

**City of Armadale Town Planning Scheme No. 2
Amendment No. 134, Rezoning from Rural “X”
to Residential “Development Area”, Lot 1
Hilbert Road, Brookdale**

City of Armadale

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

**Environmental Protection Authority
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Assessment No. 1094

Summary and recommendations

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the City of Armadale Town Planning Scheme No. 2 Amendment No. 134. This Amendment proposes the rezoning of Lot 1 Hilbert Road, Brookdale, from Rural “X” to Residential “Development Area”.

The report has been prepared pursuant to section 48D of the *Environmental Protection Act 1986*. Section 48D requires the EPA to report to the Minister for the Environment on the relevant environmental factors, and the conditions, if any, to which the Amendment should be subject. In addition, the EPA may make recommendations as it sees fit.

Relevant environmental factors

In the EPA’s opinion, the following are the environmental factors relevant to the Amendment, which require detailed evaluation in the report:

- (a) protection of the river and estuarine systems into which Lot 1 Hilbert Road drains; and
- (b) enhancement of Wungong Brook.

Conclusion

The EPA has considered the City of Armadale Town Planning Scheme No. 2 Amendment No. 134 to rezone Lot 1 Hilbert Road, Brookdale, from Rural “X” to Residential “Development Area”.

The EPA notes that an urban water management strategy is underway for the Southern River-Forrestdale-Brookdale-Wungong Structure Plan study area in which Lot 1 is located, that more detailed planning is required for the site before development may occur, and that the Responsible Authority proposes a range of scheme provisions to address drainage and nutrient management and protection of the Wungong Brook foreshore.

The EPA has concluded that it is unlikely that the EPA’s objectives would be compromised, provided there is satisfactory implementation of the recommended conditions set out in Appendix 5 and summarised below.

While the EPA considers that the subject Amendment that was initiated in 1996 can proceed subject to environmental conditions, the EPA advises that a number of environmental matters within the broader Southern River-Forrestdale-Brookdale-Wungong District Structure Plan Area require further attention before the broad land use changes proposed in the Structure Plan can be considered acceptable (EPA 2000). The EPA considers that the completion of the Urban Water Management Strategy being undertaken for the Structure Plan area, and the subsequent demonstration that land use changes proposed are compatible with the Strategy, is essential prior to further rezoning of land for intensive land use within the area.

Recommendations

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

1. That the Minister notes that the scheme amendment being assessed is the City of Armadale Town Planning Scheme No. 2 Amendment No. 134 to rezone Lot 1 Hilbert Road, Brookdale, from Rural “X” to Residential “Development Area”;
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 it is unlikely that the EPA’s objectives would be compromised, provided that, if the Amendment proceeds, there is satisfactory implementation of the recommended conditions set out in Appendix 5, and summarised in Section 4;
4. That the Minister imposes the conditions recommended in Appendix 5 of this report;

5. That the Minister notes that the EPA considers that it is imperative that no further land use changes are initiated within the area covered by the Southern River-Forrestdale-Brookdale-Wungong District Structure Plan until the Urban Water Management Strategy for the area has been completed and it has been demonstrated that the land use changes proposed within the District Structure Plan area are compatible with this Strategy.

Conditions

Having considered the Responsible Authority's proposed Amendment provisions and the information provided in this report, the EPA has developed a set of conditions which the EPA recommends be imposed if Amendment No. 134 is approved. These conditions are presented in Appendix 5. Matters addressed in the conditions include the following:

- (a) the Structure Plan for the area that includes Lot 1 Hilbert Road to make appropriate provision for water management including the identification of strategic land requirements for drainage and the provision of information on drainage and nutrient management to ensure the protection of the relevant river and estuarine systems;
- (b) an Integrated Stormwater and Nutrient Management Strategy to be prepared and implemented;
- (c) a Wungong Brook foreshore reserve of minimum width of 35 metres, and a flood plain storage area of minimum width of 50 metres to be provided; and
- (d) a Foreshore Management Plan for Wungong Brook to be prepared and implemented.

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1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the City of Armadale Town Planning Scheme No. 2 Amendment No. 134. This Amendment proposes the rezoning of Lot 1 Hilbert Road, Brookdale, from Rural “X” to Residential “Development Area”.

The report has been prepared pursuant to section 48D of the *Environmental Protection Act 1986*. Section 48D requires the EPA to report to the Minister for the Environment on the relevant environmental factors, and the conditions, if any, to which the Amendment should be subject. In addition, the EPA may make recommendations as it sees fit.

Details of the Amendment are presented in Section 2 of this report, and Section 3 discusses environmental factors relevant to the Amendment. The environmental conditions to which the Amendment should be subject, if it is 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.

Appendix 6 contains a summary of submissions and the City of Armadale’s response to submissions. This appendix is included as a matter of information only and does not form part of the EPA’s report and recommendations. Issues arising from this process and which have been taken into account by the EPA appear in the report itself.

2. The Amendment

The City of Armadale Town Planning Scheme No. 2 Amendment No. 134 proposes the rezoning of Lot 1 Hilbert Road, Brookdale, from Rural “X” to Residential “Development Area”. The Responsible Authority for the Amendment is the City of Armadale.

Lot 1 occupies an area of approximately 74 hectares, and has a frontage of approximately 700 metres to Wungong Brook (Figure 1). The site is flat to gently undulating, cleared of bushland, classified as palusplain, and has been used for agisting stock. Figure 2 shows an aerial view of the locality of Lot 1.

The site is located on the divide of two major drainage catchments where water quality of the waterways is of concern, namely the Swan and Canning Rivers catchment system and the Peel-Harvey system.

The Amendment was referred to the EPA pursuant to section 48A of the *Environmental Protection Act 1986* in February 1997. The EPA decided that the Amendment should be subject to formal environmental impact assessment, taking into account a number of factors including potential impacts on the Swan and Canning Rivers system, and the pursuit of the rezoning ahead of the consideration of broader subregional drainage issues.

The City of Armadale’s Environmental Review document (Halpern Glick Maunsell 2000a) describes the proposed development of Lot 1, the existing environment, the potential environmental impacts of residential development, and the proposed management of those impacts.

A concept plan for residential development on the site is shown in Halpern Glick Maunsell (2000a). The concept provides mainly for single residential dwellings. However, group housing, schools, a local shopping centre, other community facilities, public open space, a buffer to Wungong Brook, and land to accommodate drainage requirements, are also proposed.

The Amendment, including the City of Armadale’s Environmental Review document (Halpern Glick Maunsell 2000a) was advertised for public comment for six weeks, ending 7 July 2000. The planning authorities permitted the City of Armadale’s Amendment to proceed to advertising in 2000, following the lifting of the Urban Deferred zoning from Lot 1 and adjoining land, to Urban, under the Metropolitan Region Scheme (MRS). Zoning of surrounding land under the MRS is shown in Figure 3.

