Authority has discussed this issue with the proponent, and considers that a nutrient management strategy as amended in the commitments should be prepared, with on-going monitoring and maintenance.

Recommendation 9

The Environmental Protection Authority recommends that:

- (i) nutrients should be monitored and managed to the satisfaction of the Environmental Protection Authority, on the advice of the Leschenault Inlet Management Authority;

- (ii) should nutrients from the development have any adverse effects on the environment, the proponent will be required to put in place ameliorative measures, to the satisfaction of the Environmental Protection Authority on the advice of the Leschenault Inlet Management Authority.

8.7 Noise, and risks and hazards

8.7.1 Noise

In the public submissions, concerns were raised about restrictions being placed on noisy port activities or on the use of the port access corridor, because of the proposed residential area on Lot 100 and on Lot 26. Issues raised included the size and adequacy of the buffer zone in relation to the residential housing on Lot 100, the effectiveness of the remaining buffer on Lot 100 from the port access corridor, whether the Rigden Lines included noise emissions, or whether they addressed noise propagation characteristics under varying conditions.

The Rigden Lines are a concept developed in the Bunbury Region Plan to delineate industrial buffer zones, based on the minimum distance that particular class of industry should be from existing or proposed residential zones, and is discussed in Section 3.2 of the Bunbury Region Plan.

Noise may be an environmental issue because of the location of the golf course residential units in relation to the proposed port access corridor, and the location of the residential units on Lot 26 in relation to the port expansion.

The Environmental Protection Authority gives the whole of the State the same minimum noise protection for residential areas from industry. The following are the upper limits above which action will be taken by the Authority:

- 50dB(A) from 7am to 7pm Monday to Saturday;
- 45dB(A) on Sunday, and from 7pm to 10pm Monday to Saturday; and
- 40dB(A) from 10pm to 7am every day.

The Authority considers that noise below these levels is reasonable provided it does not include tonal components, impulses or other intrusive characteristics.

Residents in Clifton Park have had problems with noise which was generated about 1000 metres away. Some residences at Pelican Point could be approximately that distance from loud noise generated in the port area or from the port access corridor.

The Environmental Protection Authority held discussions with the South West Development Authority, the Industrial Lands Authority, the Bunbury Port Authority, the City of Bunbury and the Leschenault Inlet Management Authority in an effort to resolve this issue. As the port industries likely to use the area and their noise generating potential have not been determined, no resolution was possible.

The Environmental Protection Authority draws the potential incompatibility between noisy port activities and residential development at Pelican Point to the attention of the Government.

8.7.2 Risks and hazards

The emphasis has been placed in both the Public Environmental Review and the proposed Town Planning Scheme Amendment on protecting the residential areas from risks and hazards generated by future port industry. Public submissions on the Pelican Point proposal raise the issue of the protection of the port access corridor, and protection of future industrial development at the port and/or at industrial areas such as Picton and Kemerton. Comments have also been made in the submissions that the proponent has made no commitment to management of any problems should their "Rigden Line" argument, which is not a cumulative assessment of industry effect, prove to be inadequate. The Rigden Lines are discussed in Section 3.2 of the Bunbury Region Plan.

In April 1991, the Authority advised the proponent that it was not his responsibility to resolve the issue of risks and hazards created by both the proposed expansion of port facilities and the proposed residential areas at Pelican Point, and that at this stage, the issue should be pursued through the planning process.

The Environmental Protection Authority notes that potential conflicts between residential development and industry may arise as a result of the Pelican Point development, and draws this factor to the attention of the Government.

8.8 Environmental management

The proponent has made a number of commitments to monitor and manage the environmental impacts of the proposal (Appendix 1). The Authority considers that the proponent's commitments and the Authority's recommendations based on its assessment of the proposal should be drawn into a comprehensive environmental monitoring and management programme for all components of the development.

Recommendation 10

The Environmental Protection Authority recommends that the proponent prepares an environmental management programme, which draws together the proponent's initial and subsequent commitments and the previous recommendations in this report, to the satisfaction of the Minister for the Environment, on the advice of the Environmental Protection Authority, the Leschenault Inlet Management Authority, the City of Bunbury and the Department of Conservation and Land Management.

The programme should contain, but not necessarily be limited to, the following elements:

- remnant vegetation management during and after construction;
- foreshore management during and after construction;
- monitoring and management of waterbird habitat during and after construction;
- mosquito breeding management;
- nutrient management;
- monitoring and management of all waterbodies, including wetlands; and
- management commitments made in all the proponent's documents and in correspondence.

The environmental management programme (EMP) shall be prepared into two stages. The first stage (the pre-construction EMP) shall address the management of those parts of the environment requiring protection during construction, and shall be approved prior to the commencement of site works to the satisfaction of the Minister for the Environment.

The second stage (pre-commissioning EMP) shall address the management of the other issues, and shall be approved prior to completion of Stage 1 of the site works to the satisfaction of the Minister for the Environment.

The implementation of the approved environmental management programmes (Stages 1 and 2), and on-going investigation and reporting requirements should be to the satisfaction of the Environmental Protection Authority.

9. Conclusion

The Environmental Protection Authority considers that the environmental impacts associated with the Pelican Point proposal as identified in this assessment report are manageable, subject to the recommendations made in this assessment report, and the commitments provided by the proponent.

10. References

- Bunbury City Council, Town Planning Scheme No 6, Government Gazette of Western Australia, April 1984.
- Department of Conservation and Environment, Bulletin 103, Water Quality Criteria for Marine and Estuarine Water of Western Australia, 1981.
- Department of Conservation and Environment, Conservation Reserves for Western Australia, The Darling System - System 6, Part II, Report and Recommendations, 1983.
- Environmental Protection Authority and the Leschenault Inlet Management Authority, Bulletin 267, Pelican Point Country Club and Resort Bunbury, Report and Recommendations, 1986.
- Environmental Protection Authority, Bulletin 374, A Guide to Wetland Management in Perth, 1990.
- Environmental Protection Authority, Bulletin 398, Port Geographe, Report and Recommendations of the Environmental Protection Authority, 1989.
- Environmental Protection Authority, Bulletin 488, Mandurah Quay, Report and Recommendations of the Environmental Protection Authority, 1990.
- Environmental Protection Authority, Draft Environmental Protection (Swan Coastal Plains Wetlands) Policy, 1991.
- Environmental Protection Authority, Environmental Protection (Swan Coastal Plain Wetlands) Regulations, Government Gazette of Western Australia, March 28, 1991.
- Gerritse, Barber and Adeney, The Impact of Residential Urban Areas on Groundwater Quality: Swan Coastal Plain, Western Australia, Water Resources Series No 3, CSIRO, 1990.
- LeProvost Environmental Consultants, Pelican Point Public Environmental Review, volumes I and II, 1991.
- LeProvost Provost Environmental Consultants, Pelican Point Nutrient and Water Balance, 1992.
- Taylor and Burrell, Bunbury Region Plan Policy Statement, State Planning Commission of Western Australia, 1985
- Waterways Commission, Report No 19, Leschenault Inlet Management Programme Review, 1990.
- Waterways Commission, Report No 21, Draft Integrated Mosquito Control Strategy for the Leschenault Estuary Region, Western Australia.
- Western Australian Water Resources Council, Water Conservation Through Good Design, 1986.

Appendix 1

Proponent's commitments

PROPONENT'S COMMITMENTS

The Proponent, Pelican Point Pty Ltd, undertakes to abide by all commitments made in the Public Environmental Review and in subsequent discussions with the EPA, as detailed below. The project will be operated and maintained in accordance with the guidelines established in the management programmes detailed in Section 6 of the PER. These commitments, which the Proponent accepts as being legally binding on approval of the project by the Government of Western Australia, will be incorporated into the Environmental Management Programme and any agreement entered into between the Proponent, the State and the City of Bunbury.

Commitments which have been marked with an asterisk (*) are largely issues of a planning or engineering nature which will be addressed through local authority or other approvals and will not be subject to the EPA environmental audit programme.

1 CONSTRUCTION MANAGEMENT

Pelican Point Pty Ltd (the Proponent) undertakes to carry out the following works prior to or during construction of the Pelican Point project:

1.1 Public Access During Construction*

- (i) In the interests of public safety the construction site will be fenced and appropriately worded signs will be erected at access points around the project area to enforce public access restrictions, to the satisfaction of the City of Bunbury.

