

**Proposed subdivision of Swan Location 2703 Nisa
Road, Pinjar, City of Wanneroo**

Mirreen Nominees

**Position statement and report and recommendations
of the Environmental Protection Authority**

**Environmental Protection Authority
Perth, Western Australia
Bulletin 728
December 1993**

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 report.

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 contents of the assessment report or 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
12th Floor, Dumas House
2 Havelock Street
WEST PERTH WA 6005

CLOSING DATE

Your appeal (with the \$10 fee) must reach the Minister's office no later than 5.00 pm on 23 December 1993.

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Part A

1. The proposal

A proposal to subdivide Swan Location 2703 Nisa Road, Pinjar within the Shire of Wanneroo was first referred to the Environmental Protection Authority by the Department of Planning and Urban Development in February 1993. The subject land, located on the western side of Lake Pinjar, is 66 hectares in area and the proposal seeks to divide the land into three lots of 22 hectares (Figure 1).

The proponents are Mirreen Nominees.

Most of Lake Pinjar is in private ownership and is used for a variety of rural pursuits. With the exception of its south western extremity, Lake Pinjar is adjoined by State Forest. Lake Pinjar has a number of environmental factors that need to be considered when development is being proposed. The three most significant factors are:

- Lake Pinjar is part of the System Six Recommendation Area M8 (Wanneroo Wetlands - Eastern Chain);
- some of the lake is protected by the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992; and
- Water Authority of Western Australia priority one and two groundwater source protection areas cover the entire area of Lake Pinjar.

The setting of a formal level of environmental assessment for this proposal by the Environmental Protection Authority was initiated because of these issues. The Authority considers that the environmental assessment of the proposal to subdivide Location 2703 should be undertaken within the context of an overall environmental framework for Lake Pinjar. It is anticipated that this approach will assist the planning agencies with future proposals affecting Lake Pinjar.

This report therefore consists of two parts. The first part (Part A), considers the specific proposal to subdivide Swan Location 2703, Nisa Road, Pinjar. Part A has been assessed using the context provided by the second part of this report. The second part (Part B) provides the planning and environmental context for Lake Pinjar and indicates the environmental issues which the Authority considers should be taken into account for all proposals on Lake Pinjar. Part B concludes with a position statement which should assist the planning agencies in their determination of future proposals for Lake Pinjar.

It is anticipated that where future proposals are consistent with the Position Statement provided in Part B of this report, then formal environmental impact assessment of that proposal, by the Environmental Protection Authority will not be required.

2. Environmental assessment process

The Environmental Protection Authority decided that the proposal for subdivision of a 66 hectare lot into three 22 hectare lots did not require the proponent to produce a report for public review. Instead, the Environmental Protection Authority managed the Consultative Environmental Review process and consulted with relevant organisations and agencies prior to preparing its report and recommendations. When released, the Authority's report will be distributed to all relevant agencies, organisations and affected landholders. The normal appeal rights apply to this report.

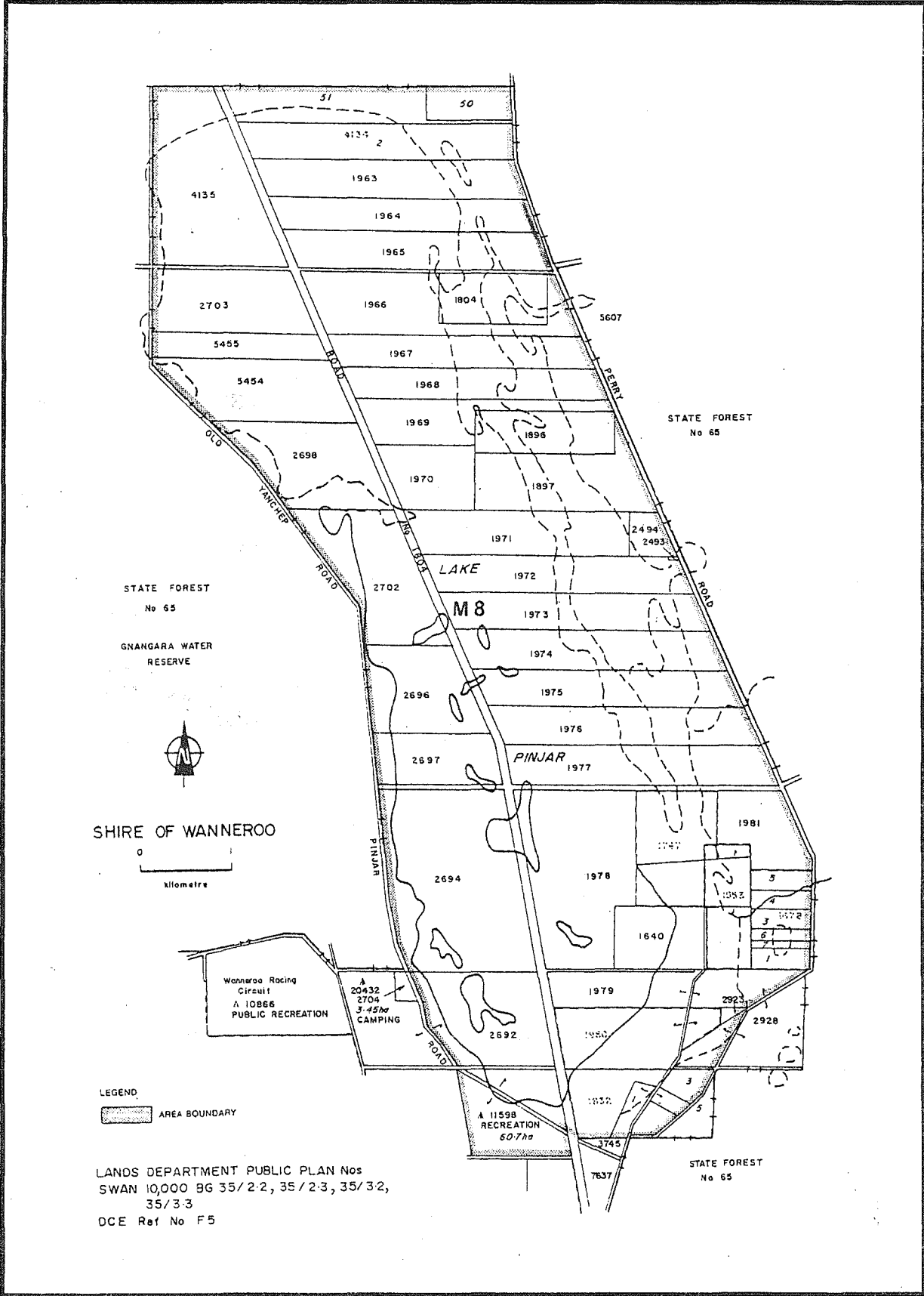


Figure 1. Lake Pinjar (from Environmental Protection Authority System Six Recommendation Report, Report 13, October, 1983)

It should be noted that the Authority's assessment of this proposal primarily addresses the issue of the environmental capacity of Lake Pinjar. 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 sewage policies or the impact on the adjacent landusers may also need to be addressed by the agencies with responsibility for planning approvals.