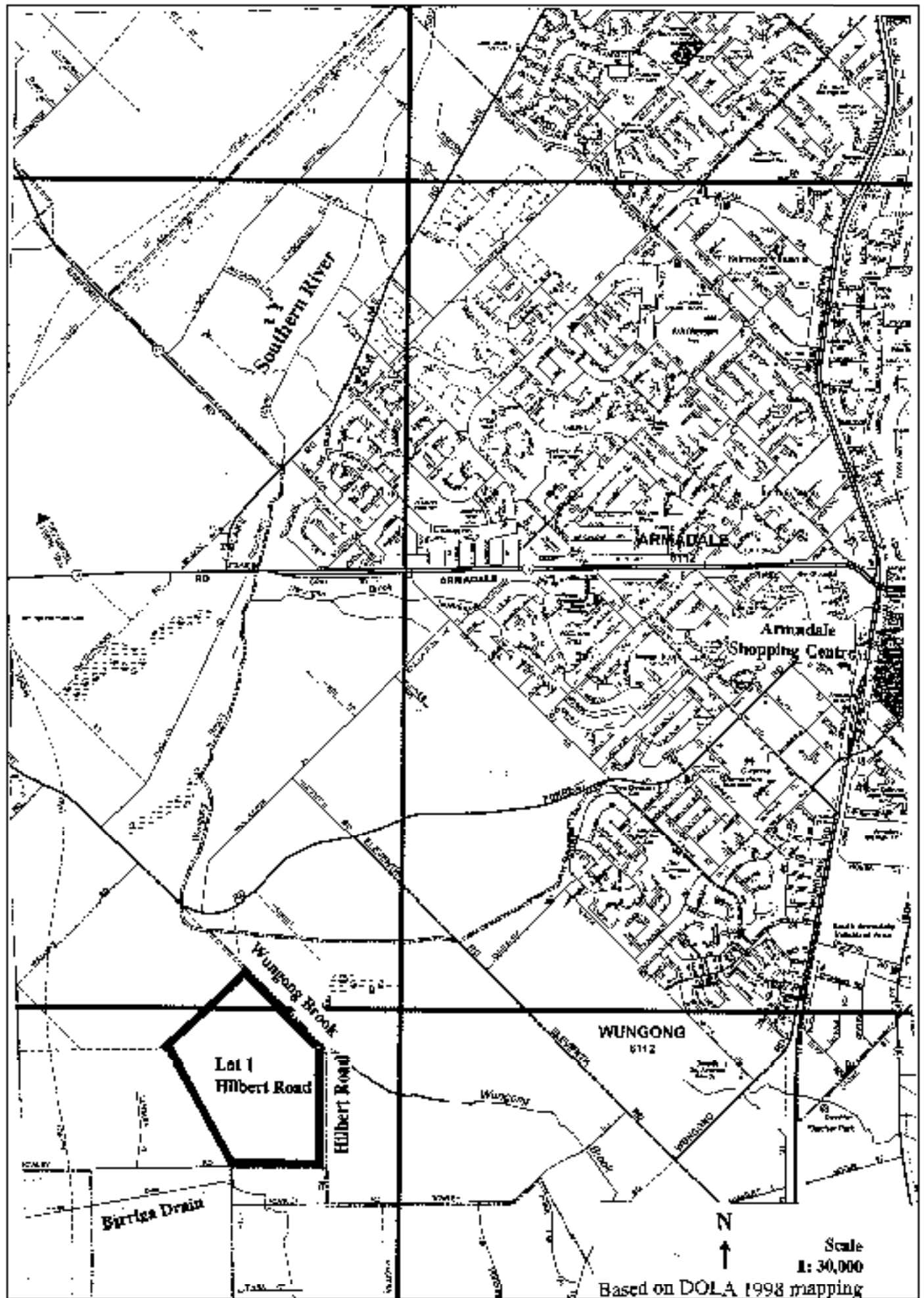


Figure 1. Location of Lot 1 Hilbert Road, Brookdale.

