

**Subdivision - Lots 1 & 2 Baldivis Road,
Baldivis (1134)**

Karinya Nominees, Dalacen Pty Ltd and Benara Pty Ltd

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

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Summary and recommendations

Karinya Nominees Pty Ltd, Dalacen Pty Ltd and Benara Pty Ltd propose to subdivide Lots 1 & 2 Baldvis Road, Baldvis for residential development. This report provides the Environmental Protection Authority's (EPA's) advice and recommendations to the Minister for the Environment on the environmental factors relevant to the proposal.

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

Relevant environmental factors

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

- (a) Wetlands - provision of adequate buffer and indirect impacts;
- (b) Ground and surface water - impacts on wetlands (including water levels); and
- (c) Public health and safety risk - high pressure gas pipeline.

Conclusion

The EPA has considered the proposal by Karinya Nominees Pty Ltd, Dalacen Pty Ltd and Benara Pty Ltd to subdivide Lots 1 & 2 Baldvis Road, Baldvis for residential development.

The EPA notes that the proposed development includes portion of Tamworth Hill Swamp which is protected under the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 and is contained and protected within an existing Metropolitan Region Scheme Parks and Recreation Reserve. In addition, there is a small (7500 m²) 'Conservation' category wetland on the eastern side of Nairn Road within the proposed Public Open Space reserve.

The proposal complies with EPA's guide of a 50m or 1m AHD buffer between the proposed subdivision, Nairn Road and the remaining vegetation surrounding Tamworth Hill Swamp. In addition, the proponent intends to provide compensating basins to the satisfaction of the Water and Rivers Commission and the City of Rockingham to manage the stormwater impact on the small 'Conservation' category wetland and ensure protection of the associated paperbark thicket.

EPA also notes that required buffer distances from the natural gas pipeline have been designed into the subdivision.

The EPA has concluded that the proposal can be managed in an environmentally acceptable manner to meet the EPA's objectives provided there is satisfactory implementation by the proponent of the recommended conditions set out in Section 4, including the proponent's commitments.

Recommendations

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

1. That the Minister notes that the project being assessed is for Karinya Nominees Pty Ltd, Dalacen Pty Ltd and Benara Pty Ltd to subdivide Lots 1 & 2 Baldvis Road, Baldvis for residential development.
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3;

3. That the Minister notes that the EPA has concluded that the proposal can be managed to meet the EPA's objectives provided there is satisfactory implementation by the proponent of the recommended conditions set out in Section 4, including the proponent's commitments.
4. That the Minister imposes the conditions and procedures recommended in Appendix 3 of this report.

Conditions

Having considered the proponent's commitments and information provided in this report, the EPA has developed a set of conditions which the EPA recommends be imposed if the proposal by Karinya Nominees Pty Ltd, Dalacen Pty Ltd and Benara Pty Ltd to subdivide Lots 1 & 2 Baldivis Road, Baldivis for residential development is approved for implementation. These conditions are presented in Appendix 3. Matters addressed in the conditions include the following:

- (a) that the proponent be required to fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 3; and
- (b) that the proponent prepare (prior to commencement of any subdivision works) and implement (prior to commencement of subdivision works for the portion of the site west of the gas pipeline easement) an Environmental Management Plan for the portion of Lots 1 and 2 Baldivis Road which are affected by the Metropolitan Region Scheme Parks and Recreation Reserve for Tamworth Hill Swamp. This Environmental Management Plan should be to the requirements of the Environmental Protection Authority on advice from the Department of Conservation and Land Management and the City of Rockingham, the Water and Rivers Commission and the Department of Environmental Protection.
- (c) to ensure the preparation and implementation of prescriptions and mitigation measures as detailed in the quantitative assessment (Stratex-EWI Pty Ltd, 1994), for public safety and the protection of the CMS pipeline as agreed with by the pipeline operator, to the requirements of the Environmental Protection Authority on advice of the Department of Minerals and Energy, the City of Rockingham and the Department of Environmental Protection.

Other Advice

CALM, as manager for Tamworth Hill Swamp, is advised of current EPA requirements relating to this proposal and the City of Rockingham Town Planning Scheme Amendment 295, for the preparation and implementation of EMPs for Tamworth Hill swamp. CALM is encouraged to co-ordinate and consolidate these requirements in the form of an overall EMP for the Tamworth Hill Swamp reserve.

Contents

Page

Summary and recommendations.....	i
1. Introduction.....	1
2. The proposal.....	1
3. Environmental factors.....	6
3.1 Relevant environmental factors.....	6
3.2 Wetlands - Provision of adequate buffer and indirect impacts.....	13
3.3 Ground and surface water - impact on wetlands (including water levels).....	15
3.4 Public health and safety risk - high pressure gas pipeline.....	18
4. Conditions and commitments.....	19
4.1 Proponent's commitments.....	19
4.2 Recommended conditions.....	20
5. Other Advice.....	20
6. Conclusions.....	20
7. Recommendations.....	21

Tables

1. Summary of key proposal characteristics.....	6
2. Identification of Relevant Environmental Factors.....	7
3. Summary of environmental factors, EPA advice and recommendations.....	9

Figures

1. Location Map.....	2
2. Plan of Subdivision.....	3
3. Tamworth Hill Swamp - Conservation category wetland.....	4
4. Aerial Photo.....	5

Appendices

1. List of submitters	
2. References	
3. Recommended Environmental Conditions and Proponent's Consolidated Commitments	
4. Summary of submissions and proponent's response to submissions	

1. Introduction

Karinya Nominees Pty Ltd, Dalacen Pty Ltd and Benara Pty Ltd propose to subdivide Lots 1 & 2 Baldivis Road, Baldivis in the City of Rockingham for residential development.

The subdivision area is bordered on the west by the currently unconstructed alignment for Nairn Road and further west by Tamworth Hill Swamp, the margins of which extend as a tongue of wetland into the development site. Two easements are aligned in parallel through the site, one containing a high pressure gas transmission and the other is unused in favour of Alcoa of Australia Ltd.

There are public health and safety issues relating to the high pressure gas pipeline through the site as well as wetland and water quality issues relating to Tamworth Hill Swamp associated with the proposal.

The proposal has been formally assessed at Consultative Environmental Review (CER). The Guidelines were issued in October 1997, the review period was 4 weeks, closing on 24 August 1998, and five submissions were received.

Further details of the proposal are presented in Section 2 of this Report. Section 3 discusses environmental factors relevant to the proposal. The conditions and procedures to which the proposal should be subject, if the Minister determines that it may be implemented, are set out in Section 4. Section 5 provides Other Advice by the EPA. Section 6 presents the EPA's Conclusions and Section 7, the EPA's Recommendations.

A list of people and organisations that made submissions is included in Appendix 1. References are listed in Appendix 2, and recommended conditions and procedures and proponent's commitments are provided in Appendix 3.

Appendix 4 contains a summary of the public submissions and the proponent's response. The summary of public submissions and the proponent's response is included as a matter of information only and do not form part of the EPA's report and recommendations. The EPA has considered issues arising from this process relating to identifying and assessing relevant environmental factors.

2. The proposal

The site is located on Nairn Road (unconstructed) Baldivis, approximately 10km south east from the Rockingham City Centre (Figure 1). It is approximately 60ha in area and is currently used for grazing and market gardening and contains some remnant vegetation. The site is zoned Urban in the Metropolitan Region Scheme and is included in the Development Zone of the City of Rockingham Town Planning Scheme No.1.

The CMS Gas Transmission of Australia high pressure gas pipeline runs through the western side of the site on a north-south alignment within a 20m wide easement. When referred to the EPA, residential lots were proposed within 30 metres of the gas pipeline and was therefore unlikely to meet the EPA criteria for Public Health and Safety. The proponent has since amended the subdivision to accommodate a 32m buffer zone from the pipeline and has committed to undertake other works within the easement in order to comply with the EPA's criteria (Figure 2).

Tamworth Hill Swamp, located to the west of the site is reserved for Parks and Recreation and is separated from the site by the Nairn Road proposed alignment. This wetland is protected by the Environmental Protection (Swan Coastal Lakes) Policy (1992) and included in the Rockingham Lakes Regional Park and Perth's Bushplan. A small (7500 m²) 'Conservation' category wetland occurs on the eastern side of Nairn Road on Lot 1, this wetland or paperbark thicket is proposed to be retained in Public Open Space and primarily used for drainage purposes (Figures 3 and 4).

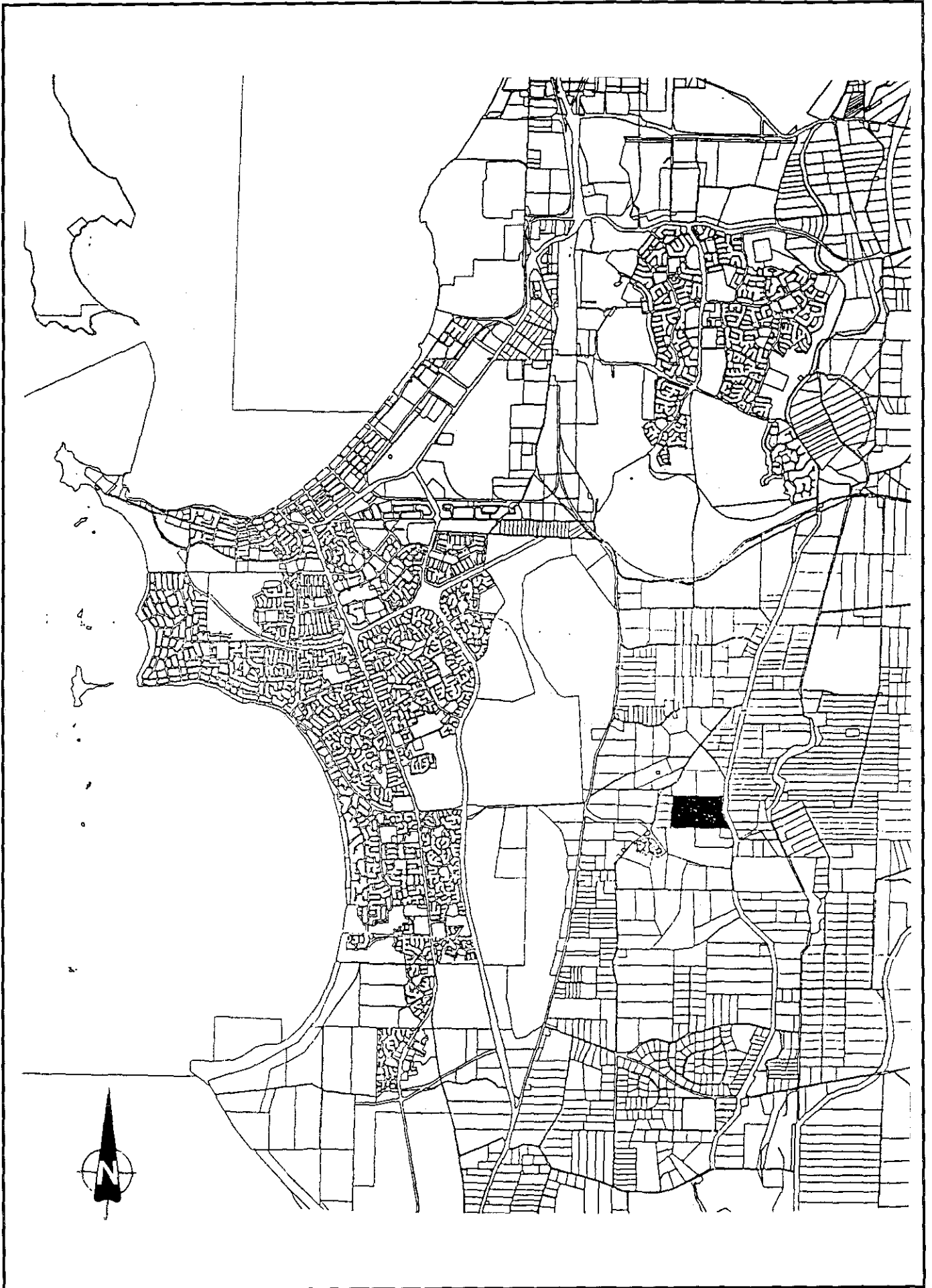


Figure 1. Location Map (Source: Mitchell Goff & Assoc. 1998).

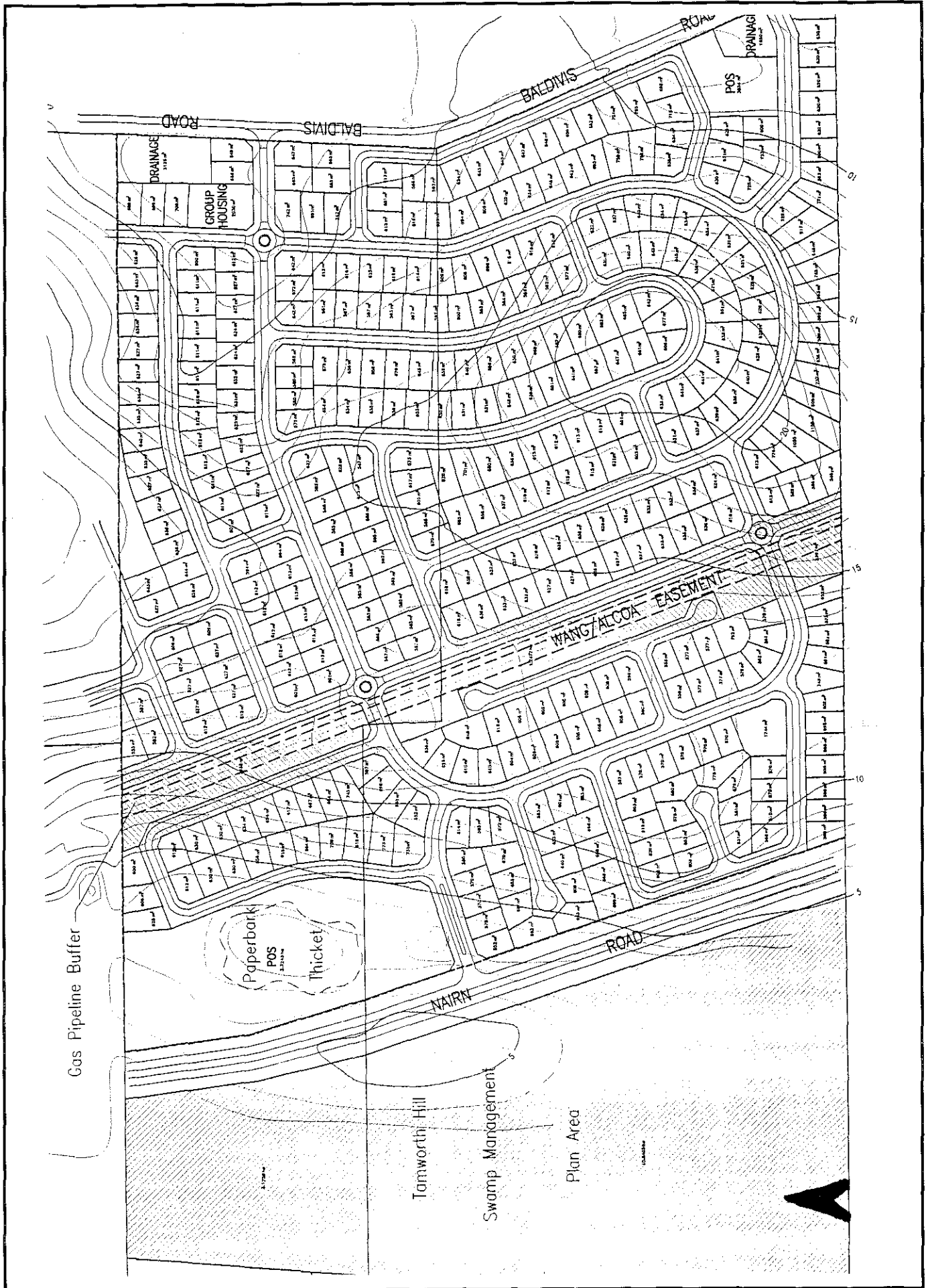


Figure 2. Plan of Subdivision (Source: Mitchell Goff & Assoc. 1998).

