

**Shire of Murray Town Planning Scheme No. 4,
Amendment 108**

Shire of Murray

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

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Summary

The Shire of Murray initiated Amendment 108 to Town Planning Scheme (TPS) No. 4 to rezone Lot 3 Fiegert Road, Barragup from 'Rural' to 'Special Rural' and 'Public Recreation/Conservation Reserve'. The amendment includes a subdivision guide plan which indicates that Lot 3 will be subdivided into 28 special rural lots of around two hectares. A foreshore reserve will be created along the edge of Wolyannup Lake to protect the lake and fringing remnant vegetation.

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

This report provides the advice and recommendations of the EPA to the Minister for the Environment on the environmental factors relevant to Amendment 108 to the Shire of Murray Town Planning Scheme No. 4.

Relevant environmental factors

In the EPA's opinion, the following are the environmental factors relevant to the scheme amendment:

- a) Regionally significant vegetation - impact on remnant foreshore vegetation;
- b) Regionally significant wetlands - provision of adequate foreshore buffer areas;
- c) Regionally significant fauna - impact on fauna and habitat;
- d) Watercourse - provision of an adequate vegetated buffer;
- e) Flood management - impact on hydrological role of the flood plain;
- f) Surface water quality - impact of on-site effluent disposal and nutrient export;
- g) Groundwater quality - impact of on-site effluent disposal and nutrient export;
- h) Aboriginal heritage - impact on heritage sites;
- i) Mosquitoes - health risk to future residents; and
- j) Environmental performance - audit of implementation

Conclusions

The EPA has concluded that Amendment 108 to the Shire of Murray Town Planning Scheme No. 4 to rezone part of Lot 3 Fiegert Road, Barragup from 'Rural' to 'Special Rural' and 'Public Recreation/Conservation Reserve' is environmentally acceptable provided that there is satisfactory implementation of the recommended conditions set out in Appendix 3.

It was generally agreed by the EPA that it was appropriate for the performance review or auditing of the environmental conditions to occur as part of the review of Town Planning Scheme No. 4 by the Shire of Murray. However, a recommendation for the inclusion of a scheme provision requiring a base line audit of the sites prior to subdivision has been included in this report.

Recommendations

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

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

1. That the Minister considers the report on the relevant environmental factors of:
 - Regionally significant vegetation - impact on remnant foreshore vegetation;
 - Regionally significant wetlands - provision of adequate foreshore buffer areas;
 - Regionally significant fauna - impact on fauna and habitat;
 - Watercourse - provision of an adequate vegetated buffer;
 - Flood management - impact on hydrological role of the flood plain;
 - Surface water quality - impact of on-site effluent disposal and nutrient export;
 - Groundwater quality - impact of on-site effluent disposal and nutrient export;
 - Mosquitoes - health risk to future residents;
 - Aboriginal heritage - impact on heritage sites; and
 - Environmental performance - audit of implementation.
2. That, subject to the satisfactory implementation of the provisions contained in Amendment 108 to the Shire of Murray Town Planning Scheme No. 4 and the EPA's recommended environmental conditions as set out in Appendix 3 that are based on the EPA recommendations in Section 3, the proposal can be managed to meet the EPA's objectives.
3. That the Minister for the Environment imposes the conditions set out in Appendix 3 of this report.

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1. Introduction

The Shire of Murray (the responsible authority) initiated Amendment 108 to Town Planning Scheme (TPS) No. 4 to rezone Lot 3 Fiegert Road, Barragup from 'Rural' to 'Special Rural' and 'Public Recreation/Conservation Reserve'.

The Shire of Murray referred Amendment 108 to the Environmental Protection Authority (EPA) in November 1996, and the environmental impacts were considered to be significant enough to warrant a formal environmental assessment. An Environmental Review document, hereinafter called the environmental review, was prepared by Rizzo and Associates on behalf of the Shire of Murray in accordance with Instructions issued by the EPA under Section 48C of the *Environmental Protection Act 1986*.

The Environmental Review was available for comment during a 6 week public review period from 9 January to 20 February 1998, in conjunction with the advertising of the scheme amendment report by the Shire of Murray. Both reports can be viewed at the offices of the Shire of Murray, and the Environmental Review can be viewed at the Department of Environmental Protection (DEP) library.

The EPA is also assessing Amendment 109 to rezone an adjoining lot, Lot 201 Fiegert Road, from 'Rural' to 'Special Rural' and 'Public Recreation/Conservation Reserve' in conjunction with Amendment 108.

This report provides the advice and recommendations of the EPA to the Minister for the Environment on the environmental factors relevant to the Amendment 108 to rezone Lot 3 Fiegert Road, Barragup from 'Rural' to 'Special Rural' and 'Public Recreation/Conservation Reserve'.

In compiling this report, the EPA has considered the information provided in the Environmental Review; issues raised by the public; specialist advice from government agencies; the responsible authority's response to issues raised; the EPA's own research and, in some cases, research provided by other expert agencies.

Further details of the proposed amendment are provided in Section 2 of this Report. Section 3 discusses the environmental factors and recommended EPA conditions relevant to the amendment. Section 4 provides information on the environmental conditions which should be applied if the amendment is approved. Other EPA advice is outlined in Section 5. Section 6 presents the EPA's conclusion and Section 7 the EPA's recommendations.

A list of people and organisations that made submissions is included in Appendix 1. A list of references is contained in Appendix 2 and the list of recommended Ministerial conditions is provided in Appendix 3. Appendix 4 contains the scheme provisions as contained in the environmental review for this amendment.

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

2. The Town Planning Scheme amendment

Amendment 108 to the Shire of Murray TPS No. 4 proposes to rezone Lot 3 Fiegert Rd, Barragup from 'Rural' to 'Special Rural' and 'Public Recreation/Conservation Reserve'. Lot 3 is approximately 80 hectares and is situated 7.5km east of the centre of Mandurah in the Shire of Murray. The property includes the foreshore reserve and a portion of Wolyannup Lake to the west, Rogers Road (unconstructed) to the south and Fiegert Road to the east (Figure 1).

Amendment 108 will facilitate the subdivision of 28 special rural of approximately two hectares and the creation of a foreshore reserve of approximately 19 hectares along the edge of Wolyannup Lake to protect the lake and fringing remnant vegetation. (Figure 2).

