Residential development, Peel-Harvey

Swan Coastal Plain Catchment of the Peel-Harvey Estuary

Residential Rezoning, Subdivision and Development of Lot 79 Tuart Road, Sherwood Park, Mandurah

Hacalong Pty Ltd

Report and recommendations
of the Environmental Protection Authority

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Foreword

The Peel-Harvey estuarine system is badly degraded. The system shows signs of severe eutrophication (nutrient enrichment), which results in excessive algal growth. The algae live on the nutrients, and multiply rapidly, stifling life in the Estuary in warmer weather. The algae accumulate on the shores of the Estuary and rot, causing odour problems, polluting the shore, and killing wildlife and fish. This results in a significant reduction in the recreational, environmental, social and economic values of the area.

The cause of the eutrophication is an inflow of nutrients (mainly phosphorus and nitrogen) from the coastal plain catchment into the Estuary. The nutrient inflow is currently far above the Estuary's ability to cope - hence the huge production of algae.

Although the primary source of the nutrients is agricultural runoff from the sandy soils of the catchment which have been extensively cleared and drained, other land uses such as residential, industrial and commercial can also contribute significant amounts of nutrients to the Estuary.

The Government has taken specific action to rescue the Estuary. Environmental Conditions were set on 3 January 1989 under Section 45 of the Environmental Protection Act for the Peel Inlet - Harvey Estuary Management Strategy (Stage 2).

These Conditions, which impose constraints on existing and proposed developments in the catchment with the objective of reducing the flow of nutrients into the Estuary to about half their present level, can be summarised as follows:

- a moratorium on further clearing and drainage in the catchment until the Minister for the Environment is satisfied that these activities would be environmentally acceptable;
- the specification of interim target levels for the quantity of phosphorus flowing into the estuary;
- a requirement for the Ministers for Transport, Agriculture and Waterways of the Management Strategy to prepare an Environmental Protection Policy and a Catchment Management Plan designed to meet the targets; and
- a requirement that, for the present, decisions should be conservative on developments which may release phosphorus or nitrogen to the environment in the Peel-Harvey Estuary area and coastal plain catchment.

Owners of existing broadacre agricultural holdings have, by and large, accepted the recommended constraints by making a significant reduction in the rates of phosphorus fertilisers applied to their properties, and by the planting of large numbers of trees. The approval of new developments involving excessive applications of nutrients to the soil or large scale clearing or drainage would raise concerns over equity, and may jeopardise the progress already made.

This Report examines a proposal for residential development. This form of development can involve clearing, drainage, and the fertilising of public open space and domestic gardens, all of which can have environmental impacts in the coastal plain catchment of the Estuary. However, in some situations it is possible to plan a residential development with appropriate controls on these activities, given the co-operation of the Local Authority, so as to make the development environmentally acceptable.

1. Introduction

The Environmental Protection Authority has considered a group of proposals, of which this is one, within the Peel-Harvey Catchment. The first part of this report sets the scene with a review of the issues which the Authority has taken into account for all of the proposals in the catchment. The second part provides a specific assessment of the proposal under consideration.

2. Relationship between environmental and planning approvals

It should be noted that the Authority's assessment of this proposal primarily addresses the issue of the environmental capacity of the Peel-Harvey Coastal Catchment. This assessment does not include planning preference which may include environmental aspects such as risk from surface inundation or flooding during winter months. Other planning issues such as servicing requirements, relevance of other policy such as the Government's sewerage policies or the impact on the adjacent landusers may also need to be addressed by the agencies with responsibility for planning approvals.

Environmental approval granted through this process does not imply that planning approval will automatically follow.

It may be that the planning agencies require a local authority to undertake planning studies before a development of this nature can proceed in the local area. As stated above, the Authority supports the concept of such overall planning studies which take into account the broad spectrum of planning and environmental issues in the selection of land for subdivision and development.