1.2 Ethnographic and Archaeological Sites*

- (i) The Proponent will comply with the provisions of the Western Australian *Aboriginal Heritage Act 1972-1980*, and in particular will make application under Section 18 of the Act in the event that it is proposed to disturb any identified site.

1.3 Landscape Aesthetics and Landform

- (i) A comprehensive landscape master plan for the development, including the golf course and areas of public open space, will be prepared to the satisfaction of EPA on advice from LIMA and the City of Bunbury, prior to construction. Landscaped areas to be provided within the development will incorporate:
 - a review at the detailed design stage to ensure the retention of a greater proportion of remnant vegetation and in particular the retention of mature trees, fringing vegetation and areas of bushland;
 - retention of the samphire and wetland vegetation fringing that part of the wetland which is to be retained within Pt. Loc. 26;

- maintenance of samphire and other wetland vegetation on Lot 100 sufficient to support the current levels of feeding by egrets, on the advice of CALM and LIMA;
 - planting of indigenous vegetation species, including a high proportion of flowering shrubs; and
 - planting of fringing vegetation along the Leschenault Inlet foreshore to screen the development from the estuary.
- (ii) All housing and tourist accommodation within the site will be constructed outside the industrial buffer zone as defined by the Rigden Lines.*
- Tree belts will be planted within the buffer zone along the western boundary of Lot 100.
- (iii) Buildings will be restricted to two development levels.*
- (iv) Power supply to the development will be underground and constructed to SECWA approved standards.*
- (v) The provisions of the Collie River Flood Study, notably the adoption of the recommended development set-back from the Collie River and the provision of a 250 m wide relief floodway, will be incorporated to the satisfaction of WAWA.
- (vi) The relief floodway will be established as a wetland reserve to the satisfaction of the EPA.

1.4 Traffic, Noise and Vibration

- (i) Hours of operation will be subject to approvals to be granted by the City of Bunbury. All construction vehicles will be fitted with effective emission controls. Ground vibration will be monitored on site and in surrounding areas if this is identified as a problem. Liaison with the City of Bunbury throughout the construction phase will identify any public concerns arising from noise or vibration.
- (ii) All roads, roundabouts and other entry points to the Pelican Point development will be constructed to meet the safety standards and requirements of the Main Roads Department and the City of Bunbury.*

1.5 Protection of Vegetation During Clearing

All vegetation to be retained on site, as indicated in the detailed design plan, will be clearly marked and, where appropriate, fenced off from construction activity.

1.6 Importation of Fill and Disposal of Spoil

- (i) Bulk earthworks will be undertaken in two phases separated by 1-3 years. Phase One will involve construction of Stage One of the project on the ILDA land.*

Works to resolve the mosquito and odour problem on Pelican Point will also be undertaken during Phase One.

- (ii) Filling of the site will only occur to the level necessary to comply with flood level requirements and potential sea level rise, to an average level of 2.7 m AHD. In general the fill levels will be set at the minimum level required by the City of Bunbury for the various land uses proposed.*
- (iii) Topsoil removed during construction will be stockpiled on parts of the site which will be subsequently disturbed. Excavated soil will later be used in landscaping the golf course and areas of public open space within the resort. There will be no export of spoil from the site.*
- (iv) Stockpiled topsoil and spoil will be stabilised to the satisfaction of the City of Bunbury to prevent erosion or the generation of dust. Dust will be suppressed by watering if necessary. Exposed soil surfaces will be revegetated with appropriate grasses, e.g. cereal rye, for interim soil stabilisation. As earthworks are completed the land will be revegetated with native species or planted to lawn and trees as appropriate.

1.7 Excavation and Dredging

- (i) Dewatering fluids will be impounded on site to allow suspended particulates to settle out before the water is discharged to the Collie River. Turbid water will be contained within the canal and lake until the entrance is breached. Timing of discharge of dewatering fluids and breaching of the canal and lake connections to the estuary will take place when turbidity is seasonally high and flow is out to sea. Construction timing and techniques will be subject to approvals by LIMA and the City of Bunbury.
- (ii) The residential portion and the connection channel of the non-navigable waterway will be excavated to a design depth of -1.6 m AHD, to the satisfaction of EPA and LIMA. From this point invert levels will increase to mean water level at the southern portion of the wetlands lake to ensure that water does not stagnate within the waterway.
- (iii) The non-navigable waterway will be transferred to the Crown free of cost and where it forms part of a private housing and resort development, will be maintained initially by the Proponent and subsequently by a Home Owners Association, or alternatively, by the City of Bunbury under a possible differential rating scheme. Those sections of the non-navigable waterway which lie within the Collie River foreshore reserve or within the floodway, will be established and maintained by the Proponent during the agreed maintenance period, after which time the City of Bunbury will become responsible for ongoing maintenance and management.

- (iv) Excavation of the canal and non-navigable floodway lake will be undertaken under dry conditions with traditional earthmoving equipment wherever possible, to the approval of LIMA and City of Bunbury.
- (v) The canal and entrance channel will be excavated and maintained at a depth of -1.6 m AHD, with a centre line depth of -2 m AHD to allow for sedimentation, to the satisfaction of DMH and the City of Bunbury.
- (vi) The canal waterway will be transferred to the Crown free of cost and be maintained, initially by the Proponent and subsequently by a Home Owners Association, or alternatively, by the City of Bunbury under a possible differential rating scheme.

1.8 Wetland Reconstruction and Rehabilitation

- (i) Artificial wetlands planned within the development (perched freshwater lakes, irrigation lakes and saltwater lakes) will be developed and maintained over the lifetime of the project in accordance with a management plan to the satisfaction of EPA, LIMA and the City of Bunbury. These water bodies will remain in private ownership and be maintained initially by the proponent and subsequently by a Home Owners Association, or alternatively, by the City of Bunbury under a possible differential rating scheme.
- (ii) Artificial wetlands and associated vegetation will be designed to replace traditional sites lost as a result of the development. The design of artificial wetlands planned for the development, which will be further detailed in the management plan, will incorporate:
 - existing native wetland vegetation;
 - a variety of water depths;
 - natural or artificial variations in water levels;
 - revegetation using indigenous plant species; and
 - islands for refuge.

2 OPERATIONS MANAGEMENT

The Pelican Point project involves the management of a number of interactive aspects which have the potential to adversely impact on the environment, if not adequately managed. These include:

- mosquito breeding;
- odour;
- drainage;
- groundwater;
- nutrients;
- wetland water quality and productivity;
- canal water quality, siltation (water depth) and structural integrity; and
- landscape.

The commitments given by the Proponent in relation to each of these issues are described in the following sections.

2.1 Mosquito Breeding

- (i) Sites in which mosquito breeding currently takes place will be modified to reduce or eliminate breeding, to the satisfaction of the City of Bunbury. Artificial wetlands created within the development will be designed to minimise mosquito breeding to the satisfaction of the Mosquito Control Review Committee.

2.2 Odour

- (i) The existing odour problem generated by wetlands which dry in summer will be eliminated by converting the wetland to a tidally-flushed permanent wetland to the approval of LIMA and the City of Bunbury.

2.3 Drainage

- (i) Stormwater from the development will be managed to the satisfaction of the City of Bunbury and LIMA. Disposal will be on site to localised soakage pits to the maximum extent possible. Excess stormwater will be discharged to the perched lakes within the development and by discharge to the residential canal or non-navigable lake. The stormwater drainage plan proposed will ensure that silt, contaminants and nutrients are trapped before discharge to the artificial waterways. The drainage system will be maintained to ensure effective trapping of contaminants.

2.4 Groundwater Management

- (i) Groundwater will be pumped from the Leederville Formation, subject to the granting of a licence by WAWA prior to the commencement of abstraction, into a series of interconnected lakes which will be lined to form a water storage facility, from which the reticulated water supplies will be drawn.
- (ii) The availability of shallow groundwater to supplement that drawn from the Leederville Formation will be further investigated and reported to WAWA prior to the commencement of abstraction.