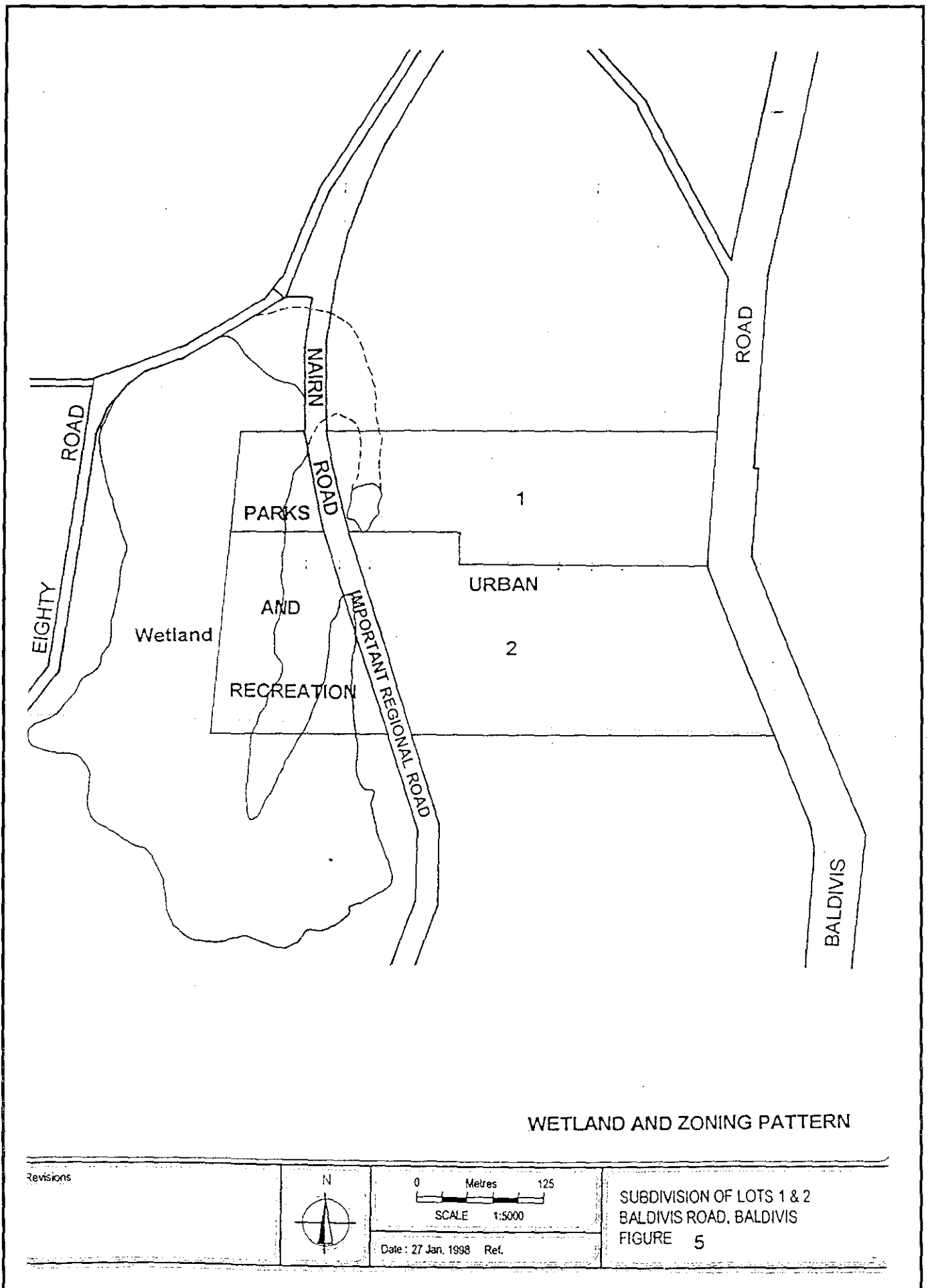


Figure 3. Tamworth Hill Swamp - Conservation category wetland (Source: Mitchell Goff & Assoc. 1998).



Figure 4. Aerial Photo (Source: Mitchell Goff & Assoc. 1998).

A summary of the key characteristics of the proposal is presented in Table 1. A detailed description of the proposal is provided in Section 1.0 of the Consultative Environmental Review (Mitchell Goff and Associates, 1998)

Table 1. Summary of key proposal characteristics

Element	Description
Development site	Lots 1 & 2 Baldivis Road, Baldivis
Encumbrances	Easement pursuant to <i>Petroleum Pipelines Act 1969</i> (as amended) Easement pursuant to <i>Alumina Refinery (Pinjarra) Agreement Act 1976</i> (as amended)
Development Areas	Lot 1: 18.28 hectares Lot 2: 25.29 hectares
Development Yield	386 single housing lots 4 group housing lots 3 recreation reserves 3 drainage basins 1 community purpose site
Planned Population	386 single dwellings x 2.8 persons = 1080 persons 32 grouped dwellings x 2 persons = 64 persons Total Persons = 1144
Risk (CMS Gas Pipeline)	A minimum separation distance of 32m (excluding roads, car parking and landscaping) from the pipe centreline to the lot boundary of any development; and A minimum separation distance of 96m from the pipe centreline to the lot boundary of any sensitive development (eg. aged care, schools, hospitals or child care).
Wetlands (Tamworth Hill Swamp)	The minimum separation distance from the subdivision to the Tamworth Hill Wetland is 100m, which includes the Nairn Road road reserve (40m). The average separation distance is 180m, including Nairn Road.
Surface Water Catchment	Tamworth Hill Swamp and Peel-Harvey Estuary

3. Environmental factors

3.1 Relevant environmental factors

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

Having considered appropriate references, public and government submissions and the proponent's response to submissions, in the EPA's opinion, the following are the environmental factors relevant to the proposal:

- (a) Wetlands - provision of adequate buffer and indirect impacts;
- (b) Ground and surface water - impacts on wetlands (including water levels); and
- (c) Public health and safety risk - high pressure gas pipeline.

The identification of Relevant Factors is presented in Table 2

Details on the relevant environmental factors and their assessment is contained in Sections 3.2 - 3.4. The description of each factor shows why it is relevant to the proposal and how it will be affected by the proposal.

The assessment of each factor is where the EPA decides whether or not a proposal meets the environmental objective set for that factor.

A summary of the assessment of the environmental factors is presented in Table 3.

The EPA does not consider remnant vegetation to be a relevant factor for this proposal as the remnant vegetation on the site is not of regional significance. The EPA expects the proponent to ensure that subdivision works are implemented so as to retain as much remnant vegetation on this site as possible.

Table 2. Identification of Relevant Environmental Factors

Preliminary Factor	Proposal characteristics	Government Agency and Public comments	Identification of Relevant Environmental factors
BIOPHYSICAL			
<p>Wetlands - provision of adequate buffer and indirect impacts</p>	<p>Tamworth Hill Swamp is located to the west of the site, separated by the Nairn Road Reserve. This wetland is protected by the Environmental Protection (Swan Coastal Lakes) Policy (1992) and included in the Rockingham Lakes Regional Park and Perth's Bushplan. The minimum buffer/setback to Tamworth Hill Swamp, including Nairn Road (40 metres) is 100 metres and averages 180 metres.</p> <p>A small (7500 m²) wetland occurs on the eastern side of Nairn Road on Lot 1. It is proposed to retain this wetland within a 2.3ha parcel of Public Open Space and use it primarily for drainage purposes.</p> <p>The subdivision will provide housing for approximately 1150 people.</p>	<p>The addition of Tamworth Hill Swamp to System 6 Area M103 and the alignment of Nairn Road was considered and supported by the EPA during a Public Environmental Review of "Selected South-West Corridor Land-use Changes" (Page 36, Assessment 746).</p> <p>The EPP prohibits unauthorised filling, draining, mining, discharge of effluent or alteration of water levels.</p> <p>The EPA recommends a minimum dryland vegetation buffer of 50 metres or 1 metre AHD higher than the furthest extent of wetland dependent vegetation.</p> <p>While neither WRC or the CALM provided comment regarding the adequacy or inadequacy of proposed buffer and therefore the appropriateness of the Urban/Nairn Road/Parks and Recreation boundary these agencies have previously (EPA Bulletin 892 and 906) recommended significant wetland buffer distances.</p> <p>CALM as manager of the Rockingham Lakes Regional Park has recommended that the proponent manage the indirect impacts to Tamworth Hill Swamp by implementing appropriate management eg. access, signage, fencing and revegetation.</p>	<p>Requires further evaluation.</p> <p>Considered to be a relevant factor.</p>

Preliminary Factor	Proposal characteristics	Government Agency and Public comments	Identification of Relevant Environmental factors
POLLUTION			
Ground and Surface water - impact on wetlands (including water levels)	<p>The amendment area is located adjacent to Tamworth Hill Swamp.</p> <p>The proposal is located over moderately deep sands which are very permeable. The site does not exhibit a high water table.</p> <p>The vegetation has been mostly cleared over the site for farming activities, though some good stands of local remnant vegetation occur in the north of the site (Jarrah, Marri and Tuart).</p> <p>The CER estimated that recharge rates will be reduced to more closely resemble the pre-clearing regime (ie. 21%).</p> <p>The proposal will also be designed to meet Water Sensitive Urban Design Guidelines. Stormwater management based on local on-site recharge using infiltration and compensation basins.</p> <p>No direct drainage is proposed to Tamworth Hill Swamp.</p> <p>The proposal will be fully sewered.</p>	<p>All submissions reiterated and supported the need to manage stormwater consistent with Water Sensitive Design Guidelines, as proposed in the CER. In addition the WRC advised that subsoil drains may be installed to control rises in groundwater but should be located no lower than the Average Annual Maximum Groundwater Level (AAMGL). There should be a separation of 1.2 meters between the floor level and AAMGL. With regard to the paperbark thicket/wetland which is proposed to be included in a drainage lake the Conservation Council of WA recommended that ground levels should not be altered such that the paperbarks are permanently inundated as they require a summer drying out period. The DEP supports this recommendation and advises that drainage should first discharged into a compensation basin before flowing into the paperbark thicket/wetland.</p> <p>Provision of infiltration basins as proposed are most important, however more emphasis should be placed on the necessity for the removal of fuels, grease and oils, chemicals, solvents, pesticides, metallic residues before they are permitted to enter the groundwater, rather than merely the nutrients.</p>	<p>Requires further evaluation.</p> <p>Considered to be a relevant factor.</p>
SOCIAL SURROUNDINGS			
Public Health and Safety - risk of high pressure gas pipeline	<p>The CMS high pressure natural gas pipeline traverses the site in an approximate north-south alignment, within an existing 20 m wide easement.</p>	<p>Submissions supported the 32 metre separation of residential lots to the gas pipeline, as proposed in the revised subdivision plan submitted with the CER.</p>	<p>Requires further evaluation.</p> <p>Considered to be a relevant factor.</p>

Table 3. Summary of Environmental Factors, EPA advice and recommendations

Factor	Relevant Area	EPA Objectives	Assessment	Advice
BIOPHYSICAL				
<p>Wetlands - provision of adequate buffer and indirect impacts</p>	<p>Tamworth Hill Swamp</p>	<p>Maintain the integrity, functions and environmental values of wetlands.</p>	<p>The addition of Tamworth Hill Swamp to System 6 Area M103 (EPA, 1983) and the current alignment of Nairn Road was considered and supported by the EPA during its assessment of the major Metropolitan Region Scheme Amendment for the South West Corridor (EPA, 1994a). The small 'Conservation' category wetland was not included in the System 6 area. In its previous assessment of Baldivis Town Centre amendment (EPA, 1998b), the EPA concluded that the existing Parks and Recreation Reserve would provide a satisfactory buffer for Tamworth Hill Swamp. The proposal sets aside land for future acquisition, consistent with this existing Parks and Recreation Reserve for Tamworth Hill Swamp. It thereby provides some measures for the long term health and viability of Tamworth Hill Swamp through regional park management objectives as identified in the Port Kennedy and Rockingham Parks Management Framework (WAPC, 1997).</p> <p>The proposal will achieve a minimum buffer of 100 metres and an average of 180 metres, (including Nairn Road) between Tamworth Hill Swamp and residential development. As the EPA guide for the minimum dryland buffer required is 50 metres or 1 metre AHD higher than the furthest extent of the wetland dependent vegetation, whichever is the largest (EPA 1997b), the proposal will therefore satisfy the EPA's buffer requirements for Tamworth Hill Swamp.</p> <p>Several submissions raised concerns regarding the indirect impacts of the subdivision on Tamworth Hill Swamp, particularly in terms of human use. The proposal will introduce a population of approximately 1150 into the area. The EPA has raised concern regarding the affects of urban densities on Tamworth Hill Swamp area in several previous assessments. In September 1994 the EPA found a proposal to mine peat at Tamworth Hill Swamp environmentally unacceptable and recommended that the then State Planning Commission prepare a management strategy to minimise the adverse impact of urbanisation on Tamworth Hill Wetland, to be resourced and implemented prior to urbanisation in the Baldivis Area (EPA, 1994b). Currently, although a framework for management of Tamworth Hill Swamp has been identified (WAPC, 1997) a detailed management plan has not yet been adopted by CALM which is its current manager.</p> <p>CALM did not comment on this proposal but during the EPA's previous assessment of Baldivis Town Centre amendment (EPA, 1998b) it requested that the developer contribute funds towards fencing of the Parks and Recreation reserve, signage and revegetation in recognition of the indirect impacts of weeds, controlled access, fire, feral animals and rubbish dumping that may occur in the wetland following development.</p>	<p>Having particular regard to the:</p> <ul style="list-style-type: none"> a) the listing of Tamworth Hill Swamp as a Conservation Category wetland protected under the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 and being contained and protected within an existing Metropolitan Region Scheme Parks and Recreation Reserve; b) compliance with EPA guide of a 50m or 1m AHD buffer between the proposed subdivision, Nairn Road and the remaining vegetation surrounding Tamworth Hill Swamp; c) the EPA's recommendations of previous assessments involving proposals which impact on Tamworth Hill Swamp, particularly the assessment of major Metropolitan Region Scheme Amendment for the South West Corridor (EPA, 1994a) and the assessment of Baldivis Town Centre amendment (EPA, 1998b); and d) the protection of the small (7500 m²) 'Conservation' category wetland on the eastern side of Nairn Road within the proposed Public Open Space reserve:

Factor	Relevant Area	EPA Objectives	Assessment	Advice
			<p>In that instance the EPA recommended, in the absence of adequate scheme provisions to manage these issues, that a Wetland Management Plan be prepared by the City of Rockingham and implemented in conjunction with CALM to the requirements of the Department of Environmental Protection to provide for the protection of Tamworth Hill Swamp (p.10 EPA, 1998b). In this case, the proponent's CER and response to submissions (p.9, appendix 4) does not sufficiently detail the management measures to address abovementioned impacts as they relate to the subject land. To be consistent with the EPA's previous position on this issue and in the absence an adopted management plan by CALM at this time, it is considered that the proponent should prepare and implement an appropriate Environmental Management Plan for the portion of the subject land affected by the Tamworth Hill wetland Parks and Recreation reserve.</p> <p>The small (7500 m²) 'Conservation' category wetland on the western side of Lot 1 consists of a paper bark thicket and sedge species. In its assessment of major Metropolitan Region Scheme Amendment for the South West Corridor (EPA, 1994a), the EPA recognised that this wetland, although originally connected to Tamworth Hill Swamp, is currently and will be further isolated from it due to fill, clearing and ultimately the construction of Nairn Road. This previous assessment, however, recognised the importance of this small wetland in relation to the future drainage design for the road and urbanisation, to ensure appropriate protection of water quality and water quantity in the balance of Tamworth Hill Swamp.</p> <p>While the EPA considers it unlikely that this 7500m² wetland can maintain a 'Conservation' category status, the importance of its drainage function is acknowledged. The proposal retains this wetland within a 2.3 hectare piece of Public Open Space (POS) for drainage purposes and allows a 10 metre buffer from Nairn Road (west) and the proposed development (east). The EPA's usual minimum buffer requirement is 50 metres but given the small size of this wetland, its condition and future primary purpose as a drainage basin, it is considered that a reduced setback can be acceptable in this case.</p>	<p>it is the EPA's opinion that the proposal is capable of being managed to meet the EPA's environmental objective for Wetlands - provision of adequate buffer and indirect impacts, provided that the proponent prepare and implement an Environmental Management Plan (EMP) for the portion of Lots 1 and 2 Baldivis Road which are affected by the Metropolitan Region Scheme Parks and Recreation Reserve for Tamworth Hill Swamp.</p> <p>It is the EPA's opinion that CALM, as manager for Tamworth Hill Swamp, should be advised of current EPA requirements relating to this proposal and the City of Rockingham Town Planning Scheme Amendment 295, for the preparation and implementation of EMP's for Tamworth Hill swamp. CALM is encouraged to co-ordinate and consolidate these requirements in the form of an overall EMP for the Tamworth Hill Swamp reserve.</p>
<p>Ground and Surface water - impact on wetlands (including water levels)</p>	<p>Tamworth Hill Swamp</p>	<p>Maintain or improve the quality of surface and ground water to ensure that existing and potential uses, including ecosystem maintenance are protected.</p>	<p>The proposal will be connected to reticulated sewerage and water supply.</p> <p>The CER estimates, a current annual rainfall recharge rate of approximately 50-60% compared with an estimated 12% over native bushland. An annual rainfall recharges rate of 21% is anticipated from the subdivision to more closely resemble the pre-clearing regime based on studies by Cargeeg et al (1987). All stormwater is proposed to be recharged on site via local infiltration with no direct drainage into Tamworth Hill Swamp and no lowering of groundwater through subsoil drains. The WRC and the City of Rockingham raised no objections. Accordingly the EPA considers that the proposal will not adversely affect surface and groundwater levels.</p>	<p>Having particular regard to the:</p> <p>a) the commitments made by the proponent to manage stormwater consistent with <i>Guidelines for Water Sensitive Urban Design</i> (DPUD et al 1994);</p>

Factor	Relevant Area	EPA Objectives	Assessment	Advice
			<p>The small 'Conservation' category wetland is proposed to be established as a permanent lake containing the paperbark thicket (as an island) into which stormwater will be directed. The Conservation Council of WA have advised that paperbarks will not survive permanent inundation and therefore recommend that proposal be modified to include a primary compensation basin and ensure ground levels in the wetland are managed such that a summer drying out period occurs. The proponent has made an additional commitment to address this issue as follows:</p> <p><i>All Stormwater generated from the site will be discharged to ground using infiltration devices. Infiltration devices will be designed, located and constructed in accordance with best management practices, to the satisfaction of the City of Rockingham and the Water and Rivers Commission to accommodate a summer drying out period for the paperbark thicket.</i></p> <p><i>This commitment requires that the land to the west of the central north-south ridge is to be designed and developed for the disposal of stormwater for all events with a return period of less than 1 in 10 years into normally dry infiltration basins. Flood events in excess of that occurring once every 10 years will be accommodated by overland flow by utilising the road system and will overflow the dry basin into the adjacent paperbark thicket. In the extreme 1 in 100 year storm event, the wetland will have to deal with 8,275 m³ of stormwater and it is estimated that the water level will rise to RL4.0m AHD. That is, the water will be 1.5m deep. It is calculated that such an event will take 2 days to return to normal levels through seepage.</i></p> <p>The CER proposes that water quality will be protected through a stormwater drainage system designed in accordance with objectives for <i>Guidelines for Water Sensitive Urban Design</i> (DPUD et al 1994). The CER indicates that land use control and removal of potentially high nutrient landuses (market gardens, horticulture and grazing) as a result of this proposal could reduce the ground and surface water quality impacts on Tamworth Hill swamp. In any event, the pollution level from nutrients as a result of the proposal is considered to be negligible as the site will be connected to reticulated sewerage.</p> <p>Submissions raised concerns regarding water borne pollutants. The EPA considers the extent of ground and surface water pollution from these sources to be negligible given that no commercial activities or industrial wastes will be generated by the proposal. Further, the proponent has committed to adopting a number of infiltration drainage measures to enable the adequate dilution of any small quantities of such water borne pollutants that may result from the proposal</p>	<p>b) the additional commitment to provide compensating basins to the satisfaction of the Water and Rivers Commission and the City of Rockingham to manage the stormwater impact on the small 'Conservation' category wetland and ensure protection of the associated paperbark thicket; and</p> <p>c) commitments to connect to reticulated sewerage and to provide infiltration systems to disperse the negligible quantity of water-borne pollutants that is expected:</p>

	Relevant Area	EPA Objectives	Assessment	Advice
			The EPA notes the raised by the City of Rockingham and the Conservation Council regarding the direction of groundwater flow from the site. The EPA considers that the proposed management measures and commitments are sufficient to ensure negligible impacts on groundwater flow so that the proposal can meet EPA objectives regarding groundwater quality and quantity.	it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for ground and surface water - impacts on wetlands (including water levels).
SOCIAL SURROUNDINGS				
Public Health and Safety - risk of high pressure gas pipeline	The amendment area in the vicinity of the pipeline.	Ensure that risk is managed to meet the EPA's criteria for individual fatality risk off-site and the DME's requirements in respect of public safety.	<p>The CMS high pressure natural gas pipeline traverses the site in an approximate north-south alignment, within an existing 20 m wide easement. The risk to public safety has been quantitatively assessed in accordance with EPA risk criteria. In residential zones a risk level of 1 in a million or less deaths per year is considered to be acceptable. The DEP has advised that to meet this criteria an acceptable separation distance to residential lots of 32m each side of the centreline of the pipeline (ie a total of 64m). For more sensitive land uses (ie aged persons' accommodation and child care centres) the DEP has advised that a greater separation of 96m each side of the pipeline is acceptable (risk of 0.5 in a million or less deaths per year). Land uses which allow for large numbers of people to congregate should be excluded from within the 96m line. These separation distances assume that appropriate risk mitigation measures are implemented consistent with the proponent commitments and have adopted in the revised subdivision plan in the CER.</p> <p>There is a potential for a second pipeline to be installed within the existing easement. If this was to be proposed the new pipeline would be required to be developed to a much higher specification and be better protected to ensure that the risk is not significantly increased.</p>	<p>Having particular regard to the:</p> <ul style="list-style-type: none"> a) EPA's required buffer distances being designed into the subdivision; b) ground disturbing activity with the easement must conform with minimum safety standards are required in accordance with the Petroleum Pipelines Act 1969-70, the Australian Pipeline Code AS 2885-1997 and HB 105; and c) proponent commitments to implement appropriate risk mitigation measures within the easement; <p>it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for Public health and safety risk - high pressure gas pipeline subject to an Environmental Condition to ensure the preparation of prescriptions for public safety, the implementation of mitigation measures as detailed in the quantitative assessment and the protection of the CMS pipeline as agreed with by the pipeline operator.</p>

3.2 Wetlands - provision of adequate buffer and indirect impacts

Description

Tamworth Hill Swamp is a sumpland which occurs west of the site, separated by the Nairn Road, which is reserved as an Important Regional Road in MRS. This wetland is protected by the Environmental Protection (Swan Coastal Plain Lakes) Policy (EPA, 1992) and has been assigned a 'Conservation' management category (Hill et al 1996). It is included in the Port Kennedy and Rockingham Parks Management Framework (WAPC, 1997) and Perth's Bushplan (Government of WA, 1998). The minimum buffer/setback to Tamworth Hill Swamp, including Nairn Road (40 metres) is 100 metres and averages 180 metres.

A small (7500 m²) 'Conservation' category wetland containing a paperbark thicket occurs on the eastern side of Nairn Road on Lot 1. This wetland was mapped as 'Conservation' category (Hill et al, 1996) because it was originally connected to Tamworth Hill Swamp. However, fill and clearing has isolated it from Tamworth Hill Swamp. The western boundary of this wetland will be formed by the construction of Nairn Road which will effectively act as a dam preventing direct surface discharge into Tamworth Hill Swamp, even in extreme storm events. It is therefore unlikely that this wetland is a 'Conservation' category wetland when considered in isolation from Tamworth Hill Swamp and is more likely to be 'Resource Enhancement' category. The associated vegetation of this wetland is not recognised as being regionally significant in Perth's Bushplan (Government of WA, 1998).

It is proposed to retain this wetland within a 2.3ha parcel of Public Open Space and use it primarily for drainage purposes to establish a lake of approximately 8000m² containing an island of paperbark thicket.

Submissions

While neither the Water and Rivers Commission or the Department of Conservation and Land Management (CALM) provided comment regarding the adequacy of the proposed buffer, these agencies have previously recommended significant wetland buffer distances, for example 200m was recommended for the Baldivis Town Centre amendment (EPA, 1998b).

The Conservation Council of WA and the City of Rockingham raised concerns that the indirect impacts of the subdivision on Tamworth Hill Swamp had not been adequately addressed in the CER. Appropriate management measures were suggested such as controlled access, signage, fencing and revegetation.

Assessment

The area considered for assessment of this factor is the Tamworth Hill Swamp and the small (7500 m²) 'Conservation' category wetland to the east across the Nairn Road Reserve.

The EPA's objective in regard to this environmental factor is to maintain the integrity, functions and environmental values of wetlands.

The addition of Tamworth Hill Swamp to System 6 Area M103 (EPA, 1983) and the current alignment of Nairn Road was considered and supported by the EPA during its assessment of the major Metropolitan Region Scheme Amendment for the South West Corridor (EPA, 1994a). The small 'Conservation' category wetland was not included in the System 6 area. In its previous assessment of Baldivis Town Centre amendment (EPA, 1998b), the EPA concluded that the existing Parks and Recreation Reserve would provide a satisfactory buffer for Tamworth Hill Swamp. The proposal sets aside land for future acquisition, consistent with this existing Parks and Recreation Reserve for Tamworth Hill Swamp. It thereby provides some measures for the long term health and viability of Tamworth Hill Swamp through regional park management objectives as identified in the Port Kennedy and Rockingham Parks Management Framework (WAPC, 1997).

The proposal will achieve a minimum buffer of 100 metres and an average of 180 metres, (including Nairn Road) between Tamworth Hill Swamp and residential development. As the EPA guide for the minimum dryland buffer required is 50 metres or 1 metre AHD higher than

the furthestmost extent of the wetland dependant vegetation, whichever is the largest (EPA 1997b), the proposal will therefore satisfy the EPA's buffer requirements for Tamworth Hill Swamp.

Several submissions raised concerns regarding the indirect impacts of the subdivision on Tamworth Hill Swamp, particularly in terms of human use. The proposal will introduce a population of approximately 1150 into the area. Currently, although a framework for management of Tamworth Hill Swamp has been identified (WAPC, 1997) a detailed management plan has not yet been adopted by CALM which is its current manager.

The EPA has raised concern regarding the effects of urban densities on Tamworth Hill Swamp area in several previous assessments. In September 1994 the EPA found a proposal to mine peat at Tamworth Hill Swamp environmentally unacceptable and recommended that the then State Planning Commission prepare a management strategy to *minimise* the adverse impact of urbanisation on Tamworth Hill Swamp, to be resourced and implemented prior to urbanisation in the Baldivis Area (EPA, 1994b).

CALM did not comment on this proposal but during the EPA's previous assessment of Baldivis Town Centre amendment (EPA, 1998b) it requested that the developer contribute funds towards fencing of the Parks and Recreation reserve, signage and revegetation in recognition of the indirect impacts of weeds, controlled access, fire, feral animals and rubbish dumping that may occur in the wetland following development. In that instance the EPA recommended, in the absence of adequate scheme provisions to manage these issues, that a Wetland Management Plan be prepared by the City of Rockingham and implemented in conjunction with CALM to the requirements of the Department of Environmental Protection to provide for the protection of Tamworth Hill Swamp (p.10 EPA, 1998b).

In this case, the proponent's CER and response to submissions (p.9, appendix 4) does not sufficiently detail the management measures to address abovementioned impacts as they relate to the subject land. To be consistent with the EPA's previous position on this issue and in the absence of an adopted management plan by CALM at this time, it is considered that the proponent should prepare and implement an appropriate Environmental Management Plan for the portion of the subject land affected by the Tamworth Hill Swamp Parks and Recreation reserve. In addition, CALM should be encouraged to coordinate development of a consolidated Environmental Management Plan for Tamworth Hill Swamp reserve.

The small (7500 m²) 'Conservation' category wetland on the western side of Lot 1 consists of a paperbark thicket and sedge species. In its assessment of major Metropolitan Region Scheme Amendment for the South West Corridor (EPA, 1994a), the EPA recognised that this wetland, although originally connected to Tamworth Hill Swamp, is currently and will be further isolated from it due to fill, clearing and ultimately the construction of Nairn Road. This previous assessment, however, recognised the importance of this small wetland in relation to the future drainage design for the road and urbanisation, to ensure appropriate protection of water quality and water quantity in the balance of Tamworth Hill Swamp.