3. Environmental considerations in the Peel-Harvey Catchment

In examining the environmental implications of development in the Peel-Harvey coastal plain catchment, the Environmental Protection Authority has given consideration to the following issues:

3.1 Impact on the Peel-Harvey Estuary

3.1.1 The problems in the estuary

The Estuary shows signs of severe eutrophication, including large buildups of rotting algae which greatly reduce its recreational and environmental values. The cause of the eutrophication is an inflow of nutrients (mainly phosphorus and nitrogen) from the coastal catchment into the Estuary. The nutrient inflow is currently far above the Estuary's ability to cope; hence the huge accumulations of rotting algae.

3.1.2 The Environmental Conditions and their implications

The Government has taken specific action to rescue the Estuary. Environmental Conditions were set on 3 January 1989 under Section 45 of the Environmental Protection Act for the Peel Inlet - Harvey Estuary Management Strategy (Stage 2). These conditions imposed constraints on developments in the catchment with the objective of reducing the flow of nutrients into the Estuary to about half their present level.

The Stage 2 proposal by the Ministers for Transport, Agriculture and Waterways sought to improve flushing of the Estuary by constructing the Dawesville Channel and to reduce the input of nutrients by controlling developments in the catchment. The proposal included a commitment to a moratorium on further clearing and drainage in the catchment. In approving the proposal, the Minister for the Environment imposed the condition that the moratorium should continue "until the Minister for the Environment is satisfied that these activities would be environmentally acceptable."

The interpretation of this condition has been that a proposal which involves some additional clearing and/or drainage may proceed provided that the proponent can demonstrate that the proposal incorporates sufficient ameliorative measures to ensure that the overall impact is consistent with the objective of reducing nutrient inflows to the estuarine system by about half.

Condition 2 specifies interim target levels for the quantity of phosphorus flowing into the estuary. In operational terms these targets mean that on average phosphorus losses to the estuary should not exceed 0.375 kg of phosphorus per hectare per year. This target is to be achieved on a catchment-wide basis and is not a figure for determining individual proposals. Conditions 3 and 4 require the Ministers for Transport, Agriculture and Waterways to prepare an Environmental Protection Policy and a Catchment Management Plan designed to meet the targets in Condition 2. These documents are currently in preparation. The Department of Planning and Urban Development is also preparing a Statement of Planning Policy for the control of management of landuse in the catchment.

Further, Condition 9 states that, for the present, decisions on developments which may release phosphorus or nitrogen to the environment in the Peel-Harvey Estuary area and coastal plain catchment should be conservative.

Under the Environmental Protection Act these Environmental Conditions have the force of law, and are binding on the Ministers for Transport, Agriculture and Waterways who are the proponents of the Management Strategy.

3.2 Jandakot Underground Water Pollution Control Area

There is an overlap between the Peel-Harvey Catchment and the Jandakot Underground Water Pollution Control Area. The Pollution Control Area has been defined to protect an underground water source used for Perth's domestic supplies.

At the present time a landuse study for the Jandakot Water Mound (Jandakot Land Use and Water Management Study) is being prepared by consultants to the Water Authority and the Department of Planning and Urban Development, and an Environmental Protection Policy for the same area is also being prepared under the Environmental Protection Act 1986. The Authority considers development over the water supply area needs to be carefully controlled to prevent pollution of this important water source.

3.3 Other groundwater resources proposed for future water supplies

Other groundwater areas have been identified in the Peel-Harvey Catchment and have been proposed for future water supplies. Controls over development over these areas have not yet been put in place.

3.4 The proposed Jandakot Botanic Park

The Department of Planning and Urban Development is currently considering setting aside land for the Jandakot Botanic Park. The Park is for the protection of banksia ecosystems and to provide for recreation. Management proposals for the Park range from reservation for core areas and landuse and development controls over buffer areas to ensure private development is consistent with the Park's objectives. Planning for the park is not yet finalised but it is anticipated that decisions will be made in the near future.