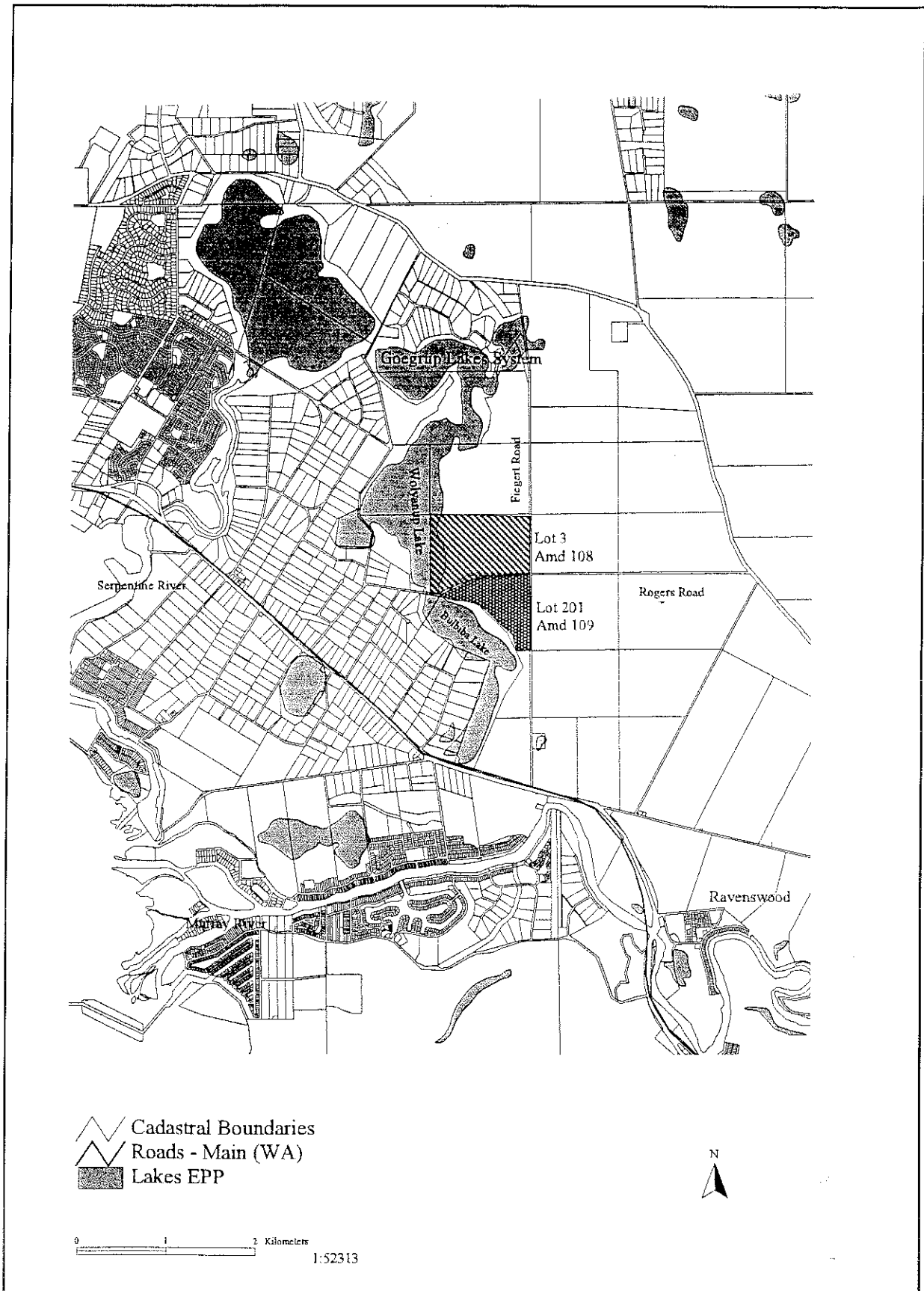


Figure 1. Locality plan

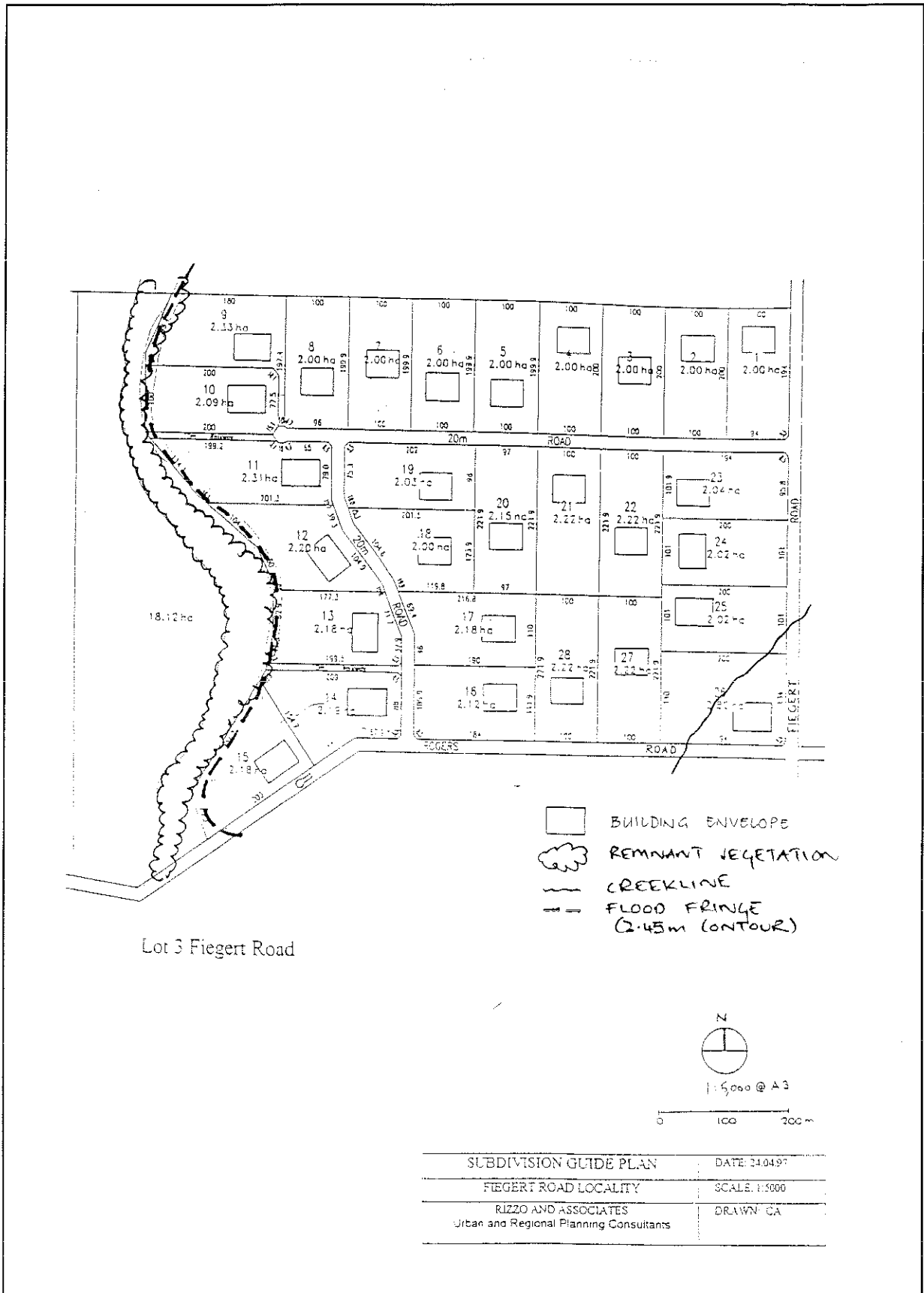


Figure 2. Subdivision guide plan.

Wolyannup Lake is part of the Goegrup Lakes system which is protected by the Environmental Protection (Swan Coastal Lakes) Policy (1992) and is also identified as having significant conservation value in the EPA System 6 report (recommendation M 108).

The property is situated within the catchment of the Peel-Harvey Estuary. It is subject to the provisions of the Environmental Protection (Peel Inlet-Harvey Estuarine System) Policy (1998) and Statement of Planning Policy No 2. The Peel-Harvey Estuary is also recognised by the RAMSAR Convention.

The scheme amendment is summarised in Table 1.

Table 1. Summary of Town Planning Scheme amendment

ELEMENT	DESCRIPTION
Existing zoning	Rural
Proposed zoning	Special Rural and Public Recreation/Conservation Reserve
Total area of lot	80 hectares
Number of proposed lots	28 special rural lots
Size of proposed lots	2.0 to 2.8 hectares
Proposed foreshore reserve area	18.12 hectares
Water supply	each lot will have a 92,000 litre rainwater tank.
Effluent disposal	alternative treatment units (ATUs)
AMENDMENT PROVISIONS	
Subdivision guide plan	subdivision to be in accordance with the subdivision guide plan (Figure 2)
minimum lot size	2 hectares minimum lot size
maximum building envelope	2,000m ² of which a maximum of only 1000m ² can be cleared
Clearing Restrictions	vegetation shall not be cleared except for a single house and associated facilities
Land Use Restrictions	land uses requiring an excessive nutrient load or clearing are not permitted (SPP No 2)
Remnant vegetation	procedures to be put in place to protect vegetation through the scheme provisions and conditions
Landscape Planting Programme	intend to minimise nutrient export and land erosion (scheme provisions No 13, 14, & 15)
Alternative Treatment Units (ATUs)	all dwellings must be connected to an ATU
Stocking rates	procedures shall be in place to prevent overstocking (scheme provision No 17)

3. Environmental factors

3.1 Relevant Environmental factors

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

Having considered public and government submissions (Appendix 1) and appropriate references (Appendix 2), in the EPA's opinion the following are the environmental factors relevant to the scheme amendment which require detailed evaluation in this report:

- a) Regionally significant vegetation - impact on remnant foreshore vegetation;
- b) Regionally significant wetlands - provision of adequate foreshore buffer areas;
- c) Regionally significant fauna - impact on fauna and habitat;
- d) Watercourse - provision of an adequate vegetated buffer;
- e) Flood management - impact on hydrological role of the flood plain;
- f) Surface water quality - impact of on-site effluent disposal and nutrient export;
- g) Groundwater quality - impact of on-site effluent disposal and nutrient export;
- h) Mosquitoes - health risk to future residents;
- i) Aboriginal heritage - impact on heritage sites; and
- j) Environmental performance - audit of implementation.

The above relevant factors were identified from the EPA's consideration and review of all environmental factors generated from the Environmental Review and the submissions received, in conjunction with the proposal characteristics (including significance of the potential impacts), the effectiveness of current management and alternative approval processes which ensure that the factors will be appropriately managed. On this basis, the EPA considers that Declared Rare Flora, Specially Protected (Threatened) Fauna and wind erosion factors and other issues raised in the submissions do not require further evaluation by the EPA. The identification of relevant environmental factors is summarised in Table 2, and a summary of their assessment is set out in Table 3.

The relevant environmental factors are discussed in Section 3.2 to 3.11 of this report. The description of each factor shows why it is relevant to the scheme amendment and how it will be affected by the scheme amendment. The assessment of each factor is where the EPA decides whether the scheme amendment meets the environmental objective set for that factor.

3.2 Regionally significant vegetation

Description

Lot 3 has been extensively cleared for grazing. The majority of remnant vegetation on the property is situated on the foreshore of Wolyannup Lake. This vegetation is in good condition and is proposed to be retained within a foreshore reserve of width 50 to 75 metres.

Wolyannup Lake and the remnant foreshore vegetation is identified as having regionally significant conservation value in the EPA System 6 report (recommendation M 108). The report recommends that "areas identified through planning procedures as open space of regional significance should, where appropriate, be designated as Regional Parks".

The foreshore of Wolyannup Lake is identified as 'Open Space-Conservation' in the Inner Peel Region Structure Plan.

Table 2. Identification of environmental factors requiring EPA evaluation

Preliminary Factor	Proposal Characteristics	Government Agency and Public Comments	Identification of Relevant Factors
Biophysical			
Regionally significant vegetation - impact on remnant foreshore vegetation	<ul style="list-style-type: none"> The majority of Lot 3 has been cleared for grazing. No remnant vegetation will be cleared as part of the proposal. All the remnant riparian vegetation along the lake foreshore is proposed to be included in a foreshore reserve and will be protected. The foreshore reserve is 50 to 75 m in width. 	<ul style="list-style-type: none"> The subsequent subdivision will destroy native flora. Firebreaks to be constructed within the foreshore reserve, but outside the existing remnant vegetation to the satisfaction of CALM (CALM). All remnant vegetation other than that cleared for site works and building envelopes should be retained (CALM). The proposal to retain existing vegetation is commended and the use of native species as part of the planting of the buffer to the Peel deviation highway is recommended (AgWA). What controls are planned to manage any stock allowed near the lake to prevent damage to the lake (AgWA). 	Requires further evaluation. Considered to be a relevant factor.
Declared Rare Flora	Surveys have showed that there are no DRF in the amendment area.		No further evaluation required.
Regionally significant wetlands - adequate foreshore buffer protection	<ul style="list-style-type: none"> The proposal abuts Wolyannup Lake which is part of the Goegrup Lake wetlands system which connects with Peel-Harvey Estuary. The Peel-Harvey Estuary recognised by the RAMSAR Convention. The Goegrup Lakes wetlands system is protected by the Environmental Protection (Swan Coastal Lakes) Policy (1992) and also identified as having significant conservation value in the Conservation Through Reserves (System 6) report (recommendation M 108). Wolyannup Lake is categorised as a Conservation category wetland. 	<ul style="list-style-type: none"> What controls are planned to manage any stock allowed near the lake to prevent damage to the riparian vegetation (AgWA). The proposed buffer to the lake is inadequate. The Guidelines for Design of Effective Buffers for Wetlands on the Swan Coastal Plain" should be referred to (Cons Council) The Goegrup lakes system and the foreshore areas have high conservation value as waterbird habitat, fish breeding grounds, habitat for rare flora and fauna and as Aboriginal heritage sites and should be protected (PPG). The developer should be required to replant with native species any part of the foreshore reserve which has been degraded (PPG). The foreshore reserve should be fenced to discourage human access except at certain points (PPG). A foreshore reserve be created and ceded to the Crown free of cost and be no less than 50m from the edge of the lake containing all remnant lake vegetation (CALM). Foreshore should be fenced, including fencing and gates running to the lake's edge on the northern and southern boundaries of the reserve to the satisfaction of CALM (CALM). Foreshore should be surveyed, pegged and clearly identified prior to the commencement of any works (CALM). A foreshore management plan should be prepared and implemented by the owner to the satisfaction of CALM and the WRC (CALM). 	Requires further evaluation. Considered to be a relevant factor.
Regionally significant fauna - impact on waterbirds	<ul style="list-style-type: none"> The majority of Lot 3 has been cleared for grazing. No remnant vegetation will be cleared as part of the proposal. All of the remnant foreshore vegetation is proposed to be located within the foreshore reserve. 	Increased number of cats and dogs will destroy native flora (KB).	Requires further evaluation. Considered to be a relevant factor.