While the EPA considers it unlikely that this 7500m² wetland can maintain a 'Conservation' category status, the importance of its drainage function is acknowledged. The proposal retains this wetland within a 2.3 hectare portion of Public Open Space (POS) for drainage purposes and allows a 10 metre buffer from Nairn Road (west) and the proposed development (east). The EPA's usual minimum buffer requirement is 50 metres but given the small size of this wetland, its condition and future primary purpose as a drainage basin, it is considered that a reduced setback can be acceptable in this case.

Summary

Having particular regard to the:

- (a) the listing of Tamworth Hill Swamp as a Conservation Category wetland protected under the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 and being contained and protected within an existing Metropolitan Region Scheme Parks and Recreation Reserve;

- b) compliance with EPA guide of a 50m or 1m AHD buffer between the proposed subdivision, Nairn Road and the remaining vegetation surrounding Tamworth Hill Swamp;
- c) The EPA's recommendations of previous assessments involving proposals which impact on Tamworth Hill Swamp, particularly the assessment of major Metropolitan Region Scheme Amendment for the South West Corridor (EPA, 1994a) and the assessment of Baldivis Town Centre amendment (EPA, 1998b); and
- d) the protection of the small (7500 m²) 'Conservation' category wetland on the eastern side of Nairn Road within the proposed Public Open Space reserve:

it is the EPA's opinion that the proposal is capable of being managed to meet the EPA's environmental objective for Wetlands provided that the proponent prepare and implement an Environmental Management Plan for the portion of Lots 1 and 2 Baldivis Road which is affected by the Metropolitan Region Scheme Parks and Recreation Reserve for Tamworth Hill Swamp.

CALM, as manager for Tamworth Hill Swamp, should be advised of current EPA requirements relating to this proposal and the City of Rockingham Town Planning Scheme Amendment 295, for the preparation and implementation of EMP's for Tamworth Hill swamp. CALM is encouraged to co-ordinate and consolidate these requirements in the form of an overall EMP for the Tamworth Hill Swamp reserve.

3.3 Ground and surface water - impacts on wetlands (including water levels)

Description

The proposal is located adjacent to Tamworth Hill Swamp, a surface expression of the local groundwater, and has moderately deep sands which are very permeable. The site itself does not exhibit a high water table.

The vegetation has been mostly cleared over the site for farming activities, though some good stands of local remnant vegetation occur in the north of the site (Jarrah, Marri and Tuart).

The CER estimates that recharge rates as a result of the development will be reduced to more closely resemble the pre-clearing regime (ie. 21%).

The proposal will also be designed to meet *Guidelines for Water Sensitive Urban Design* (DPUD et al 1994) and stormwater management is based on local on-site recharge using infiltration and compensation basins. No direct drainage is proposed into Tamworth Hill Swamp and the proposal will be fully sewerred.

Submissions

All submissions supported the need to manage stormwater consistent with *Guidelines for Water Sensitive Design* (DPUD et al 1994), as proposed in the CER. In addition the WRC advised that should subsoil drains be installed to control rises in groundwater resulting from urbanisation, they should be located no lower than the Average Annual Maximum Groundwater Level (AAMGL) so that existing groundwater levels are not lowered. There should be a separation of 1.2 meters between future building pads and AAMGL.

With regard to the small wetland which is proposed to be included as a drainage lake, the Conservation Council of WA advised that the paperbarks will not survive permanent inundation. The Council requested that the proposal be modified so that drainage is first discharged into a compensation basin before flowing into the paperbark wetland in order to ensure groundwater levels are managed so that a summer drying out period is achieved. A drying out period would also minimise the risk of midge and mosquito nuisance.

Other submissions supported the provision of infiltration basins with a suggestion that, in addition to nutrients, there should be provision to remove fuels, oils, chemicals, solvents, pesticides and metallic residues before run-off is permitted to enter the groundwater.

The City of Rockingham and the Conservation Council suggested that the direction of groundwater flows west from the site to recharge Tamworth Hill.

Assessment

The area considered for assessment of this factor is Tamworth Hill Swamp and the small (7500 m²) 'Conservation' category wetland on the subject land.

The EPA's objective in regard to this environmental factor is to maintain or improve the quality of surface and ground water to ensure that existing and potential uses, including ecosystem maintenance are protected.

The proposal will be connected to reticulated sewerage and water supply.

The CER indicates that recharge rates may be reduced by the development to more closely resemble the pre-clearing regime. As the land is currently mostly cleared pasture, the aquifer is heavily recharged by rainfall with little uptake from shallow rooted plants. The CER thus estimates, based on the findings of studies by Sharma et al (1993), a current annual rainfall recharge rate of approximately 50-60% compared with an estimated 12% over native bushland. An annual rainfall recharges rate of 21% is anticipated from the subdivision based on studies by Cargeeg et al (1987).

All stormwater is proposed to be recharged on site via local infiltration. There is to be no direct drainage into Tamworth Hill Swamp and no lowering of the groundwater is proposed through subsoil drains. The WRC and the City of Rockingham raised no objections to this proposal. Accordingly the EPA considers that the proposal will not adversely affect surface and groundwater levels.

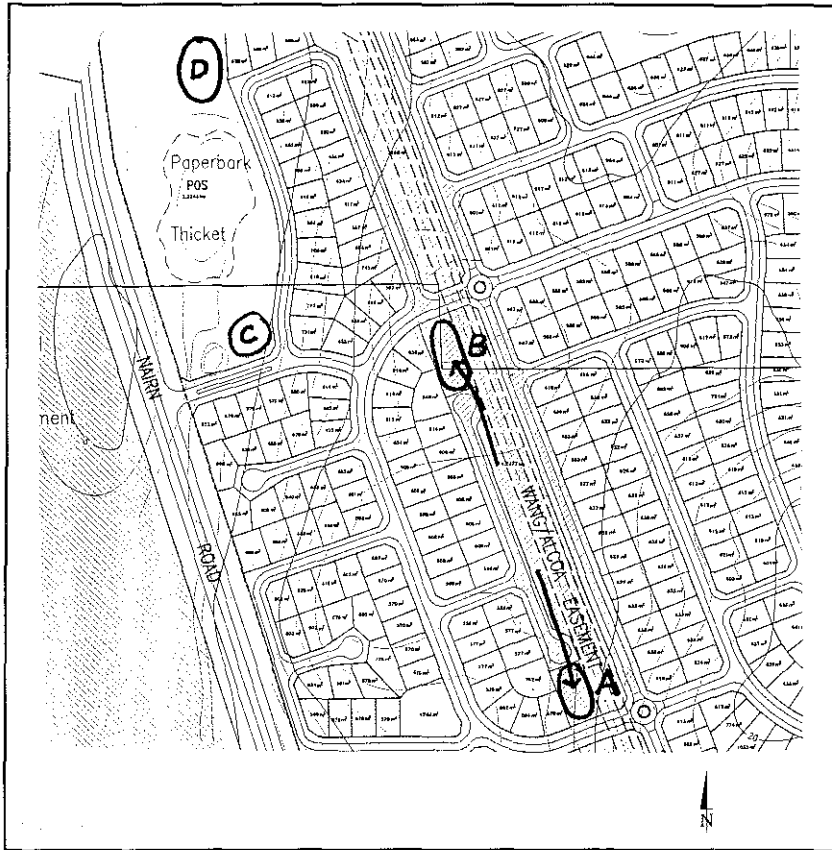
The small 'Conservation' category wetland is proposed to be established as a lake, with a surface area of approximately 8000m² containing the paperbark thicket (as an island) into which stormwater will be directed. The Conservation Council of WA has advised that paperbarks will not survive permanent inundation and therefore recommended that the proposal be modified to include a primary compensation basin and ensure ground levels in the wetland are managed such that a summer drying out period occurs.

The proponent has made an additional commitment to address this issue as follows:

All Stormwater generated from the site will be discharged to ground using infiltration devices. Infiltration devices will be designed, located and constructed in accordance with best management practices, to the satisfaction of the City of Rockingham and the Water and Rivers Commission to accommodate a summer drying out period for the paperbark thicket.

This commitment requires that the land to the west of the central north-south ridge is to be designed and developed for the disposal of stormwater for all events with a return period of less than 1 in 10 years into normally dry infiltration basins located at A, B, C and D on the attached sketch.

Note: the clearance to the water table at A and B is in excess of 10.0m AHD and at C and D will be the maximum achievable consistent with falls from the adjacent roads. Flood events in excess of that occurring once every 10 years will be accommodated by overland flow by utilising the road system and will overflow the dry basins at C and D into the adjacent paperbark thicket. In the extreme 1 in 100 year storm event, the wetland will have to deal with 8,275 m³ of stormwater and it is estimated that the water level will rise to RL4.0m AHD. That is, the water will be 1.5m deep. It is calculated that such an event will take 2 days to return to normal levels through seepage (Goff, P pers comm, 1999).



The CER proposes that water quality will be protected through a stormwater drainage system designed in accordance with objectives for *Guidelines for Water Sensitive Urban Design*. (DPUD et al 1994). The CER indicates that land use control and removal of potentially high nutrient landuses (market gardens, horticulture and grazing) as a result of this proposal could reduce the ground and surface water quality impacts on Tamworth Hill Swamp. In any event, the pollution level from nutrients as a result of the proposal is considered to be low as the site will be connected to reticulated sewerage.

Submissions raised concerns regarding water-borne pollutants such as fuels, oils, chemicals, solvents, pesticides and metallic residues. The EPA considers the extent of ground and surface water pollution from these sources to be negligible given that no commercial activities or industrial wastes will be generated by the proposal. Further, the proponent has committed to adopting a number of infiltration drainage measures to enable the adequate dilution of any small quantities of such water-borne pollutants that may result from the proposal.

The EPA notes the point raised by the City of Rockingham and the Conservation Council regarding the direction of groundwater flow from the site. The EPA considers that the proposed management measures, the new commitment and other commitments are sufficient to ensure negligible impacts on groundwater flow so that the proposal can meet EPA objectives regarding groundwater quality and quantity.

Summary

Having particular regard to the:

- a) the commitments made by the proponent to manage stormwater consistent with *Guidelines for Water Sensitive Urban Design* (DPUD et al 1994);
- b) the additional commitment to provide compensating basins to the satisfaction of the Water and Rivers Commission and the City of Rockingham to manage the stormwater impact on the small 'Conservation' category wetland and ensure protection of the associated paperbark thicket; and

- c) commitments to connect to reticulated sewerage and to provide infiltration systems to disperse the negligible quantity of water-borne pollutants that is expected:

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for ground and surface water.

3.4 Public health and safety risk - high pressure gas pipeline

Description

The CMS high pressure natural gas pipeline traverses the site in an approximately north-south alignment, within an existing 20 m wide easement. The route of the pipeline is clearly visible on the subdivision plan (Figure 2).

The risk to public safety in relation to the location of the pipeline through a residential subdivision has previously been quantitatively assessed in accordance with EPA risk criteria (Stratex-EWI Pty Ltd, 1994). The proponent proposes to protect public safety by adopting the required separation distances from the pipeline in accordance with the EPA's criteria.

Submissions

Submissions supported the 32 metre separation of residential lots to the gas pipeline, consistent with EPA requirements, as proposed in the revised subdivision plan submitted with the CER.

Assessment

The area considered for assessment of this factor is the subdivision in the vicinity of the CMS pipeline.

The EPA's objective in regard to this environmental factor is to ensure the risk is managed to meet the EPA's criteria for individual fatality risk and the Department of Mineral and Energy's requirements in respect of public safety.

This proposal has the potential to expose future users and residents to an unacceptable level of public risk from the CMS high pressure natural gas pipeline. The EPA has defined acceptable criteria for Individual Risk of Fatality as it relates to five main types of landuse in its Interim Guidance No. 2 for 'Risk Assessment and Management: Off-site Individual Risk from Hazardous Industrial Plant' (EPA, 1998). This criteria states that in residential zones a risk level of one in a million or less deaths per year is considered so small as to be acceptable. The EPA has previously established, during assessment of Baldivis Town Centre amendment (EPA, 1998) that, in order to meet this criterion, an acceptable separation distance to residential development (ie. lot boundary) is 32m each side of the centreline of the pipeline (ie a total corridor width of 64m). The risk criteria has recently been further translated into recommended separation distances from the gas pipeline as specified in the soon to be released Draft Guidance Statement for 'Achieving EPA risk criteria for development in proximity to existing and proposed gas transmission pipelines' (EPA, July 1999). The proposal complies with the latter.

For more sensitive land uses (ie aged persons' accommodation, child care centres, hospitals and schools) the EPA criteria states a risk level of one half (0.5) in a million or less deaths per year as being so small as to be acceptable. The EPA has previously established, during assessment of Baldivis Town Centre amendment (EPA, 1998), that a greater separation distance to sensitive developments (ie. lot boundary) of 96m each side of the pipeline is required to meet this criterion (ie total corridor width of 192m).

These separation distances assume that appropriate risk mitigation measures as detailed in the quantitative assessment (Stratex-EWI Pty Ltd, 1994), are implemented as agreed with the pipeline operator. The proponent has made commitments for mitigation measures within the easement and adopted a revised subdivision plan in the CER which maintains the EPA's required separation distances from the gas pipeline. It is considered however that an environmental condition should be imposed to ensure that the mitigation measures are carried out appropriately as detailed in the quantitative assessment (Stratex-EWI Pty Ltd, 1994).

It should also be noted that management of the pipeline any ground disturbing activity with the easement must conform with minimum safety standards are required in accordance with the Petroleum Pipelines Act 1969-70, the Australian Pipeline Code AS 2885-1997 and HB 105.

There is the potential for a second pipeline to be installed within the existing 20m pipeline easement. If this was to be proposed the new pipeline would be required to be developed to a much higher specification and be better protected to ensure that the total risk is not significantly increased. The development setbacks would not require altering if this was to occur.

Summary

Having particular regard to the:

- a) EPA's required buffer distances being designed into the subdivision;
- b) ground disturbing activity with the easement must conform with minimum safety standards are required in accordance with the Petroleum Pipelines Act 1969-70, the Australian Pipeline Code AS 2885-1997 and HB 105; and
- c) proponent commitments to implement appropriate risk mitigation measures within the easement;

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for Public health and safety risk subject to an Environmental Condition to ensure the preparation of prescriptions for public safety, the implementation of mitigation measures as detailed in the quantitative assessment and the protection of the CMS pipeline as agreed with the pipeline operator.

4. Conditions and commitments

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

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

The EPA recognises that not all of the commitments are written in a form which makes them readily enforceable, but they do provide a clear statement of the action to be taken as part of the proponent's responsibility for, and commitment to, continuous improvement in environmental performance. The commitments, modified if necessary to ensure they are enforceable, then form part of the conditions to which the proposal should be subject if it is to be implemented.

The EPA may, of course, also recommend conditions additional to those relating to the proponent's commitments.

4.1 Proponent's commitments

The proponent's commitments as set in the CER and subsequently modified, as shown in Appendix 3, should be made enforceable conditions.