The Authority supports the concept of this Park but given the lack of detail on boundaries and planning requirements, the Authority cannot recommend against developments which may compromise the Park on this basis.

3.5 Wetlands policy

In March 1991, the Environmental Authority published the Draft Environmental Protection (Swan Coastal Plain Wetlands) Policy 1991 for public comment. Regulations were also published at the same time to ensure the wetlands in the Policy area were protected during the submission period. As a generality, any area which holds water at the beginning of summer (December 1) must not be filled, drained or polluted.

Subdivision and development around designated wetlands is not excluded provided the requirements of the Policy are accommodated.

3.6 The nature and impact of developments

The Authority is assessing a number of proposals within a range of landuse classifications. These include rural, rural residential, special residential and urban landuses. These are described below and the impacts associated with each development type identified.

3.6.1 Rural developments

Rural subdivision involves the subdivision of land zoned 'Rural' under a local authority's planning scheme. Rural zoning generally permits the full range of agricultural activities and landuses to be undertaken without any form of control or management through the planning scheme.

The Authority considers the objective for rural land in the Peel-Harvey Catchment to be a reduction in long term nutrient application rates to no greater than half that of traditional broadacre dry land farming on that particular soil type. This requires that some form of control and management of rural landuse takes place, particularly with regard to intensive agriculture.

Intensive agriculture and lot sizes

The Authority has determined that new market gardening and irrigated horticulture using sprinkler irrigation systems are environmentally unacceptable on sandy soils in the Peel-Harvey coastal plain catchment because of the very high fertiliser and water applications associated with such activities (Bulletin 449). Other intensive agricultural uses such as intensive animal production and some agricultural industries are also associated with high nutrient generation on the site. The Authority wishes to discourage such uses in the catchment.

It is understood that such uses can be controlled through the landuse provisions in a local authority's planning scheme. The Authority is also aware, however, that smaller lot sizes attract purchasers wishing to establish intensive agricultural uses in an area. The Department of Agriculture has advised that twenty hectares is the lot size recommended, as a general rule, for the establishment of an intensive agricultural activity such as market gardening.

The Authority considers, therefore, that, should lots be created below 20 hectares, such lots should be associated with the management provisions and design constraints recommended for rural residential landuses discussed below rather than unconstrained rural uses. Lot sizes above 20 hectares, restricted to broad acre, dry land grazing, would be environmentally acceptable in terms of protecting the Peel-Harvey Estuary.

It is acknowledged that there may be other issues which need to be addressed in order to determine the most suitable lot size for agricultural use in an area and it is considered that a local authority's local rural strategy is the most appropriate place for these wider environmental and planning issues to be addressed.

Management of agricultural land

In response to the government's rescue plan which aims to reduce the flow of nutrients to the Estuary by half, farmers have, in the main, significantly cut back their fertiliser application. They have also been prohibited from significant additional clearing through the Soil Conservation legislation. The voluntary participation by farmers in this scheme is acknowledged and supported.

One objective of the Environmental Protection Policy, the Statement of Planning Policy and the Catchment Management Plan is to ensure that new rural developments and landuse zoning changes will be evaluated on a catchment-wide basis. Rural strategies and planning schemes in the catchment should also reflect the principles adopted in these documents to ensure that appropriate landuses and management provisions are allocated for rural land.

3.6.2 Rural Residential Developments

Rural residential lots (or rural retreats) are defined as being greater than 1 hectare and are used primarily for residential purposes. These lots often also attract hobby farm activities which can be associated with land degradation and nutrient problems. A number of issues which address the management of these problems are examined below.