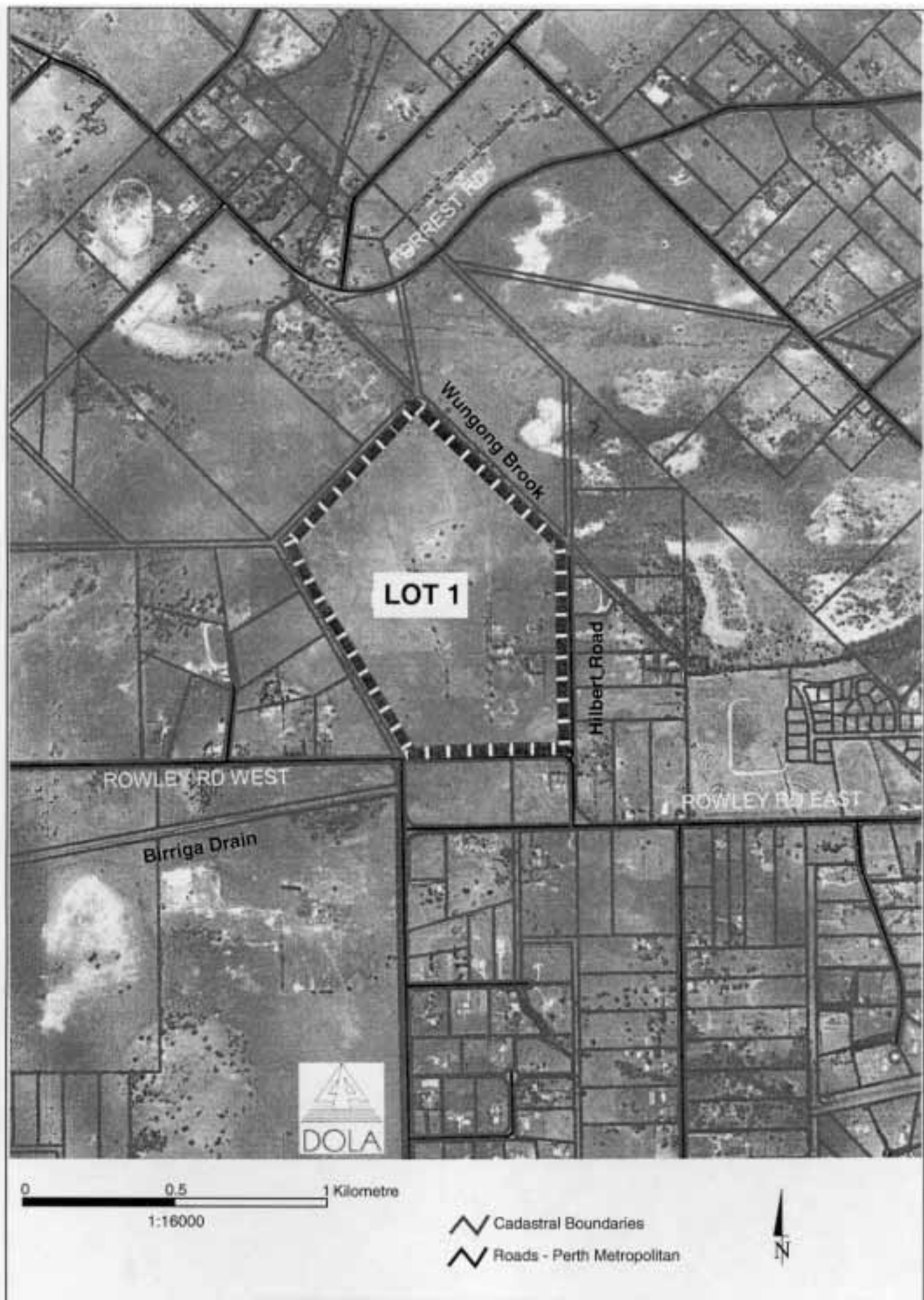


Figure 2. Aerial view of the locality of Lot 1 Hilbert Road.

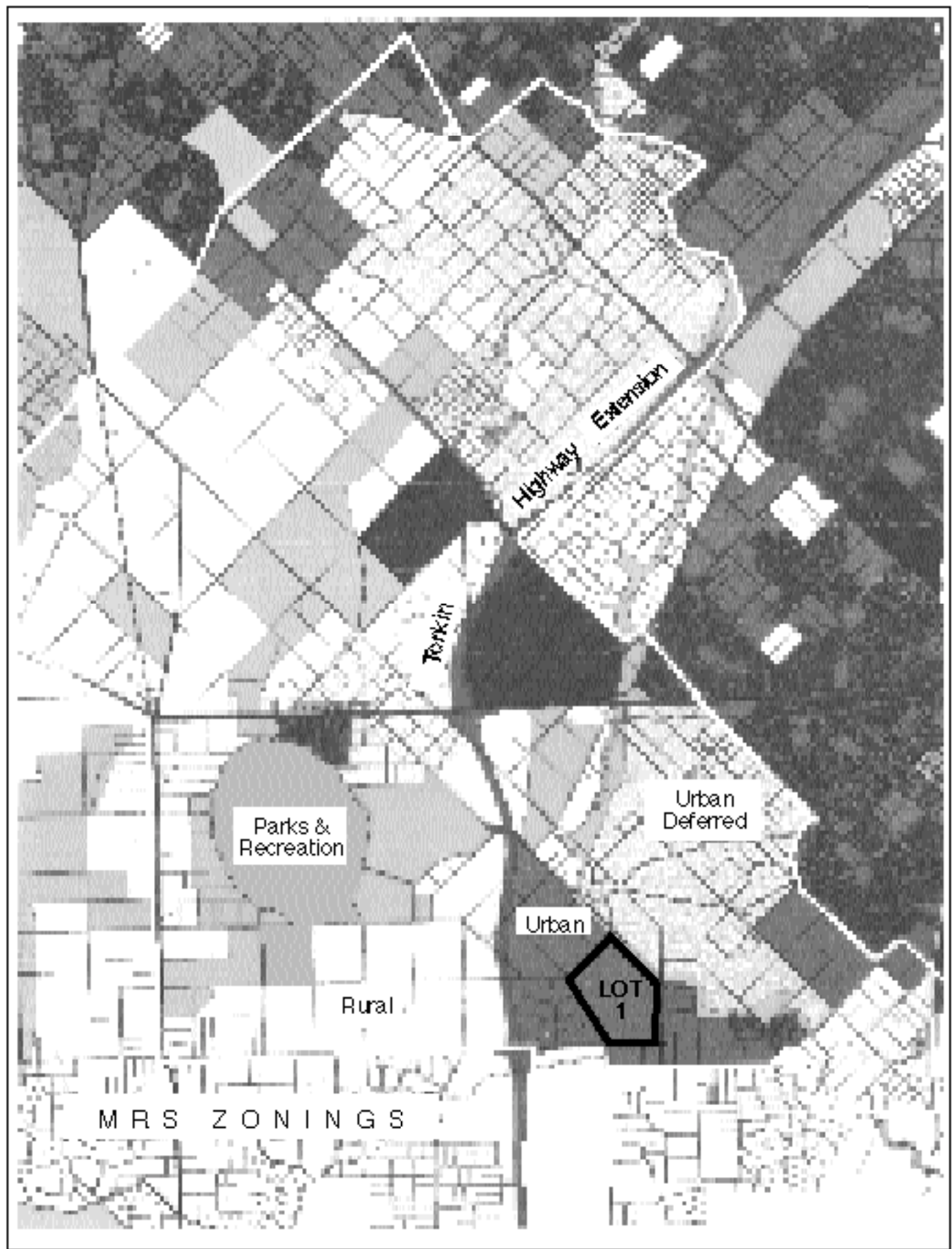


Figure 3. Surrounding land use zoning.

Three submissions raising environmental issues were lodged with the City of Armadale. These were from the Water and Rivers Commission, the Water Corporation, and a member of the public. The contents of the submissions are summarised in Appendix 6.

Following the public review period for the Amendment, the City of Armadale further developed scheme provisions to address environmental issues, as detailed in Appendix 6 and outlined in Section 3 below.

3. Relevant environmental factors

It is the EPA's opinion that the following are the environmental factors relevant to the proposal which require detailed evaluation in this report:

- (a) protection of the river and estuarine systems into which Lot 1 Hilbert Road drains; and
- (b) enhancement of Wungong Brook.

The above relevant factors were identified from the EPA's consideration and review of all environmental factors (preliminary factors) generated from the Environmental Review document and the submissions received, in conjunction with consideration of the characteristics of the development which may occur under the rezoning, and the locality.

The identification process for the relevant environmental factors is summarised in Appendix 3. The reader is referred to Appendix 3 for evaluation of preliminary factors not discussed in detail in the main body of this report, including the reasons why these were not considered to be relevant factors.

Details on the relevant environmental factors and their assessment are contained in Sections 3.1 and 3.2.

A summary of the assessment of the environmental factors is presented in Appendix 4.

3.1 Protection of river and estuarine systems

Description

Lot 1 Hilbert Road is located adjacent to Wungong Brook. Wungong Brook becomes the Southern River to the north of Lot 1 Hilbert Road and is an important tributary of the Canning River.