Any environmental approval granted through this environmental assessment process does not imply that planning approval will automatically follow.

It may be that the State government planning agency requires the City of Wanneroo to undertake a specific planning study such as a local rural strategy or specific land use strategy, before further development of Lake Pinjar can proceed. 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. The Authority is aware that the City of Wanneroo has already given serious consideration to issues affecting Lake Pinjar.

3. Environmental consultation

The Environmental Protection Authority has included the following groups and agencies in its assessment of the proposal:

- Water Authority of Western Australia;
- Department of Planning and Urban Development;
- City of Wanneroo; and
- Conservation Council of Western Australia.

4. Environmental assessment and recommendations

The Authority has assessed the proposal on the basis of:

- the information and submissions provided from a number of the above groups and agencies including meetings and discussions;
- the Authority's knowledge of current rural residential developments and their environmental effects;
- on-site inspections including discussion with some landowners; and
- the Authority's knowledge of the environmental issues affecting Lake Pinjar (Part B Section 3 of this report), and the Position Statement outlined in Part B Section 3.10 of this report.

Location 2703 is not in an area identified by the Department of Planning and Urban Development's Regional Park study as containing high conservation value for remnant vegetation, nor does Location 2703 contain any portion of a gazetted lake. The major environmental issues affecting Location 2703 is the Priority One groundwater resource and protection of water levels and quality in nearby wetlands. However, the proposed subdivision of the land into lot sizes of over 20 hectares is considered compatible with the protection of these issues providing adequate management controls are in place to ensure:

- Minimum lot size range of between 15 to 20 hectares;
- High nutrient generating landuses are not permitted such as intensive agriculture;
- Remnant vegetation is protected;

- The use of modified on site effluent disposal systems with adequate phosphorus retention capacity are required to the satisfaction of the Health Department of WA; and
- Stock numbers are controlled.

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 include environmental aspects, may need further consideration.

Recommendation 1

The Environmental Protection Authority has concluded that the proposal to subdivide Swan Location 2703 Nisa Road, Pinjar within the City of Wanneroo, as proposed is environmentally acceptable.

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

- groundwater considerations;
- protection of gazetted lakes;
- protection of remnant vegetation;
- protection of future landusers from flood risk, fire risk, and noise impacts; and
- proper management of the above.

Accordingly, the Environmental Protection Authority recommends that the proposal could proceed subject to the Environmental Protection Authority's recommendations in this report.

Recommendation 2

The Environmental Protection Authority considers that the proposal to subdivide Swan Location 2703 Nisa Road, Pinjar within the City of Wanneroo could proceed subject to meeting the relevant requirements in Appendix 1 to the satisfaction of the State Planning Commission.

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 a positive effect on the environmental performance of the project. The Authority believes that such non-substantial changes and especially those which improve environmental performance should be provided for.

The Authority believes that 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 only occur following a new referral to the Authority.

5. Recommended environmental conditions

Based on its assessment of this proposal and recommendations in this report, the Environmental Protection Authority considers that the following Recommended Environmental Conditions are appropriate.

PROPOSED SUBDIVISION, SWAN LOCATION 2703, NISA ROAD PINJAR (789)

1 Implementation

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

- 1-1 Subject to these conditions, the manner of detailed implementation of the proposal shall conform in substance with that set out in any designs, specifications, plans or other technical material submitted by the proponent to the Environmental Protection Authority with the proposal. Where, in the course of that detailed implementation, the proponent seeks to change those designs, specifications, plans or other technical material in any way that the Minister for the Environment determines on the advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

2 Planning statement

To achieve the environmental objectives through the planning process the proponent shall fulfil the relevant requirements listed in Appendix 1 of this Statement to the satisfaction of the State Planning Commission.

3 Proponent

These conditions legally apply to the nominated proponent.

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

4 Time Limit on Approval

The environmental approval for the proposal is limited.

- 4-1 If the proponent has not substantially commenced the project within five years of the date of this statement, then the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment shall determine any question as to whether the project has been substantially commenced. Any application to extend the period of five years referred to in this condition shall be made before the expiration of that period, to the Minister for the Environment by way of a request for a change in the condition under Section 46 of the Environmental Protection Act. (On expiration of the five year period, further consideration of the proposal can only occur following a new referral to the Environmental Protection Authority.)

Procedure

The Environmental Protection Authority is responsible for verifying compliance with the conditions contained in this statement, with the exception of conditions stating that the proponent shall meet the requirements of either the Minister for the Environment or any other government agency.

If the Environmental Protection Authority, other government agency or proponent is in dispute concerning compliance with the conditions contained in this statement, that dispute will be determined by the Minister for the Environment.

Note: Advice regarding subsequent planning approval

This environmental approval under the provisions of the Environmental Protection Act does not imply that planning approval will follow automatically.

Part B Basis for environmental assessment of proposals at Lake Pinjar

1. Introduction

Most of Lake Pinjar is in private ownership and is used for a variety of rural pursuits. With the exception of its south western extremity, Lake Pinjar is adjoined by State Forest .

Lake Pinjar has a number of environmental factors that need to be considered when development is being proposed. The three most significant factors are:

- Lake Pinjar is part of the System Six Recommendation Area M8 (Wanneroo Wetlands - Eastern Chain);
- some of the lake is protected by the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992; and
- Water Authority of Western Australia priority one and two groundwater source protection areas cover the entire area of Lake Pinjar.

To date, land use planning for lots on Lake Pinjar has been largely undertaken on a case by case basis without an environmental framework to guide planning decisions. Increasing pressure from landowners to subdivide their land and the potential for uncontrolled intensification of rural activities and land uses occurring at Lake Pinjar is not likely to diminish. Case by case assessment of individual proposals, is not desirable. Such an approach is likely to create landowner uncertainty, result in ad hoc decision making and has the potential to lead to environmental degradation and loss of amenity.

The Authority considers that the environmental assessment of proposals to subdivide land at Lake Pinjar should be undertaken within the context of an overall environmental framework for Lake Pinjar. It is anticipated that this approach will assist the planning agencies with future proposals affecting Lake Pinjar.