2.5 Nutrient Management

Nutrient management will be implemented through a comprehensive nutrient and irrigation management plan prepared to the satisfaction of the EPA and LIMA with the objective of minimising impacts on wetlands and adjacent and downstream water quality in the Collie River and Leschenault Inlet.

To minimise nutrient migration from the site, the following management strategies are proposed:

(i) Minimise application of fertiliser by:

- use of recommended fertilizer types at a frequency and application rate determined on the advice of the Department of Agriculture (Bunbury);
- monitoring soil and foliar nutrient levels to determine appropriate rates of nutrient application;
- monitoring of nutrient levels and chlorophyll in all saline and freshwater lakes between October and January of each year to determine the trophic status;
- use of slow release fertilisers;
- soil modification to enhance retention of nutrients;
- minimising grassed areas in the golf course and landscaped open spaces;
- use of local species of grass wherever possible;
- encouraging residents to minimise fertiliser application and plant native species through the establishment of landscaped demonstration gardens and providing advice on recommended species appropriate to the area.

(ii) Minimise groundwater use by:

- reducing the golf course grassed areas to minimum required;
- irrigation of grassed areas only. Intervening areas will be allowed to dry in summer;
- adoption of appropriate water conservation measures such as seasonal modifications to irrigation programme and dawn/dusk irrigation;
- use of stormwater runoff;
- monitoring of soil moisture levels to determine appropriate irrigation requirements;
- planting of native drought-tolerant species throughout landscaped parts of the development.

2.6 Existing and Artificial Wetland Habitat Management

To manage urban, human, domestic and feral animal pressures on the use of wetlands by waterfowl, the following measures will be introduced:

- creation of islands;
- planting of shelter belts;
- setting paths back from the water's edge;
- development of a public education programme;
- strict control of dogs;
- formulation of a fox and feral cat reduction programme if required in consultation with the Agriculture Protection Board;
- direction of light away from water;
- provision of vegetated refuge areas;
- provision of warning signs indicating the possibility of wildlife movement within the development; and

- enforcement of speed limits within the development.

These measures will be incorporated into a wetland management plan prepared to the satisfaction of the EPA on the advice of LIMA and CALM.

2.7 Foreshore Management

A foreshore management plan for the Collie River and Leschenault Inlet foreshores adjacent to the development will be finalised following negotiation between the Proponent, the local authority and LIMA incorporating the following elements.

- (i) Land, identified on the land transfer plan (Fig. 15), will be transferred to the Crown free of cost.*
- (ii) Fringing shoreline trees will be retained wherever possible and additional plantings at an increased density will be made at the conclusion of the site preparation phase of construction. Those parts of the Collie River foreshore which still support a fringing rush vegetation will be protected wherever possible. Minor variations to the Collie River foreshore reserve boundary will be made to maintain mature trees, on advice from LIMA.
- (iii) The Proponent will re-construct the Collie River public boat ramp, and car and boat trailer parking will be provided.*
- (iv) The tennis courts, currently shown as being partly located within the Collie River floodway, will be relocated outside of the Collie River foreshore reserve;
- (v) A kiosk and associated parking area will be constructed on freehold land adjacent to the boat ramp facility to provide convenience items to the boating public and foreshore users.*
- (v) A dual-use pathway is proposed around the Collie River and Vittoria Bay foreshores, as well as through the development to facilitate access between the two foreshores. Three public toilet blocks are proposed in locations along the foreshore and at the boat launching ramp.
- (vi) A public thoroughfare around the foreshore of the hotel and accommodation units will be maintained by way of an easement on title in favour of Bunbury City Council and LIMA. This easement will provide continuous pedestrian access and limited vehicular access for maintenance purposes in perpetuity.
- (vii) Areas of the foreshore which are currently degraded will be grassed to provide for greater public use.
- (viii) Parking areas will be provided in all defined areas of public open space within the development which lie adjacent to the foreshore reserve.*
- (ix) To minimise the pressures of adjacent development and human disturbance on the foreshore regions, the following management strategies are proposed:

- the dual use pathways will be set back from the water's edge;
- a public education programme will be established and implemented in order to stress the significance of waterbirds utilising the area; and
- signs will be erected to direct the strict control of dogs.

2.8 Canal and Navigable Waterway Management

A management plan designed to address the operational aspects of the waterways will be prepared to the satisfaction of the City of Bunbury, EPA, DMH and LIMA and will incorporate the following commitments:

Physical requirements

The physical elements of the canal and artificial waterway system are generally discussed in the construction programme. The following relate however to the on-going management of the project:

- (i) Easements to the satisfaction of LIMA and the City of Bunbury will be located at least every 300 m along the canal banks to facilitate access for canal maintenance.*
- (ii) The Collie River shoreline will be stabilised adjacent to the public boat launching ramp and at the entrance of the canal and non-navigable lake to the satisfaction of LIMA and the City of Bunbury.
- (iii) Navigation aids to the approval of DMH will be provided within the canal and adjacent estuary. Following their construction responsibility for navigation aids will be handed over to that authority.*

Water quality

It is proposed to maintain water quality within the canal (within the limits imposed by the waters of the Collie River and Leschenault Inlet) to meet the criteria set down in Schedules 1, 2, 5, 7, 8 and 16 of Bulletin No. 103 (DCE, 1981). To achieve these aims the following commitments are made:

- (iv) Discharge from boat holding tanks will be strictly prohibited.
- (v) Long-term accommodation on vessels will not be permitted within the development's waterways.
- (vi) The development site will be fully deep sewered to the satisfaction of WAWA.
- (vii) The refuelling facility will include appropriate drains to trap pollutants before runoff discharges into the canal.
- (viii) A ban on the use of TBTO-based antifouling paint coatings on vessels less than 25 m in length will come into effect in July 1991, but will take up to five years to

become fully effective. In the interim boats with TBTO coatings will not be permitted to moor within the canal waterway or marina.

- (ix) In the event that water quality declines to the point where ameliorative action is required, forced circulation and aeration will be achieved through use of a boat and compressor. If coliform counts exceed permissible limits, appropriate advisory signs will be erected around the canal shore, and water contact will be restricted as necessary.

Fishing pressure

- (x) The Proponent will co-operate with the Fisheries Department in developing a public education programme aimed at managing exploitation of the fish resource. It is proposed to provide informative signage within the marina, including information about minimum catchable fish sizes and bag limits.

Contingency plans

- (xi) Contingency plans to ensure the navigability of the canal entrance, water quality maintenance, the prevention of accidental overflow from the sewerage system and repair of storm and flood damage will be documented in an Emergency Procedures Manual to the satisfaction of DMH, LIMA and the City of Bunbury.

3 MONITORING PROGRAMMES

3.1 Nutrient and Groundwater Monitoring Programme

- (i) Nutrient monitoring will include recording the levels of nutrient used within the site on the golf course and public areas and the monitoring of nutrient levels within the soil and plant tissues in order to determine application rates, based on application at the minimum rates necessary to maintain the health of the target species.
- (ii) Monitoring of groundwater resources will include:
 - observation of the migration of the seawater interface over time, so that action can be taken to protect the aquifer within the Leederville Formation from seawater intrusion if necessary;
 - water levels and quality (including nutrients) on a monthly basis; and
 - groundwater abstraction rates on a monthly basis.
- (iii) Monitoring results will be reported annually and reviewed following five years of operation.

3.2 Wetland Monitoring Programme

Monitoring of the wetlands within the project site will incorporate the following:

- (i) Nutrient, dissolved oxygen and salinity levels within the lakes.
- (ii) Re-establishment of wetland vegetation around the margins of the lakes.
- (iii) Use of the wetlands by birds and other vertebrate animals.
- (iv) Productivity of the lakes measured in terms of invertebrate and amphibian population levels.