Regional drainage catchment plans show a portion of the site in the Southern River sub-catchment of the Swan and Canning Rivers catchment, and part of the site in the Peel-Harvey catchment (Figure 4). As shown on Figure 1, the site is near the Birriga Drain, a main drain in the Peel-Harvey Catchment. However, the site contours fall away from the Peel-Harvey catchment, and agricultural drains on Lot 1 discharge directly into the Wungong Brook in the Swan and Canning Rivers catchment (Halpern Glick Maunsell 2000a). A preliminary drainage concept for the site is described in the Environmental Review (Halpern Glick Maunsell 2000a) and provides for drainage to ultimately discharge into Wungong Brook (Figure 5).

A hydrological assessment of the site concludes that in most years the average annual maximum groundwater level would be at or just below natural ground surface (Halpern Glick Maunsell 2000a). Water and Rivers Commission mapping shows that the site is palusplain and has been assigned a management category of multiple use.

The Environmental Geology Series Map for the Armadale area and the map of soil types in the Environmental Review indicate a mixture of soil types, some sandy and some clayey.

The Environmental Review provides estimates of nutrient loads to Wungong Brook, and concludes that nutrient loads are likely to be less under residential development than under agricultural use. Information provided by Halpern Glick Maunsell (2000b) shows that water samples taken in October 2000 from groundwater in bores on Lot 1 and from Wungong Brook are generally within the current 20 year catchment targets. However, water samples from agricultural drains on the property have concentrations of nutrients significantly outside the targets.