Specially Protected (Threatened) Fauna - impact on habitat	The riparian vegetation provides valuable habitat for the Southern Brown Bandicoot.	The Southern Brown Bandicoot was listed in Schedule 1 of the Wildlife Conservation Act 1950 as a species that is rare or likely to become extinct. It is proposed to remove the Southern Brown Bandicoot from Schedule 1 in June 1998.	No further evaluation required.
Soil - wind erosion	There is a risk of wind erosion in the western part of the property.	What measures are proposed to minimise wind erosion (AgWA).	The risk of wind erosion is high only if the existing vegetation cover is removed. Clearing restrictions will prevent wind erosion. No further evaluation required.
Watercourse - provision of adequate buffer	A watercourse flows intermittently through the lower corner of the property from the south-east towards the south-west.	Will the creek be fenced and protected from stock and people? The Agreement to Reserve proposed for the creek is applauded (AgWA).	Requires further evaluation. Considered to be a relevant factor.
Flood management - impact on the hydrological role of the flood plain	The Serpentine River Flood Study lists the lots that abut the proposed foreshore reserve as being in a potential 1:100 year flood fringe.	The foreshore reserve should be extended to the 2.45m contour which is the edge of the flood fringe, but ideally up to the 3m contour (PPG).	Requires further evaluation. Considered to be a relevant factor.
Pollution Management			
Surface water quality - impact of on-site effluent disposal and nutrient export.	<ul style="list-style-type: none"> The amendment proposes on site effluent disposal for all dwellings utilising ATUs. The dwellings proposed as part of the special rural subdivision will produce a minimal phosphorus load due to the use of ATUs. Intensive agricultural activity will be restricted through the provisions of the Amendment. No target loads or concentrations have been set for nitrogen for the Peel-Harvey System. 	<ul style="list-style-type: none"> The calculation of proposed nitrogen loading following development are challenged. It is estimated that post development N loading will be 75.45kg N/ha/year which would be higher than existing loads. The proponent should show that this increase in N loading will not contaminate groundwater and downstream wetlands (AgWA). Whilst the proponent claims that P loads will be reduced following development, no estimate is given for P export from the site. The proponent should show that P export will be less than the current target (AgWA). Preclusion of intensive landuses should not occur but, rather, case by case assessment of proposal as they arise should take place (AgWA). Development would put at risk the health of the Goegrup Lake system through increased fertiliser, pesticide and herbicide usage; increased pollution from domestic animals, stock and human effluent; and greater human pressure from increased usage of the lake (CC, PPG). Concerns in relation to the susceptibility to perching of the waterable and surface waterlogging (PIMA). Stormwater drainage is a concern on land with a perched water table (PIMA). PIMA supports the treatment and disposal of stormwater drainage in accordance with Water Sensitive Design Principles (PIMA). All surface and subsurface drains are to be located at or above the Average Annual Maximum Groundwater Level (AAMGL) (PIMA). No additional stormwater is to be directed to existing streams (PIMA). 	Requires further evaluation. Considered to be a relevant factor.
Groundwater quality - impact of on-site effluent disposal	The amendment proposes on site effluent disposal for all dwellings utilising ATUs.	<ul style="list-style-type: none"> The property is possibly unsuitable for conventional on-site effluent disposal (PIMA). Effluent disposal must be in accordance with the provisions of the SPP No 2. Concern is raised with regard to effluent and nutrient management and the possibility of the development's success being dependent on using techniques that artificially lower groundwater levels or alter surface water flows in order to achieve environmental acceptability and also to comply with the provisions of the SPP No 2 (PIMA). 	Requires further evaluation. Considered to be a relevant factor.

Social Surroundings			
Mosquitoes - health risk to future residents	<ul style="list-style-type: none"> Lot 3 is within the flight radius of mosquito breeding areas located outside the amendment area. Since the opening of the Dawesville Channel, mosquitoes have begun to breed all year round in the Peel Harvey Estuary and surrounding areas. 	<ul style="list-style-type: none"> The health risks from mosquito-borne disease in this area is to great too support an increase in human population. Council should not support the rezoning (HD). Runnelling of the salt marsh area should be carried out at either the cost of the developer or through specific levy imposed on the land to protect the health and lifestyle of the future residents (HD). Memorials on titles be placed notifying prospective purchasers about the mosquito and Ross River virus issues (HD). Replanting the foreshore area with native species will reduce mosquito and midge problems (PPG). 	Requires further evaluation. Considered to be a relevant factor.
Aboriginal heritage - impact on heritage sites	An archaeological and ethnographic survey were conducted. One arefact scatter site was identified on the north western boundary of the amendment area.	The Aboriginal heritage survey found some sites, though none will be impacted during the development (DAA).	Requires further evaluation. Considered to be a relevant factor.
Other factors			
Environmental performance - audit of implementation			Requires further evaluation. Considered to be a relevant factor

Abbreviations for agency comments:

- Agriculture WA (AgWA)
- Bush Fires Board of WA (BFB)
- Department of Conservation and Land Management (CALM)
- Health Department of WA (HD)
- Main Roads Western Australia (MR)
- Peel Inlet Management Authority (PIMA)
- Water Corporation (WC)
- Conservation Council of WA Inc (CC)
- Peel Preservation Group (PPG)
- Kelliher Brothers (KB)

Table 3. Summary of assessment of relevant environmental factors

Environmental Factor	Relevant Area	EPA Objective	Assessment	EPA Recommendation
<p>Biophysical</p> <p>Regionally significant vegetation - impact on remnant foreshore vegetation</p>	<p>Swan Coastal Plain</p>	<p>Maintain the abundance, diversity, geographical distribution and productivity of regionally significant vegetation communities.</p>	<ul style="list-style-type: none"> • The majority of remnant vegetation on Lot 3 is proposed to be located within the foreshore reserve abutting Wolyannup Lake. • Clearing remnant vegetation will not be permitted as part of the proposed special rural subdivision (Scheme provision). • Building envelopes will be located in areas that are already cleared (Fig 2). • The proposed special rural subdivision provides a foreshore reserve between 50 and 75m wide. • The Amendment requires the preparation of a foreshore management plan. • The amendment also requires and the fencing of remnant vegetation. 	<p>Having particular regard to:</p> <ul style="list-style-type: none"> (a) the significant value of the remnant foreshore vegetation surrounding the Wolyannup Lake; (b) the protection provided to the System 6 area and the regional significant vegetation through its inclusion in the proposed foreshore reserve; (c) the extent of the foreshore reserve which complies with the EPA's policy for wetland buffers; (d) the provisions contained in the proposed amendment which require the preparation of a foreshore management plan, prevent further land clearing and require remnant vegetation to be fenced; <p>it is the EPA's opinion that the proposed amendment can meet the EPA's objective for regionally significant vegetation.</p> <p>Although the EPA is confident that the provisions contained in the Scheme amendment will ensure that the proposal can meet the objective for regionally significant vegetation, the EPA considers that it is necessary to impose a number of conditions to reflect the Scheme provisions to ensure that the provisions contained in the amendment are included in the TPS.</p> <p>The EPA recommends that environmental conditions be imposed requiring the:</p> <ul style="list-style-type: none"> • provision of an area of foreshore reserve to ensure that the foreshore buffer meets the EPA's requirements; • preparation of a foreshore management plan that includes the following information: <ul style="list-style-type: none"> ▪ specific measures to protect the wetland, foreshore vegetation and fauna habitats; ▪ fencing requirements of the foreshore reserve; ▪ management of human pressures and public access to the foreshore; ▪ rehabilitation of degraded areas; ▪ maintenance of the foreshore reserve; ▪ timing and responsibilities for the above. • protection of remnant vegetation including the following information: <ul style="list-style-type: none"> ▪ fencing of areas of remnant vegetation; ▪ restrictions on clearing in the proposed special rural subdivision to areas required for the erection of a house, outbuildings, effluent disposal systems, accessways, fences and firebreaks; ▪ building envelopes should be located in areas that are already largely cleared, at least 50m from the foreshore reserve and restricted in size to 2000 m²; and ▪ clearing within the building envelopes should be restricted to 1000 m².

Regionally significant wetlands - provision of adequate buffer areas	Swan Coastal Plain	<p>Maintain the integrity, functions and environmental values of regionally significant wetlands.</p> <p>Ensure Environmental Protection Policy (EPP) lakes are protected and their key ecological functions are maintained.</p>	<ul style="list-style-type: none"> The amendment proposes a foreshore reserve between 50 and 75m wide. The EPA policy for the width of a wetland buffer is 50m from the furthest extent of the wetland vegetation. The Amendment requires the preparation of a foreshore management plan (Scheme provision). The amendment also requires and the fencing of remnant vegetation (Scheme provision). On-site drainage is a provision of SPP No 2. 	<p>Having particular regard to:</p> <ol style="list-style-type: none"> the significant value of Wolyannup Lake; the foreshore buffer width meeting the EPA's policy requirements; the inclusion of the EPP and System 6 boundaries within the proposed foreshore reserve; the inclusion of the riparian remnant vegetation within the proposed foreshore reserve; the provisions contained in the proposed amendment requiring preparation of a foreshore management plan, preventing further land clearing and requiring remnant vegetation to be fenced; <p>it is the EPA's opinion that the proposed amendment and associated scheme provisions can meet the EPA's objectives.</p> <p>Although the EPA is confident that the provisions contained in the Scheme amendment will ensure that the proposal can meet the objective for regionally significant wetlands the EPA considers that it is necessary to impose a number of conditions to reflect the Scheme provisions to ensure that the provisions contained in the amendment are included in the TPS.</p> <p>The EPA recommends that conditions be imposed as stated in Regionally significant vegetation - impact on remnant foreshore vegetation above.</p>
Regionally significant fauna - impact on waterbirds	Swan Coastal Plain	<p>Maintain the abundance, species diversity and geographical distribution of terrestrial fauna.</p>	<ul style="list-style-type: none"> Riparian vegetation is required for waterbird habitat. The proposed foreshore reserve abutting Wolyannup Lake protection the riparian vegetation. The Amendment requires the preparation of a foreshore management plan to protect waterbird habitat (Scheme provisions). 	<p>Having particular regard to:</p> <ol style="list-style-type: none"> the inclusion of the System 6 wetland and riparian vegetation habitats within the proposed foreshore reserve; and the provisions in the amendment requiring the preparation of a foreshore management plan and fencing of remnant vegetation and the foreshore reserve. <p>it is the EPA's opinion that the proposed amendment can meet the EPA's objective in relation to regionally significant fauna.</p>
Watercourse -provision of an adequate vegetated buffer.	The Murray Groundwater area	<p>Maintain the integrity, functions and environmental values of watercourses.</p> <p>Ensure riparian vegetation on substantial streamlines is adequately protected.</p>	<ul style="list-style-type: none"> Building envelopes will be setback at least 30 metres from the watercourse. The watercourse buffer will be fenced off to protect the values of the watercourse. 	<p>Having particular regard to:</p> <ol style="list-style-type: none"> the lack of remnant vegetation along the watercourse; and the location of the building envelopes in relation to the watercourse; <p>it is the EPA's opinion that the proposed amendment can meet the EPA's objectives.</p> <p>Although the EPA is confident that the provisions contained in the Scheme amendment will ensure that the proposal can meet the objective for the watercourse it is necessary to impose a condition to reflect the relevant Scheme provision so that the provisions contained in the amendment are included in the TPS.</p> <p>The EPA recommends that a condition be imposed requiring the provision of a minimum 30 metre fenced buffer that includes all remnant vegetation along the watercourse within the amendment area to protect the watercourse and its values.</p>
Flood management - impact on the hydrological role of the flood plain	The amendment area	<p>Maintain the integrity and function of the floodway.</p>	<ul style="list-style-type: none"> The 1 in 100 year flood level is 2.5m. The majority of lots are higher than 3m. Development will be subject to the provisions of the Shire of Murray TPS which contains provisions controlling development in floodways (existing Scheme provisions). 	<p>Having particular regard to:</p> <ol style="list-style-type: none"> the existing provisions contained with the Shire of Murray's TPS controlling development within the floodway; <p>it is the EPA's opinion that there are sufficient management measures in place to ensure that the proposed special rural subdivision will meet the EPA's objective in relation to flood management.</p>