4.2 Recommended conditions

Having considered the proponent's commitments and the information provided in this report, the EPA has developed a set of conditions which the EPA recommends be imposed if the proposal by Karinya Nominees Pty Ltd, Dalacen Pty Ltd and Benara Pty to subdivide Lots 1 & 2 Baldivis Road, Baldivis for residential development, is approved for implementation. These conditions are presented in Appendix 3. Matters addressed in the conditions include:

- (a) that the proponent be required to fulfil the commitments in the Consolidated Commitments statement set out as an attachment to the recommended conditions in Appendix 3;
- (b) that the proponent prepare (prior to commencement of any subdivision works) and implement (prior to commencement of subdivision works for the portion of the site west of the gas pipeline easement) an Environmental Management Plan for the portion of Lots 1 and 2 Baldivis Road which are affected by the Metropolitan Region Scheme Parks and Recreation Reserve for Tamworth Hill Swamp. This Environmental Management Plan should be to the requirements of the Environmental Protection Authority on advice from the Department of Conservation and Land Management and the City of Rockingham, the Water and Rivers Commission and the Department of Environmental Protection.
- (c) to ensure the preparation and implementation of prescriptions and mitigation measures as detailed in the quantitative assessment (Stratex-EWI Pty Ltd, 1994), for public safety and the protection of the CMS pipeline as agreed with by the pipeline operator, to the requirements of the Environmental Protection Authority on advice of the Department of Minerals and Energy, the City of Rockingham and the Department of Environmental Protection.

5. Other Advice

CALM, as manager for Tamworth Hill Swamp, is advised of current EPA requirements relating to this proposal and the City of Rockingham Town Planning Scheme Amendment 295, for the preparation and implementation of EMP's for Tamworth Hill swamp. CALM is encouraged to co-ordinate and consolidate these requirements in the form of an overall EMP for the Tamworth Hill Swamp reserve.

6. Conclusions

The EPA has considered the proposal by Karinya Nominees Pty Ltd, Dalacen Pty Ltd and Benara Pty Ltd to subdivide Lots 1 & 2 Baldivis Road, Baldivis for residential development.

The EPA notes that the proposed development includes portion of Tamworth Hill Swamp which is protected under the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 and is contained and protected within an existing Metropolitan Region Scheme Parks and Recreation Reserve. In addition, there is a small (7500 m²) 'Conservation' category wetland on the eastern side of Nairn Road within the proposed Public Open Space reserve.

The proposal complies with EPA guide of a 50m or 1m AHD buffer between the proposed subdivision, Nairn Road and the remaining vegetation surrounding Tamworth Hill Swamp. In addition, the proponent intends to provide compensating basins to the satisfaction of the Water and Rivers Commission and the City of Rockingham to manage the stormwater impact on the small 'Conservation' category wetland and ensure protection of the associated paperbark thicket.

EPA also notes that required buffer distances from the natural gas pipeline have been designed into the subdivision.

The EPA has concluded that the proposal can be managed in an environmentally acceptable manner to meet the EPA's objectives provided there is satisfactory implementation by the proponent of the recommended conditions set out in Section 4, including the proponent's commitments.

7. Recommendations

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

1. That the Minister notes that the project being assessed is for Karinya Nominees Pty Ltd, Dalacen Pty Ltd and Benara Pty Ltd to subdivide Lots 1 & 2 Baldvis Road, Baldvis for residential development.
2. That the Minister considers the report on the relevant environmental factors as set out in Section 3;
3. That the Minister notes that the EPA has concluded that the proposal can be managed to meet the EPA's objectives provided there is satisfactory implementation by the proponent of the recommended conditions set out in Section 4, including the proponent's commitments.
4. That the Minister imposes the conditions and procedures recommended in Appendix 3 of this report.

Appendix 1

**List of Submitters for CER - Residential Development (Assess. 1134) Lots 1
and 2 Baldvis Road, Baldvis**

City of Rockingham
Conservation Council of WA
Water and Rivers Commission
Department of Minerals and Energy
Baldivis Community Association

Appendix 2

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- Western Australian Planning Commission (1992) *Statement of Planning Policy No.2, The Peel-Harvey Coastal Plain Catchment*, Perth, WA.

Appendix 3

Recommended Environmental Conditions and Proponent's Consolidated Commitments

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

**RESIDENTIAL DEVELOPMENT OF LOTS 1 AND 2 BALDIVIS ROAD, BALDIVIS
CITY OF ROCKINGHAM**

- Proposal:** Subdivision of Lots 1 and 2 Baldivis Road, Baldivis, City of Rockingham, as documented in schedule 1 of this statement.
- Proponent:** Karinya Nominees Pty Ltd, Dalacen Pty Ltd and Benara Nominees Pty Ltd.
- Proponent Address:** PO Box 104, West Perth, WA 6872
- Assessment Number:** 1134
- Report of the Environmental Protection Authority:** Bulletin 939

The proposal to which the above report of the Environmental Protection Authority relates may be implemented subject to the following conditions and procedures:

1 Implementation

- 1-1 Subject to these conditions and procedures, the proponent shall implement the proposal as documented in schedule 1 of this statement.
- 1-2 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is substantial, the proponent shall refer the matter to the Environmental Protection Authority.
- 1-3 Where the proponent seeks to change any aspect of the proposal as documented in schedule 1 of this statement in any way that the Minister for the Environment determines, on advice of the Environmental Protection Authority, is not substantial, those changes may be effected.

2 Proponent Commitments

- 2-1 The proponent shall implement the consolidated environmental management commitments documented in schedule 2 of this statement.

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

3 Environmental Management Plan

- 3-1 Prior to commencement of any subdivision works, the proponent shall prepare an Environmental Management Plan for the portion of Lots 1 and 2 Baldivis Road which are affected by the Metropolitan Region Scheme Parks and Recreation Reserve for Tamworth Hill Swamp, to the requirements of the Environmental Protection Authority on advice of the Department of Conservation and Land Management, the City of Rockingham, Water and Rivers Commission and the Department of Environmental Protection.

The objective of this Plan is to:

- protect the conservation values of the Parks and Recreation Reserve, including protection of wetlands, vegetation and terrestrial fauna.

The Plan shall address:

1. impacts of residents and visitors;
 2. impacts of construction activities;
 3. the provision of facilities, including fencing, signage and accessways;
 4. revegetation;
 5. maintenance and responsibilities for maintenance; and
 6. implementation timing.
- 3-2 Prior to commencement of subdivision works for the portion of the site west of the gas pipeline easement, the proponent shall implement the Environmental Management Plan required by condition 3-1.
- 3-3 The proponent shall make the Environmental Management Plan required by condition 3-1 publicly available, to the requirements of the Environmental Protection Authority.

4 Risk - CMS High Pressure Natural Gas Pipeline

- 4-1 Prior to commencement of subdivision works, the proponent shall prepare the prescriptions and mitigation measures as detailed in the quantitative assessment (Stratex-EWI Pty Ltd, 1994), for public safety and the protection of the CMS pipeline, as agreed to by the pipeline operator, to the requirements of the Environmental Protection Authority on advice of the Department of Minerals and Energy, the City of Rockingham and the Department of Environmental Protection.

Note: Minimum safety standards are required in accordance with the Petroleum Pipelines Act 1969-70, the Australian Pipeline Code AS 2885-1997 and HB 105 or the most recent equivalent recognised by the Environmental Protection Authority.

- 4-2 The proponent shall implement the prescriptions for public safety and protection of the CMS pipeline referred to in condition 4-1.

5 Proponent

- 5-1 The proponent for the time being nominated by the Minister for the Environment under section 38(6) or (7) of the Environmental Protection Act 1986 is responsible for the implementation of the proposal until such time as the Minister for the Environment has exercised the Minister's power under section 38(7) of the Act to revoke the nomination of that proponent and nominate another person in respect of the proposal.
- 5-2 Any request for the exercise of that power of the Minister referred to in condition 5-1 shall be accompanied by a copy of this statement endorsed with an undertaking by the proposed replacement proponent to carry out the proposal in accordance with the conditions and procedures set out in the statement.
- 5-3 The proponent shall notify the Department of Environmental Protection of any change of proponent contact name and address within 30 days of such change.

6 Commencement

- 6-1 The proponent shall provide evidence to the Minister for the Environment within five years of the date of this statement that the proposal has been substantially commenced.
- 6-2 Where the proposal has not been substantially commenced within five years of the date of this statement, the approval to implement the proposal as granted in this statement shall lapse and be void. The Minister for the Environment will determine any question as to whether the proposal has been substantially commenced.
- 6-3 The proponent shall make application to the Minister for the Environment for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement at least six months prior to the expiration of the five year period referred to in conditions 6-1 and 6-2.
- 6-4 Where the proponent demonstrates to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority that the environmental parameters of the proposal have not changed significantly, then the Minister may grant an extension not exceeding five years for the substantial commencement of the proposal.

7 Compliance Auditing

- 7-1 The proponent shall submit periodic Performance and Compliance Reports, in accordance with an audit program prepared in consultation between the proponent and the Department of Environmental Protection.
- 7-2 Unless otherwise specified, the Chief Executive Officer of the Department of Environmental Protection is responsible for assessing compliance with the conditions, procedures and commitments contained in this statement and for issuing formal written advice that the requirements have been met.
- 7-3 Where compliance with any condition, procedure or commitment is in dispute, the matter will be determined by the Minister for the Environment.

Schedule 1

The Proposal

The proposal is to subdivide Lots 1 and 2 Baldvis Road, Baldvis into 386 single residential lots, 4 group housing lots, 1 community purposes site, 3 recreation reserves and 3 drainage basins. The site is located approximately 10km from the Rockingham City Centre. It is approximately 60ha in area and is currently used for grazing and market gardening and contains some remnant vegetation. The site is zoned Urban in the Metropolitan Region Scheme and is included in the Development Zone of the City of Rockingham Town Planning Scheme No.1.

The CMS Gas Transmission of Australia high pressure gas pipeline runs through the western side of the site on a north-south alignment within a 20m wide easement. When referred to the Environmental Protection Authority (EPA) residential lots were proposed within 30 metres of the gas pipeline and it was therefore unlikely to meet the EPA criteria for Public Health and Safety. The proponent has since modified the subdivision to accommodate a 32m buffer zone from the pipeline in order to comply with the EPA's criteria.

Tamworth Hill Swamp, located to the west of the site, is reserved for Parks and Recreation and is separated from the site by the Nairn Road proposed alignment. This wetland is protected by the Environmental Protection (Swan Coastal Lakes) Policy (1992) and included in the Rockingham Lakes Regional Park and Perth's Bushplan. A small (7500 m²) 'Conservation' category wetland occurs on the eastern side of Nairn Road on Lot 1. This wetland or paperbark thicket is proposed to be retained in Public Open Space and primarily used for drainage purposes.

The key characteristics of the proposal are presented in Table 1

Table 2 - Key proposal characteristics

Element	Description
Development site	Lots 1 & 2 Baldvis Road, Baldvis
Encumbrances	Easement pursuant to <i>Petroleum Pipelines Act 1969</i> (as amended) Easement pursuant to <i>Alumina Refinery (Pinjarra) Agreement Act 1976</i> (as amended)
Development Areas	Lot 1: 18.28 hectares Lot 2: 25.29 hectares
Development Yield	386 single housing lots 4 group housing lots 3 recreation reserves 3 drainage basins 1 community purpose site
Planned Population	386 single dwellings x 2.8 persons = 1080 persons 32 grouped dwellings x 2 persons = 64 persons Total Persons = 1144
Risk (CMS Gas Pipeline)	A minimum separation distance of 32m (excluding roads, car parking and landscaping) from the pipe centreline to the lot boundary of any development; and A minimum separation distance of 96m from the pipe centreline to the lot boundary of any sensitive development (eg. aged care, schools, hospitals or child care).
Wetlands (Tamworth Hill Swamp)	The minimum separation distance from the subdivision to the Tamworth Hill Wetland is 100m, which includes the Nairn Road road reserve (40m). The average separation distance is 180m, including Nairn Road.
Surface Water Catchment	Tamworth Hill Swamp and Peel-Harvey Estuary

Schedule 2: Proponents consolidated environmental Management Commitments

Table 3 Summary - Commitments

Issue	Objectives	Action	Timing (Phase)	Whose Advice	Specifications (Performance Indicator)
Tarnworth Hill Swamp	To maintain the long term health and viability of Tarnworth Hill Swamp including adequate buffers and long term management.	1. Not to use any land within the Rockingham Parks Tarnworth Hill Swamp Management Plan area for any purpose associated with the development (eg drainage).	Subdivision of development design.	City of Rockingham, Western Australian Planning Commission, C.A.L.M.	Condition of subdivision.
Surface and Groundwater Quality	<ul style="list-style-type: none"> • Management of stormwater in accordance with Water Sensitive Urban Design Guidelines. • Prevent direct stormwater discharge from the site. • Control/manage the potential for nutrients (and any other potential pollutants) to discharge from the site via groundwater. 	<p>2. All stormwater generated from the site will be discharged to ground using infiltration devices. Infiltration devices will be designed and constructed in accordance with best management practices, to the satisfaction of the City of Rockingham and Water and Rivers Commission to accommodate a summer drying out period.</p> <ul style="list-style-type: none"> • This commitment requires that the land to the west of the central north south ridge is to be designed and developed for the disposal of stormwater for all events with a return period of less than 1 in 10 year into normally dry infiltration basins located at A, B, C and D on the attached sketch. <p>Note: the clearance to the water table at A and B is in excess of 10.0m AHD and at C and D will be the maximum achievable consistent with falls from the adjacent roads. Flood events in excess of that occurring once every 10 years will be accommodated by overland flow by utilising the road system and will overflow the dry basins at C and D into the adjacent paperbark thicket. In the extreme 1 in 100 year storm event, the wetland will have to deal with 8275m³ of stormwater and it is estimated that the water level will rise to RL4.0m AHD. That is, the water level will be 1.5m deep. It is calculated that such an event will take 2 days to return to normal levels through seepage.</p>	Final subdivision approval.	City of Rockingham, W.R.C.	Design & Construction standard.