Land capability

An assessment of the site's environmental capability has been undertaken by the Environmental Protection Authority to determine whether the site is capable of sustaining rural residential development without resulting in an unacceptable environmental impact. This assessment includes the Department of Agriculture's Land Capability Assessment for the site. With regard to the Department of Agriculture's Land Capability Assessment, the Authority prefers this form of development to be sited on land which is classed as 'fair', 'high' or 'very high' for use as 'rural retreats' (i.e. environmentally capable of supporting conventional rural residential development). The development may proceed on such land provided a number of design constraints and management provisions are applied. These fall into two categories: those which apply to the developer and are implemented prior to the issuing of titles for the proposed lots; and those which apply to the local authority and must be reflected in the local authority's town planning scheme.

A number of proposals are on land which has a land capability classification for rural retreats which is 'low' or 'very low'. This is generally because the groundwater is very high and the nutrient retention and microbial purification ability of the soils is not adequate or the land is subject to flooding. The Authority has considered this form of development on these land capability classifications and has concluded that development may be acceptable (in terms of nutrient management and the impact on the estuary) provided that it is not over the Underground Water Pollution Control Area and modified effluent disposal systems, which are certain to prevent the nutrients from entering the groundwater, are used, in addition to other design constraints identified.

Sewage disposal

Domestic septic tanks typically release about 3.5kg of phosphorus and 35kg of nitrogen into the soil each year, and because it is confined and concentrated, a significant portion of this reaches the groundwater.

Because of the low density of development associated with rural residential development, connection to reticulated sewerage is not viable and conventional septic tanks with alternating leach drains are typically used for sewage disposal.

For these systems to work effectively, the Authority considers it is necessary for the bottom of the leach drain to be a minimum of 2 metres above the highest water table, and for the system to be at least 100 metres from the nearest watercourse or drain. In many cases this requires the creation of a mound to accommodate the leach drains.

Conventional septic tanks are unacceptable on land classified as 'low ' to 'very low' in the Department of Agriculture's Land Capability assessment, due to high groundwater levels. Until recently rural residential development proposals on land with a 'low ' to 'very low' land capability were considered to be unacceptable to the Authority. However, the Health Department of Western Australia has recently approved a number of alternative, domestic wastewater treatment systems (two types of 'Aerated Treatment Units' and 'a modified septic tank') which have an acceptable phosphorus retention capacity and meet the Department's health requirements.

The 'Aerated Treatment Units' comprise of a septic tank which feeds into a sealed aeration and chlorination tank. The effluent which is discharged from this tank is free from microbial problems but is still high in nutrients. The effluent is disposed of by irrigating a section of the property. In catchments such as the Peel-Harvey, the irrigation areas need to be amended with high phosphorus retention soils. The irrigation area must be at least 900mm above the highest known water table.

The 'modified septic tanks' have dual leach drains which are situated in high phosphorus retaining soils contained in a membrane. When the effluent leaves the amended soil area, it is free from microbial problems and nutrients. The base of this system also needs to be above the highest known groundwater table.

Both systems have only been approved for a period of 2 years during which the Health Department will monitor their effectiveness. Both types of system are also associated with management issues which still need to be finalised with local authorities and the Health Department. The 'Aerated Treatment Units' need to be serviced quarterly to ensure they work effectively and both systems need to have the amended soils replaced periodically to ensure their nutrient stripping capacity is maintained.

On the advice of the Health Department, the Authority will accept these systems in areas with 'low ' to 'very low' land capability, outside water supply areas and provided the systems are installed above the highest known water table and acceptable ongoing management requirements are implemented. An assessment of the proposal in relationship to the Government's sewerage policies also needs to be undertaken by the planning agencies.

Landuse controls

The keeping of livestock may be possible on larger lots but as one horse can contribute the equivalent of 12-14 kg of phosphorus per year, the keeping of a horse on every rural residential block would not be desirable. However, it should be pointed out that, in regard to nutrients, one horse can have less of an impact than a septic tank system because disposal of the wastes is dispersed and spread over the soil surface and grasses. Acceptable stocking rates need to be determined on a case by case basis, taking soil type, feed source and cumulative impacts in the subcatchment into consideration. Until such acceptable stocking rates can be defined, and especially on land which has a 'low' to 'very low' land capability assessment, the Authority considers that a stocking rate of one horse (or the stock equivalent) per two hectare lot is the maximum stocking rate which should be permitted for this form of landuse.