3.3 Canal and Artificial Waterway Monitoring Programme

A canal and artificial waterway monitoring programme will be detailed to the satisfaction of the City of Bunbury and LIMA, incorporating the following commitments:

- (i) A survey of canal earthworks will be conducted prior to the cessation of dewatering. Subsequently, an annual hydrographic survey will be undertaken and compared with the "as constructed" survey to establish whether sedimentation is occurring and thus the necessity for, and frequency of, dredging. Navigable water depth will be maintained by dredging as required. Plans for both maintenance dredging and the disposal of dredged material will be submitted to LIMA for approval prior to dredging.
- (ii) The condition of wall structures within the canal and lake will be monitored on an annual basis for five years, commencing within one month of practical completion, and the results reported to the City of Bunbury. A monitoring programme will be developed to confirm that the design and construction of the walls and scour protection material is satisfactory.
- (iii) The artificial waterways will be inspected daily by the Waterways Manager and any corrective action, required to maintain water quality and aesthetics to the high standard required by the Proponent and Government agencies, will be implemented immediately.
- (iv) The condition of shoreline stabilisation structures will be monitored on an annual basis for five years by the Proponent and the results reported to the City of Bunbury and LIMA.
- (v) Water quality monitoring of physical, chemical and aesthetic parameters will be conducted at selected sites both within the canal and lake and within the Collie River commencing on completion of the construction phase. Monitoring will be conducted on a quarterly basis for the first five years of operation and be reported on annually to the City of Bunbury, LIMA and the EPA. Monitoring after the initial five years will be dependent upon a review of the initial monitoring results.

Parameters to be monitored and the frequency of monitoring will be as follows:

- Bacteria levels within the canal will be monitored five times over a 30 day period in January and February each year.
- Nutrients (i.e. total phosphorus, orthophosphate, total nitrogen and inorganic nitrogen) will be monitored within the artificial wetlands on a quarterly basis.
- Sediments within the canal will be monitored as follows:
 - (a) biannually in the canal for nutrients, including apatite and non-apatite phosphorus; and
 - (b) when the canal is initially opened, and subsequently in years three and five for a range of metals and derivatives. These are copper, zinc, cadmium, tin, lead and chromium. Sediments will be sampled at the water quality monitoring sites identified in Figure 23 of the PER and at a control site within the Collie River.

Appendix 2

Summary of submissions and responses by the proponent

PELICAN POINT PUBLIC ENVIRONMENTAL REVIEW

SUMMARY OF SUBMISSIONS AND RESPONSES BY THE PROPONENT

This document is a summary prepared by the Environmental Protection Authority of the issues raised in public submissions. Wherever possible, the submitters' own words have been used by the EPA in preparing the summary. Issues which are not of direct environmental concern have not been summarised.

The summary points are printed in italics. The response by the Proponent follows in upright print.

1 PROJECT HISTORY AND ALTERNATIVE OPTIONS

- 1.1** *Section 2.2 Project History discusses the previous proposal assessed in 1986, and refers to a joint EPA/LIMA assessment as being acceptable subject to four modifications. This leaves the reader with the feeling that the present proposal is also acceptable, when in fact the EPA has not yet reported on the present proposal.*

The purpose of Section 2.2 was to provide a history of the project, up to the time of release of the PER for public review, describing major influences on the design of the project. These include the previous approval, the acquisition of additional land and the modifications to early project designs undertaken in an attempt to produce a project that is both economically viable and meets the requirements of the various authorities concerned with the development of this land.

The readers' attention is drawn to the 'Invitation' bound inside the front cover of the PER which clearly sets out the process of seeking submissions on the proposal from both public and government prior to the EPA preparing its assessment report.

- 1.2** *The differences between the 1986 and the current proposal should be discussed in this section also. The current proposal should be assessed in light of 1991 values for recreation, conservation and public access criteria.*

The major changes to the project are discussed in the PER in general terms in Section 2.2 and shown diagrammatically in Figures 3, 8A and 8B, however, it is considered that a detailed comparison between the two projects would only draw the readers' attention away from the central issue, which is the assessment of the present proposal. The original report is however fully referenced in the PER and any reader wishing to undertake a more detailed comparison will find copies of the 1986 PER and EPA report in the EPA, State and Bunbury regional libraries.

- 1.3 *Alternative options have not been dealt with in enough detail to determine whether a smaller development, which would have less impact/disturbance to wetland areas, would be viable or not.*

This project is somewhat unusual in that a number of different alternatives have been formally assessed by environmental and planning authorities over a period of several years. This has resulted in the site being assessed for alternative uses more thoroughly than most. A smaller resort project was approved with conditions in 1986, but found by the Proponent to be not viable. Subsequently, two further proposals were put to the State Planning Commission (now Department of Planning and Urban Development) and EPA which were also smaller than the current proposal, but considered to be viable by the Proponent. These alternatives were, however, found to be unacceptable by the authorities on policy grounds, due to the high residential component. The current proposal, although larger, contains a greater percentage of resort type accommodation and facilities and has been designed to take into consideration as many as possible of the sometimes conflicting demands of the various state and local government departments who have an interest in this project.

- 1.4 *The discussion of alternative developments does not include the option of not developing the ILDA land, and seeking to improve the land's value to wildlife. The no development option is considered only from the point of view that the present rural based activities will continue. One option for the land is to not develop the area, cease rural activities, and rehabilitate the area to enhance waterbird usage. With other areas around the Estuary being destroyed, e.g. Bunbury Harbour extension and Pelican Point Lot 26, it is essential that we establish the value of and necessity for those remaining.*

The agreed purchase price for the ILDA land under the contract of sale to Pelican Point Pty Ltd is based on the level of development proposed, i.e. 18 hole golf course, 100 units and a small commercial centre. In the scenario proposed in the submission the land would have a negative value to the Proponent and he would be unable to proceed with its acquisition, as the returns on the remainder of the project are not sufficient for the Proponent to finance such a course of action. This being the case it would fall back on the State Government to finance and manage the land for the purposes identified in the submission. No approach has ever been made to the Proponent to purchase the Pelican Point land for conservation purposes.

The development as proposed has been designed to maximise wetland conservation values, consistent with maintaining the viability of the project. This has involved the retention where possible of existing wetlands on the Pelican Point and ILDA sites and the creation of additional wetlands on the ILDA land.

2 LIMA POLICY

- 2.1 *The PER does not discuss LIMA canal policy, and does not consider LIMA policy on residential development adjacent to the Estuary. The canal should not be approved, because of the loss of public access around the river foreshore, and the potential for costly management for public authorities in the future.*

The Proponent's planning consultants had discussions with LIMA and the Waterways Commission during the development of the design which resulted in specific improvements in the layout of the parklands, foreshore reserves, boatramp and related amenities and the shape and orientation of the canal. There was advice given that the proposed canal was not in accordance with LIMA policy, however, that LIMA would assess the whole project, including the canal, on its merits during the assessment period. Copies of the draft PER showing the canal in its present format were provided to the EPA for referral to LIMA and the Waterways Commission in November of 1990, however, no additional feedback was received from either Authority suggesting that the agreed modifications were not acceptable.

The proposal allows for increased managed access to the Leschenault Inlet foreshore and to the Collie River mouth, including the provision of foreshore reserves on what is now private land. The area in which the canal entrance is located is privately owned land to which the public has no present right of access.

- 2.2 *It is stated on page 13 that "It is considered that an acceptable balance of accommodation has been provided in the concept plans, while public equity in the form of facilities, access to and use of the foreshores and open space is ensured." The proponents have not stated which organisations consider this to be so. LIMA has resolved that the proposal does not meet LIMA's stated policy for non-residential development alongside the estuary, and LIMA has also stated that there should be a minimum 50 metre foreshore reserve along the Collie River. In addition any resort development should be set back to form the foreshore reserve boundary.*

The balance between short term and permanent accommodation has been accepted by the Department of Planning and Urban Development and the City of Bunbury.

The 50 m foreshore reserve was identified in Town Planning Scheme 6 as a reasonable starting point for the detail design process and negotiations. Bunbury City Council and DPUD saw merit in providing a balance between larger POS and additional public facilities and narrower foreshores along the Collie River.

- 2.3 *The LIMA position on the two above issues would seem to be unresolved.*

Previous attempts to find a development solution acceptable to all authorities have foundered repeatedly on the issue of the proportion of permanent versus short-stay

accommodation. LIMA has been represented at previous government inter-departmental meetings at which this issue has been discussed and a balance has been sought in fact that the residential units are to be fully managed and the rental/permanent mix would be the subject of the Council Development Agreement to be entered into by the parties. The costs of development including infrastructure and holding costs, simply do not allow for a wholly short-stay resort to be viable.