The Environmental Protection Authority anticipates that this report should ultimately trigger the development of a specific planning strategy for Lake Pinjar which would serve to reduce land holder uncertainty and provide a sound framework for future planning decisions.

2. Planning context of the site

The North West Corridor Structure Plan was published by the Department of Planning and Urban Development in 1992. The Structure Plan is intended to provide the framework for the development of the Corridor to the year 2021. The plan is an advisory document which contains proposals for residential development and local employment, the provision of services and infrastructure, and conservation and protection of the environment. The principles in the Structure Plan are intended to provide a guide to more detailed planning and development at the local level.

The Structure Plan identified Lake Pinjar as proposed Landscape Protection Zone. The purpose of the landscape protection zoning is to ensure the natural character of the area is conserved and enhanced through sensitive subdivision and development which recognises existing landscape systems and natural features.

In its advice to the Department of Planning and Urban Development regarding the Structure Plan, the Environmental Protection Authority supported the formation of a landscape protection zone. However, it is understood by the Authority that the establishment of a landscape protection zone in the Metropolitan Region Scheme as foreshadowed in the Structure Plan will not be initiated.

The Department of Planning and Urban Development also indicated in the Structure Plan that a study, based around the System Six Recommendation M8 (Wanneroo Wetlands - Eastern Chain), was in progress. The study area included Lake Pinjar. The detailed natural resources mapping study would determine whether any or all of the land should be reserved for Parks and Recreation. At the time of this report it is understood that a natural resource mapping study has been completed. The implementation and final form of the proposed Parks and Recreation Reservation, should it proceed, will be determined by the State Planning Commission and the Minister for Planning.

A major amendment to the Metropolitan Region Scheme is also proposed for land east of Wanneroo Road. The East Wanneroo amendment proposes rezoning rural zoned land to urban deferred. This comprises all the land shown Future Urban in the North-West Corridor Structure Plan (1992) except land currently zoned Urban or in the process of being rezoned by earlier separate amendments.

Lake Pinjar is currently zoned Rural under both the Metropolitan Region Scheme and the City of Wanneroo's District Town Planning Scheme. Historically, the lake has been used for a variety of rural pursuits although in recent years some landholders have sought to subdivide their land.

3. Environmental issues affecting Lake Pinjar

In examining the environmental implications of further development at Lake Pinjar, the Environmental Protection Authority has given consideration to the following issues.

3.1 System Six Recommendation Area M8 (Wanneroo Wetlands — Eastern Chain)

The Environmental Protection Authority considers that an adequate and representative system of reserves should be set aside for the conservation of flora, fauna and landscape. Such reserves should be properly managed and given security of tenure commensurate with their conservation value. The integrity of such reserves should be maintained.

The System Six Report established through the Conservation Through Reserves studies has formed the principle focus for the Authority's conservation efforts on the Swan Coastal Plain.

System Six covers the most intensively used part of the State where land values are high and competition for differing land use is often intense. The study's objective was to define those parts of the region which should be kept mainly natural.

This study identified 209 metropolitan and country areas of regional conservation significance and/or regional representation of biological and physical values on the Swan Coastal Plain and made recommendations for their management. The Recommendations of the System Six Study were endorsed in principle by Government in 1983.

The Environmental Protection Authority believes the integrity of System Six Recommendation areas should not be further compromised and defends them strongly.

Lake Pinjar is part of a chain of wetlands about 24km long in the East Wanneroo area running in a roughly north-south line that form part of the intersection of the Spearwood dunes and Bassendean dune landforms (Figure 2). Other wetlands include Lakes Mariginiup, Jandabup and Gnangara. These wetlands, including Lake Pinjar are directly affected by the recommendations contained within the System Six report, specifically the System Six Recommendation M8.2 in Part 11 of the System Six Report, identified Lake Pinjar for reservation as Parks and Recreation under the Metropolitan Region Scheme.

Recommendation 15 within Part 1-General Principles and Recommendations, of the System Six Report applies to M8 and states that :