The average domestic garden can contribute a comparable amount in nutrients to a septic tank system, although the actual impact can obviously vary greatly with the nature of the garden and its management.

The acceptability of ancillary landuses within the rural residential development would be dependent upon their potential contribution to the nutrient balance of the development.

Clearing controls

The clearing of substantial areas of the little remaining remnant vegetation for the establishment of 'hobby farms' is inconsistent with the moratorium on clearing in the catchment. However, the rural residential concept can be consistent with revegetation of the catchment. Since almost all forms of intensive agriculture are ruled out because of their high nutrient impact, it is possible for the whole lot, apart from the building envelope, to be fully revegetated. The revegetation of cleared land will eventually lead to a lowering of the water table, a reduction in nutrient loss from the lot and an improvement in the landscape amenity and aesthetics of the area.

Drainage

The moratorium on drainage in the catchment means that it is necessary for drainage associated with developments to be managed on-site so that nutrients and drainage water resulting from development are not exported from the site. The Authority acknowledges that this is an issue which requires further investigation. In the interim, drainage should be managed so that a 1 in 10 year flood event can be retained within a specific location of the development for 3-4 days. This will be facilitated by the revegetation mentioned above, but it is highly likely that significant areas of land in the catchment will not be suitable for rural residential development because they are low lying, and off-site disposal of drainage would not be permitted. A more detailed assessment of groundwater levels should be undertaken on land with a 'low' to 'very low' land capability before any development is permitted to proceed.

Ongoing management

The success of rural residential developments in terms of their environmental impact is dependent upon ongoing management and, where appropriate, enforcement. There must be a clear commitment by the relevant local authority, and the appropriate financial and staffing arrangements, to ensure the satisfactory implementation of the measures specified by the Environmental Protection Authority as necessary for the proposals to be environmentally acceptable. The statutory controls required to protect the environment are available through the planning process.

3.6.3 Special Residential Development

Special residential lot sizes (2000m^2-10 000 m^2) have in the past been required to be connected to deep sewerage. However, the use of the approved alternative wastewater treatment systems described above are acceptable in some situations for lots of this size.

Special residential lots also require some control over landuses to ensure that activities which would have an environmental impact or which could cause problems with nutrients are controlled. These are similar to those described for rural residential landuses but also include the following.

- Stock should not be permitted at this development density.
- Dwellings and gardens should be restricted to an appropriate sized building envelope. Natural vegetation should be retained or replaced outside the building areas.

3.6.4 Urban development

The specific requirements which should apply to urban developments are connection to reticulated sewerage, on-site containment of drainage, water sensitive design and management, maximum retention of indigenous vegetation, appropriate management of public open space, and vegetation buffers along watercourses and drains. There are some circumstances, where the requirement for deep sewerage could be relaxed. An example would be small developments within an already established area.

4. The proposal

This residential development proposal is 4.05 ha in area and is located at lot 79 Tuart Road, Sherwood Park, Mandurah, in the City of Mandurah (Figure 1). The proponent is Hacalong Pty Ltd. It is proposed to subdivide the property into 40 lots ranging in size from approximately 700m^2 to 1000m^2. It is proposed to connect all lots to the reticulated sewerage system. An area of 4050m^2 has been set aside for Public Open Space.