Pollution Management			
Surface water quality - impact of on-site effluent disposal and nutrient export.	The amendment area, the Goegrup Lake wetland system, the Peel Harvey Estuary and nearshore coastal waters.	Maintain or improve the quality of surface water to ensure that existing and potential uses, including ecosystem maintenance are protected, consistent with the draft WA Guidelines for Fresh and Marine Waters. Ensure that the environmental quality objectives for the Peel Inlet-Harvey Estuary specified in the Environmental Protection (Peel Inlet-Harvey Estuary) Policy 1992 and the water quality guidelines specified in the EPA Bulletin 711 for the protection of aquatic ecosystems are met.	<p>PIMA raised concerns in relation to land prone to surface water logging. These concerns can be managed through the setting of appropriate conditions on the subdivision approval.</p> <ul style="list-style-type: none"> The proposed amendment should comply with the provisions of the SPP No. 2 which are intended to reduce nutrient export to the Peel - Harvey Estuary. These provisions restrict vegetation clearing, lot sizes and building envelope sizes and implement revegetation. Nutrient flow to the lake will be managed by provisions controlling appropriate landuses, stocking rates, the use of alternative effluent disposal systems and managing stormwater runoff (Scheme Provisions). The proposed amendment also requires fencing to protect remnant vegetation and the preparation of a Landscape Planting Programme to control surface runoff (Scheme Provisions).
Groundwater quality - impact of on-site effluent disposal	The Murray Groundwater Area.	Maintain or improve the quality of ground water to ensure that existing and potential uses, including ecosystem maintenance are protected, consistent with the draft WA Guidelines for Fresh and Marine Waters.	<p>Having particular regard to:</p> <ol style="list-style-type: none"> the environmental quality objectives set by the Peel-Harvey EPP; the provisions contained in the Amendment to meet the requirements of the SPP No. 2 with the aim of reducing nutrient export; the maximum phosphorus export loadings that have been determined for the Serpentine River catchment and the similarity of the phosphorus export loadings expected from the proposed special rural subdivision; and the intention to set performance standards for nitrogen as part of the current review of the Peel Inlet-Harvey Estuary EPP. <p>it is the EPA's opinion that the proposed amendment can meet the EPA's objectives.</p> <p>The EPA acknowledges that the SPP No 2 for the Peel-Harvey Estuary can manage new rezoning for special rural development so that phosphorus export will meet the objectives of the Peel-Harvey EPP.</p> <p>However, drainage requirements have been more tightly defined by WRC in recent times and the EPA recommends that a condition be imposed requiring all drainage systems including roads, either surface or subsurface, be located at or above the Average Annual Maximum Groundwater Level (AAMGL).</p>
		<ul style="list-style-type: none"> The dwellings proposed in the special rural subdivision will produce a minimal phosphorus load due to the use of ATUs. Agricultural activity will be restricted through the provisions of the Amendment. No target loads or concentrations have been set for nitrogen for the Peel-Harvey System. Nutrient flow to the lake will be managed by provisions controlling stocking rates, restricting high nutrient land uses and specifying the use and installation of alternative effluent disposal systems (SPP No 2). 	<p>Having particular regard to:</p> <ol style="list-style-type: none"> the environmental quality objectives set in the Peel Inlet-Harvey Estuary EPP. the management of nutrient export through the application of provisions contained in the SPP No. 2; and <p>it is the EPA's opinion that the proposed amendment can meet the EPA's objectives.</p> <p>The EPA acknowledges that the SPP No 2 for the Peel-Harvey Estuary can manage new rezoning for special rural development so that nutrient export will meet the objectives of the Peel-Harvey EPP.</p>

The EPA policy for the minimum wetland buffer width is 50m or 1 metre AHD higher than the furthest extent of the wetland vegetation (EPA, 1997b). The proposed foreshore reserve meets the EPA's policy requirements.

Provisions contained in the amendment restrict any clearing in the proposed special rural subdivision to areas required for the erection of a house, outbuildings, effluent disposal systems, accessways, fences and firebreaks, however, the only remnant vegetation remaining, except for single trees, is associated with the foreshore. Building envelopes will be located in areas that are already cleared, as shown on the subdivision guide plan (Figure 2). Scheme provisions require that the building envelopes are restricted in size to 2000 m² and that clearing within the building envelopes is restricted to 1000 m².

The provisions of the amendment (Appendix 4) also require:

- the preparation of a foreshore management plan to protect foreshore vegetation, important wetlands and fauna habitats; and
- the fencing of the foreshore vegetation.

Assessment

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

The EPA's objective in regard to this environmental factor is to maintain the abundance, diversity, geographical distribution and productivity of regionally significant vegetation communities.

Provisions contained in the scheme amendment restrict further clearing and protect remnant vegetation within the amendment area. All of the regionally significant remnant vegetation on Lot 3 identified in the System 6 report is proposed to be contained within a foreshore reserve abutting Wolyannup Lake. This reserve is proposed to have a width of 50 to 75 metres between the subdivision and Wolyannup Lake.

A submission by Agriculture WA supported the preservation of existing remnant vegetation. Their submission also advised that local species suited to existing soil types should be used when revegetating the buffer area between the proposed Perth-Bunbury Highway and the amendment area, however the buffer is not within the assessment area of this report.

Having particular regard to:

- a) the significant value of the remnant foreshore vegetation surrounding the Wolyannup Lake;
- b) the protection provided to the System 6 area and the regionally significant vegetation through its inclusion in a foreshore reserve;
- c) the extent of the proposed foreshore reserve which complies with the EPA's policy for wetland buffers; and
- d) the provisions contained in the proposed amendment which require the preparation of a foreshore management plan, prevent further land clearing and require remnant vegetation to be fenced,

it is the EPA's opinion that the proposed amendment can meet the EPA's objective for regionally significant vegetation.

EPA recommendations on environmental conditions

Although the EPA is confident that the provisions contained in the scheme amendment will ensure that the proposal can meet the EPA's objective for regionally significant vegetation, the EPA considers that it is necessary to impose a number of conditions to reflect the scheme provisions to ensure that the provisions contained in the amendment are included in the TPS.

The EPA recommends that environmental conditions be imposed requiring the:

- provision of an area of foreshore, including all remnant foreshore vegetation to a minimum of 50 metres, to ensure that the foreshore buffer meets the EPA's requirements;

Social Surroundings			
Mosquitoes - health risk to future residents	The amendment area	Control the breeding of mosquitoes without adversely affecting other flora and fauna.	<ul style="list-style-type: none"> The issue of mosquitoes is a regional problem. The proposal does not involve creating any additional mosquito breeding areas as part of the proposed special rural subdivision. Currently there are investigations under way to determine whether other methods of control such as constructing runnelling is viable. The Shire of Murray is prepared to expand the mosquito control program to include the wetlands in the locality of the amendment. Prospective purchasers should be notified of the health risks associated with mosquitoes.
Aboriginal heritage - impact on heritage sites	The amendment area	<p>Ensure that the proposal complies with the requirements of the Aboriginal Heritage Act 1972; and</p> <p>Ensure that changes to the biological and physical environment resulting from the project do not adversely affect cultural associations with the area.</p>	<p>The EPA considered the impact of mosquitoes on the proposed residential subdivision at Amarillo, Karnup in its report to the Minister for the Environment (Bulletin 862) in June 1997. In that assessment the EPA noted that there is a need for the State Government to consider and implement off-site measures to adequately control mosquito numbers at Amarillo so that the EPA's objectives can be met.</p> <p>The EPA reiterates this advice in relation to the proposed special rural subdivision on Lot 3. The risk to human health posed by mosquitoes is a regional issue beyond the scope of individual proposals by private landowners and requires a strategic approach by the State Government.</p> <p>The EPA recommends that an environmental condition should be imposed requiring measures to be put in place to ensure that prospective purchasers of the special rural lots are advised of the existence of a health risk due to mosquitoes.</p>
			<p>Having particular regard to:</p> <ol style="list-style-type: none"> results of the archaeological and ethnographic survey; the fencing of the artefact scatter site in accordance with the Aboriginal heritage Act; and the fencing of all areas of ethnographic significance as an outcome of the scheme amendment; <p>it is the EPA's opinion that the proposed amendment can meet the EPA's objectives</p>
Other factors			
Environmental performance - audit of implementation	The amendment area	To ensure that through appropriate auditing, no significant environmental harm or long term loss of environmental values will occur.	<p>The EPA recommends that an environmental condition be imposed requiring:</p> <ul style="list-style-type: none"> a performance review of the Special Rural subdivision of Lot 3 to determine whether it is meeting the environmental objectives; and the Shire of Murray to review the performance of the environmental conditions imposed on the Special Rural subdivision of Lot 3 in the review of TPS No. 4 under Section 7AAA of the Town planning and Development Act.
			<ul style="list-style-type: none"> The performance review or auditing of the environmental conditions shall occur as part of the review of TPS N.4 by the Shire of Murray. Prior to the subdivision, the developer should provide adequate baseline data related to the environmental factors identified in Section 3 above so that the implementation of the amendment can be monitored. This baseline audit statement is required to provide a benchmark for future audits. The review of the environmental conditions should be made available to the DEP.