With respect to access, the design has adopted the specific recommendation in EPA Recommendation 2 (1986) that ‘... the alignment of the foreshore area along the Collie River should be the Recommended Limit of Floodplain Encroachment shown in the Collie River Flood Strategy’. Recognising that this line may not always result in a reserve width of 50 m, the provision of additional open space at the tip of Pelican Point and in the vicinity of the proposed public boat ramp, where it is anticipated that public use pressure will be most intense, ensures that the average reserve width along the Collie river will exceed 50 m.

3 CONSERVATION VALUES

- 3.1 *The proposed location is an important conservation area, and its value will increase as a result of the proposed destruction of the tidal mudflats at the mouth of the Preston River for the proposed Bunbury Harbour extensions.*

The mudflats at the mouth of the Preston River diversion will not be destroyed during the process of diverting the river. The mud flats will persist in their present form, however, accretion of riverine sediment at the mouth of the existing Preston River delta will cease and there will be some gradual shifting of sediments once the entrance is relocated. A new delta will also form about the relocated river mouth which will be similarly valuable to waterbirds as the existing delta.

It is pointed out that the existing mud flats have evolved about the mouth of a river which was previously shifted for harbour extension purposes.

- 3.2 *The stands of Eucalyptus rudis and Melaleuca on the Point should be maintained and not disturbed by construction work, because it will take many years to replace them.*

Mature trees are regarded as a valuable asset and at all points on the site existing trees, and particularly those in open space areas, will be retained wherever possible. Open space areas will also be landscaped with additional trees of the same species as are present at the moment.

- 3.3 *The significance of the Leschenault Inlet and the Collie River for conservation is apparent from their listing in the System Six Red Book (C66 and C67). The area proposed for this development lies close to the southern boundary of C66, and we*

believe that the Leschenault Inlet and Collie River foreshore and the delta at Pelican Point should all be in the conservation estate.

Pelican Point and the adjacent shorelines of Leschenault Inlet and the Collie River have not been identified in existing reports, e.g. the System 6 Report on conservation reserves and the Mosquito Review Control Committee report on waterbird habitats of Leschenault Inlet, as having a high conservation value, presumably due to the disturbed nature of these areas and their importance for other uses. Acknowledgement of the high cost of rehabilitating such areas frequently leads Government to use its limited resources to acquire and manage areas of higher conservation status requiring less rehabilitation and with lower ongoing management costs. It is assumed that the exclusion of the areas identified from the proposed conservation areas reflects the Government's priorities in this area.

- 3.4** *A canal development will increase the boat use of the southern end of the Inlet, which is used by large numbers of Little Pied and Little Black Cormorants and Black Swans.*

The proposed development contains only 80 residential units, which, based on typical usage patterns, will lead to a very marginal impact on boating activity on Leschenault Inlet.

The waters mainly frequented by Black Swans are shallow and not generally suitable for boating, and in particular power boat use. All three species are known to habituate well to the presence of man and are able to tolerate moderate to high levels of disturbance.

- 3.5** *The mouth of the Collie River possesses a tranquil beauty, and with care, it can be enhanced, rather than degraded. A privately owned enterprise inhibits public access in general, and enjoyment of the natural beauty.*

Additional landscaping will be undertaken to improve already degraded areas of the foreshore and riverbank. However, it is acknowledged that use of the foreshore will increase, both from increased use of the estuary by the general public (related to regional population pressures) as well as that generated by users of the resort.

To compensate for this additional use a greater area of the foreshore will be made available to the public and additional access to the foreshore will be provided.

- 3.6** *There is also the risk of flooding as the Collie River swells considerably; the Greenhouse Effect should also be taken into consideration.*

Both aspects have been taken into consideration in the design of the development.

- 3.7 *The real challenge for Australians is to preserve the real Australia for the benefit of future generations. The prospect of continuous urban development from Yanchep to Bunbury in the following century makes preservation a vital necessity. We need a green belt along the lines of Adelaide's whose architect had a vision beyond immediate commercial gain. The area should be developed back into a beautiful wilderness belt, a sanctuary for flora and fauna, accessible to the public.*

The Pelican Point development proposal is consistent with regional planning guidelines and includes a strong wildlife sanctuary component.

- 3.8 *I have counted up to 150 Cormorants resting on posts in adjacent waters. Cormorants need undisturbed resting places to dry their plumage as without drying off they can become waterlogged. Increased disturbance in addition with loss of some or all of the SCM causeway, another drying area, should affect the number of Cormorants inhabiting the estuary. The shallows to the south of the proposed development are also important feeding areas and disturbance there could disrupt the breeding colonies of Cormorants around the estuary.*

There will be no direct disturbance by the Pelican Point project of the areas indicated in this submission. The areas described are publicly accessible, subject to regulation by public authorities and, incidentally, will come under increased pressure as use of the estuary increases, irrespective of this development.

- 3.9 *Over 300 Black Swans were using these waters in the late summer of 1990/91 at a time when there is a scarcity of other suitable wetlands. Disturbance to birds at this time of high stress (weather and moult), could be detrimental to the breeding population of swans over a large area.*

It is assumed by the term 'these waters' that the submission refers to the area of shallow water between Pelican Point and the Preston River delta. The water in this area is generally too shallow for boating and other forms of active recreation (with the exception of crabbing) and thus disturbance tends to be naturally limited.

- 3.10 *The presence of a residential population would bring large numbers of dogs and cats into the area, causing further disturbance along the shore line. The proposed developments to the foreshore and wetlands of the Collie River Delta are unacceptable because of the conservation value of the area. It is vital that the rich feeding areas at the mouth of the Collie River are protected.*

The presence of uncontrolled dogs and cats in public places, particularly on reserves where native fauna is present, is a recognised concern. It is recognised that the number of domestic animals in the area will increase due to the development, although feral cats presently occurring on the development site will be controlled. Once on public land, however, domestic animals fall under the jurisdiction of the local authority, which is responsible for implementing and enforcing animal control

regulations. In this respect, steps taken toward effective cat control by some WA local authorities, following the lead of their Victorian counterparts, and by the Victorian Government, are to be commended.

Recognising the potential problems of domestic animals on the golf course and adjacent wetlands, the Proponent will undertake to make residents of the development aware of the problem and will co-operate with the local authority in implementing any required control measures.

3.11 *The wetlands and mudflats at the mouth of the Collie River are the best remaining wildlife habitat in the southern part of the Leschenault Inlet and they must be protected.*

Data from the 1989 study on the distribution of waterbirds at Leschenault Inlet with respect to mosquito breeding areas (Mosquito Control Review Committee, Waterways Commission, 1989) conflicts with this statement. Those studies identified the most productive wildlife (waterbird) habitats as being located about the mouth of the Preston River, and at the north of the Inlet, adjacent to the western shore. These areas, in addition to containing extensive shallows enriched by nutrients contained in run-off, are also protected from the prevailing south westerly winds, making them ideal feeding and loafing areas for waterbirds.

3.12 *I fail to see how these waterbirds can feed and breed successfully with a supermarket and housing around them.*

Swans, and some ducks and other waterbird species feed and breed in many developed wetland areas, e.g. swans, ducks and swamp hens on Lake Monger and Jackadder Lake and wading birds at Alfred Cove. In these areas they feed in close proximity to roads, houses and, in the case of Jackadder Lake, a shopping centre.

The ILDA wetlands are not noted waterbird breeding areas.

3.13 *Shore birds do not at present use Pelican Point but with the loss of much of Point Mornington to the Bunbury Harbour expansion, this may well change. Although shore birds do not use Pelican Point often, they do so under adverse environmental conditions making this use more rather than less important. The term 'loafing' refers to the time wading birds spend when they cannot feed. The birds need these rest times between low tides. It would be like depriving a mammal of safe sleeping quarters.*

Although the Preston River is to be relocated to allow for further port expansion this will not result in the destruction of the shallows at the existing mouth of the Preston River. In time a new delta will also form about the relocated river mouth further north toward Pelican Point. As previously explained this will result in a similar area of shallows continuing to be available to shore birds.

- 3.14** *Stop the Pelican Point development, as this could be a beautiful area like Leschenault Peninsula. Many people are concerned about it. I am requesting that Pelican Point should be made into an A class reserve, managed by CALM.*

The area has not in previous Government studies been identified as a conservation area and has not been shown as such. No offer has ever been made by Government to purchase the land for this purpose.