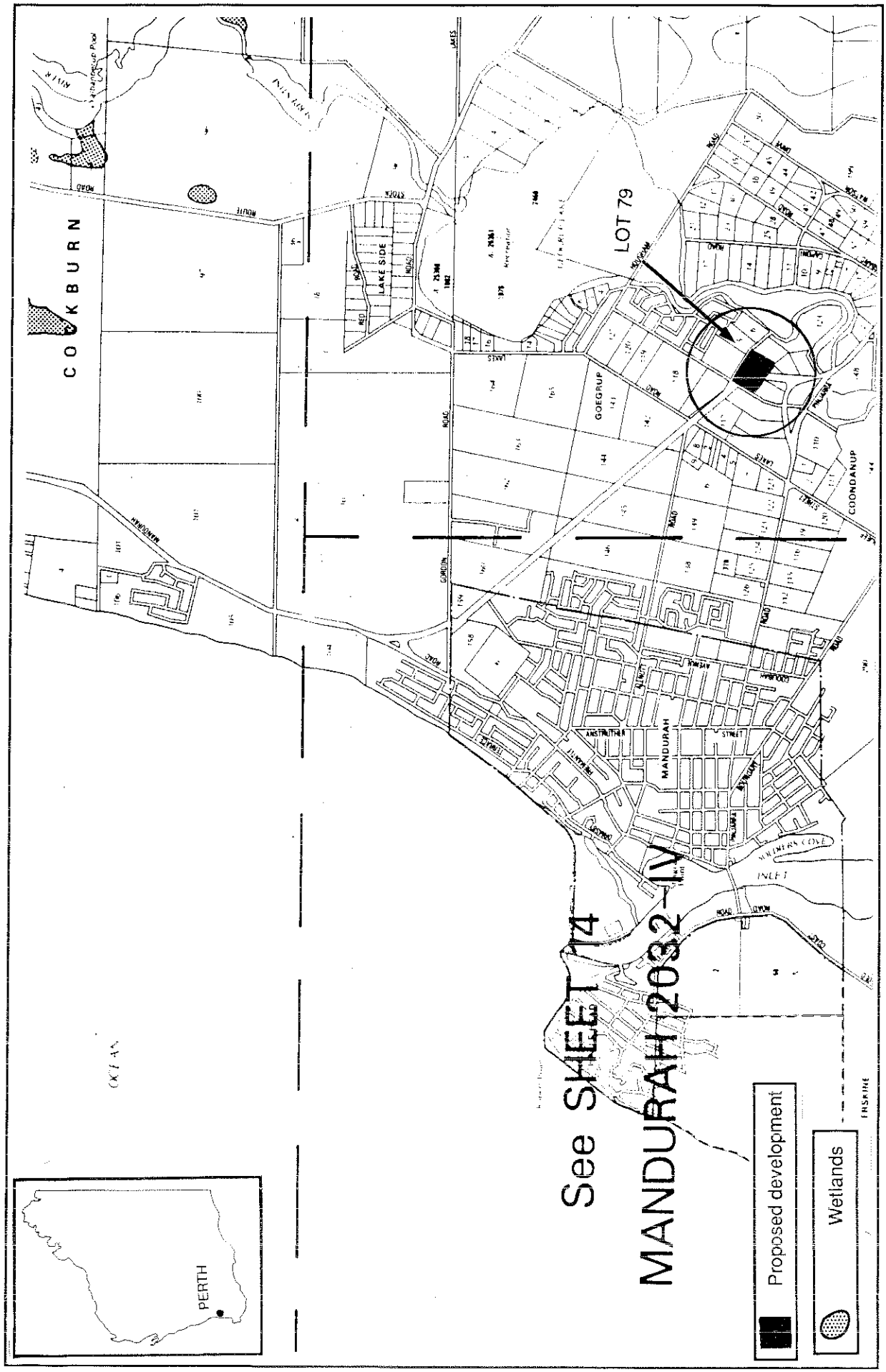

Figure 1: Location of the development proposal in the City of Mandurah.