- preparation of a foreshore management plan that includes the following information:
 - specific measures to protect the wetland, foreshore vegetation and fauna habitats;
 - fencing requirements of the foreshore reserve;
 - management of human pressures and public access to the foreshore;
 - rehabilitation of degraded areas;
 - maintenance of the foreshore reserve;
 - timing and responsibilities for the above.
- protection of remnant vegetation including the following information:
 - fencing of areas of remnant vegetation;
 - restrictions on clearing in the proposed special rural subdivision to areas required for the erection of a house, outbuildings, effluent disposal systems, accessways, fences and firebreaks;
 - building envelopes should be located in areas that are already largely cleared, at least 50 metres from the foreshore reserve and restricted in size to 2000 m²; and
 - clearing within the building envelopes should be restricted to 1000 m².

3.3 Regionally significant wetlands

Description

Lot 3 directly abuts Wolyannup Lake which is part of the Goegrup Lakes wetlands system.

The Goegrup wetland system is protected by the Environmental Protection (Swan Coastal Lakes) Policy (1992) (EPP). The lake and surrounding remnant riparian vegetation is also identified as having regionally significant conservation value in the System 6 report (recommendation M 108) (DCE, 1983).

Wolyannup Lake is categorised as a Conservation category wetland which means that it has a high degree of naturalness (EPA Bulletin 686, 1993).

Provisions of the amendment require the preparation of a foreshore management plan and the fencing of remnant vegetation around the foreshore reserve. The foreshore reserve is proposed to be 50 to 75 metres wide, and include all land below the 2 metre contour line.

The EPA policy for the minimum wetland buffer width is 50m or 1 metre AHD higher than the furthest extent of the wetland vegetation (EPA, 1997b). The proposed special rural subdivision provides a foreshore reserve which meets the EPA's policy requirements.

The Conservation Council stated that the proposed buffer width does not provide adequate protection to maintain the integrity of the wetland system. The Conservation Council advised that the methodology outlined in the report by Davies and Lane, *Guidelines for Design of Effective Buffers for Wetlands on the Swan Coastal Plain*, should be applied to the Goegrup Lakes.

The *Guidelines for Design of Effective Buffers for Wetlands on the Swan Coastal Plain* specify a number of buffer widths depending on the likely environmental impact (ie noise, nutrients). Nutrients are considered to be the most likely impact on Wolyannup Lake from the special rural subdivision and in these circumstances a 200m buffer is recommended. The subdivision guide plan for the amendment provides a 50 to 75m fenced foreshore reserve. The building envelopes will be setback at least 50m from the foreshore boundary to provide an additional buffer for the wetland.

Assessment

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

The EPA's objectives in regard to this environmental factor are to:

- maintain the integrity, functions and environmental values of regionally significant wetlands; and
- ensure Environmental Protection Policy (EPP) lakes are protected and their key ecological functions are maintained.

The remnant riparian vegetation on Lot 3 will be contained wholly within the proposed foreshore reserve that abuts Wolyannup Lake. The provisions contained in the scheme amendment restrict further clearing, protect the remnant vegetation and require the preparation of a foreshore management plan.

Having particular regard to:

- a) the significant value of Wolyannup Lake;
- b) the foreshore buffer width meeting the EPA's policy requirements;
- c) the inclusion of the EPP and System 6 boundaries within the proposed foreshore reserve;
- d) the inclusion of the remnant riparian vegetation within the proposed foreshore reserve; and
- e) the provisions contained in the proposed amendment requiring preparation of a foreshore management plan, preventing further land clearing and requiring remnant vegetation to be fenced,

it is the EPA's opinion that the proposed amendment and associated scheme provisions can meet the EPA's objectives.

EPA recommendations on environmental conditions

Although the EPA is confident that the provisions contained in the scheme amendment will ensure that the proposal can meet the objective for regionally significant wetlands, the EPA considers that it is necessary to impose a number conditions to reflect the scheme provisions to ensure that the provisions contained in the amendment are included in the TPS.

The EPA recommends that environmental conditions be imposed requiring the:

- provision of an area of foreshore, including all remnant foreshore vegetation to a minimum of 50 metres, to ensure that the foreshore buffer meets the EPA's requirements;
- preparation of a foreshore management plan that includes the following information:
 - specific measures to protect the wetland, foreshore vegetation and fauna habitats;
 - fencing requirements of the foreshore reserve;
 - management of human pressures and public access to the foreshore;
 - rehabilitation of degraded areas;
 - maintenance of the foreshore reserve;
 - timing and responsibilities for the above.
- protection of remnant vegetation including the following information:
 - fencing of areas of remnant vegetation;
 - restrictions on clearing in the proposed special rural subdivision to areas required for the erection of a house, outbuildings, effluent disposal systems, accessways, fences and firebreaks;
 - building envelopes should be located in areas that are already largely cleared, at least 50 metres from the foreshore reserve and restricted in size to 2000 m²; and
 - clearing within the building envelopes should be restricted to 1000 m².

3.4 Regionally significant fauna

Description

The majority of native vegetation and fauna habitats have been cleared from Lot 3 except for the riparian vegetation on the foreshore of Wolyannup Lake. A fauna survey conducted in an area of remnant vegetation to the north-west of Lot 3, on the western side of Wolyannup Lake, recorded 6 species of reptiles, 29 species of birds and 5 species of mammals. Nine species of amphibians and 28 species of reptiles are expected to be in or near the area.

The environmental review indicated that foreshore vegetation around Wolyannup Lake may be the habitat for the Southern Brown Bandicoot. The Southern Brown Bandicoot was listed in Schedule 1 of the Wildlife Conservation Act 1950 as a species that is rare or likely to become extinct. However, the Department of Conservation and Land Management (CALM) has advised that the Southern Brown Bandicoot is no longer considered to be rare and it is proposed to amend Schedule 1 to remove it from the list.

Concern was raised about the potential impact that domestic animals, in particular dogs and cats, may have on native fauna. The control of domestic pets will be the responsibility of the Shire of Murray.

Due to the extent of clearing that has occurred on Lot 3, fauna is likely to be restricted to some amphibians and waterbirds.

Riparian vegetation is an important habitat for waterbirds. The riparian vegetation abutting the eastern boundary of Lot 3 is proposed to be contained within the Wolyannup Lake foreshore reserve.

There are provisions contained in the amendment requiring the preparation of a foreshore management plan for Wolyannup Lake and the fencing of the foreshore reserve to protect fauna habitats.

Assessment

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

The EPA's objectives in regard to this environmental factor are to maintain the abundance, species diversity and geographical distribution of terrestrial and aquatic fauna.

Having particular regard to:

- a) the inclusion of the System 6 wetland and existing riparian foreshore vegetation habitats within a foreshore reserve;
- b) the Shire's controls under the Scheme in relation to domestic pets; and
- c) the provisions in the amendment requiring the preparation of a foreshore management plan and fencing of remnant vegetation and the foreshore reserve,

it is the EPA's opinion that the proposed amendment can meet the EPA's objective in relation to regionally significant fauna.

3.5 Watercourse

Description

A watercourse flows intermittently across the lower corner of amendment area from the north-east to the south-west from June until October. There is no remaining remnant vegetation along the watercourse. The land within the watercourse boundary is subject to flooding, and consequently building envelopes will be situated outside this area.

The Subdivision Guide Plan (Figure 2) indicates that only one lot is affected by the seasonal watercourse and there are existing buildings on the property.

Assessment

The area considered for assessment of this environmental factor is the amendment area.

The EPA's objectives in regard to this environmental factor are to:

- maintain the integrity, functions and environmental values of the watercourse; and
- ensure riparian vegetation on substantial streamlines is adequately protected.

The EPA policy for the minimum buffer width for a seasonally flowing watercourse is 30m (EPA, 1997b). The proposed subdivision guide plan indicates that this buffer requirement can be met, as the building envelope for Lot 26 is greater than 30 metres from the watercourse. There is no remnant riparian vegetation along the water course, however, it is recommended that the buffer area be rehabilitated and revegetated with local species.

Having particular regard to:

- a) the lack of remnant riparian vegetation surrounding the watercourse; and
- b) the location of the building envelopes in relation to the watercourse,

it is the EPA's opinion that the proposed amendment can meet the EPA's objectives.

EPA recommendations on environmental conditions

Although the EPA is confident that the provisions contained in the scheme amendment will ensure that the proposal can meet the objective for the watercourse, the EPA considers that it is necessary to impose a number conditions to reflect the scheme provisions to ensure that the provisions contained in the amendment are included in the TPS.

The EPA recommends that a condition be imposed requiring the provision of a minimum 30 metre fenced buffer along the watercourse within the amendment area to protect the watercourse and its values, and that building envelopes be situated beyond this buffer.

3.6 Flood management

Description

The Serpentine River Flood Study (Water Authority of Western Australia, 1991) indicates that some land within the amendment area is within the potential 1 in 100 year flood fringe. Areas below the 2.5 metre contour (see Figure 2) may be flooded during a 1 in 100 year flood event, however the effected lots are only those that abut the proposed foreshore reserve. The building envelopes of the effected lots should be situated above the 3 metre contour to avoid flooding in a 1 in 100 year storm event.

Assessment

The area considered for assessment of this environmental factor is the amendment area.

The EPA's objectives in regard to this environmental factor is to maintain the integrity and function of the floodway.

Development in the floodway will be controlled by the Shire of Murray in accordance with current provisions contained in the Shire's TPS No. 4.

Having particular regard to:

- a) the existing provisions contained with the Shire of Murray's TPS controlling development within the floodway,

it is the EPA's opinion that there are sufficient management measures in place to ensure that the proposed special rural subdivision will meet the EPA's objective in relation to flood management.

3.7 Surface water quality

Description

A watercourse flows intermittently across the property from the north-east to the south-west from June until October. There is a perched water table on some parts of the property after significant rain events due to an underlying clay layer which causes water to accumulate on the surface.

Surface waters in the coastal catchment of the Peel-Harvey typically contain significant levels of phosphorus and nitrogen from fertilisers and human and animal waste. Surface water and nutrients flow from the catchment into the wetlands, estuary and the coastal waters.