		<p>3. Infiltration devices will be appropriately maintained by the proponent to the satisfaction of the City of Rockingham, including the removal of sediments as necessary, until handover to the City of Rockingham.</p> <p>4. Drainage of the site will be to the satisfaction of the City of Rockingham, but will not incorporate subsoil drainage.</p> <p>5. The proponent shall retain the paperbark thicket within the development area as an island surrounded by a lake as part of the drainage system developed for handover to the City of Rockingham.</p> <p>6. Submit a modified plan of submission.</p>	<p>Post development.</p> <p>Final subdivision approval.</p> <p>Final subdivision approval.</p> <p>Initial subdivision approval.</p>	<p>City of Rockingham.</p> <p>City of Rockingham.</p> <p>City of Rockingham.</p> <p>Western Australian Planning Commission.</p>	<p>Standard responsibility of local government.</p> <p>Design & Construction standard.</p> <p>Condition of subdivision.</p> <p>Subdivision approval.</p>
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Issue	Objectives	Action	Timing (Phase)	Whose Advice	Specification (Performance Indicator)
Public Health and Safety	Given the existing management of the CMS-Parmelia Gas Transmission pipeline and the ALCOA pipeline determine appropriate setbacks of development and additional measures to ensure the development meets the EPA's criteria for individual fatality risk and the DME's requirements in respect of public safety.	7. Limit the number of road crossings of the pipeline easement to two.	Initial subdiv. Approval.	Western Australian Planning Commission.	Approval plan.
		8. Set residential lots at least 32 metres back from the centreline of the gas pipeline.	Initial subdiv. Approval.	Western Australian Planning Commission.	Approval plan.
		9. Not locate any site for special uses within 96 metres of the gas pipeline.	Initial subdiv. Approval.	Western Australian Planning Commission.	Approval plan.
		10. Construct a concrete dual use path within open space above and along the length of the gas pipeline.	Final subdiv. approval.	Western Australian Planning Commission.	Condition of subdivision.
		11. Install service conduits under the roads, in the vicinity of the pipeline, so that any future services can be installed without having to bore under the road.	Final subdiv. approval.	City of Rockingham, Western Australian Planning Commission, CMS Gas Transmission of Australia, Alinta Gas, Water Corp., Western Power, City of Rockingham.	Condition of subdivision.
		12. Install "No Boring Permitted" signs in the vicinity of the pipeline.	Final subdiv. approval.	CMS Gas Transmission of Australia.	Condition of subdivision.
		13. Design the layout of the services in the development such that no additional services need to be installed near the pipeline at a future date.	Final subdiv. approval.	CMS Gas Transmission of Australia, Alinta Gas, Water Corp., Western Power, City of Rockingham.	Condition of subdivision.
		14. Design the roads in the development such that they discourage the installation of additional services in the future.	Initial subdiv. approval.	CMS Gas Transmission of Australia, Alinta Gas, Water Corp., Western Power, City of Rockingham.	Approval plan.
		15. All work carried out in the vicinity of the pipeline to be supervised by CMS Gas Transmission Representative.	Construction.	CMS Gas Transmission of Australia, Alinta Gas, Water Corp., Western Power, City of Rockingham.	Condition of subdivision.
		16. All contractors and sub contractors working in the vicinity of the pipeline undertake induction training on procedures for working near a high pressure gas pipeline.	Construction.	CMS Gas Transmission of Australia.	Condition of subdivision.
				CMS Gas Transmission of Australia.	Condition of subdivision.

Issue	Objectives	Action	Timing (Phase)	Whose Advice	Specification (Performance Indicator)
		17. Carry out coating defect survey of pipeline section affected by the development. 18. Repair any coating defects. 19. Carry out pipeline depthing survey. 20. Carry out earthworks to increase pipeline depth as necessary. 21. Check intelligent pigging reports for corrosion indications.	Construction. CMS pipe maintenance. Construction. Construction. CMS pipe maintenance.	CMS Gas Transmissions of Australia. CMS Gas Transmissions of Australia. CMS Gas Transmissions of Australia. CMS Gas Transmissions of Australia. CMS Gas Transmissions of Australia.	Condition of subdivision. CMS maintenance responsibility. Condition of subdivision. Condition of subdivision. Condition of subdivision.

Appendix 4

Residential Development - Lots 1 & 2 Baldivis Road, Baldivis

(Assessment Number 1134)

Summary of Submissions and Proponent's Response to Submissions Consultative Environmental Review

A list of concerns and questions has been compiled from submissions received during the period of public comment. The Environmental Protection Authority (EPA) would appreciate responses to these concerns / questions as soon as possible. This list and the responses from Mitchell Goff & Associates on behalf of Karinya Nominees Pty Ltd, Dalacen Pty Ltd and Benara Nominees Pty Ltd will be reproduced in the EPA's report on the project to the Hon Minister for the Environment.

You will note that the summary includes substantial re-statement of issues and information presented in the Consultative Environmental Review document. It is reasonable to acknowledge these as such. However, it is the EPA's view that it is important for the public to see that their views have been received, read and considered.

BIOPHYSICAL

1.1.1 Vegetation Communities

- 1.1** Can the proponent modify the design of the subdivision so as to preserve as many as possible of the native trees which are shown in Figure 8? (**Conservation Council of WA**)
- 1.2** How will the paperbark thicket (associated with the eastern portion of Tamworth Hill swamp) which is to be preserved be managed to retain its water regime which will ensure the long term survival of the vegetation? Paperbarks cannot survive being permanently inundated and require a fluctuating water level with a drying out period during summer. (**Conservation Council of WA**)
- 1.3** Could some of the natural parkland vegetation associated with the pipeline easement, alongside the proposed new alignment of Nairn Road, and most importantly within the Tramway Reserve alongside Baldivis Road be preserved? Vegetation associated with the existing wetlands (listed as protected) could also be retained. (**Baldivis Community Association**)
- 1.4** Why have some of the remaining tuart, marri and jarrah trees in Lot 1 not been identified for preservation? Could the subdivision design be modified to allow for this? (**Baldivis Community Association**)
- 1.5** The City of Rockingham has requested that the applicant locate POS (Public Open Space) on the northern boundary of the property, particularly given the presence of significant vegetation in that area. Although the vegetation may not be regionally significant, it is believed that the retention of this area combined with POS on the adjoining property could provide a focal POS area. (**City of Rockingham**)

1.1.2 2 Groundwater quantity

- 2.1** The CER does not address the issue of private bores although it does state that large scale groundwater abstraction from the Stakehill Mound would require licensing by the Water Corporation. How will this protect Tamworth Hill Swamp? It is suggested that restrictions on bores should be addressed now as delaying a decision would lead to difficulty in obtaining community acceptance and compliance. (**Conservation Council of WA**) (**Baldivis Community Association**)
- 2.2** The conclusions in Table 2 of the report which relate to the potential impact on groundwater from different landuses have little credibility. These conclusions are in dispute and as such should not be accepted by the EPA when making decisions on land uses affecting groundwater. (**Conservation Council of WA**)

- 2.3 The land formation in the area of Spearwood Sands over Limestone provides an excellent natural filtration system. Maintaining the quantity of the water supply in this area is very important. The superficial aquifer referred to on the Stakehill Mound is that which provides household and agricultural/horticultural water to all existing homes in the rural area of Baldivis.

Therefore, how will the quantity of the groundwater associated with Stakehill Mound be managed to ensure that the groundwater resource does not become depleted as a result of excessive abstraction? **(Baldivis Community Association)**

- 2.4 Where are the figures for the abstraction of groundwater drawn from domestic bores or municipal bores to water parks and gardens in areas which have access to a reticulated water supply? These need to be included in the report. **(Baldivis Community Association)**
- 2.5 The lowering of groundwater levels is not supported as this will lead to an export of nutrients off the site and will impact adversely upon natural vegetation. Subsoil drains may be installed to control increases in groundwater levels resulting from urbanisation, however, these should be located no lower than the Annual Average Maximum Groundwater Level (AAMGL). **(Water and Rivers Commission)**
- 2.6 The Urban recharge rate quoted may not be accurate as most stormwater from the Perth urban area goes into stormwater drains, and out to sea. However, with the infiltration means envisaged as a part of the development, this proposal should be better than that achieved in Perth. **(Baldivis Community Association)**
- 2.7 Although the pre-clearing recharge rate is given as only 12%, the underground reservoir has been built up over thousands, perhaps millions of years. The recharge rate from totally cleared pastoral land is given as 50-60%, but this is more than offset by usage which did not exist pre-settlement. **(Baldivis Community Association)**
- 2.8 The report indicates that groundwater recharge from the site relies on groundwater movement from the Swan Coastal Plain in the west. However, the City of Rockingham's Environmental Impact Review Officer indicates that on-site recharge is the main input to the Tamworth Mound. The City of Rockingham, therefore, seeks confirmation from the EPA that the findings and conclusions of the report are correct given the on-site groundwater recharge. **(Baldivis Community Association)**

1.1.3 3 Wetlands

- 3.1 Tamworth Hill Swamp should be fenced, signposted and under management before urban development proceeds. Why has this issue not been addressed? **(Conservation Council of WA)**
- 3.2 As the balance of the wetland has already been wholly or parkland cleared for grazing, an excellent solution would be to incorporate the remaining tongue of the wetland within the urban area, into the development as envisaged. The preservation of the paperbark island within the permanent lake would at least conserve a fraction of the previous environment. **(Baldivis Community Association)**
- 3.3 It is critical that every opportunity is taken to safeguard the long term health and viability of Tamworth Hill Swamp. A high density urban development on the eastern side will make this difficult. However, it is appreciated that the CER provides an opportunity to put in place some protection measures and to make the best of a bad situation. Support is given for the proposed management measure not to use any land within the Rockingham Parks Tamworth Hill Swamp Management Plan for any purpose associated with the development, including drainage. **(Baldivis Community Association)**

- 3.4 It has been recognised that the northeastern corner of the wetland has been destroyed and that it is not possible to now include this area. This example of wetland loss is inexcusable. **(Conservation Council of WA)**
- 3.5 Unfortunately the major decisions have already been made, and these have not all been sound, particularly in relation to keeping the Tamworth wetland system intact, and with an upland buffer or an opportunity to regenerate an upland buffer. The compromises proposed in the CER are reasonable in respect of this wetland. **(Conservation Council of WA)**
- 4 **Terrestrial fauna**
- 4.1 What about the potential for mosquito and midge problems associated with the incorporation of the wetland into the subdivision? How will this potential problem be managed? **(City of Rockingham)**

POLLUTION MANAGEMENT

1.1.4 5 Surface water quality

- 5.1 The use of soakwells is considered an effective method of removing pollutants and containing runoff related to stormwater. Stormwater should be directed towards soak wells with the capacity to contain the first 10mm of rainfall. Runoff from house roofs should also be directed towards soakwells located within each allotment. **(Water and Rivers Commission)**
- 5.2 Water conservation and water sensitive design are strongly recommended as features for the development. **(Conservation Council of WA)**
- 5.3 The design of infiltration basins should be referred to the Water and Rivers Commission for comment. **(Water and Rivers Commission)**
- 5.4 Incorporation of the drainage basins into parklands, rather than into wetlands, will assist in maintaining the water quality of these seasonal sumplands, an important breeding ground for water birds. **(Baldivis Community Association)**
- 5.5 Allotments created by the proposal must be supplied with reticulated water and connected to a reticulated sewerage service. If a reticulated sewerage service is not practical, allotments should be connected to an approved on-site disposal system. **(Water and Rivers Commission)**

6 Groundwater quality

- 6.1 The land formation in the area of Spearwood Sands over Limestone provides an excellent natural filtration system. Maintaining the purity of the water supply in this area is very important. The superficial aquifer referred to on the Stakehill Mound is that which provides household and agricultural/horticultural water to all existing homes in the rural area of Baldivis.

Therefore, how will the quality of the groundwater associated with Stakehill Mound be managed to ensure that recharge quality is high? **(Baldivis Community Association)**

- 6.2 What will be the distance of separation between the building pad and the AAMGL? It is suggested that this distance should comply with local government and Health Department regulations. As a minimum the building floor level should be 1.2m above the AAMGL. **(Water and Rivers Commission)**

- 6.3 The commitments in the CER to protect the quality of the groundwater are supported. **(Conservation Council of WA)**
- 6.4 The comparisons of Pre and Post-Development nutrient and pollutant loads are not necessarily accurate. The figure used for current fertiliser use is based on assumptions whereas there is actually no indication of current fertiliser use (if any), particularly uncleared. Also the carrying capacity does not necessarily equate to the actual stocking rate on the land which may be much less, and animal manure is a natural outcome of grazing, whilst domestic fertilisers are largely chemically based. **(Baldivis Community Association)**
- 6.5 Fertiliser application for grazing is normally once a year, if at all, whilst lawns and gardens are fertilised frequently. Also what about herbicide and weedicide usage? This is often more frequent in an urban development situation. **(Baldivis Community Association)**
- 6.6 In calculating post-development nutrient loads, consideration should also be given to the fact that urban stormwater consists largely of fuel and vehicle residue which will also contribute nutrients to the groundwater. **(Baldivis Community Association)**
- 6.7 Activities involving the discharge of liquid industrial wastes should only be permitted under strict regulations, including:
- a) secure containment measures should be installed to facilitate waste removal by registered recycling/sullage contractors, to an off-site disposal site approved by the Department of Environmental Protection, or;
 - b) connection to sewer, provided the discharge is in accordance with the Water Corporation's Industrial Waste Acceptance Policy. **(Water and Rivers Commission)**

SOCIAL SURROUNDINGS

1.1.5 7 Public Health and Safety

- 7.1 What are the current or future operational procedures for the CMS - Parmelia Gas Transmission Pipeline? This needs to be addressed as it is normal practice overseas to reduce allowable stresses of pipelines that pass through areas of high population density. **(Conservation Council of WA)**
- 7.2 What is the design pressure for the pipeline? It may have been set according to the fact that the pipeline was to pass through uninhabited areas, but this situation is about to change. **(Conservation Council of WA)**
- 7.3 What about informing new landowners of the presence of the gas pipeline and its implications? How will this be done? **(Conservation Council of WA)**
- 7.4 Dimensions of the CMS gas pipeline easement are given as a width of 12.191m and that of the unused Alcoa easement as 6.095m, giving a total of 18.286m. However, the recommended and recognised width for public health and safety purposes has been set at 32m. **(Baldivis Community Association)**
- 7.5 On September 12, 1998 the Western Australian government advertised for expressions of interest to increase gas pipeline capacity between the North West and South West of the State. This requirement would increase the easement width from 30m to 100m. How will this affect the development? **(Baldivis Community Association)**

- 7.6 What about the additional risks that may result from usage in the future of the second pipeline easement which is registered to Alcoa of Australia WA (Ltd)? **(Department of Minerals and Energy)**
- 7.7 How will public liability issues associated with the CMS - PARMELIA gas easement be handled? These issues must be addressed given that it is proposed to provide POS over the easement. **(City of Rockingham)**
- 7.8 The subdivision plan (Figure 10) does not show the 32m separation between the easement and the residential boundaries. This buffer distance needs to be reflected. **(City of Rockingham)**
- 7.9 The CER refers to a Quantitative Risk Assessment prepared by Stratex Pty Ltd for Homeswest. The Department of Minerals and Energy's understanding of the separation distances of 32m to residential boundaries and 96m to sensitive development are based on the same pipeline in another location (Yangebup/Kogalup). **(Department of Minerals and Energy)**
- 7.10 Limiting the number of crossing points over the pipeline, early provision for the installation of services and the construction of a dual use concrete pathway over the pipeline will also assist in minimising the risk to public health and safety. **(Baldivis Community Association)**

1.1.6 8 Other

- 8.1 Although zoned Urban under the Metropolitan Region Scheme, and within the Development zone of the City of Rockingham Town Planning Scheme No. 1, the small size of the house blocks tends to destroy the rural atmosphere of the district, and it would be preferred if there was a greater mix of block sizes, as in the buffer areas being observed in other developments. **(Baldivis Community Association)**
- 8.2 If Nairn Road is to be fenced adjacent to Tamworth Swamp, it would be desirable to have a firebreak established outside the perimeter fence. This would assist in preserving the parkland area and also provide a walk trail for people who seem to be forgotten in most modern developments. Provision should also be made for a dual use cycle/walkway to be established in the future. **(Baldivis Community Association)**
- 8.3 The proposed location of the fencing (Port Kennedy and Rockingham Parks Management Framework, Figure 16) should follow the proposed Nairn Road alignment more closely. As stated in the CER the Management Framework does not make any recommendations about the more easterly part of Tamworth Hill Swamp which will be cut off by the road alignment and this would most likely be due to the constraints of the consultant's brief which was set by the Government. **(Conservation Council of WA)**
- 8.4 The protection of all land within the Rockingham Regional Park including Tamworth Hill Swamp is supported as is the stated environmental objective "*to maintain the long term health and viability of Tamworth Hill Swamp including adequate buffers and long term management*". Unfortunately due to poor Government decisions in the past, including the reservation of land through part of the Tamworth wetland system for a regional road, and approval of a residence on Lot 640 Eighty Road, it is not possible to set aside adequate buffers either on the western or eastern side of the Tamworth wetland system. **(Conservation Council of WA)**
- 8.5 The issue of the alignment of Nairn Road was raised by community groups at the 1992 South West Corridor Advisory Committee Meetings and also in commenting on the South West Corridor (Stage B) Metropolitan Region Scheme Amendment No. 937/33 but was still proceeded with. Unfortunately during the amendment process the alignment failed to attract the attention it deserved probably due to the number

of environmental issues being considered, making it impossible now to set a satisfactory buffer zone.