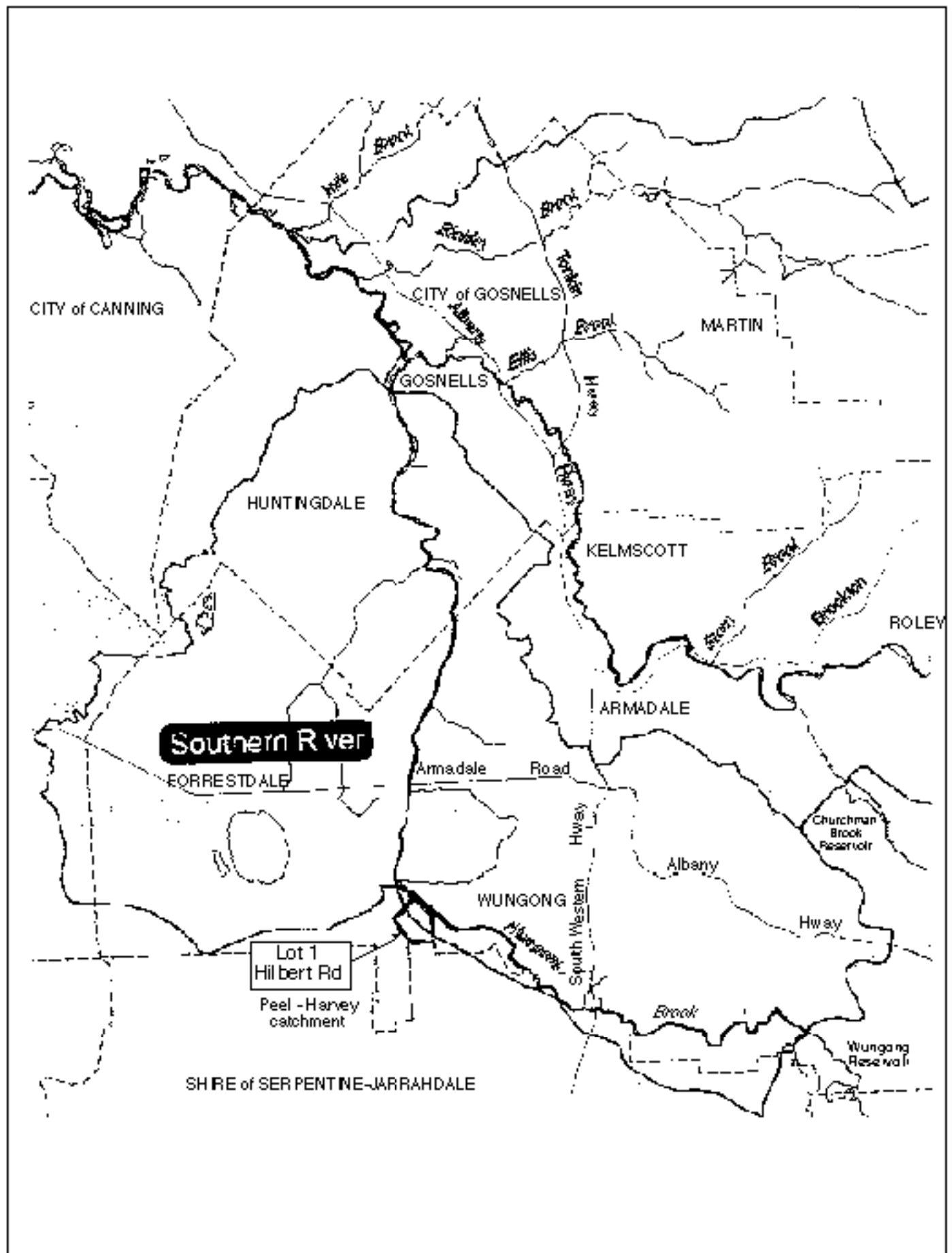


Figure 4. Catchment boundaries

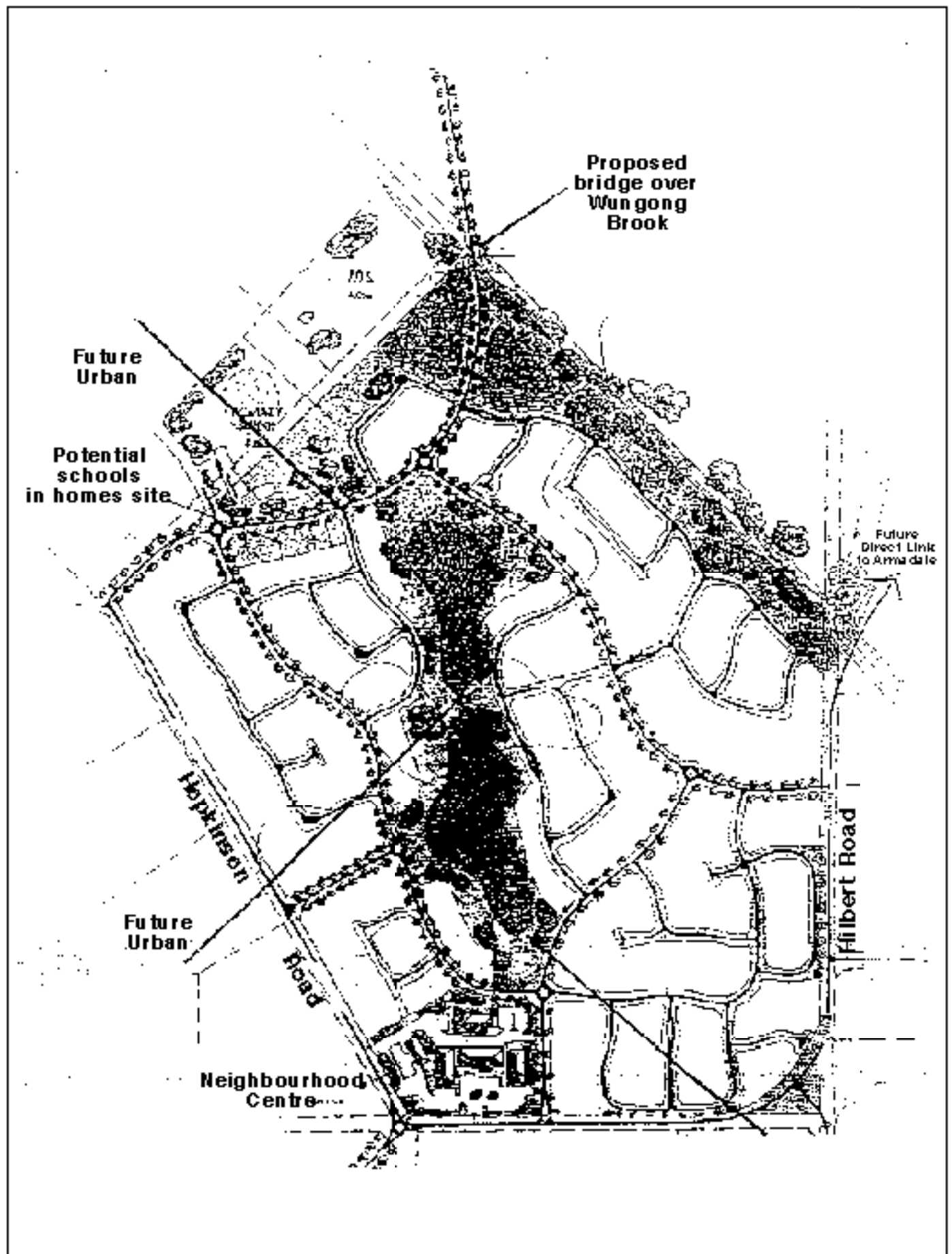


Figure 5. Subdivision Concept Plan.

Submissions

During the advertising period for the Amendment, issues raised by submitters relevant to this environmental factor include those listed below. (A complete summary of submissions is provided in Appendix 6.)

Public Submission

- The key nutrients in Wungong Brook are from urban drains rather than rural sites.
- Research shows that urbanisation on silicate soils is associated with increased nutrient runoff to waterways.
- Development in this extremely sensitive floodplain and wetland area should not proceed on an ad hoc basis but must be part of an overall comprehensive structure plan based on a catchment management approach. This cannot be achieved until the total area of the Southern River-Forrestdale-Brookdale-Wungong Structure Plan has been taken into consideration.

Water and Rivers Commission Submission

- All residential development should incorporate the principles and best management practices detailed in the *Planning and Management Guidelines for Water Sensitive Urban Design* and *A Manual for Managing Urban Stormwater Quality in Western Australia*.
- A drainage and nutrient management plan should be prepared to the satisfaction of the Water and Rivers Commission.
- Any detention basins should incorporate nutrient stripping vegetation, nutrient stripping functions and wildlife habitat.
- The average annual maximum groundwater level (AAMGL) should not be lowered through artificial drainage as this would have the effect of mobilising nutrients already in the soil and groundwater.
- Erosion controls should be implemented to ensure no erosion occurs during or after development.
- All lots should be serviced by reticulated sewer.

Water Corporation Submission

- The Water Corporation supports, in principle, the provision to compensate stormwater quantity and water quality treatment, as identified in the Environmental Review.
- Discharge to Water Corporation drains must be compensated to the predevelopment levels.

Scheme provisions proposed by the City of Armadale

Following the public review period, the City of Armadale reviewed measures to address this environmental factor, and has proposed the environmental conditions detailed in Appendix 6. These are summarised below:

- (a) the Local Structure/Outline Development Plan should include any strategic land requirements which will be required for implementation of the Integrated Stormwater Drainage and Nutrient Stripping Strategy or Systems, including requirements which are identified as necessary within regional drainage and water management strategies;
- (b) an Integrated Stormwater and Nutrient Management Strategy should be prepared prior to approval for subdivisional works or commencement of ground disturbing activity, and be subsequently implemented; and

- (c) the Integrated Stormwater and Nutrient Management Strategy should address, inter alia, objectives, ongoing management, monitoring and maintenance, contingency plans, refurbishment, periodic review, detailed designs, baseline data, water quality targets and outflow volumes, erosion controls, midge and mosquito minimisation, AAMGL criteria, implementation responsibilities, and compliance with regional water management planning.

Assessment

The area considered for assessment of this factor comprises the policy areas of the Environmental Protection (Swan and Canning Rivers) Policy 1997 and the Environmental Protection (Peel Inlet-Harvey Estuary) Policy.

The EPA's environmental objectives for this factor are:

- to restore and maintain the environmental integrity, functions and values of the Swan-Canning rivers system, consistent with the objectives of the Environmental Protection (Swan and Canning Rivers) Policy 1997; and
- to ensure that nutrient levels in waters that drain into the Peel-Harvey Estuarine system are such that the objectives and criteria of the Environmental Protection (Peel Inlet-Harvey Estuary) Policy 1992 are met.

Although Lot 1 currently drains to Wungong Brook in the Swan and Canning Rivers catchment system, it has the potential to drain into the Peel-Harvey system. In both catchments, the high levels of nutrients in the major waterways are known to adversely affect their environmental values.

Much of the locality in which Lot 1 is located has a seasonally high water table. Development is of concern since lowering of the water table to reduce waterlogging has the potential to mobilise nutrients towards watercourses and wetlands, and to adversely affect the hydrological regime on which the ecosystems of the wetlands and watercourses depend.

The EPA in August 2000 provided advice on the Southern River-Forrestdale-Brookdale-Wungong Draft Structure Plan (EPA 2000). Lot 1 is located in the structure plan study area. The EPA identified drainage and nutrient management as a key environmental issue, as the Southern River is the third highest contributor of phosphorus to the Swan and Canning Rivers system.

In particular, the EPA recommended in Bulletin 987 (EPA 2000) the development of a detailed drainage and nutrient management strategy for the Southern River Structure Plan study area prior to finalising landuse decisions. The EPA required demonstration that any changes in landuse can be managed to meet the objectives and targets of the Environmental Protection (Swan and Canning Rivers) Policy 1997 and the Swan-Canning Cleanup Program (Swan River Trust 1999).