Elevated levels of phosphorus can cause algae to grow and multiply very rapidly in the surface waters of the Peel-Harvey catchment, including Wolyannup Lake and the Peel Inlet-Harvey Estuary, leading to unacceptable algal blooms.

Increases in nitrogen concentrations in coastal waters may also result in algal blooms. The Southern Metropolitan Coastal Waters Study (DEP, 1996) has found that the outflow from the Peel Inlet-Harvey Estuary causes elevated concentrations of nitrogen and chlorophyll-*a* in near-shore waters. Consequently, it is important to ensure that any surface water flowing from the proposed special rural subdivision has concentrations of phosphorus and nitrogen which are as low as possible and conform with established water quality standards.

The Environmental Protection (Peel Inlet-Harvey Estuary) Policy 1992 (Peel-Harvey EPP) specifies environmental quality objectives for phosphorus at a catchment level. Performance standards (targets loads or concentrations) will be set for nitrogen for the Peel Inlet-Harvey Estuary as part of the current review of the EPP. The Southern Coastal Waters Study (DEP, 1996) recommends that environmental protection policies and integrated catchment management strategies for the Peel-Harvey catchment should incorporate the objective of minimising nutrient inputs into the coastal waters.

To comply with the Peel-Harvey EPP, phosphorus export loadings for the Serpentine River catchment have been set at 0.27kgP/ha/year. It is intended that the objectives of the Peel-Harvey EPP, including phosphorus export targets, will be met through the implementation of the State Planning Policy (SPP) No. 2 for the Peel-Harvey Coastal Plain Catchment (WAPC, 1992). The policy recognises the requirements of the Peel-Harvey EPP and ensures that landuse changes within the Peel-Harvey catchment, including special rural development, are brought under planning control.

The aim of the policy is to restrict or manage landuses to reduce nutrient export to the Peel Inlet-Harvey Estuary. The lot sizes and land use controls proposed in this amendment are consistent with the SPP and should lead to adequate control of phosphorus export. The SPP No. 2 also requires the provision of a drainage system which maximises the consumption and retention of drainage on site.

Concerns were raised by Agriculture WA about the calculation of the nutrient load specified in the environmental review. Their figure of 75.45kg N/ha/year is a cumulative figure that includes an estimate of nutrients produced by a family. The calculation of the nutrient load does not need to include estimates of domestic effluent, however, as the use of ATUs for disposal of domestic effluent as required by scheme provision No 16, and restrictions on the number of stock on each lot are likely to lead to phosphorus and nitrogen exports post development that are comparable to pre-development export rates.

A submission by the Peel Inlet Management Authority (PIMA) raised concerns about the lowering of the groundwater level through artificial drainage, as this is likely to mobilise nutrients already in the soil and groundwater of the subject land.

Assessment

The area considered for assessment of this environmental factor is the Goegrup Lake wetland system, the Peel-Harvey Estuary and nearshore coastal waters.

The EPA's objectives in regard to this environmental factor are to ensure that:

- the environmental quality objectives for the Peel-Harvey EPP are met; and
- the water quality standards protect the estuary and adjacent coastal waters.

There is a risk that increased nutrient loads from intensive agriculture, cattle or on-site effluent disposal in close proximity to Wolyannup Lake could increase the level of nutrients being exported to Wolyannup Lake via surface water flow. The amendment includes provisions to restrict intensive agricultural activity and manage on-site effluent disposal so that nutrient loads are minimised. The provisions contained in the amendment aim to meet the environmental quality objectives of the Peel-Harvey EPP and implement the objectives of the SPP No. 2. These provisions include:

- restrictions on vegetation clearing;
- requirements to provide a fenced buffer, including the remnant vegetation, along the watercourse to help reduce soil erosion and nutrient export into the watercourse;
- requirements to prepare a Landscape Planting Programme to control surface runoff;
- limitations on the maximum building envelope sizes;
- restrictions on inappropriate landuses;
- controls on stocking rates; and
- requirements to install alternative effluent disposal systems.

In order to contain nutrients on-site it is also proposed to contain all stormwater drainage on site as part of the special rural subdivision.

Having particular regard to:

- a) the environmental quality objectives set by the Peel-Harvey EPP;
- b) the provisions contained in the Amendment to meet the requirements of the SPP No. 2 with the aim of reducing nutrient export;
- c) the maximum phosphorus export loadings that have been determined for the Serpentine River catchment and its similarity with the phosphorus export loadings expected from the proposed special rural subdivision; and
- d) the intention to set performance standards for nitrogen as part of the current review of the Peel Inlet-Harvey Estuary EPP,

it is the EPA's opinion that the proposed amendment can meet the EPA's objectives.

EPA recommendations on environmental conditions

The EPA acknowledges that the SPP No 2 for the Peel-Harvey Estuary can manage new rezoning for special rural development so that phosphorus export will meet the objectives of the Peel-Harvey EPP. However, drainage requirements have been more tightly defined by WRC in recent times and the EPA recommends that a condition be imposed requiring all drainage systems including roads, either surface or subsurface, be located at or above the Average Annual Maximum Groundwater Level (AAMGL).

3.8 Groundwater quality

Description

Lot 3 is located within the Nambelup sub area of the Murray Groundwater Area.

- ensure that the proposal complies with the requirements of the Aboriginal Heritage Act 1972; and
- The EPA's objectives in regard to this environmental factor are to:
- The area considered for assessment of this environmental factor is the amendment area.

Assessment

An archaeological and ethnographic survey was conducted by A. Yates and R. O'Connor in March 1997 (Yates Heritage Consultants, 1997) in consultation with the traditional custodians of the area, Mr F. Nannup and Mr J. Walley of the Winjan Aboriginal Corporation. No artefact scatter sites were located within the amendment area, however one previously recorded Aboriginal sites were located within the amendment area, however one situated in the north-western portion of the amendment area.

Description

3.10 Aboriginal heritage

The EPA recommends that an environmental condition should be imposed requiring measures to be put in place to ensure that prospective purchasers of the special rural lots are advised of the existence of a health risk due to mosquitoes.

EPA recommendations on environmental conditions

The EPA reiterates this advice in relation to the proposed special rural subdivision on Lot 3. The risk to human health posed by mosquitoes is a regional issue beyond the scope of individual proposals by private landowners and requires a strategic approach by the State Government.

The EPA considered the impact of mosquitoes on the proposed residential subdivision at Amariilo, Karnup, in its report to the Minister for the Environment (Bulletin 862) in June 1997 (EPA, 1997c). In that assessment the EPA noted that there is a need for the State Government to consider and implement off-site measures to adequately control mosquito numbers at Amariilo so that the EPA's objectives could be met.

The EPA considered the impact of mosquitoes on the proposed residential subdivision at Amariilo, Karnup, in its report to the Minister for the Environment (Bulletin 862) in June 1997 (EPA, 1997c). In that assessment the EPA noted that there is a need for the State Government to consider and implement off-site measures to adequately control mosquito numbers at Amariilo so that the EPA's objectives could be met.

The EPA reiterates this advice in relation to the proposed special rural subdivision on Lot 3. The risk to human health posed by mosquitoes is a regional issue beyond the scope of individual proposals by private landowners and requires a strategic approach by the State Government.

The EPA considered the impact of mosquitoes on the proposed residential subdivision at Amariilo, Karnup, in its report to the Minister for the Environment (Bulletin 862) in June 1997 (EPA, 1997c). In that assessment the EPA noted that there is a need for the State Government to consider and implement off-site measures to adequately control mosquito numbers at Amariilo so that the EPA's objectives could be met.

The EPA reiterates this advice in relation to the proposed special rural subdivision on Lot 3. The risk to human health posed by mosquitoes is a regional issue beyond the scope of individual proposals by private landowners and requires a strategic approach by the State Government.

- to control the breeding of mosquitoes to the satisfaction of the Health Department of Western Australia without adversely affecting other flora and fauna.
- to reduce mosquito numbers on-site to a level that does not cause health risks or impact on the amenity to future residents; and

The EPA's objectives in regard to this environmental factor are:

The area considered for assessment of this environmental factor is the amendment area.

Assessment

- the landowners funding runnelling of saltmarsh areas within and adjacent to the proposed special rural subdivision; and
 - memorials be placed on the certificate of titles advising prospective purchasers of the existence of a health risk caused by mosquitoes.
- the following:
- the Health Department has recommended that if the subdivision proceeds it should be subject to

4. Conditions

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

The EPA has developed a set of conditions which the EPA recommends be imposed if Amendment 108 to the Shire of Murray's Town Planning Scheme No. 4 is approved. These conditions are presented in Appendix 3 and are based on the EPA recommendations in Section 3.

Although the EPA is confident that the provisions contained in the scheme amendment will ensure that the proposal can meet the environmental objectives for the relevant factors, it is necessary to impose conditions to reflect the relevant scheme provisions so that the provisions contained in the amendment are included in the TPS:

Matters addressed in the recommended conditions include the following:

- a) provision of a foreshore reserve;
- b) preparation of a foreshore management plan;
- c) remnant vegetation protection;
- d) revegetation of the buffer between the proposed Perth-Bunbury Highway and the amendment area;
- e) watercourse protection;
- f) provision of adequate drainage management;
- g) notification of prospective purchasers of hazards caused by mosquitoes; and
- h) audit of environmental performance.

The EPA acknowledges that other issues addressed in this report can be managed through the application of the SPP No 2 for the Peel-Harvey Coastal Plain Catchment (WAPC, 1992). The SPP No 2 has specific policy provisions that deal with rural residential lots over 4 000 m². These provisions cover issues such as:

- effluent disposal and requirements for ATUs;
- development within public groundwater resource areas;
- retention of remnant vegetation; and
- stock control rates.

It is a Policy of the WAPC that all Town Planning Schemes operating within the Peel-Harvey Coastal Plain Catchment shall require development to be subject to the provisions of this policy.

5. Other advice

The following issue is also relevant to assessment of the scheme amendment:

Revegetation

When revegetation is undertaken either within the amendment area or within the buffer area between the proposed Perth-Bunbury Highway and the amendment area, it is advised that local species suited to existing soil types should be used.

6. Conclusions

The EPA has concluded that Amendment 108 to the Shire of Murray Town Planning Scheme No. 4 to rezone part of Lot 3 Fiegeert Road, Barragup from 'Rural' to 'Special Rural' and

The matters concerning surface water quality are also of concern to groundwater quality. Groundwater from the Peel-Harvey catchment also carries nutrients into the wetlands and estuary. For this reason it is important to ensure that the groundwater flowing from the proposed special rural subdivision has concentrations of phosphorus and nitrogen which are as low as possible and conform with established water quality standards.