When the EPA formally assesses or provides advice on service corridors, including road alignments, it is essential that the issue of buffer zones be an integral part of their recommendations. Support is given to the approach taken by the Water and Rivers Commission and the Davies and Lane Guidelines on buffer zones on the Swan Coastal Plain. Decisions on road alignments which affect the ability to set adequate buffer zones on wetlands must be dealt with in the early planning stages. **(Conservation Council of WA)**

- 8.6** The DEP should be aware that the City of Rockingham has not supported a Comprehensive Development Plan for the subject land and the Structure Plan listed as Figure 10 in the CER has not been assessed by Council. As the proposed plan has not been supported by the Council, there are various issues relating to this plan which remain to be resolved, including the location of Public Open Space, integration of the drainage and POS, the lack of higher density residential sites in the estate, the road hierarchy and the design of the subdivision.

Any approval by the EPA for the CER should not restrict Council's or the Western Australian Planning Commission's ability to negotiate modifications to the proposed Structure Plan. **(City of Rockingham)**

- 8.7** The acquisition of the Parks and Recreation Reserve by the Western Australian Planning Commission should be pursued as a priority by the Commission to facilitate the implementation of the Management Plan for the overall Reserve. **(City of Rockingham)**

- 8.8** The POS provision and its purpose for drainage and/or active/passive recreation will be assessed by the City of Rockingham in further detail at the Comprehensive Development Plan stage. Detailed designs and a POS Schedule will be sought from the applicant. Council is mindful of the need for usable areas of POS to not be dominated by water features. **(City of Rockingham)**

Proponent's Response to Submissions

PROponents RESPONSE TO SUMMARY OF ENVIRONMENTAL SUBMISSIONS RESIDENTIAL DEVELOPMENT - LOTS 1 & 2 BALDIVIS ROAD, BALDIVIS CONSULTATIVE ENVIRONMENTAL REVIEW ASSESSMENT NO. 1134

The public submission period for the Consultative Environmental Review (CER) for the subdivision development of Lots 1 & 2 Baldivis Road, Baldivis commenced on 24th August and concluded on 21st September 1998.

The following sections provide the proponents response to submissions and issues summarised and prepared by the Department of Environmental Protection (DEP) dated 2nd November 1998. Summarised submissions (see italics) have been numbered for ease of reply in cross referencing. Submission points referring to a common topic have been grouped, and the response numbered accordingly.

BIOPHYSICAL

1.0 Vegetation Communities

1.1 *Can the proponent modify the design of the subdivision so as to preserve as many as possible of the native trees which are shown in Figure 8?*

1.3 *Could some of the natural parkland vegetation associated with the pipeline easement, alongside the proposed new alignment of Nairn Road, and most importantly within the Tramway Reserve alongside Baldivis Road be preserved? Vegetation associated with the existing wetlands (listed as protected) could also be retained.*

1.4 *Why have some of the remaining tuart, marrri and jarrah trees in Lot 1 not been identified for preservation? Could the subdivision design be modified to allow for this?*

Response (1.1, 1.3 & 1.4)

Three issues are raised in relation to vegetation communities. The first concerns the retention of mature eucalypts within Lot 1 and the possibility of amending the subdivision design to allow for this retention, possibly within Public Open Space. This area of eucalypts is substantially modified with there being little or no understorey retained. For this reason, the environmental values of this area are reduced although it is acknowledged that the trees have landscape value. Public Open Space has therefore been associated with the paperbark thicket towards the north-western corner of the development area because this is considered to have greater environmental value. Additionally, and in line with previous planning practice to grant a fifty percent credit for open space affected by a gas pipeline easement, the subdivision is able to be provided with greater areas of reserve by using remaining open space allocations to include those areas affected by the gas pipeline. In the light of this allocation of open space there is insufficient open space area remaining to provide a reserve encompassing the mature eucalypts. The proponents are prepared however to incorporate as many specimens as reasonably possible within road reserves and on residential lots as is appropriate.

The tuart, jarrah, marri trees are in an area where the understorey has been removed and the environmental values are substantially reduced. The area's value is mainly landscape and a planning rather than environmental issue. To this extent, the issue of public open space allocation will be addressed in the subdivision approval process.

It should also be noted that the maximum water table in the area is reported to be at about 5 metres AHD. The public open space is focused on reserving land generally below the 5 metre contour. If open space is to be provided in other locations, the amount of land reserved in seasonally damp areas would need to be reduced and fill imported for its development to the detriment of the environment and at increased cost passed to home buyers. Approximately 10 ha of a total of approximately 60 ha of the subject land is reserved for Parks & Recreation under the Region Scheme. A further 4.9 ha is shown as public open space. Accordingly around 25% of the land consumed as open space with the result that the development cannot justify more.

1.2 How will the paperbark thicket (associated with the eastern portion of Tamworth Hill swamp) which is to be preserved be managed to retain its water regime which will ensure the long term survival of the vegetation? Paperbarks cannot survive being permanently inundated and require a fluctuating water level with a drying out period during summer.

Response (1.2)

The plans incorporate a lake around the thicket. This lake is to be connected to the superficial water table with the result that the natural water regime of the area will be maintained. The lake will need to be dug below the RL of the water table to maintain a permanent water surface however, the water table within the island containing the thicket will drop in accordance with the drying out process over summer as will the water level within the lake. Accordingly the water regime associated with the paperbark thicket will be managed by natural processes.

1.5 The City of Rockingham has requested that the applicant locate POS (Public Open Space) on the northern boundary of the property, particularly given the presence of significant vegetation in that area. Although the vegetation may not be regionally significant, it is believed that the retention of this area combined with POS on the adjoining property could provide a focal POS area.

Response (1.5)

Retention of natural vegetation will occur within the pipeline easement, along the proposed new alignment of Nairn Road and within the tramway reserve alongside Baldivis Road. There is very little natural vegetation within the pipeline easement however as most of the land within the easement is proposed to be open space, there is no reason why the local authority into whom management responsibility is likely to be vested cannot maintain that vegetation.

Currently Nairn Road is an Important Regional Road under the Metropolitan Region Scheme. As a region scheme reserve, the proponents are prevented from carrying out any development on this land without the permission of the Western Australian Planning Commission (apart from the erection of boundary fencing). The planning of roadworks within the Important Regional Road reservation is the responsibility of the Western Australian Planning Commission and the City of Rockingham. The proponents have no influence over works within the Road Reserves.

2.0 Groundwater Quantity

2.1 The CER does not address the issue of private bores although it does state that large scale groundwater abstraction from the Stakehill Mound would require licensing by the Water Corporation. How will this protect Tamworth Hill Swamp? It is suggested that restrictions on bores should be addressed now as delaying a decision would lead to difficulty in obtaining community acceptance and compliance.

Response (2.1)

Groundwater abstraction licences are issued by the Water & Rivers Commission, which takes the demands of the environment into account when assessing applications for bore licences.

The agricultural development of the land and associated clearing over a substantial part of the development area is likely to have already resulted in a rise in the natural water table as transpiration by trees and native vegetation no longer occurs and recharge is increased. The development of housing and domestic gardens serviced by reticulated water supply will result in the importation of water to the area further increasing the quantity of groundwater capable of being abstracted by domestic bores whilst maintaining environmental function.

2.2 The conclusions in Table 2 of the report which relate to the potential impact on groundwater from different landuses have little credibility. These conclusions are in dispute and as such should not be accepted by the EPA when making decisions on landuses affecting groundwater.

Response (2.2)

It is well established in the technical literature that agricultural activities and in particular market gardening or horticulture, have significant potential to export nutrient and other pollutants. In the amendment area these landuses will be removed and replaced by sewered residential uses with reduced potential to pollute if appropriately managed as proposed.

No grounds are supplied for disputing the conclusions in Table 2 which are adapted from previous scientific studies.

2.3 The land formation in the area of Spearwood Sands over Limestone provides an excellent natural filtration system. Maintaining the quantity of the water supply in this area is very important. The superficial aquifer referred to on the Stakehill Mound is that which provides household and agricultural/horticultural water to all existing homes in the rural area of Baldivis.

Therefore, how will the quantity of the groundwater associated with Stakehill Mound be managed to ensure that the groundwater resource does not become depleted as a result of excessive abstraction.

Response (2.3)

The abstraction of groundwater will be controlled by the Water and Rivers Commission, however it should be noted that the site is not located in a "priority" catchment area. Furthermore, as discussed previously, the development will be connected to a reticulated water supply with the result that water will be imported to the area. Lot sizes at around 600m² are comparatively small when compared with many established parts of the metropolitan region. Even in established parts of the metropolitan region where there are domestic bores reticulating larger lots, the number of bores as a proportion of all lots seldom exceeds 25%. Where lot sizes are small the economic justification for establishing a bore is much reduced with the result that a higher proportion of gardens may be expected to be reticulated from the public water supply system. This will result in water being imported to the land rather than abstracted.

2.4 What are the figures for the abstraction of groundwater drawn from domestic bores or municipal bores to water parks and gardens in areas which have access to a reticulated water supply? These need to be included in the report.

Response (2.4)

Any figures presented in relation to possible abstraction of groundwater from domestic bores or municipal bores to water parks and gardens would be estimates. Refer to Responses 2.1 & 2.3

2.5 The lowering of groundwater levels is not supported as this will lead to an export of nutrients off the site and will impact adversely upon natural vegetation. Subsoil drains may be installed to control increases in groundwater levels resulting from urbanisation, however, these should be located no lower than the Annual Average Maximum Groundwater Level (AAMGL).

Response (2.5)

A rise in water table is normally associated with the urbanisation of land. However, as a result of the clearing that has already occurred, the establishment of domestic gardens may result in ultimately a slight decline in the present (already elevated) groundwater level. As this land is not to be drained to lower the AAMGL, there will be no export of nutrients.

2.6 The Urban recharge rate quoted may not be accurate as most stormwater from the Perth urban area goes into stormwater drains, and out to sea. However, with the infiltration means envisaged as part of the development, this proposal should be better than that achieved in Perth.

Response (2.6)

The stormwater system designed for the project is based upon infiltration and Best Management Practices rather than collection and export to the sea. No exporting of stormwater from the site is proposed.

2.7 Although the pre-clearing recharge rate is given as only 12%, the underground reservoir has been built up over thousands, perhaps millions of years. The recharge rate from totally cleared pastoral land is given as 50-60%, but this is more than off-set by usage which did not exist pre-settlement.

Response (2.7)

There is no basis to the claim that recharge rates will be more than offset by usage of groundwater resources which do not exist pre-settlement. The clearing of the land has undoubtedly resulted in a rise in the water table. Development will be accompanied by the importation of water and the discharge of stormwater from roofs and roads direct via soakage.

2.8 The report indicates that groundwater recharge from the site relies on groundwater movement from the Swan Coastal Plain in the west. However, the City of Rockingham's Environmental Impact Review Officer indicates that on-site recharge is the main input to the Tamworth Mound. The City of Rockingham, therefore, seeks confirmation from the EPA that the findings and conclusions of the report are correct given the on-site groundwater recharge.

Response (2.8)

The CER clearly describes the process of recharge beneath the site for both summer and winter seasons and additionally describes regional recharge and groundwater flow characteristics (see CER Section 4.1.2).

3.0 Wetlands

3.1 Tamworth Hill Swamp should be fenced, signposted and under management before urban development proceeds. Why has this issue not been addressed?

3.2 As the balance of the wetland has already been wholly or parkland cleared for grazing, an excellent solution would be to incorporate the remaining tongue of the wetland within the urban area, into the development as envisaged. The preservation of the paperbark island within the permanent lake would at least conserve a fraction of the previous environment.

3.3 *It is critical that every opportunity is taken to safeguard the long term health and viability of Tamworth Hill Swamp. A high density urban development on the eastern side will make this difficult. However, it is appreciated that the CER provides an opportunity to put in place some protection measures and to make the best of a bad situation. Support is given for the proposed management measure not to use any land within the Rockingham Parks Tamworth Hill Swamp Management Plan for any purpose associated with the development, including drainage.*

3.4 *It has been recognised that the north-eastern corner of the wetland has been destroyed and that it is not possible to now include this area. This example of wetland loss is inexcusable.*

3.5 *Unfortunately the major decisions have already been made, and these have not all been sound, particularly in relation to keeping the Tamworth wetland system intact, and with an upland buffer or an opportunity to regenerate an upland buffer. The compromises proposed in the CER are reasonable in respect of this wetland.*

Response (3.1 to 3.5)

The issue of management of the Tamworth Hill Swamp is addressed in the proposed Port Kennedy and Rockingham Parks Management framework. The CER advises of this fact under part 5 - relevant environmental factors and management.

Support for incorporating the remaining tongue of wetland within the urban area and preservation of the paperbark island within the permanent lake is appreciated. Support for the proposed management measure of not using and land within the Rockingham Parks Tamworth Hill Swamp Management Plan for any purpose associated with the development, including drainage is also noted.

The loss of wetland is acknowledged, however, this is outside the boundaries of the development area. It is appreciated that submissions recognise that the compromises proposed in the CER in relation to retaining the Tamworth Wetland System are considered reasonable.

4.0 Terrestrial Fauna

4.1 What about the potential for mosquito and midge problems associated with the incorporation of the wetland into the subdivision? How will this potential problem be managed?

Response (4.1)

It is well known that swamps and lakes can contribute to mosquito and midge problems. People buying into the area of Baldivis will be aware of the presence of wetlands and must reasonably take this into account when purchasing their properties. The drainage proposals related to the development will maintain a high quality of water within wetlands reducing the likelihood of wetland systems becoming "out of balance" which often results in plagues of midge. Tree planting within open spaces around wetlands will filter the penetration of light from housing to wetlands further reducing the potential for nuisance. Trees will also inhibit the path of insect flight, particularly insects on the wind.