Consistent with the EPA's recommendations, an Urban Water Management Strategy has been initiated by the Water and Rivers Commission and the Ministry for Planning for the Southern River Structure Plan study area. This will provide an overall management strategy for surface and ground water, nutrient management, and the protection of wetlands and watercourses. The brief for the Strategy also requires the development of objectives, criteria, targets, best practices, and model development controls.

However, the Amendment being considered within this report was initiated prior to the finalisation of the Urban Water Management Strategy, and the EPA is required to report on the Amendment.

Taking into account:

- the history of the Amendment, particularly that the Amendment was initiated approximately four years ago and is already zoned Urban in the Metropolitan Region Scheme; and the characteristics of the Amendment site, including the absence of regionally significant wetlands and vegetation;

- the planning process for Residential "Development Area" zones that requires that a number of planning steps are undergone before development may occur, including a structure planning phase that requires consideration of the site in its regional context;
- advice from the City of Armadale that the Outline Development Plan/Local Structure Plan should address any strategic land requirements for implementation of a drainage strategy, and should address all the current Metropolitan Region Scheme Urban Zone land to the west of Hilbert Road; and
- the underlying soils include types with higher phosphorus retention ability (see mapping in Acacia Springs Environmental (2000) and Halpern Glick Maunsell (2000a));

it is considered that the Amendment may be implemented, and that the environmental impacts of subsequent development are unlikely to compromise EPA objectives provided that there is satisfactory compliance with environmental conditions.

The EPA expects drainage and nutrient management for the Amendment site to be consistent with EPA-approved outcomes of the Urban and Water Management Strategy for the Southern River Structure Plan study area where appropriate, to ensure that adverse impacts on receiving waters do not occur, and that wetlands in the vicinity of the site are not adversely affected by hydrological modification.

The EPA provides advice with respect to further rezonings in the Southern River-Forrestdale-Brookdale-Wungong Structure Plan area in Section 5.

Having particular regard to:

- (a) the advice of the Water and Rivers Commission;
- (b) the steps in the planning process that precede development;
- (c) site characteristics and the Amendment history;
- (d) the environmental conditions proposed by the City of Armadale;
- (e) the location of the site within the catchment being such that it is not likely to compromise regional drainage strategies;
- (f) the ability of the Responsible Authority and other decision making authorities to require development to conform with regional drainage and water management strategies to ensure protection of water quality and adverse hydrological modifications to nearby wetlands; and
- (g) the ability to monitor water quality and quantity outcomes and implement contingencies to meet environmental objectives if required;

it is the opinion of the EPA that the Amendment if implemented, is able to meet the EPA's objectives provided that there is satisfactory implementation of the environmental conditions in Appendix 5. These conditions are consistent with the initial conditions put forward by the City of Armadale and include the requirements that:

- the Structure Plan for the area that includes Lot 1 Hilbert Road that is necessary prior to subdivision being approved makes appropriate provision for strategic water management including protection of the relevant river and estuarine systems; and
- a detailed Integrated Stormwater and Nutrient Management Strategy to be prepared and implemented, including a requirement for consistency with regional urban water management planning.

3.2 Enhancement of Wungong Brook

Description

Lot 1 Hilbert Road adjoins Wungong Brook for approximately 700 metres. Adjoining Lot 1 Wungong Brook is in a straight artificial canal with levy banks. The foreshore and hinterland on Lot 1 has been previously cleared and used for agisting stock. Some limited regrowth has occurred close to the Brook. The environmental values of the Brook and its foreshore are currently limited.

Wungong Brook is located on land reserved for Parks and Recreation purposes under the Metropolitan Region Scheme. The reserve is approximately 90 metres wide, and extends into Lot 1 for 30 metres.

Water and Rivers Commission floodplain mapping of the 100 year floodplain and floodway shows that adjoining Lot 1 the Wungong Brook floodplain and floodway are confined to the immediate vicinity of the Brook.

Submissions

The Water and Rivers Commission raised a number of grounds relevant to this environmental factor, including the following:

- The proposed 30 metre buffer zone along Wungong Brook should be widened to at least 50 metres to protect against potential flooding.
- A road should separate the buffer zone and residential lots.
- The subdivider should prepare a Foreshore Management Plan.
- Any planting of trees, shrubs and sedges should be sympathetic to the natural landscape and ecological well being of Wungong Brook.
- Erosion controls should be implemented during and after any development.
- All drainage with outfalls to watercourses should meet with the Water and Rivers Commission's drainage management guidelines for Water Sensitive Urban Design.

Scheme provisions proposed by the City of Armadale

Following the public review period, the City of Armadale has reviewed measures to address this environmental factor, and proposes the environmental conditions summarised below:

- a minimum 50m buffer from Wungong Brook to all private development to provide for flood plain storage;
- a minimum of 35m from Wungong Brook to be shown as Public Open Space Foreshore Reserve;
- a street pattern which encourages strong visual surveillance over, and public access to areas of public open space, along the Wungong Brook;
- a Foreshore Management Plan for the Wungong Brook to be prepared and implemented and to include rehabilitation of the watercourse banks and Foreshore Reserve to meet high standards of landscape design and environmental function, and provide for the movement of riparian fauna; and
- a detailed Integrated Stormwater and Nutrient Management Strategy to be prepared and implemented.

Assessment

The area considered for assessment of this factor is Wungong Brook and its foreshore in the vicinity of the Amendment site.

The EPA's environmental objective for this factor is to restore and maintain the environmental integrity, functions and environmental values of Wungong Brook.

Wungong Brook is a significant tributary of the Canning River, and a protected watercourse under the Environmental Protection (Swan and Canning Rivers) Policy 1998.

Protection measures applicable to Wungong Brook under the Environmental Protection (Swan and Canning Rivers) Policy 1998 include the following:

- to restore and maintain fringing native vegetation;
- to restore and maintain habitat for indigenous fauna and flora;
- to encourage species diversity and abundance;
- to restore and maintain ecological processes, including maintaining water levels and flow;
- to restore and maintain natural landscape amenity;
- to design, construct and manage drainage systems to protect the beneficial uses of the Policy Area, and to augment the existing nutrient retention capacity of the catchment; and
- to plan and manage recreation to protect the beneficial uses of the Policy Area.

The Environmental Protection (Swan and Canning Rivers) Policy 1998 makes it obligatory for State and local authorities to take decisions and actions consistent with the environmental quality objectives of the Policy.

The EPA has also prepared draft guidelines for the protection of the watercourses of the State, generally. These require that the watercourse, the 1 in 100 year floodway and a suitable vegetated buffer are protected (EPA 1997).