Assessment

The area considered for assessment of this environmental factor is the Murray Groundwater Area.

The EPA's objectives in regard to this environmental factor are to ensure that:

- the environmental quality objectives for the Peel-Harvey EPP are met; and
- the water quality standards protect the estuary and adjacent coastal waters.

To meet ground water quality objectives, scheme provisions require that alternative treatment units (ATUs) be used to dispose of effluent on-site on the proposed special rural lots.

The additional dwellings proposed as part of the special rural subdivision will produce a minimal phosphorus load. Agricultural activity will be restricted through the provisions of the amendment.

PIMA raised concerns in relation to on-site effluent disposal. The EPA considers that these concerns can be adequately managed by the provisions contained in the Amendment which are consistent with the provisions of the SPP No. 2 and control the use of conventional effluent disposal systems. Conditions can also be imposed on the subdivision approval to control the location and specifications of the ATUs.

The scheme provisions prevent the use of conventional on-site effluent disposal, restrict the minimum lot sizes and building envelope sizes and prevent vegetation clearing. The provisions also promote revegetation of land.

Nutrient export via ground water flow to the lake will also be managed by provisions controlling stocking rates and restricting high nutrient land uses.

Having particular regard to:

- a) the environmental quality objectives set in the Peel Inlet-Harvey Estuary EPP; and
- b) specific policy provisions in the SPP No 2 requiring use of effluent disposal systems that minimise nutrient export,

it is the EPA's opinion that the proposed amendment can meet the EPA's objectives.

EPA recommendations on environmental conditions

The EPA acknowledges that the SPP No 2 for the Peel-Harvey Estuary can manage new rezoning for special rural development so that nutrient export will meet the objectives of the Peel-Harvey EPP.

3.9 Mosquitoes

Description

The tidal regime in the Peel Inlet-Harvey Estuary since the opening of the Dawesville Channel has increased the breeding areas for saltmarsh mosquitoes. Lot 3 is within the flight radius of these mosquito breeding areas. Saltwater mosquitoes are considered to be a health risk because they can carry Ross River or Barmah Forest virus. The proposed subdivision will not create any new mosquito breeding, however will increase the population exposed to mosquitoes.

The Health Department of Western Australia has expressed concern that the risk from mosquito-borne diseases is too great to support an increase in human population. Nevertheless

- ensure that changes to the biological and physical environment resulting from the scheme amendment do not adversely affect cultural associations with the area.

One artefact scatter site was identified on the western boundary of Lot 3. This area, along with Wolyannup Lake and the seasonal watercourse, is considered to have ethnographic significance (Yates Heritage Consultants, 1997). The artefact scatter site will be fenced in accordance with the Aboriginal Heritage Act.

Having particular regard to:

- a) results of the archaeological and ethnographic survey;
- b) the fencing of the artefact scatter sites in accordance with the Aboriginal Heritage Act; and
- c) the fencing of other areas of ethnographic significance as an outcome of the scheme amendment,

it is the EPA's opinion that the proposed amendment can meet the EPA's objectives.

3.11 Environmental performance - audit of implementation

Description

Section 48H of the *Environmental Protection Act 1986* requires that the Shire of Murray monitor, or cause to be monitored, the implementation of any environmental conditions that may imposed on Amendment 108 for the purpose of determining whether or not the condition has been or is being complied with.

If the Minister for the Environment is not satisfied with any monitoring conducted the Minister may recommend the steps necessary to achieve compliance with the condition.

Assessment

The EPA considered a number of methods for implementing the performance review requirements required under Section 48H.

It was generally agreed by the EPA that it was appropriate for the performance review or auditing of the environmental conditions to occur as part of the review of TPS No.4 by the Shire of Murray. However, prior to the subdivision, the developer should provide adequate baseline data related to the environmental factors identified in Section 3 above so that the implementation of the amendment can be monitored.

This baseline audit statement is required to provide a benchmark for future audits. The EPA notes that much of the information required for the baseline audit statement is contained in the environmental review document.

The review of the environmental conditions should be made available to the DEP. The EPA may recommend changes to conditions or actions required within the amendment area to the Minister for the Environment, following consideration of the performance review.

EPA recommendations on environmental conditions

The EPA recommends that an environmental condition be imposed requiring:

- a performance review of the Special Rural subdivision of Lot 3 to determine whether it is meeting the environmental objectives; and
- the Shire of Murray to review the performance of the environmental conditions imposed on the Special Rural subdivision of Lot 3 in the review of TPS No. 4 under Section 7AA of the Town planning and Development Act.

'Public Recreation/Conservation Reserve' is environmentally acceptable provided that there is satisfactory implementation of the recommended conditions set out in Appendix 3.

It was generally agreed by the EPA that it was appropriate for the performance review or auditing of the environmental conditions to occur as part of the review of Town Planning Scheme No. 4 by the Shire of Murray. However, there should also be a condition imposed on Amendment 108 requiring a base line audit of the sites prior to subdivision.

7. Recommendations

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

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

1. That the Minister considers the report on the relevant environmental factors of:
 - Regionally significant vegetation - impact on remnant foreshore vegetation;
 - Regionally significant wetlands - provision of adequate foreshore buffer areas;
 - Regionally significant fauna - impact on fauna and habitat;
 - Watercourse - provision of an adequate vegetated buffer;
 - Flood management - impact on hydrological role of the flood plain;
 - Surface water quality - impact of on-site effluent disposal and nutrient export;
 - Groundwater quality - impact of on-site effluent disposal and nutrient export;
 - Mosquitoes - health risk to future residents; and
 - Aboriginal heritage - impact on heritage sites; and
 - Environmental performance - audit of implementation.
2. That, subject to the satisfactory implementation of the provisions contained in Amendment 108 to the Shire of Murray Town Planning Scheme No. 4 and the EPA's recommended conditions as set out in Appendix 3 that are based on the EPA recommendations in Section 3, the proposal can be managed to meet the EPA's objectives.
3. That the Minister imposes the conditions set out in Appendix 3 of this report.

Appendix 1

List of submitters

State and local government agencies:

- Aboriginal Affairs Department
- Agriculture WA
- Bush Fires Board of WA
- Department of Conservation and Land Management
- Health Department
- Main Roads
- Peel Inlet Management Authority
- Water Corporation.

Organisations:

- Conservation Council of WA Inc.
- Peel Preservation Group

Members of the Public:

- Kelliher Brothers

Appendix 2

References

References

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- Yates Heritage Consultants (1997) *Report on an Aboriginal Site survey of the proposed subdivision of Lot 3 & 201 Fiegert Road, Barragup, Shire of Murray*. Prepared for Landform research by A. Yates and R. O'Connor, March 1997.

Appendix 3

List of recommended Ministerial Conditions

**STATEMENT THAT A SCHEME MAY BE IMPLEMENTED
(PURSUANT TO THE PROVISIONS OF DIVISION 3 OF PART IV OF THE
ENVIRONMENTAL PROTECTION ACT 1986)**

**SHIRE OF MURRAY TOWN PLANNING SCHEME NO. 4
AMENDMENT NO. 108**

- Scheme purpose:**
- (a) to rezone part of Lot 3 Fiegert Road, Barragup, from 'Rural' zone to 'Special Rural' zone and 'Public Recreation /Conservation' reserve;
 - (b) to add special provisions to the Shire of Murray Town Planning Scheme No. 4; and
 - (c) to amend the Shire of Murray Town Planning Scheme No. 4 Scheme Maps accordingly.

Responsible Authority: Shire of Murray

Responsible Authority Address: P O Box 21, Pinjarra WA 6208

Assessment Number: 1069

Report of the Environmental Protection Authority: Bulletin 890

The Shire of Murray Town Planning Scheme No. 4 Amendment No. 108 may be implemented subject to the following conditions:

1 Implementation

- 1-1 Subject to these conditions, the special rural subdivision the subject of this scheme shall conform with the subdivision guide plan in attachment 1 of this statement.

2 Foreshore Reserve

- 2-1 A foreshore reserve shall be set aside to provide physical statutory protection of the wetlands, remnant foreshore vegetation and important fauna habitats.
- 2-2 A foreshore reserve shall be provided by the subdivider of Lot 3 in accordance with the subdivision guide plan in attachment 1, except that the foreshore reserve shall be extended where necessary so that it has a minimum width of 50 metres from the furthest extent of the wetland vegetation.
- 2-3 Building envelopes shall be setback at least 50m from the foreshore reserve.

3 Foreshore Management Plan (vegetation protection, wetland protection and protection of important fauna habitat)

- 3-1 A Foreshore Management Plan will be prepared to provide on-going protection for remnant foreshore vegetation, the wetlands and important fauna habitat.
- 3-2 Prior to endorsement of the Plan or Diagram of Survey for the special rural subdivision the subject of this scheme by the Western Australian Planning Commission, a Foreshore Management Plan shall be prepared by the subdivider for the Bulbiba Lake foreshore reserve which abuts the land the subject of this scheme, to the requirements of the Peel Inlet Management Authority, on advice from the Water and Rivers Commission and Department of Conservation and Land Management.

This Plan shall provide details on the following:

- 1. specific measures to protect the wetland, foreshore vegetation and fauna habitats;
- 2. fencing requirements of the foreshore reserve;
- 3. management of human pressures and public access to the foreshore;
- 4. rehabilitation of degraded areas;
- 5. maintenance of the foreshore reserve;
- 6. timing and responsibilities for the above.

- 3-3 The Foreshore Management Plan required by condition 3-2 shall be implemented.

4 Remnant Vegetation Protection

- 4-1 Remnant vegetation on site shall be protected.
- 4-2 All remnant vegetation on the land the subject of the scheme shall be retained except where required for the erection of a single house for each special rural lot and outbuildings, effluent disposal system, accessways, fences and firebreaks, or other reason permitted in writing by Council.
- 4-3 Areas of remnant vegetation shall be fenced to the requirements of the Shire of Murray.
- 4-4 Building envelopes shall be located in areas that are already largely cleared, setback at least 30m from the watercourse and restricted in size to 2000 m².
- 4-5 Clearing of vegetation within the building envelopes shall be restricted to 1000 m².

5 Watercourse Protection

- 5-1 A buffer to protect the watercourse shall be provided at the time of subdivision.
- 5-2 The watercourse shall be fenced to a minimum width of 30 metres to the requirements of the Shire of Murray, and all building envelopes will be situated beyond this 30m buffer.

6 Drainage management

- 6-1 All drainage systems including roads, either surface or subsurface, shall be located at or above the Average Annual Maximum Groundwater Level (AAMGL).

7 Mosquitoes

- 7-1 Measures shall be put in place to ensure that prospective purchasers are advised of the existence of a health risk due to mosquitoes.