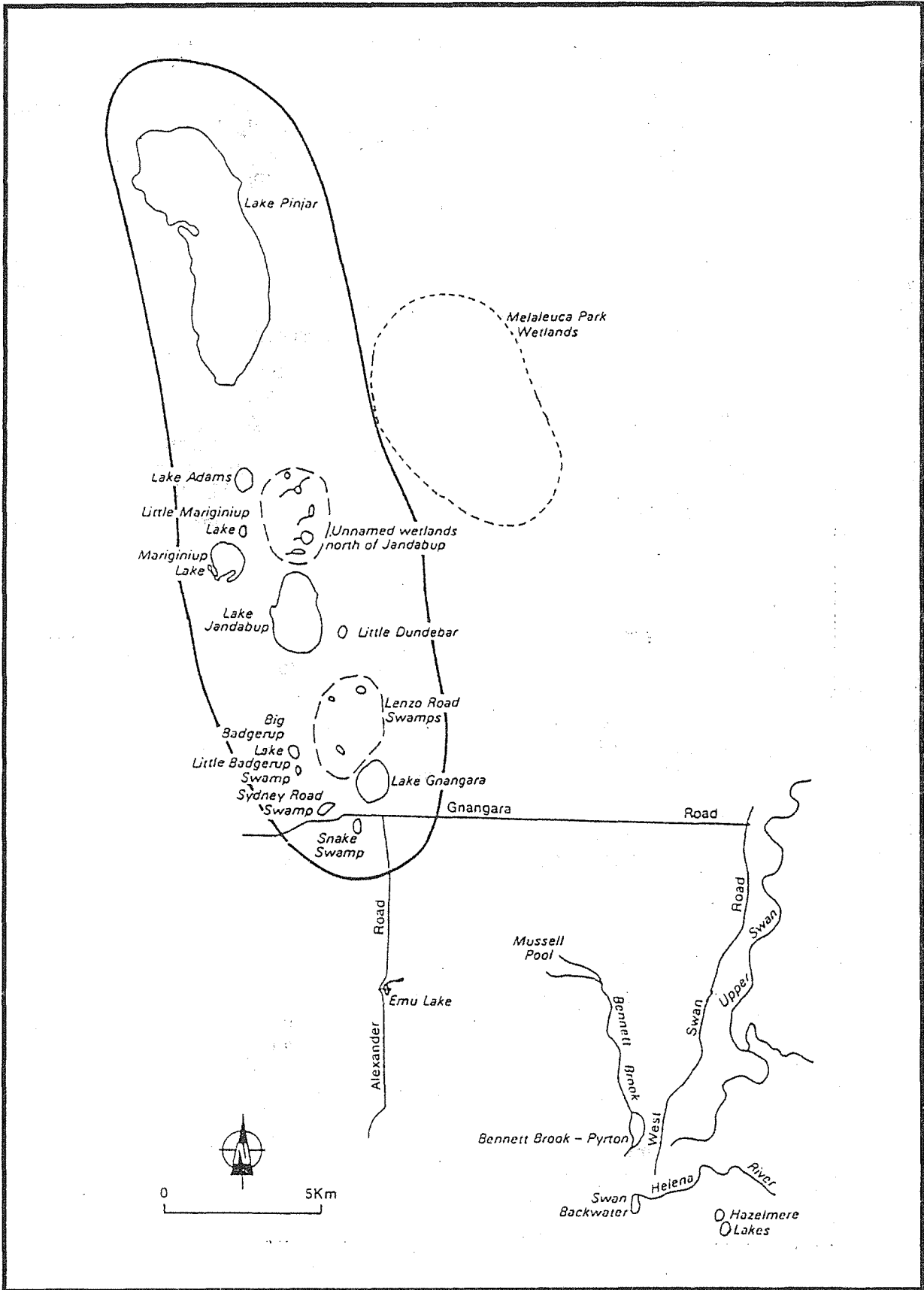


Figure 2. The Eastern Wanneroo wetlands (from Bulletin 266, Environmental Protection Authority)

Areas identified through planning procedures as open space of regional significance should, where appropriate, be designated as Regional Parks.

The vegetation complexes for the Darling System described by Heddle et al (1980), defined the vegetation at Lake Pinjar and in areas to the south as belonging to the Pinjar Complex. The natural resources mapping study commissioned by the Department of Planning and Urban Development, recognised the lake floor and its margins as belonging to the Pinjar Complex. However, the areas of dunes were considered as part of the Bassendean Complex - North and Karrakatta Complex-Central and South.

The Department of Planning and Urban Development study found that Lake Pinjar has significantly different vegetation to other wetlands studied. The study has suggested that the vegetation of the floor of Lake Pinjar may be unique or at least very unusual and finds that the conservation status of the Pinjar complex is poor with little representation in existing reserves.

It is recognised by the Environmental Protection Authority that not all of Lake Pinjar incorporates land of high conservation value. The Authority is aware that over half of the Lake has already been cleared of native vegetation to provide pasture for grazing stock, although as indicated, some areas of remnant native vegetation remain. It would therefore seem more appropriate that specific areas of high recreation and conservation value within Lake Pinjar identified through more detailed study, such as the studies commissioned by the Department of Planning and Urban Development for the wetlands east of Wanneroo Road, should be considered by the planning agencies for inclusion in a Parks and Recreation reservation.

The Authority's conclusions

It is the Authority's view that the dissimilarity between the vegetation of Lake Pinjar's basin and margins with other wetlands, identified through the Department of Planning and Urban Development's study indicates it represents a special case and warrants protection.

However, it is recognised that there are a range of mechanisms within the planning process at the State and local government level, such as Parks and Recreation Reservation and Public Open Space provisions which can achieve protection of remnant vegetation which has high conservation value.

Areas which do not have high conservation or recreational values could be considered for development within an appropriate planning framework which also protects remaining natural vegetation.

3.2 Regional Park study

In December, 1990, the government released its Metropolitan Strategy, Metroplan, for guiding and managing growth in the Perth Metropolitan Region over the next 30 years. Metroplan promotes an integrated regional open space system based around a Regional Park structure. It also recognises the establishment of the Gnaragara Regional Park based around the System Six Recommendation Area M8 (Wanneroo Wetlands - Eastern Chain).

Following the release of Metroplan, the North West Corridor Structure Plan (1992) indicated that detailed studies were in progress to determine whether any or all of the land considered for the proposed regional park should be reserved for 'Parks and Recreation' purposes under the Metropolitan Region Scheme.

As part of the above study, the Department of Planning and Urban Development has required a natural resource mapping study and analysis of the study area to be undertaken, to provide base line information and assist in determining future boundaries for Parks and Recreation Reservation proposals. Lake Pinjar is within the study area. The natural resource data collected and analysed includes vegetation and flora, wildlife and habitats, hydrological characteristics, landform and soils, landscape features, land use and tenure.

The Environmental Protection Authority endorses the Gnangara Regional Park concept proposed in Metroplan and endorses the more detailed natural resource studies initiated to further advance this proposal.

However, it is recognised that the outcomes require approval by the State Planning Commission and ultimately the Minister for Planning before any amendments would be incorporated within the Metropolitan Region Scheme.

The Authority's conclusions

The Authority believes that areas of regional conservation and recreational value identified through the detailed natural resource mapping study should be considered for inclusion as Parks and Recreation Reservations within the Metropolitan Region Scheme.

However, irrespective of whether the Regional Park is ultimately implemented or not, it is the Environmental Protection Authority's view that the areas of conservation value identified as part of the above study should be protected by the planning agencies.

3.3 Lake Pinjar (wetland and gazetted lake)

3.3.1 Wetland

Lake Pinjar is a wetland basin. The basin of Lake Pinjar is about nine kilometres long and one to two-and-a-half kilometres wide. Its area is about 19.25 km², representing more than twice the total area of remaining wetlands in the region. Lake Pinjar is the largest wetland in the Perth Metropolitan Region.

Since 1971, the Environmental Protection Authority has consistently recognised the need to conserve lakes and wetlands and has developed a strategy (EPA Bulletin 685), for wetland protection on the Swan Coastal Plain.

The Authority considers protection of wetland values are important. In particular, the Authority is concerned about proposals which affect the following:

- lakes nominated for protection in the Environmental Protection Policy;
- representative wetlands recommended for protection in the Authority's System Six report;
- wetlands with rare vegetation communities not adequately represented in reserves, or rare flora and fauna (and their habitats); and
- wetlands recognised by international agreement because of their importance primarily for waterbirds and their habitats.

Proposals which have the potential to impact upon the above will not generally be supported by the Authority. All or portions of Lake Pinjar are affected by Environmental Protection Policy Lakes, System Six Recommendations, and rare or poorly conserved vegetation communities. However, it is recognised that some of the basin is significantly degraded and has little conservation value.

The Environmental Protection Authority's Bulletin 686 "[A Guide to Wetland Management in the Perth and Near Perth Swan Coastal Plain Area](#)" (an update of EPA Bulletin 374), provides a framework for the identification of management objectives for wetlands to ensure their natural and human-use values are maintained or improved.