4 COLLIE RIVER FORESHORE AND PUBLIC ACCESS

- 4.1** *The PER incorrectly states that arrangement of Collie River foreshore has been negotiated with LIMA.*

The Collie River foreshore has been designed to comply with the requirements of the Collie River flood study and the specific requirements of Recommendation 2 of the joint EPA/LIMA assessment of 1986. The current proposal was presented at meetings attended by LIMA officers (and at a LIMA meeting by Bill Burrell?) and a draft report and plans showing the layout for the proposed development were submitted via the EPA to LIMA for comment in November 1990.

- 4.2** *The PER describes the LIMA Management Programme as considering that the Collie River river bank at Pelican Point "Has become denuded of vegetation and serious river bank erosion has occurred". In fact, LIMA has established log walling along part of this river bank to control river bank erosion, and has planted hundreds of trees on the foreshore.*

The quote is from the Leschenault Inlet Management Plan 1983 and the reference is to the state of the land as it appeared at the time the management plan was prepared. The presence of the log walling is referred to in Section 5.3.1.4 of the PER and also shown in Plate 5 on page 127 of Volume 1 of the PER. The erosion referred to is occurring towards the mouth of the river, northward from the old boat shed toward the tip of Pelican Point and a typical example of the form of this erosion is shown in Plate 6, also on Page 127 of the PER. This same area of foreshore is also deficient in vegetation.

- 4.3** *The proponents should be required to upgrade river bank walling.*

Stability of the river bank will be improved by the construction of small artificial headlands to provide a series of small sheltered coves where natural river bank vegetation will be protected from erosion.

- 4.4** *Is the City of Bunbury the responsible authority for foreshore management, and therefore responsible for the construction and maintenance of the boat ramp?*

The City of Bunbury will be the authority ultimately responsible for foreshore management, however, the upgrading of the foreshore and the construction of the boatramp will be carried out by the Proponent, at his cost, to approved standards.

- 4.5** *The Collie River foreshore is well used by people fishing, swimming, wading, bird watching and for boat access. Many people use the track along the river bank from the end of Taylor Road through to Pelican Point. Public access to Pelican Point should be maintained by the provision of a walkway across the canal entrance.*

Access will be provided within and through the site to all parts of the foreshore, including Pelican Point, and public facilities in these areas will be improved.

A walkway across the canal entrance would prevent access to the resort by sail craft, ferries and tourist vessels.

- 4.6** *There should be a suitable setback from the reserve boundary for the resort development.*

Building setbacks from the reserve boundary will be in accordance with the building codes of the City of Bunbury. The hotel facility, which is for the enjoyment of the public, has to be set as close as reasonably possible to the river and canal entrance in order to capture views and a strong visual association with the water.

- 4.7** *The regional community would very much appreciate a wider foreshore reserve on the south bank of the Collie River between the Australind Bridge and the proposed canal, than than would be provided by adopting the Flood Plain Encroachment Limit as the reserve setback, because this particular area is a very pleasant sheltered location particularly when the strong south-westerly and south-easterly winds are blowing during the summer months.*

In the area described the width of the proposed foreshore reserve is generally greater than the width defined by the flood plain encroachment limit.

The regional community would also appreciate a large park at the end of Pelican Point combined with leisure facilities at convenient locations. This will allow closer interaction between these activities and the waters edge. This variable width approach is superior in civic design and landscape terms than a straight 50 m foreshore reserve.

- 4.8 *Stage 6 appears to cater for provision of four tennis courts east of the apartments, resort hotel and function centre. Two of these courts are located on the existing Taylor Road alignment which places them within the area delineated by the WA Water Authority Plan PWD 52387-14-1 as the Recommended Limit of Flood Plain Encroachment. As both the Environmental Protection Authority and the Leschenault Inlet Management Authority have indicated in Recommendation 2 in DCE Bulletin 267, 1986, that the area of the Collie River foreshore contained within the Flood Plain Encroachment Limit should be reserved as public open space, the proponent should be required to resite the location of these two courts. The siting of these courts in such close proximity to the river foreshore also conflicts with recommendation C67 on page 115 in Part II of System 6, Red Book Conservation Reserves, 1983.*

The Proponent is prepared to relocate these courts outside of the flood plain area.

- 4.9 *Section 4.2.3 Foreshore Reserve discusses the EPA/LIMA recommendation which says that the reserve should coincide with the flood line. It would appear from the development plan prepared by the proponent that this line allows the development to take place within the formal 50 metre foreshore reserve area.*

Parts of the Proponent's Pelican Point property, comprising land along the Collie River north of the Taylor Road and adjacent parts of the Leschenault Inlet foreshore, is privately owned to the waterline (and in some cases beyond) and there is no existing foreshore reserve. The intent to create a foreshore reserve is identified in the TPS 6 reservation and LIMA policy.

The flood line foreshore reserve recommendation would provide for a reserve of variable width due to localised meanders in the shoreline. In recognition of this variability, and the fact that the proposed foreshore reserve is considered inadequate in places, additional open space is proposed at the tip of Pelican Point and at the boat ramp on the Collie River, where it is anticipated that public usage will be most intense.

Parts of the foreshore reserve in the vicinity of the canal entrance, although complying with the flood line requirement, will be less than 50 m in width. The foreshore reservation will however guarantee the public free access around the foreshore in the vicinity of the hotel as it will to the other parts of the foreshore.

5 BOATING

- 5.1 *A canal development as proposed will increase the boat use of the southern end of the Inlet and conflict with its extensive use by waterbirds. Control of boating in this area would be difficult even with appropriate legislation. Policing any legislation would be fraught with difficulties and also expensive.*

It is unlikely, due to the small scale of the canal development proposed, that boat usage will increase appreciably as a result of the canal, as compared to that arising from the overall growth in population in the Leschenault region, noting that the public boat ramp on the Collie River will continue to be the point of origin of the largest portion of boat use in this area. Boating in the area of principal use by waterbirds will to a large degree be self regulatory as the shallowness of the water makes its use by most types of boat difficult, if not impossible.

The shallow waters at the southern end of the Inlet are principally used by wading birds and because of the limited water depth there will be no conflict with power boats. The width of the shallows will ensure that at most times there will be a substantial buffer between the waterbirds and boats.

6 MOSQUITOES

- 6.1 *The presence of people living near water will inevitably mean calls for control of mosquitoes and midges. Even with the design of the waterways, there will still be mosquitoes present, even though maybe of different species than are presently there. Further reduction to troublesome effects of mosquitoes can be made by type and design of street lighting and the type, thickness and height of associated vegetation. Guidelines for private and public buildings and gardens should include wall colour, shade, thick vegetation, ferneries and standing water.*

The Pelican Point area contains a number of recognised mosquito breeding areas which presently affect the residents of adjacent urban areas. Action on a long term solution to the Pelican Point mosquito problem has been delayed subject to the approval of a suitable development for this site.

In addition to the works proposed to control mosquito breeding, intending residents of Pelican Point will be advised on ways of minimising mosquito problems.

- 6.2 *A more environmentally suitable method of solving the mosquito problem should be sought. One that benefits the land, animals and public, not just council and developers pockets.*

The minimum cost method of solving the mosquito problem would be to fill in the wetlands. The proposed solution is, by comparison, expensive in terms of initial construction and ongoing management costs.

- 6.3 *The proponent's intention to reconnect the cut-off canals to the Collie River as they were in the 1940s is appreciated, as this will result in a dramatic reduction of mosquito breeding in the area provided that an efficient tidal interchange is achieved.*

The entrance will be designed to ensure that there are as few sites as possible available for mosquito breeding and that the wetland flushes adequately.

7 PROJECT VIABILITY

- 7.1 *Section 4.2.6. The need to maximise project viability has been brought about partially by the need to fund the ILDA land purchase, the need to provide 9 holes of golf course during the early stages of development, and the need to provide funds for the long term management of the wetlands. These costly viability problems could be avoided if the proponents did not include the ILDA land in the development.*

The resort component of the project is not considered viable in the absence of the golf course and the ILDA land is the only possible site for the golf course development.