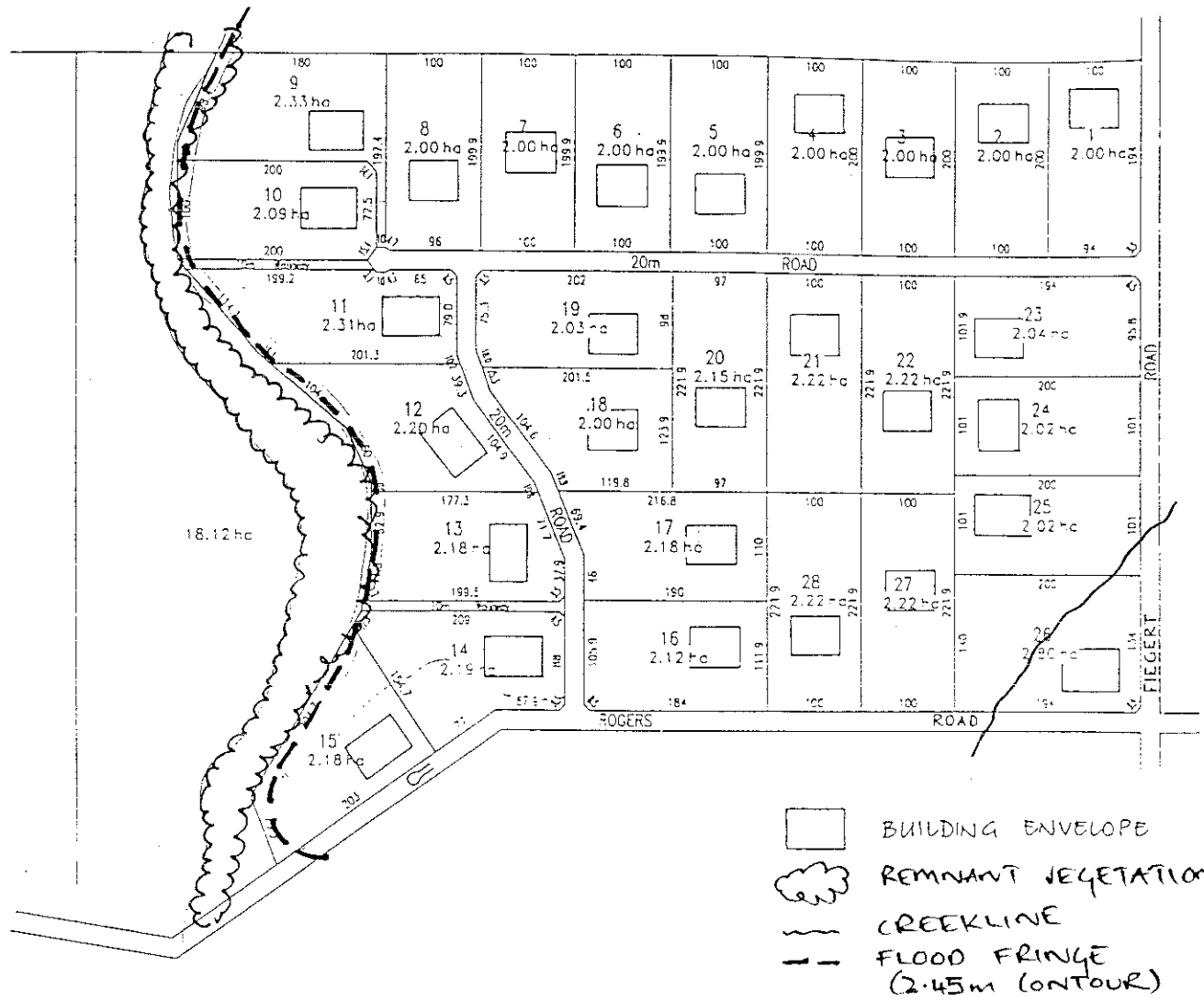
8 Audit of environmental conditions

- 8-1 A baseline audit statement of the amendment area describing the condition of the environment in relation to the key environmental factors identified in the Environmental Protection Authority's report (Bulletin 890) shall be provided by the developer prior to any development or work associated with the subdivision commencing on site.

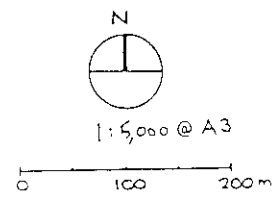
Note: The base-line audit statement will form the basis of any review of the environmental performance of the proposed special rural subdivision within the amendment area.

- 8-2 The responsible authority shall review the performance of the environmental conditions imposed on the Special Rural subdivision of the amendment area in the review of Shire of Murray Town Planning Scheme No. 4 under Section 7AA of the Town Planning and Development Act and provide the Department of Environmental Protection with a report of this review.

Attachment 1 Subdivision guide plan



Lot 3 Fiegert Road



SUBDIVISION GUIDE PLAN	DATE: 24.04.97
FIGERT ROAD LOCALITY	SCALE: 1:5000
RIZZO AND ASSOCIATES Urban and Regional Planning Consultants	DRAWN: CA

Appendix 4

Scheme provisions for Shire of Murray TPS 4 Amendment 108

TOWN PLANNING AND DEVELOPMENT ACT 1928

RESOLUTION DECIDING TO AMEND A TOWN PLANNING SCHEME

SHIRE OF MURRAY TOWN PLANNING SCHEME No. 4

AMENDMENT No. 108

The Shire of Murray under and by virtue of the powers conferred upon it in that behalf by the Town Planning and Development Act 1928 (as amended), hereby amends the above Town Planning Scheme by:

1. Amending Town Planning Scheme No. 4 map No. 5, by rezoning Murray Location 3 Fiegert Road, Barragup from "*Rural*" zone to "*Special Rural*" and "*Public Recreation/Conservation Reserve*" as per the Scheme Amendment Map.
2. Amending Schedule 4 - Special Rural Zone by adding the following Specified Land and Special Provisions:

Schedule 4
Special Rural Zone

<u>A</u> <u>Specified Land</u>	<u>B</u> <u>Special Provisions Relating to (A)</u>
Lot 3 Fiegert Rd, Barragup	<ol style="list-style-type: none">1. The Subdivision of portion of Lot 3 Fiegert Road, Barragup shall be in accordance with the approved Subdivision Guide Plan or any variation to that plan approved by the Western Australian Planning Commission.2. Each lot shall be not less than 2 hectares in area and contain a building envelope the area of which shall not exceed 2000m².3. Within the building envelope an area of not more than 1000m² may be cleared of vegetation to allow for the construction of a single house and outbuildings.

4. In order to conserve the landscape, trees and other indigenous vegetation shall not be felled or cleared without the prior written approval of the Council except where required for the erection of a single house, outbuildings, effluent disposal system, accessways, fences and firebreaks.
5. The Foreshore Reserve shown on the Scheme Amendment Map shall be subject to a Foreshore Management Plan approved by Council and the Peel Inlet Management Authority prior to the commencement of subdivision.
6. Buildings shall not be constructed within 20 metres of any boundary.
7. a) The following uses are permitted ("P") : Single House
Outbuilding
Public Utility

b) The following uses may be permitted at the discretion of the Council ("AA"):
Home Occupation
Keeping of livestock for non-commercial purposes; and
Stables

c) All other uses are not permitted ("X")
8. Land uses, other than a single house, that are permitted or may be permitted by the Council pursuant to the Scheme shall only be permitted when Council is satisfied, following consultation with the Department of Environmental Protection, that the land use does not involve excessive nutrient application or the clearing of the land.
9. All fencing shall be provided in consultation with Agriculture W.A., and shall generally be of open post and rail or post and wire construction, and shall be maintained to the satisfaction of the Council.

10. Fences shall be erected of a type and where required in consultation with Agriculture W.A. to protect trees and other vegetation from damage by grazing livestock.

11. Each dwelling shall be provided with a supply of potable water from either an underground bore or a rainwater storage tank with a capacity of not less than 92,000 litres being connected to a roof catchment with an area of not less than 120m² in projected plan area.

12. Water Supply Provisions:

- a) The subdivider shall make arrangements satisfactory to the Council for prospective purchasers to be advised that a reticulated water supply cannot be provided by the Water Authority of Western Australia.
- b) The land is subject to the provisions of the Water Authority of Western Australia's By-laws applicable to underground water supply and pollution control. The subdivider shall inform all prospective purchasers in writing of the Water Authority of Western Australia's requirements mentioned in (c) and (d) below.
- c) A well licence must be obtained prior to construction of a well or bore to draw groundwater. Groundwater may be drawn from each of the lots to supplement household water supply and to supply water for irrigated development of an are of not more than 1000m². The maximum amount of groundwater permitted to be drawn shall be 1500 cubic metres annually.

- d) Activities carried out on this land shall not contravene the Water Authority of Western Australia's By-laws applicable to underground water pollution control.
13. The subdivider shall submit a landscape plan to the Council showing site contours, stands of existing trees and vegetation to be retained, and proposals for tree planting and maintenance at the time of making an application for subdivision.
14. The subdivider shall, in accordance with the landscape plan approved by the Council, plant indigenous trees and shrubs of a species and at a density and distribution to the satisfaction of the Council prior to the sale of the land.
15. The subdivider shall either maintain the trees and shrubs planted until the land is sold or shall plant sufficient numbers of trees to allow for natural loss. Thereafter, the owners of the subdivided lots shall be responsible for the maintenance and replacement of those trees and shrubs planted by the subdivider to the satisfaction of the Council.
16. No dwelling shall be approved by Council unless it is connected to an alternative domestic waste water treatment system with an adequate phosphorous retention capacity, as approved by the Health Department of Western Australia, and with the base of the system or modified irrigation area being 500mm above the highest known water table to the satisfaction of the Council.
17. The keeping or agistment of livestock shall be in accordance with the type, number of livestock and pasture as recommended by the Department of Agriculture.

Individual landowners shall be responsible for organising advice from the Department of Agriculture where the keeping of any stock is proposed. Notwithstanding the foregoing, Council may require the stocking rates to be reduced where, in the opinion of the Department of Agriculture, they are excessive or the land is subject to significant additional nutrient application and soil erosion due to wind and rain.

18. Prior to the sale of any subdivided lots the subdivider shall make arrangements satisfactory to Council to ensure that prospective purchasers of the lots created are advised of those provisions of the Shire of Murray Town Planning Scheme No.4 which relate to the use and management of land.

19. Firebreaks shall be established and maintained to the specifications and satisfaction of the Council, and strategic firebreaks shall be provided in accordance with the requirements of the Bush Fires Board.