Prior to the Department of Planning and Urban Development study, Lake Pinjar was classified as a category M wetland using the Bulletin 686 wetland classification method. This information is derived from the wetland 'atlases' prepared by the Water Authority of Western Australia and the Environmental Protection Authority. The management categories are regarded as preliminary only. Category M wetlands are regarded as being significantly degraded,

possessing few natural attributes and limited human-use interest. Despite this, wetlands in this category can be a focus for controversy if developments impinge upon them.

However, recognition of Lake Pinjar's status as a System Six Recommendation Area, the classification of some parts of Lake Pinjar as gazetted lakes and the possible presence of unique or poorly conserved vegetation communities warrant a re-assessment of the Lake using Bulletin 686.

3.3.2 Lakes gazetted for protection in the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992

The Authority has worked to provide legal protection for the remaining lakes on the Swan Coastal Plain through the preparation of the Environmental Protection (Swan Coastal Plain Lakes) Policy which was gazetted in December 1992 and prohibits unauthorised filling, mining, drainage into or out of, and effluent discharge into lakes. This policy applies to those lakes on the Swan Coastal Plain that are shown in green on Department of Land Administration Miscellaneous Plan No 1815.

Wetlands protected by this policy have the highest level of protection under the Environmental Protection Act.

Those areas of Lake Pinjar identified in Figure 3 of this report are gazetted lakes under the policy.

The Environmental Protection Authority is concerned that an intensification of land use activities within the catchment and sufficiently close to the gazetted lakes could result in contamination from pollutants, especially nutrients, to the quality and quantity of the groundwater and/or surface water that flows into the lake.

The Environmental Protection Authority therefore considers that gazetted lakes within Lake Pinjar should be protected from potential impacts resulting from adjoining land use activities by the provision of an adequate buffer. In the case of Lake Pinjar the buffer would separate the water habitat from the human activity on the surrounding land. A buffer may also provide a complementary habitat for any wildlife using the gazetted lake.

The Authority's conclusions

Lakes on the site should not be mined, filled, drained or polluted. Land uses in the catchment should not impact on water levels in the lakes or the quality of the water. A minimum buffer of 50 metres from the lake's margin is generally considered acceptable but this needs to be determined on-site, taking site characteristics into account.

The Authority recognises that there are a number of planning mechanisms through which the gazetted lake and its buffer can be protected from the surrounding land use activities. Such measures could include reservation in regional open space or public open space, or enforceable management controls where the wetland is to remain in private ownership. The protected area should include the gazetted lake and the physical buffer.

3.4 Protection of groundwater

3.4.1 Gnangara mound groundwater

Lake Pinjar is located on the Gnangara Mound. The Gnangara Mound is a large mound of groundwater beneath the deep sandy soil north of Perth. The Gnangara Mound is an unconfined aquifer, which has its upper boundary, or water table, at the ground surface. The groundwater contained within the Mound originates from direct infiltration of rainfall. Recharge of the aquifer by rainfall leads to a build-up of water, forming mounds of groundwater in the sediments. The groundwater flows at very slow rates generally outward



Figure 3. Location of lakes protected by the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992

from the centre of the Mound, under the action of gravity since the water table is higher than sea level. Regional groundwater flows generally towards the west in the Lake Pinjar area.

Water is abstracted from the Gnangara Groundwater Mound for domestic, commercial and recreational purposes while a significant portion of the native vegetation also draws from this superficial aquifer. It supplies a significant amount of Perth's drinking water.

All land use developments, whether urban, industrial, recreation or agricultural, have the potential to contaminate the groundwater and alter recharge to the aquifers. There are regulatory mechanisms which seek to protect the quality and quantity of this water resource.

3.4.2 Groundwater source protection areas

Because the Mound is an important water supply for Perth, it is protected by a number of regulations. The Lake Pinjar area is mainly covered by a Priority 1 Protection Zoning under the Metropolitan Water Supply, Sewerage and Drainage Act By-Laws. These by-laws relate to the control of noxious industry and storage of petroleum products.

The Water Authority of WA policy for Priority 1 source protection areas advises that the objective for groundwater protection is that no degradation of the resource should be permitted. In general terms this means that land use in the area should be restricted to passive activities like rural grazing, tree plantations and Special Rural Zones. All activities would be subject to conditions to minimise pollution of the groundwater resource.

The Water Authority of Western Australia has advised that it would be reluctant to support subdivision below one residence per 10 hectares within the Priority 1 area. The Water Authority would also prefer the use of non conventional amended soil systems for septic tanks, although it advises that this does not imply that lot sizes can be reduced.

The bottom section of the lake is a Priority 2 protection area where land use activities and lot sizes could be relaxed.

3.4.3 Pinjar Groundwater Scheme

To provide water for the expanding North-West Corridor, the Water Authority of Western Australia proposed the Pinjar Groundwater Scheme. As the scheme has the potential to significantly affect the environment, an Environmental Review and Management Programme (ERMP) was produced in November 1986 for assessment by the Environmental Protection Authority and the public. In March 1988 the Minister of the Environment approved Stage 1 of the Pinjar Scheme subject to certain conditions set on the development and management of the Gnangara Mound.

One of the conditions specified minimum water levels which needed to be maintained in nine wetlands, including Lakes Joondalup, Jandabup and Nowergup. The predicted water level change for the groundwater beneath Lake Pinjar was a greater than 1.5 metre drawdown. This predicted change was considered acceptable.

Pinjar stages 2 and 3 were also assessed as being environmentally acceptable, subject to further review by the Water Authority.

However, there have been considerable changes since the time the environmental conditions were set, both in the pattern of development in the Wanneroo Region and the consequent demands for groundwater, and in the state of knowledge about the water requirements of the environment. As a result, the Water Authority of Western Australia is currently reviewing the allocation and management of groundwater in the Wanneroo Region.

Until this process has been completed, some uncertainty will remain about groundwater and surface water hydrology within the Lake Pinjar area.

3.4.4 Draft environmental protection policy for Gngangara Mound private land groundwater

In order to protect groundwater under the Crown and State-owned land on the Gngangara Mound for public water supply and the surrounding environment, the Environmental Protection Authority has formulated the Environmental Protection (Gngangara Mound Crown Land) Policy 1992. The purpose of the Policy is to protect -

- (a) the level and quality of groundwater on or under the policy area (an area consisting of Crown land and covering a large portion of Gngangara mound); and
- (b) native vegetation and wetlands in the policy area.

Although Lake Pinjar lies within the Gngangara Groundwater Mound it is not affected by the above policy which was developed to protect groundwater and associated ecosystems on the Crown Land portion of the Gngangara Mound. However, public submissions received during the development of the Crown Land Policy included frequent reference to the need for a similar policy to protect public water supply groundwater under the private land portion of the Gngangara Mound.