In the context of the Amendment, the objectives of the EPA for Wungong Brook can be met through the implementation of environmental conditions requiring foreshore protection, rehabilitation and management to restore and maintain the environmental values of Wungong Brook.

Having particular regard to the:

- (a) the objectives and requirements of the Environmental Protection (Swan and Canning Rivers) Policy 1998, and the EPA's draft guidelines for the protection of the State's watercourses;
- (b) the potential for improvement of the degraded Wungong Brook foreshore following rezoning;
- (c) the advice of the Water and Rivers Commission with respect to foreshore and waterway management; and
- (d) scheme provisions proposed by the City of Armadale which require foreshore buffers and preparation of environmental management plans;

it is the EPA's opinion that the environmental objective for Wungong Brook can be met, provided that there is satisfactory implementation of the environmental conditions in Appendix 5. These conditions are a modification of those proposed by the City of Armadale.

4. Conditions

Section 48D of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the Amendment and on

the conditions, if any, to which the Amendment should be subject, if the Amendment is implemented. In addition, the EPA may make recommendations as it sees fit.

Having considered the Responsible Authority's proposed conditions to manage the potential environmental impacts of development on Lot 1 Hilbert Road, and the information provided in this report, the EPA has developed a set of conditions which the EPA recommends be imposed if the City of Armadale Town Planning Scheme No. 2 Amendment No. 134 is approved.

These conditions are presented in Appendix 5. Matters addressed in the conditions include the following:

- (a) the Structure Plan for the area that includes Lot 1 Hilbert Road shall make appropriate provision for water management including the identification of strategic land requirements for drainage and the provision of sufficient information on drainage and nutrient management to ensure the protection of the relevant river and estuarine systems;
- (b) an Integrated Stormwater and Nutrient Management Strategy shall be prepared prior to commencement of development or subdivision works, and shall be implemented in accordance with the provisions of the Strategy;
- (c) a Foreshore Management Plan for the Wungong Brook shall be prepared and implemented;
- (d) a buffer at least 50 metres in width shall be provided between Wungong Brook and all private development on Lot 1 to provide for flood plain storage; and
- (e) a foreshore reserve at least 35 metres in width from Wungong Brook shall be provided.

5. Other Advice

While the EPA considers that the subject Amendment that was initiated in 1996 may proceed subject to environmental conditions, the EPA advises that in the Southern River-Forrestdale-Brookdale-Wungong Structure Plan study area there are environmental matters that require further attention before the proposed broad land use changes can be considered acceptable (EPA 2000). The EPA considers that further rezonings in that study area should not be initiated until the Urban Water Management Strategy for the study area is finalized and any land use changes are shown to be compatible with the strategy. It is expected that future Metropolitan Region Scheme and town planning scheme amendments will be required to show that any proposed land use changes will avoid adverse impacts on wetlands, groundwater, watercourses, and the Swan and Canning Rivers system and Peel-Harvey system (where relevant); can be managed to meet the objectives and targets of the relevant river and estuarine systems; and will appropriately reflect EPA-approved outcomes of the Urban Water Management Strategy.

6. Conclusions

The EPA has considered the City of Armadale Town Planning Scheme No. 2 Amendment No. 134 to rezone Lot 1 Hilbert Road, Brookdale, from Rural "X" to Residential "Development Area".

The EPA notes that an Urban Water Management Strategy is underway for the Southern River-Forrestdale-Brookdale-Wungong Structure Plan study area in which Lot 1 Hilbert Road is located, that more detailed planning is required for the site before development may occur, and that the Responsible Authority proposes a range of scheme provisions to address drainage and nutrient management and protection of the Wungong Brook foreshore.

The EPA has concluded that the locational characteristics of Lot 1 Hilbert Road within the Swan-Canning and Peel-Harvey catchments are such that environmental conditions can be set for the change in land use to ensure that environmental and drainage issues are addressed prior to development proceeding. Appendix 5 sets out recommended conditions. It is the EPA's view that if there is satisfactory implementation of the recommended conditions then it is likely

that development in accordance with the proposed change in zoning can be made environmentally acceptable.

7. Recommendations

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

1. That the Minister notes that the Amendment being assessed is to rezone Lot 1 Hilbert Road, Brookdale, from Rural “X” to Residential “Development Area”;
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 it is unlikely that the EPA’s objectives would be compromised, provided there is satisfactory implementation of the recommended conditions set out in Appendix 5 and summarised in Section 4;
4. That the Minister imposes the conditions recommended in Appendix 5 of this report;
5. That the Minister notes that the EPA considers that it is imperative that no further land use changes are initiated within the area covered by the Southern River-Forrestdale-Brookdale-Wungong District Structure Plan until the Urban Water Management Strategy for the area has been completed and it has been demonstrated that the land use changes proposed within the District Structure Plan area are compatible with this Strategy.

Appendix 1

List of submitters (environmental issues)