- 7.2 *The proponents have not included in the PER an alternative cost/benefit analysis of a smaller development confined to Lot 26.*

A development on lot 26 only was proposed previously and was approved subject to conditions which have been met in this project. The Proponents did not proceed with that project because it was not viable.

8 FRESHWATER WETLANDS

- 8.1 *The freshwater wetlands at Pelican Point are also an essential component of the system, as all waterfowl and most wildlife need fresh water regularly. It is not enough to merely protect the Leschenault Inlet itself and ignore the fringing vegetation, samphire flats and freshwater wetlands. If these are lost, the wildlife also will be forced to abandon the Inlet.*

The wetlands of Pelican Point are only fresh in winter at the time when there are adequate sources of freshwater in the region. In summer, when freshwater is at a premium, the Pelican Point wetlands are either dry or saline due to the concentration of salts in the water by evaporation. At this time seeps along the edge of the estuary are the main source of fresh water. The proposed development will provide permanent freshwater lakes and soaks as replacement wetlands.

- 8.2 *Page 8 acknowledges LIMA's desire to see wetland areas retained in their natural form, and yet the development proposal details the dredging and significant disturbance to these areas (within Pt Lot 26).*

None of the wetlands within or fringing the Pelican Point development is in its natural form.

The internal wetlands of the site have been modified by clearing and modification of drainage patterns, while the Collie River riverbed has been dredged and the river bank is either eroding or protected by walls. Physically, the Leschenault Inlet foreshore is the most natural in form of the wetland margins, however, the Inlet is now marine rather than river dominated and the supra-tidal vegetation is completely modified with just grass (couch) and a few sparse shrubs on the higher ground.

9 INTERNATIONAL OBLIGATIONS

- 9.1** *Australia has international obligations to protect the habitat of transequatorial migratory waterfowl and this area clearly falls into this category.*

The treaty obligations are acknowledged in the report. This project will not prevent these obligations being met.

10 WATER QUALITY AND QUANTITY

- 10.1** *The proposed boat harbour and golf course will pollute the wetlands.*

Management of the boat harbour, in accordance with the proposed management programme, will ensure that it will not adversely impact on adjacent wetlands.

Similarly, the development of a golf course management programme, responsive to the results of a regular monitoring programme, will ensure that the wetlands are not unsuitable for the specified purposes. Note that the wetlands of the site are already polluted as evidenced by the regular odour problems experienced each summer.

- 10.2** *I am concerned about pollution to the waterways, both underground and estuarine.*

Control of nutrients to acceptable levels will undertaken through the implementation of an approved Nutrient and Irrigation Management Programme, as discussed in the PER.

- 10.3** *The few old trees like this on the edge of a saltwater body are often very dependent on the fresh ground water, and any change to the water table may endanger their survival. Would there be restrictions on private bores in the area?*

There will be no private bores within the resort/residential accommodation areas as test drilling has shown that there is insufficient fresh groundwater to support bores anywhere within these areas.

- 10.4** *Satisfactory canal water quality depends on nutrient contamination being held below acceptable levels. The proposed golf estate is a potential major source of nutrients which will need to be managed effectively if water quality targets are to be met. The PER provides a general strategy for achieving this, but a firm legal commitment is required to ensure responsible parties maintain water quality standards.*

A formal and binding Nutrient and Irrigation Management Plan will form part of the Environmental Management Programme for the project, to be prepared to the satisfaction of the authorities as part of the approval process.

- 10.5** *Fertiliser use on the golf course could produce excess nutrient runoff to the wetlands and Inlet. This will require careful attention as the costs of dealing with eutrophication problems can be enormous e.g. Peel-Harvey system. The Leschenault Inlet already has a problem with nutrients, and probably cannot tolerate another major source such as this development. If that is the case, we urge you to reject the entire proposal. There are many potential uses for Lot 100 which would not add to the nutrient load on the Inlet.*

Nutrient on site will be strictly managed according to the NIMP, as described above.

11 CANAL STYLE DEVELOPMENT

- 11.1** *Studies by Riedel and Byrne show that siltation of the canal should not be a problem in the short to intermediate term. However the PER does not explicitly consider siltation due to settling of fines during Collie River flood events. Is this contingency to be covered by a proposed Legal Agreement which will define responsibilities for dredging maintenance?*

Siltation from all sources will be addressed in the Legal Agreement.

- 11.2** *The PER does not discuss LIMA canal policy, which is that the area is not considered suitable for canal developments, and also does not consider LIMA policy on residential development adjacent to the estuary.*

LIMA policy is not based on a scientific or engineering study of the ability of the Inlet to support a canal style of development. Studies undertaken as part of the environmental review have shown that water quality within the canals (given

existing riverine water conditions) will be acceptable and that the canal will not have an adverse impact on the water quality of the Collie River or Leschenault Inlet. Previous development of this nature has shown that it is a desired lifestyle. For example, it has been reported that most of the land in the latest canal development at Mandurah (Port Mandurah) was purchased by local residents familiar with that area.

- 11.3** *The connection of the waterway to the Collie River should be kept to a minimum width to preserve existing foreshore vegetation.*

The width of both channels to the Collie River will be the minimum necessary to achieve adequate flushing, and in the case of the navigable waterway to allow for safe navigation.

- 11.4** *The canal should not be approved, because of the loss of public access around the river foreshore, and the potential for costly management for public authorities in the future.*

Canal management costs will be met by the development in perpetuity through a home owners association. Public access to the River and Inlet foreshores, which is currently privately owned and is at best limited, will be improved as a consequence of the development.

The Proponent will improve access around the foreshore by providing public boardwalks in a landscaped setting.

- 11.5** *Our greatest concern is with the proposal for a canal-style development in the Collie River delta north of the Old Coast Road. This area contains valuable wetlands and waterfowl habitat which should not be destroyed. The whole area is of such value that it should be purchased by the State and included in the proposed Leschenault Regional Park.*

This land has not been identified as a significant conservation area in any Government study and no approach has been made to the owners to acquire the land for this purpose. It should be acknowledged that canal estates are a very low density form of development and that they provide a net increase in usable water area for both humans and aquatic fauna.

- 11.6** *Construction of the carpark and boat ramp and connection of the non-navigable waterway to the Collie River are planned for an area that has good coverage of Casuarina obesa, Eucalyptus rudis and others. The connection of the waterway to the River should be kept to a minimum width, and carried out in such a way that the existing vegetation on the river bank is maintained.*

These requirements will be met and the appropriate modifications to design made to preserve trees wherever possible. The non-navigable waterway will be designed to avoid any valuable tree groups, but at the same time will have regard for the flushing requirements of the system. The car park can be designed to retain both individual and groups of trees and it is intended that these be supplemented by plantings of existing species.

- 11.7** *All jetty structures to waterside residential lots, apartments, hotel and marina shall require the approval of the waterway management authority, Local Government and the Department of Marine and Harbours in accordance with an agreed Jetty Policy. A waterbed zone for jetty construction should be approved by this Department.*

All statutory procedures in relation to jetty licencing will be adhered to. This is a normal subdivision and development requirement which will be addressed during detailed design.

- 11.8** *The rip-rap rock walling proposed for foreshore protection should be designed by a competent structural/civil engineer for a design life of 30 years.*

All foreshore protection works will be designed by a suitably qualified engineer for the required lifespan.

12 LAKE VILLAS WATERWAY

- 12.1** *It is important that the Lake Villas waterway be un-navigable at all times. This can be achieved by the proposed road bridge, provided that it is a permanent structure designed to prevent any small craft from passing underneath.*

Provision is made in the design proposals to provide a barrier to prevent boats from passing beneath the road bridge.

- 12.2** *The Department of Marine and Harbours is not to be held responsible for any dredging maintenance of the Lake Villas Waterway.*

The corporate body charged with the ongoing responsibility for the maintenance and management of the estate and its waterways will carry out the dredging as and when required.