The Environmental Protection Authority has prepared and recently released the Draft Environmental Protection (Gngangara Mound Private Land Groundwater) Policy 1993. This Draft Policy seeks to protect important groundwater supplies of the private land portion of the Gngangara Mound from contamination, and thereby to protect the quality of the resource for ecosystem maintenance and public water supply.

All of Lake Pinjar is included within the area considered by the Draft Policy (see Figure 4).

The Policy proposes two levels of groundwater protection, designated as, Areas A and B. In the more environmentally sensitive Area A, new urban development and the expansion of intensive agriculture activities or the establishment of new intensive agriculture activities (including extensive stocking and rearing of sheep, deer, cattle and pigs), cannot take place and there are further controls on the use of groundwater, filling of land with contaminated material, and discharge of contaminants.

The Draft Policy recommends in Policy Area A that domestic effluent treatment and wastewater disposal systems incorporating non-conventional nutrient and pathogen attenuating devices should be included in residential design and development.

The Draft Policy proposes for Area A that there be a minimum land parcel size of 4 hectares. As indicated in Figure 4, most of Lake Pinjar is within Area A.

In Area B it is proposed that some activities not permitted in Area A may take place, but subject to environmental controls.

For Lake Pinjar, areas A and B in the Draft Environmental Protection (Gngangara Mound Private Land Groundwater) Policy 1993, are the same area as the Priority 1 and Priority 2 groundwater source protection areas defined by the Water Authority of Western Australia, and described in section 4.4.2 of this report.

It should be noted that the new Draft Policy is not intended to apply to existing lawful activities undertaken at the time when the Draft Policy comes into effect. It is intended to underpin appropriate land use planning and decision-making for the protection of the groundwater resource. Provision is made in the Draft Policy for planning agencies to make appropriate planning decisions as long as the beneficial uses of the groundwater are protected.

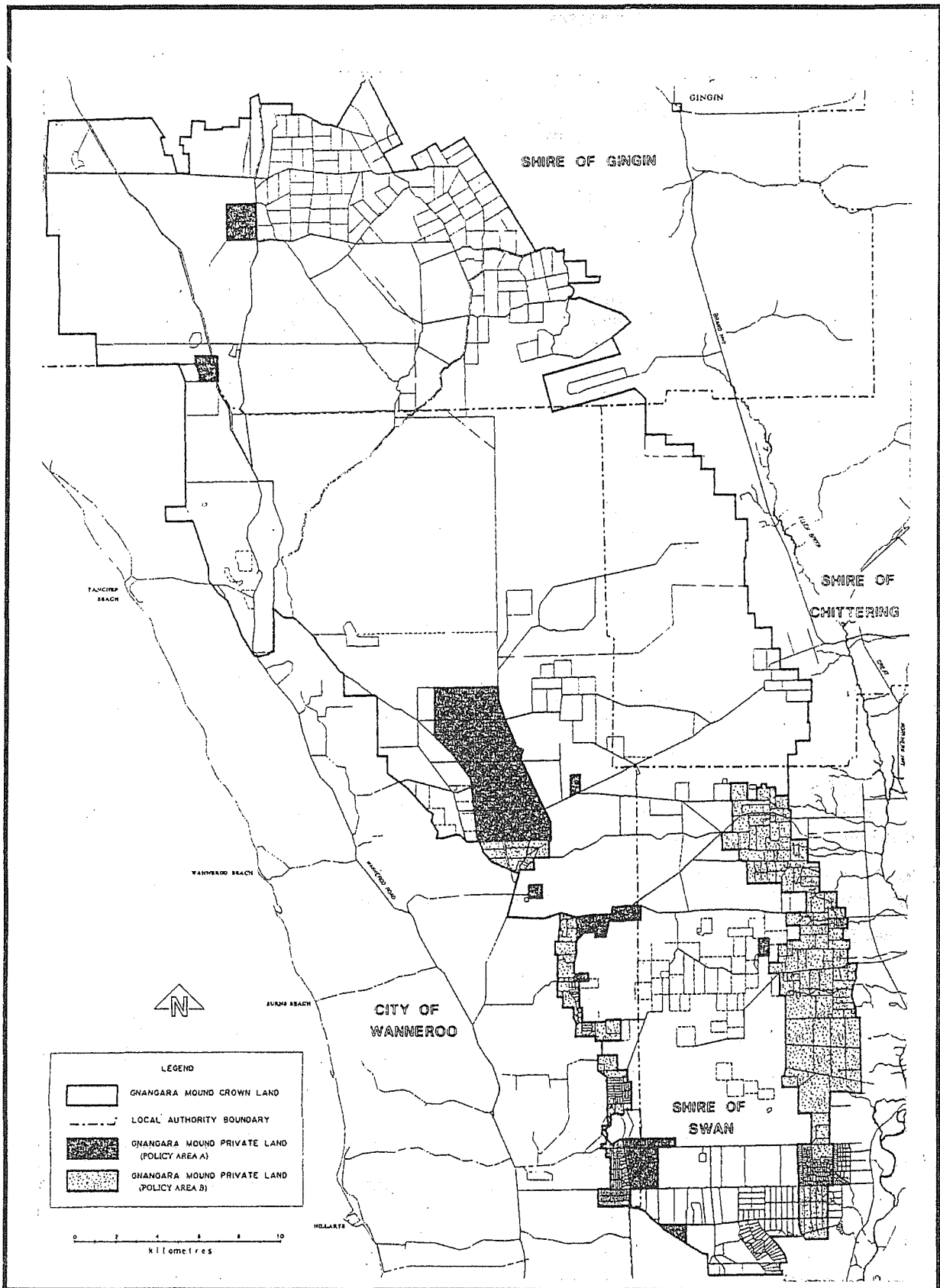


Figure 4. Proposed Gnamptara Mound Private Land Policy Area (from Draft Environmental Protection Policy for Gnamptara Private Land Groundwater, 1993, Environmental Protection Authority)

The Authority's conclusions

For the following reasons Lake Pinjar represents a special case and warrants special measures to protect the groundwater:

- Lake Pinjar is within and is almost entirely surrounded by the Priority 1 groundwater source protection area.
- The Pinjar Groundwater Scheme proposes the location and operation of a number of public water supply bores to the west of Lake Pinjar. It is therefore considered important by the Authority to maintain the quality of the future groundwater resource up-gradient of this area.

The major environmental concern is the potential for the quality and quantity of groundwater to be affected by the intensification of land use and development on Lake Pinjar, the impacts of which could affect water users 'down-gradient' and future public water supplies.