5. Environmental consultation

The Environmental Protection Authority received comments on the proposal from the following groups and agencies:

Conservation Council of Western Australia;

Members of the public;

Peel Preservation Group;

Peel Inlet Management Authority;

Water Authority of Western Australia;

Department of Planning and Urban Development;

Health Department of Western Australia; and

Pinjarra Community Catchment Centre

Department of Agriculture

City of Mandurah

6. Environmental assessment

The Authority has assessed the proposal on the basis of:

- the information provided in the referral documents;
- submissions received from government agencies and the public;
- the Authority's knowledge of current residential developments and their environmental effects;
- the Authority's knowledge of the current status of the Peel-Harvey estuarine system and associated catchments; and
- in the context of the Environmental Conditions for the Peel Inlet-Harvey Estuary Management Strategy (Stage 2).

The specific development design and management provisions which should apply to residential development in the Peel-Harvey coastal catchment are; connection to reticulated sewerage, on-site containment of drainage, water sensitive design and management, maximum retention of indigenous vegetation, appropriate management of public open space, and vegetation buffers along watercourses and drains.

This proposal is in general consistent with the Authority's objective for residential development in the Peel-Harvey coastal catchment.

7. Conclusions and recommendations

The Environmental Protection Authority is aware that a number of decision making authorities must provide approvals for a development such as this one to proceed. These other authorities, including the Department of Planning and Urban Development, the Department of Health and the Local Authority must provide planning, health and other approvals.

Recommendations by the Environmental Protection Authority, and ultimately the decision of the Minister for the Environment, primarily address the potential environmental impacts of nutrients from the proposed development on the Peel-Harvey Estuary.

Notwithstanding the Environmental Protection Authority's advice and the Minister for the Environment's decision, the proposal may or may not be approved by the other decision making authorities.

Accordingly the Environmental Protection Authority wishes to provide advice and recommendations in two parts. The first part comprises advice to the other decision making authorities before they make decisions on whether or not to approve the proposal.

If the proposal is subsequently approved by the other decision makers, then the Environmental Protection Authority makes further recommendations relevant to the proponent and to the Local Authority.

Advice to the decision making authorities

The Environmental Protection Authority advises that any environmental approval granted through this process does not imply that planning approval will automatically follow. A number of planning issues, which may include environmental aspects, may need further consideration. Some of the issues to be addressed include the following matters:

- Further consideration by relevant approving authorities of the use of the alternative on-site wastewater treatment systems with regard to implementing procedures to ensure that the systems are properly managed and maintained and that mechanisms to evaluate their long term performance and effectiveness are in place.
- Consistency of the use of alternative wastewater treatment systems with the Government's Sewerage Policies.
- Risk from flooding or surface inundation during winter months.
- Planning decisions regarding the proposed Jandakot Botanic Park.
- Appropriateness of lot sizes for the land practices of the area and potential for land degradation.

Recommendations

The Environmental Protection Authority concludes that the proposal is environmentally acceptable, with respect to protection of the Peel-Harvey Estuary, if the design constraints and management provisions in the following recommendations are applied.

<u>On the developer</u>

Recommendation 1

The Environmental Protection Authority recommends that the developer be required to undertake the following:

1.1 Connect all the residential lots to a reticulated sewerage service.

1.2 Construct a stormwater disposal system capable of retaining a 1 in 10 year storm event in a specific locality of the development for 3-4 days or according to guidelines prepared by the Local Government Authority to the satisfaction of the Environmental Protection Authority.

Recommendation 2

The Environmental Protection Authority recommends that public open space associated with the development shall be managed so that stormwater is contained on-site to the extent that a 1 in 10 year storm event will be contained for three to four days before leaving the site or in accordance with guidelines prepared by the local authority to the satisfaction of the Environmental Protection Authority. The public open space should also be managed so fertiliser usage is minimised and as much of the site as possible is covered with natural vegetation.

In addition the Authority would encourage the retention and reinstatement of indigenous vegetation through the public open space system, on as much other public and private land as possible, and along watercourses and drains. Also, the Authority suggests the residential development be designed, developed and managed to encourage reduced water consumption, increased water retention, and minimal nutrient application (particularly to public open space).

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

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 this report, then such approval should lapse. After that time, further consideration of the proposal should occur only following a new referral to the Authority.