13 LOT 100 GOLF COURSE ESTATE

- 13.1** *There should be no residential development on the flood plain area of Lot 100. The proposed golf estate residential units should be located on the southern high undulating area of Lot 100, and the 18 hole golf course on the flood plain. One centrally located saltwater lake with tidal interchange to the Estuary would eliminate the potential for mosquito breeding and at the same time, would provide a better habitat for the estuarine bird population than would a number of freshwater lakes. The proximity of the superficial groundwater to the surface of the flood plain on Lot 100 would simplify the maintenance of the grass on the tees, fairways and greens of the golf course thus reducing the amount of fertiliser required. The opposite would be the case if the first nine holes were located on the high ground to the south of Lot 100, as the soil in that area is very dry and hungry, and would require copious amounts of water and fertiliser to maintain the grass in a satisfactory state.*

Bunbury Region Plan precludes residential development on the southern part of Lot 100. Waterways Commission officers have indicated that they do not wish to see a connection between the wetland on Lot 100 and the Inlet. As much as possible of the golf course is located on the low ground. The provision of freshwater is considered important for fauna as well as being required for golf course irrigation.

- 13.2** *An article in the "Big Weekend" of 5 January 1991, reveals the dangers to the environment from golf courses, and mounting opposition to them.*

Articles in the daily press are generally over-simplistic in their approach and cannot be applied to specific cases. A more recent article in the West Australian, published on 13 January 1992, and the 'Wildscreen' programme broadcast on ABC television on 23 January 1992 have both commented on different aspects of the attraction and value of golf courses to wildlife. Environmentally acceptable management of the golf course will be addressed in detail in the Environmental Management Programme.

- 13.3** *I see the proposed development as a degradation of the quality of life of the Australian community, and am strongly opposed to it.*

The proposed development will be of a high standard compatible with the Australian lifestyle.

- 13.4** *An adequate foreshore reserve should be retained along the Preston River, and groundwater extraction carefully controlled to prevent salt water intrusions into the aquifer.*

The Proponent has no involvement in the determination of the foreshore reserve along the Preston River. There will, however, be an additional tree planted buffer established on land being purchased by the Proponent adjacent to the Preston River reserve.

The main freshwater source for the project will be the Leederville aquifer. Some additional water may be drawn from the shallow unconfined aquifer at the southern end of Lot 100, subject to available resources. All groundwater sources will be licenced by WAWA and will be subject to regular monitoring for quality and control over the volume extracted.

- 13.5** *There has been no justification given for the establishment of a golf course on Lot 100, other than it will assist the economic viability of the project. The PER states that the golf course will cater for the recreational criteria set down in the Bunbury Region Plan, however, the proponents have not proven this to be so, and have not considered alternative forms of recreational use that might also fulfil this criteria. The Bunbury Region Plan shows this area as "Parks, Recreation and Drainage", not simply "Recreation". Many important waterbird and foreshore vegetation areas around the estuary are also shown on the Bunbury Region Plan as "Parks, Recreation and Drainage" such as Point Duoro, Alexander Island, all of the Collie River and Brunswick River foreshore up to the Australind Bypass Road, and parts of the Vittoria Bay foreshore near the proposed Harbour dredge spoil disposal site. Therefore the need for a golf course on the ILDA land has not been justified.*

There are two golf courses in the Greater Bunbury Area - Capel and Australind - both of which are private. Bunbury City Council has supported this golf course primarily on the basis that it will be a public golf course with limited private club membership. It has also been supported because there is a need on population grounds (8,000 population per golf course). In this context it should be noted that Bunbury City Council was investigating the feasibility of a public golf course north of the airport but has since dropped this option.

- 13.6** *The statement in Section 2.4.1 that the development of a golf course is essential to maximising the public recreational use of the site is disputed. There is a high standard golf course within 1 kilometre of this site. Bunbury Golf Club has advised that all categories of membership are available. There is also another golf course planned to be constructed on the other side of Bunbury along the Boyanup Road. Where is the established need for a golf course on this site? If a golf course is established, will it be a public course or a private course? This will affect the level of public recreational use.*

This public golf course and associated sporting facilities (bowls, squash, tennis etc.) can be justified on population and availability grounds.

- 13.7** *The lowland/wetland component of Lot 100 (ILDA) should be separated from the development, and upgraded to provide for a significant waterbird habitat. The Golf Course Estate should be confined to the higher ground on Lot 100. The wetland should have a minimum size of 22 hectares.*

The Golf Course Estate cannot be located on the high ground on Lot 100 due to policy decisions affecting future industrial development options. Integration of the golf course with the wetlands allows the maximum area of wetlands to be maintained. As no justification is given for the area of wetland stated (a minimum of 22 ha or 50 acres) it is not possible to comment on this statement.

- 13.8** *The Golf Estate residential area should be reduced in size, and the wetland created on Lot 100 should be a single purpose wetland with the golf course (if there is to be one) completely separated from the wetland area.*

To attract a variety of species it is necessary to create a diversity of habitat. There is a need to create a freshwater lake for irrigation purposes, however, the size is limited by the need to conserve freshwater, i.e. by the need to limit losses due to evaporation. To provide the area of wetland proposed it is necessary that some of the wetlands have to be saline and hence a mixture of wetland types has been proposed.

- 13.9** *The samphire marshes to the east of the Old Coast Road are a feeding area in the spring for Great Egret, Little Egret and Yellow-billed Spoonbill, and possibly Night Heron, while they are breeding in the colony by the old SCM factory. The biomass of this marsh is unlikely to be met by new wetlands for many years at least, which may make the colony unviable.*

The marshes to the east of the Old Coast road are only one of a number of feeding areas for these species within the Leschenault area. More remote from human activity and larger in area are the marshes at the north end of the Inlet. While it is agreed that there will be a short term loss in habitat value it is not likely that this will affect the viability of the SCM swamp breeding colonies. In the longer term the provision of fresh water will be of greater benefit on a regional basis than the existing wetlands. The species described above are also able to make use of recently disturbed wetlands and this may be clearly seen at the north east corner of Herdsman Lake, where excavation and filling activities are taking place simultaneously and the area is still being regularly used by egrets and herons.

14 LESCHENAULT REGIONAL PARK

- 14.1** *There is an urgent need to implement the long-promised Leschenault Regional Park, and to include in it some significant areas of foreshore. This is one of the*

best remaining undeveloped sections of the foreshore. If development is allowed, it will overwhelm the natural environment and destroy this valuable wildlife refuge.

There are no known proposals to include the subject land in the proposed Leschenault Regional Park. The land, although largely undeveloped is extensively modified as a result of previous land use.

15 NUTRIENT AND IRRIGATION MANAGEMENT PLAN

15.1 *The NIMP is very vague with no figures on fertiliser usage or estimates of areas to be fertilised and irrigated.*

The information provided on nutrient management is at this stage an outline of that to be provided in the detailed NIMP to be prepared subject to the project receiving approval. It will not be possible to finalise the NIMP until final details on the volume of water to be made available by the Water Authority are known (a licence will not be granted until the project is approved) and the area which can be landscaped is calculable.

15.2 *Although the use of additional nutrients for the golf course and public open space may be restricted, this still adds to the nutrient load.*

Use of fertilizers on the golf course will be in accordance with an approved management plan and will be monitored and amended as necessary to minimise the transport of nutrients away from the golf course. The existing input of nutrients from agricultural sources will be removed.

15.3 *The presence of a number of residential dwellings and gardens will result in uncontrolled nutrient run off. This will pose a threat to the local invertebrate biomass. The only control over private use of fertilisers and insecticides is by ongoing public education, which will need to be maintained even after all land has been sold and still if there is a change of ownership of residential housing or the resort complex.*

There is a general need public education on the subject of fertilizer use on the coastal plain which is being recognised and addressed by the relevant authorities. At Pelican Point development on smaller than average size lots with reduced garden areas will assist in reducing the use of fertilizer on private lots. In addition public open space areas will be maintained according to plans which will include restrictions on the use of both groundwater and fertilizer.

16 FORESHORE MANAGEMENT PLAN

- 16.1** *The foreshore management plan needs to be specified as a clear commitment on the part of the proponent, to the satisfaction of both Bunbury City Council and LIMA.*

The foreshore management plan will be prepared to the satisfaction of the City of Bunbury, on advice from LIMA.

- 16.2** *Public toilets constructed on the foreshore reserve should be connected to sewerage.*

The public toilets will be connected to the regional sewerage system which will be extended to serve the whole of the Pelican Point development.