The Authority therefore concludes that for Lake Pinjar careful consideration should be given to the intensity of subdivision and the management controls applied through the planning process. The maintenance of larger lot sizes than would normally be considered for rural residential land use is preferred by the Authority and would be environmentally acceptable if managed appropriately.

3.5 Flood risk

Factors which have a major effect on lake water levels are management of the nearby pine plantations, public and private groundwater abstraction, urbanisation and climate.

As part of its on-going investigations into management of the Gnangara Mound groundwater resource the Water Authority of Western Australia in their report *Review of Groundwater Availability, Wanneroo, March 1989* has modelled groundwater levels under three climatic sequences (driest, average and wettest) based on a number of land use and water resource utilisation assumptions. Under the wettest sequence, groundwater levels in the Lake Pinjar area are projected to rise by up to 3 metres.

Some landowners in the Lake have constructed bunded walls to prevent water flooding their land. While this practice is effective in preventing winter flooding in average or low rainfall years the Water Authority of Western Australia advises that it will be ineffective in a prolonged sequence of wet years.

Aerial photographs such as those for 1963 testify to wet sequences resulting in extensive flooding of Lake Pinjar in the past. The possibility of similar events occurring in the future is recognised and should not be discounted by landowners or the planning agencies.

The Authority's conclusions

The Environmental Protection Authority recognises that Lake Pinjar is a flood plain which may be inundated under certain circumstances such as consecutive years of high rainfall.

The potential flood risk provides additional reason for controlling residential use of the area through the provision of larger lot sizes, possibly larger than the minimum 10 hectare lot size recommended by the Water Authority of Western Australia.

However, the Environmental Protection Authority recognises that the issue of flood risk is a planning matter and should be addressed by the City of Wanneroo in consultation with the Water Authority of Western Australia.

3.6 Noise

A motor sports facility, the Wanneroo Park Motor Racing Circuit, is located close to the south west boundary of Lake Pinjar. It is expected that the Wanneroo raceway generates substantial noise during times events are being held there. Although understood to be infrequent, the potential for noise levels to adversely affect the amenity of existing nearby residents is likely to be high. Therefore, in the absence of detailed noise studies, a precautionary approach is warranted for proposals which lead to an intensification of residential land ownership in this area. The potential noise impacts also provides additional support for controlling residential use of the area through the provision of larger lot sizes.

Measurements should be undertaken to establish the level, frequency and nature of the noise impacts arising from the raceway and appropriate provisions put in place to manage these impacts. The requirement for a noise buffer around this facility may be one such management provision, residential design standards which incorporate noise attenuation provisions may be another.

The Authority's conclusions

The Environmental Protection Authority considers that the City of Wanneroo, in consultation with the Environmental Protection Authority, should undertake a survey, to define in detail the noise impacts arising from the Wanneroo Park Raceway.

A policy addressing land use adjacent to the raceway should be developed by the City of Wanneroo in consultation with the Environmental Protection Authority and the Department of Planning and Urban Development Planning. The policy should reflect the findings of the survey and incorporate appropriate management requirements.

3.7 Fire risk

With the exception of the south west sector, Lake Pinjar is surrounded by State Forest. The Department of Conservation and Land Management's controlled burning of the State Forest occurs on a three to five year rotation, depending upon fuel loads. The Department of Conservation and Land Management's fire management strategies are intended to reduce the risk of fire spreading from the forest into the surrounding areas, and of fire spreading into the forest from surrounding areas.

However, due to its proximity to State Forest, Lake Pinjar is considered an area of potentially high fire risk. Intensification of land use will increase the human population and the number of buildings within this area of fire risk.

The Authority's conclusions

The potential fire risk is a planning issue. However, the potential fire risk supports the case for a subdivision strategy which does not greatly increase the number of landholdings.

3.8 Areas of potential organochlorine contamination

Potential organochlorine contamination occurs within some areas of Lake Pinjar that have been treated for Argentine Ant control. The main areas of concern are:

- possible groundwater contamination and its extraction for human use; and
- soil contamination and the possible contamination of stock products to be used for human consumption eg: accumulation of organochlorines in stock and fossicking species such as poultry (by direct ingestion of contaminated soil).

This is an issue which will require consideration by the planning agencies in consultation with the Department of Agriculture and the Health Department of WA prior to subdivision and development. It may be appropriate to require soil testing prior to development and/or to develop specific provisions within an overall planning strategy, to deal with the problem.

3.9 Impact of developments

Impacts associated with developments within a range of land use classifications are described below.

3.9.1 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 land uses to be undertaken without any form of control or management.

The predominant use throughout the Lake Pinjar area is the grazing and agistment of livestock, although, some intensive commercial agricultural activities have been established (eg: horticulture, a piggery and poultry farms.)

The objectives for rural land in Lake Pinjar should be to prevent contamination of underground water supplies, protect gazetted Lakes and prevent further loss of remnant vegetation. Under the current zoning these objectives are not met.

3.9.2 Special rural/rural residential developments

The City of Wanneroo's District Zoning Scheme also contains provisions for 'Special Rural Zones'. Special Rural Zones enable greater controls to be imposed on rural activities than would normally exist in rural zones.

The Authority considers, that where subdivision and development is considered acceptable, all land in Lake Pinjar should be associated with the stricter management provisions and design constraints usually associated with Special Rural Zones.

In particular the following aspects should be considered.

Lot sizes

Decisions regarding subdivision and development at Lake Pinjar should be based upon the capacity to achieve the following:

- protection of groundwater;
- protection of gazetted lakes and their buffers;
- protection of areas of remnant vegetation;
- protect future land users from flood risk, fire risk and noise impacts; and
- proper management of the above.

Lot sizes influence stocking rates, density of houses and wastewater treatment systems, density of dwellings exposed to flood risk, fire risk and noise impacts. It is the Authority's view that in order to meet the above requirements, lot sizes within the 15-20 hectare range would be preferred. However, the Authority believes that some flexibility in lot sizes should be allowed where environmental constraints are extensive and significant conservation measures are proposed. For example, where important areas of remnant vegetation or a portion of a gazetted lake are being given up to the Crown or subject to specific land use controls. In these circumstances, subdivision to 10 hectares could be considered.

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. In addition, nutrient run-off to surface waterbodies such as Lakes and wetlands also affects the quality of water in these systems.

The Environmental Protection Authority would prefer that all residential development is connected to reticulated sewerage. However, because of the low density of development associated with rural residential development, connection to reticulated sewerage is not always 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. This is not easily achieved for some parts of Lake Pinjar due to the height of the water table.