POLLUTION MANAGEMENT

5.0 Surface Water Quality

5.1 The use of soakwells is considered an effective method of removing pollutants and containing runoff related to stormwater. Stormwater should be directed towards soakwells with the capacity to contain the first 10mm of rainfall. Runoff from house roofs should also be directed towards soakwells located within each allotment.

5.2 *Water conservation and water sensitive design are strongly recommended as features for the development.*

5.3 *The design of infiltration basins should be referred to the Water and Rivers Commission for comment.*

5.4 *Incorporation of the drainage basins into parklands, rather than into wetlands, will assist in maintaining the water quality of these seasonal sumplands, an important breeding ground for water birds.*

5.5 *Allotments created by the proposal must be supplied with reticulated water and connected to a reticulated sewerage service. If a reticulated sewerage service is not practical, allotments should be connected to an approved on-site disposal system.*

Response (5.1 to 5.5)

The drainage system proposed for the subdivision involves infiltration through soakage basins. There will be no direct discharge from the property. There is no proposal to link the drainage from house lots to the road drainage system. Each household will need to direct runoff from roofs as well as hard surfaces on-site to soakwells within each allotment.

The development adopts many of the water sensitive urban design principles, in particular the on-site infiltration of all stormwater with no discharge of stormwater off-site. The infiltration basins will be designed in accordance with standard engineering practice and in accordance with the requirements of the City of Rockingham and the designs will be referred to the Water & Rivers Commission for comment.

Drainage basins are incorporated into parklands where parklands are proposed. In particular, there is to be an infiltration basin within the parkland to the north of subdivision area and east of the proposed Nairn Drive road reserve.

The subdivision is to be fully serviced with reticulated deep sewerage and water supplies.

6.0 Groundwater Quality

6.1 *The land formation in the area of Spearwood Sands over Limestone provides an excellent natural filtration system. Maintaining the purity of the water supply in this area is very important. The superficial aquifer referred to on the Stakehill Mound is that which provides household and agricultural/horticultural water to all existing homes in the rural area of Baldivis.*

Therefore, how will the quality of the groundwater associated with Stakehill Mound be managed to ensure that recharge quality is high?

Response (6.1)

The proposed subdivision is to be deep sewered minimising risks of polluted water supplies within the superficial aquifer. The risk of groundwater pollution as a result of urban development is acknowledged within government studies to be low to moderate particularly where the development is deep sewered.

Stormwater will be treated using best management practices prior to infiltration in accordance with DEP guidelines. Potentially polluting landuses, specifically farming will be replaced.

6.2 *What will be the distance of separation between the building pad and the AAMGL? It is suggested that this distance should comply with local government and Health Department regulations. As a minimum the building floor level should be 1.2m above the AAMGL.*

Response (6.2)

The AAMGL in this locality is at approximately 5 metres AHD. Most of the development area is above 10 metres AHD and consequently well clear of groundwater. Where land is approximately 6.5 metres or lower and is to be developed for housing, filling and sub-soil drainage will be required.

6.3 *The commitments in the CER to protect the quality of the groundwater are supported.*

6.4 *The comparisons of Pre and Post-Development nutrient and pollutant loads are not necessarily accurate. The figure used for current fertiliser use is based on assumptions whereas there is actually no indication of current fertiliser use (if any), particularly uncleared. Also the carrying capacity does not necessarily equate to the actual stocking rate on the land which may be much less, and animal manure is a natural outcome of grazing, whilst domestic fertilisers are largely chemically based.*

6.5 *Fertiliser application for grazing is normally once a year, if at all, whilst lawns and gardens are fertilised frequently. Also what about herbicide and pesticide usage? This is often more frequent in an urban development situation.*

6.6 *In calculating post-development nutrient loads, consideration should also be given to the fact that urban stormwater consists largely of fuel and vehicle residue which will also contribute nutrients to the groundwater.*

6.7 *Activities involving the discharge of liquid industrial wastes should only be permitted under strict regulations, including:*

- a) *secure containment measures should be installed to facilitate waste removal by registered recycling/sullage contractors, to an off-site disposal site approved by the Department of Environmental Protection, or,*
- b) *connection to sewer, provided the discharge is in accordance with the Water Corporation's Industrial Waste Acceptance Policy.*

Response (6.3 to 6.7)

Currently use of the land for rural purposes, the grazing of cattle, is minimal in anticipation that the land will be urbanised. The owners simply lease the property for grazing so that grasses are managed and some income is earned in order to defray holding costs. If the land were not to be developed for urban purposes, rural activities would be substantially intensified and such activity could occur without the necessity to gain approval as rural pursuits are a current legitimate use. The land is also potentially market gardening land and this activity is also a reasonable alternative in the event that urbanisation cannot proceed. It is against this background that the comparisons of rural occupation and urban use are made. In the event that rural activities were intensified fertiliser application would be greater and particularly in the event of market gardening, there would be far greater use of herbicides and pesticides.

The presence of hydrocarbons in stormwater runoff is generally minimal. The subdivision area is to be used for residential purposes with no commercial activities consequently there will be no liquid industrial wastes.

SOCIAL SURROUNDINGS

7.0 Public Health and Safety

7.1 *What are the current or future operational procedures for the CMS - Parmelia Gas Transmission Pipeline? This needs to be addressed as it is normal practice overseas to reduce allowable stresses of pipelines that pass through areas of high population density.*

7.2 *What is the design pressure for the pipeline? It may have been set according to the fact that the pipeline was to pass through uninhabited areas, but this situation is about to change.*

Response (7.1 & 7.2)

At page 25 of the CER it is noted that the pipelines at Yangebup and Baldivis have the same dimensions including wall thicknesses, strength and operating pressure. The position in Western Australia is that pipeline within the metropolitan area conforms to metropolitan standards with a change of standards outside the metropolitan area. As a consequence of Baldivis being within the metropolitan area, the metropolitan standards apply. The licensed operating pressure is 813psi (5.61M Pa). This is in compliance with metropolitan standards which apply to the Baldivis area as well as inhabited areas elsewhere within the metropolitan region for this pipeline.

7.3 *What about informing new landowners of the presence of the gas pipeline and its implications? How will this be done?*

Response (7.3)

The presence of the gas pipeline will be signposted. Signs locating the pipeline are placed within site distance of one another. Where the pipeline passes through private property, there is an easement registered on the title advising landowners of the presence of the pipeline. In addition, CMS carries out regular patrols of the pipeline with the result that landowners directly affected are made aware of the presence of the pipeline.

7.4 Dimensions of the CMS gas pipeline easement are given as a width of 12.191m and that of the unused Alcoa easement as 6.095m, giving a total of 18.286m. However, the recommended and recognised width for public health and safety purposes has been set at 32m.

Response (7.4)

The easement covering the gas pipeline is established for operational purposes such as servicing the pipeline allowing adequate space for vehicles and other equipment to work on the pipeline. The requirements for the easement should not be confused with the requirement for a buffer which is based on separate issues.

7.5 On September 12, 1998 the Western Australian government advertised for expressions of interest to increase gas pipeline capacity between the North West and South West of the State. This requirement would increase the easement width from 30m to 100m. How will this affect the development?

Response (7.5)

The advertisement by the Western Australian government for expressions of interest to increase gas pipeline capacity between the north-west and the south-west of the state does not affect the CMS pipeline. This advertisement relates to the Dampier to Bunbury pipeline which is approximately 2.5 kilometres to the east of the CMS pipeline. It will therefore not affect the development.

7.6 *What about the additional risks that may result from usage in the future of the second pipeline easement which is registered to Alcoa of Australia (WA) Ltd?*

Response (7.6)

The Alcoa easement is not currently utilised. Were Alcoa to use the easement to locate a second pipeline, they would need to make application for approval to construct that pipeline. That application would then be assessed and risk factors taken into account in granting any approvals. It is therefore not envisaged that risks for people living within 32 metres of the gas pipeline would be increased.

7.7 *How will public liability issues associated with the CMS - PARMELIA gas easement be handled? These issues must be addressed given that it is proposed to provide POS over the easement.*

Response (7.7)

Where the CMS easement is located within Public Open Space, the normal public liability insurances would be carried by the Council and/or government body in which it is vested. CMS must approve any works within its easement and can therefore control risks associated with works. CMS also carries public liability insurance in the event of damage/injury if responsibility is shown to rest with the Company. In summary, if somebody using Public Open Space over a gas main were injured by an accident associated with the pipeline, the legal system would need to conclude whether the claim is against the government/local government's public liability policy or if CMS is shown to be negligent/responsible then the claim would be against the Company's policy.

7.8 *The subdivision plan (Figure 10) does not show the 32m separation between the easement and the residential boundaries. This buffer distance needs to be reflected.*

Response (7.8)

The 32 metre separation is between the centre of the pipeline and the boundaries of the residential lots and not between the edge of the easement and the boundary of the residential lots. Accordingly, the subdivision plan shows the correct buffer distance.

7.9 The CER refers to a Quantitative Risk Assessment prepared by Stratex Pty Ltd for HomesWest. The Department of Minerals and Energy's understanding of the separation distances of 32m to residential boundaries and 96m to sensitive development are based on the same pipeline in another location (Yangebup/Kogolup).

Response (7.9)

As illustrated in the comparison on page 25 of the CER, the construction standards and operating pressure of the pipeline at Baldivis and Yangebup are identical. Accordingly, the Stratex Quantitative Risk Assessment has relevance to the Baldivis location.

7.10 Limiting the number of crossing points over the pipeline, early provision for the installation of services and the construction of a dual use concrete pathway over the pipeline will also assist in minimising the risk to public health and safety.

Response (7.10)

The measures of early installation and services and conduits for possible additional services, the construction of the concrete pathway over the pipeline and the minimisation of the number of crossing points are all commitments within the CER.

8.0 Other

8.1 Although zoned Urban under the Metropolitan Region Scheme, and within the Development zone of the City of Rockingham Town Planning Scheme No. 1, the small size of the house blocks tends to destroy the rural atmosphere of the district, and it would be preferred if there was a greater mix of block sizes, as in the buffer areas being observed in other developments.

Response (8.1)

Lots 1 & 2 are immediately to the north of the Baldivis Town Centre. This will be an area of intense commercial and residential development which will alter the character of Baldivis, particularly that part of Baldivis to the north of Safety Bay Road. The development of Lots 1 & 2 will be in conformity with this new character however the area has a strip of urbanisation to the north of Safety Bay Road will be buffered on the west by the Tamworth Hill Swamp Region Open Space and on the east by the Tramway Reserve running parallel and to the east of Baldivis Road. Accordingly areas to the west and the east of the subject land will be adequately buffered from the urban development.

8.2 If Nairn Road is to be fenced adjacent to Tamworth Swamp, it would be desirable to have a firebreak established outside the perimeter fence. This would assist in preserving the parkland area and also provide a walk trail for people who seem to be forgotten in most modern developments. Provision should also be made for a dual use cycle/walkway to be established in the future.

Response (8.2)

The management of Nairn Road and the Tamworth Hill Swamp Reserve will be vested in other parties. The developers have no authority over the management of either of these reserves. It is however clear from the proposed Port Kennedy and Rockingham Parks Management Plan that trails and fencing are indeed proposed. In addition, it is also normal practice for dual use paths to be accommodated within the reserves of Important Regional Roads such as Nairn Road.

8.3 The proposed location of the fencing (Port Kennedy and Rockingham Parks Management Framework, Figure 16) should follow the proposed Nairn Road alignment more closely. As stated in the CER the Management Framework does not make any recommendations about the more easterly part of Tamworth Hill Swamp which will be cut off by the road alignment and this would most likely be due to the constraints of the consultant's brief which was set by the government.

Response (8.3)

The location of fencing within the Tamworth Hill Swamp Reserve is a matter for the management authorities. It is unknown what the Consultants Brief was in relation to that consultant's appointment to prepare the Port Kennedy and Rockingham Parks Management Framework.

8.4 The protection of all land within the Rockingham Regional Park including Tamworth Hill Swamp is supported as is the stated environmental objective "to maintain the long term health and viability of Tamworth Hill Swamp including adequate buffers and long term management". Unfortunately, due to poor government decisions in the past, including the reservation of land through part of the Tamworth wetland system for a regional road, and approval of a residence on Lot 640 Eighty Road, it is not possible to set aside adequate buffers either on the western or eastern side of the Tamworth wetland system.

Response (8.4)

The statement that it is not possible to set aside adequate buffers either on the western or eastern side of the Tamworth Wetland System is noted.

8.5 The issue of the alignment of Nairn Road was raised by community groups at the 1992 South West Corridor Advisory Committee Meetings and also in commenting on the South West Corridor (Stage B) Metropolitan Region Scheme Amendment No. 937/33 but was still proceeded with. Unfortunately during the amendment process the alignment failed to attract the attention it deserved probably due to the number of environmental issues being considered, making it impossible now to set a satisfactory buffer zone.

When the EPA formally assesses or provides advice on service corridors, including road alignments, it is essential that the issue of buffer zones be an integral part of their recommendations. Support is given to the approach taken by the Water and Rivers Commission and the Davies and Lane Guidelines on buffer zones on the Swan Coastal Plain. Decisions on road alignments which affect the ability to set adequate buffer zones on wetlands must be dealt with in the early planning stages.

Response (8.5)

The issues raised at 8.5 are statements of opinion in relation to planning and environmental assessment procedures.

8.6 The Department of Environmental Protection should be aware that the City of Rockingham has not supported a Comprehensive Development Plan for the subject land and the Structure Plan listed as Figure 10 in the CER has not been assessed by Council. As the proposed plan has not been supported by the Council, there are various issues relating to this plan which remain to be resolved, including the location of Public Open Space, integration of the drainage and POS, the lack of higher density residential sites in the estate, the road hierarchy and the design of the subdivision.

Any approval by the EPA for the CER should not restrict Council's or the Western Australian Planning Commission's ability to negotiate modifications to the proposed Structure Plan.

Response (8.6)

Subdivision approval from the Western Australian Planning Commission is required before development can proceed. That subdivision approval cannot be granted until this CER process has been concluded. As part of the subdivision approval process, the Council of the City of Rockingham has been consulted and has made recommendations to the Planning Commission. Council's comments and recommendations will be taken into account by the Commission in deciding the subdivision application.

8.7 The acquisition of the Parks and Recreation Reserve by the Western Australian Planning Commission should be pursued as a priority by the Commission to facilitate the implementation of the Management Plan for the overall Reserve.

8.8 The POS provision and its purpose for drainage and/or active/passive recreation will be assessed by the City of Rockingham in further detail at the Comprehensive Development Plan stage. Detailed designs and a POS Schedule will be sought from the applicant. Council is mindful of the need for usable areas of POS to not be dominated by water features.

Response (8.7 & 8.8)

The proponents are in agreement that the Western Australian Planning Commission should pursue acquisition of the Parks & Recreation Reserve as a priority facilitating the implementation of the Management Plan for the overall reserve. The proponents believe that a reasonable balance has been struck in relation to the provision of Public Open Space. The plan shows the full requirement of Open Space allowing only a 50% credit for water features.