The proposed Draft Environmental Protection (Gnangara Mound Private Land Groundwater) Policy 1993, advocates that the achievement of specified environmental quality objectives and the protection generally of groundwater and its beneficial uses is to be effected by, in conjunction with other requirements:

"...(2) in Policy Area A...

(d) domestic effluent treatment and wastewater disposal systems incorporating non-conventional nutrient and pathogen attenuating devices being included in residential design and development."

Alternative domestic wastewater treatment systems, approved by the Health Department of Western Australia, with an adequate phosphorus retention capacity would be environmentally acceptable provided they are installed in accordance with Health Department guidelines on advice from the Water Authority of Western Australia.

It should be recognised that these systems require a greater management commitment from the local authority than conventional systems.

Landuse controls

The measures described above go a long way to addressing the issues regarding the protection of groundwater quality and the protection of gazetted lakes. However, the quality and quantity of water in the lakes, the protection of System Six values such as remnant vegetation is also important. The nature and intensity of the surrounding landuses are likely to have some impact on these values.

For example, one horse can contribute the equivalent of 12-14kg of phosphorus per year. Grazing by domestic stock can also have a significant effect on the composition of plant communities and the extent of vegetation cover. Livestock can have a deleterious effect on surface soils particularly on sloping land, due the chisel action of their hooves, to vegetation due to habitat disturbance from grazing, trampling and the spread of weeds. A reduction in vegetation cover could lead to soil erosion and subsequent deterioration in water quality of the lakes. Therefore, whilst the keeping of livestock may be possible on larger lots for the reasons indicated above, acceptable stocking rates which maintain the environmental values of Lake Pinjar, should be determined by the City of Wanneroo in conjunction with advice from relevant agencies. It is recognised by the Authority that the Department of Agriculture stocking rates are determined primarily upon pasture and soil type and do not consider other environmental issues, such as remnant vegetation, groundwater and wetland protection, which may warrant reduced stocking rates from those specified.

The acceptability of ancillary landuses within the special rural 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 would be inconsistent with the intent of the System Six recommendation and may compromise the regional conservation values indicated in the Regional Park studies for the area. However, the special rural concept can be consistent with revegetation of excessively cleared areas. Since almost all forms of intensive agriculture are ruled out because of their high nutrient impact, it is possible for areas outside of the building envelope to be revegetated.

Drainage

Without provision of a reticulated drainage system it will be necessary for drainage associated with developments to be managed on-site. The potential for nutrients associated with drainage adversely affecting groundwater and surface water quality is usually an issue of concern associated with smaller lot sizes by virtue of more houses, lawns etc. However, it is the Authority's view that environmental and planning preference for larger lot sizes will reduce the risk of impacts from these sources.

On-going management

The success of special rural developments in terms of their environmental impact is dependent upon on-going management and, where appropriate, enforcement. The statutory controls required to protect the environment are available through the planning process.

3.10 Position statement

Landholders within Lake Pinjar are currently subject to a high degree of uncertainty when considering proposals to develop their land. The Environmental Protection Authority believes that the planning process provides the means to eliminate that uncertainty through the provision of a formal planning strategy for Lake Pinjar.

The Environmental Protection Authority considers that the environmental objectives for Lake Pinjar should be maintained through mechanisms within the planning process. The environmental objectives include:

- **the protection of groundwater;**
- **the protection of gazetted lakes and their buffers;**
- **the protection of remnant vegetation;**
- **the protection of future land users from flood risk, fire risk and noise impacts; and**
- **proper management of the above.**

The Environmental Protection Authority has determined that, until a formal planning strategy has been prepared for the Lake Pinjar area, the environmental acceptability of rural residential development on Lake Pinjar should be determined individually by the planning authorities, based on the position outlined in this report.

The Authority's determination of the environmental acceptability of proposed rural residential developments in no way suggests planning approval. It is the Authority's expectation that, the relevant planning authorities will determine the suitability of the site for the proposed land use from the planning and environmental perspective within the framework provided by this Position Statement.

Where subdivision is proposed, the following provides the requirements necessary to meet the environmental protection objectives for Lake Pinjar. It is expected that the approved planning strategy will contain more detailed management provisions and guidelines and may require more conservative requirements in order to meet planning objectives which may also include environmental issues.

1. Lot sizes ranging from 15-20 hectares would be considered environmentally acceptable for Lake Pinjar. However, it is recognised that some flexibility in lot sizes should be allowed where environmental constraints are extensive and significant conservation measures are proposed. For example, where important areas of remnant vegetation or a portion of a gazetted lake are being given up to the Crown or subject to specific land use controls. In these circumstances, subdivision to 10 hectares could be considered environmentally acceptable.
2. No more than one residence should be permitted on each lot.
3. With the exception of minimal clearing necessary for the building envelopes, fences, firebreaks, access and servicing, there should be no removal of remnant vegetation.
4. Gazetted lakes protected by the Environmental Protection (Swan Coastal Plain Lakes) Policy should be protected from possible adverse impacts resulting from adjoining land uses activities through the provision of a suitable buffer. A minimum 50 metre buffer is generally considered acceptable but this needs to be determined on site, taking site characteristics into account.
5. Controls should be introduced to prevent potentially polluting landuses such as intensive agriculture, as defined in the Environmental Protection Authority's Draft Environmental Protection Policy for Gngangara Mound Private Land Groundwater, (EPA September 1993).
6. Vegetation should be protected from damage by grazing livestock. The type and numbers of livestock should also be controlled in order to prevent excessive nutrient input.
7. For Water Authority of WA Priority One source protection areas, provide alternative domestic wastewater treatment systems approved by the Health Department of Western Australia with an adequate phosphorus retention capacity and installed in accordance with Health Department guidelines on advice from the Water Authority of Western Australia.
8. The City of Wanneroo, in consultation with the Environmental Protection Authority should undertake a survey, to define in detail the noise impacts arising from the Wanneroo Park Raceway, prior to development of the land.
9. The City of Wanneroo in consultation with the Department of Planning and Urban Development, the Environmental Protection Authority and the Water Authority of Western Australia should prepare a formal subdivision strategy for Lake Pinjar which takes account of the issues identified in this Position Statement and Section 4 of this report. The suitability of this and future development proposals for Lake Pinjar should be determined through the planning process within the context of this strategy and the Position Statement provided in this report.

4. References

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Appendix 1

Land use controls are in place to ensure:

1. Minimum lot size range of between 15 to 20 hectares.
2. High nutrient generating landuses are not permitted such as intensive agriculture.
3. Remnant vegetation is protected.
4. The use of modified on site effluent disposal systems with adequate phosphorus retention capacity are required to the satisfaction of the Health Department of WA.
5. Stock numbers are controlled.