Government Agencies

Water and Rivers Commission
Water Corporation

Individuals

P. Hart

Appendix 2

References

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Appendix 3

Summary of identification of relevant environmental factors

Appendix 3: Summary of identification of relevant environmental factors

Preliminary environmental factor	Site characteristics	Summary of Government agency and public submissions	Identification of environmental factors
<p>Surface water quality - Wungong Brook: Canning River Catchment</p>	<p>Lot 1 Hilbert Road is located adjacent to Wungong Brook, which becomes the Southern River, a major tributary of the Canning River.</p> <p>The site is flat to gently undulating, cleared for grazing, and contains sandy and clayey soils.</p> <p>The site is within an extensive area of palusplain.</p> <p>The site is also near the Birriga Main Drain in the Peel-Harvey Catchment.</p> <p>Regional catchment plans show portion of the site in the Southern River Catchment of the Swan-Canning system, and part of the site in the Peel-Harvey catchment.</p> <p>However, site contours and drainage currently appear to fall towards the north west and Wungong Brook.</p> <p>Drainage plans in the Environmental Review propose drainage towards the Wungong Brook.</p>	<p>Public Submission</p> <ul style="list-style-type: none"> • Many of the statements made (<i>in the Environmental Review</i>) are subjective. There has been no monitoring of the site. Water quality testing down stream by the Water Corporation shows that the key nutrients in the Wungong Brook were from the urban drains and not the rural sites. • The site has been leased for a number of years and not used for intensive feed lots, nor crops which required fertilising. Research shows that urbanisation on these silicate soils increases nutrient runoff (R. Gerritse). • It needs to be demonstrated that the stormwater system is part of a regional drainage system based on a catchment management approach. The total area of the Southern River Structure Plan should be considered. • Development in this extremely sensitive floodplain and wetland area should not proceed on an ad hoc basis but must be part of an overall comprehensive structure plan. • The scheme amendment should not proceed any further until the Southern River-Forrestdale-Brookdale-Wungong Structure Plan has been finalised. • In the conclusion (<i>of the Environmental Review</i>) it is stated that the only regional policy relevant to the proposed change is the draft Canning Environmental Protection Policy (EPP). This is not correct. <p>Government Agency Submission – Water and Rivers Commission</p> <ul style="list-style-type: none"> • All residential development should incorporate the principles and best management practices detailed in the <i>Planning and Management Guidelines for Water Sensitive Urban Design</i> and <i>A Manual for Managing Urban Stormwater Quality in Western Australia</i>. • A drainage and nutrient management plan should be prepared to the satisfaction of the Water and Rivers Commission. • Any detention basins should be to the satisfaction of the Water and Rivers Commission and include nutrient stripping functions and wildlife habitat values. • All drainage systems of future development should be located at or above the average annual maximum groundwater level (AAMGL). The lowering of the groundwater level through artificial drainage would have the effect of mobilising nutrients already in the soil and groundwater. • Erosion controls should be implemented to ensure no erosion occurs during or after development. • All lots should be serviced by reticulated sewer. <p>(Also see submissions under “Watercourses - Wungong Brook”.)</p> <p>Government Agency Submission - Water Corporation</p> <ul style="list-style-type: none"> • Wastewater planning has been completed for the land and the development will be serviced by the Armadale-Byford Wastewater Scheme. • Reticulated water will be provided by the Water Corporation’s Armadale-Kelmscott Lower Gravity Scheme. • The Water Corporation supports, in principle, the provision to compensate stormwater quantity and water quality treatment as identified in the Environmental Review. • The site is within the catchment of the Mundijong Drainage District in which urban developments are required to contain the flows from a one in one hundred year storm event on site. Discharge to Water Corporation drains must be compensated to the predevelopment levels. Design calculations and plans for any development will be required to be lodged with the Water Corporation for approval. • Reserves for the protection of existing Water Corporation drains should form part of the requirements for the drainage of this area. • The fill level should be the greater of either the Wungong 100 year flood study level or 1.2 m above the annual average maximum groundwater level. This will be determined by the Water and Rivers Commission. 	<p>Drainage and nutrient export arising from residential development may potentially impact on the environmental values of the Swan and Canning Rivers system, and the Peel-Harvey estuarine system.</p> <p>Protection of the Swan and Canning Rivers and Peel-Harvey Estuarine systems is considered to be a relevant environmental factor that requires further investigation by the EPA.</p>
<p>Preliminary environmental factor</p>	<p>Site characteristics</p>	<p>Summary of Government agency and public submissions</p>	<p>Identification of environmental factors</p>
<p>Watercourses - Wungong Brook</p>	<p>Lot 1 Hilbert Road adjoins Wungong Brook which becomes the Southern River, a major tributary of the Canning River.</p>	<p>Government Agency Submission - Water and Rivers Commission</p> <ul style="list-style-type: none"> • The proposed 30 m buffer zone along the Wungong Brook boundary of the development should be widened to at least 50 m to protect against potential flooding from a possible levee breach on Wungong Brook. • A minimum floor level of 0.50 m above the general natural surface level should be set for future development. • A road should separate the buffer zone and residential lots. • The subdivider should prepare a foreshore management plan that shall 	<p>The Wungong Brook foreshore is degraded.</p> <p>Enhancement of Wungong</p>

	<p>The portion of Wungong Brook adjoining Lot 1 is in a straight artificial drainage channel with levy banks, and is within a Parks and Recreation Reserve approximately 90 metres wide.</p> <p>At Lot 1 the Wungong Brook foreshore and hinterland has been cleared with local farm drains leading through Lot 1 into Wungong Brook. The foreshore is dominated by non-indigenous species with minor regrowth of indigenous riparian species.</p>	<p>include the design and implementation by the subdivider for provision of community access, walk trails, fencing, joint management between developers and government agencies, removal of declared weeds and revegetation.</p> <ul style="list-style-type: none"> • Any planting of trees, shrubs and sedges should be sympathetic to the natural landscape and ecological well being of Wungong Brook. • The proposed road crossing over Wungong Brook should be to the satisfaction of the Water and Rivers Commission, and designed to minimise erosion and any clearing required should be replanted with native species including understorey. • Erosion controls should be implemented during and after any development. • Drainage from residential development should not be directly connected to Wungong Brook, and should meet with the Water and Rivers Commission's guidelines for Water Sensitive Urban Design. • The Water Corporation is responsible for managing this section of Wungong Brook and should be contacted for their requirements. 	<p>Brook is considered to be a relevant environmental factor that requires further investigation by the EPA.</p>
<p>Other issues identified in submissions</p>		<p>Public Submission</p> <ul style="list-style-type: none"> • The cost of maintaining a development in such an environmentally sensitive area is extremely high. The ratepayers of the City of Armadale may be unaware of the financial imposition that will be placed on them if this development proceeds. • There should be a cost analysis of the maintenance that will be required for this development. • Any cost cutting of maintenance could result in increased nutrients flowing into the waterways, with the City of Armadale legally responsible to rectify the situation, given the backing of the Swan and Canning Rivers EPP and Riverplan. • Does the City of Armadale propose to strike a higher rate for properties in this Hilbert Road site to cover the additional expenses that will be required? • Over the past years we have been told on many occasions that the City is short of money because of the huge cost involved in redoing drainage that was incorrectly constructed years ago. • How does the City intend to monitor not only the Hilbert Road development but also the Churchman Brook development with all its environmental considerations, given the shortage of staff? • All Councillors should be made aware of the legal requirements of Council in the maintenance of this site before they are required to vote on this development. 	<p>These submissions either relate to issues that are addressed under the environmental factor "protection of the river and estuarine systems into which the site drains", or are beyond the scope of the assessment process, as provided for in the Environmental Protection Act 1986.</p>

Appendix 4

Summary of assessment of relevant environmental factors

Appendix 4: Summary of assessment of relevant environmental factors

Relevant Environment -al Factor	EPA Preliminary Objectives; Relevant Area	EPA Assessment	EPA Advice
<p>Protection of the river and estuarine systems into which the Amendment site drains</p>	<p>Preliminary EPA Objectives</p> <ul style="list-style-type: none"> Maintain or improve the quality of surface water to ensure existing and potential uses are protected; and to ensure the proponent meets the requirements of the draft Western Australian Water Quality Guidelines for Fresh and Marine Waters (EPA Bulletin 711). <p>Relevant area considered for assessment of this factor</p> <p>The policy areas for the Environmental Protection (Swan and Canning Rivers) Policy 1997, and the Environmental Protection (Peel Inlet-Harvey Estuary) Policy 1992.</p>	<p>The EPA objectives for this environmental factor are updated as follows:</p> <ul style="list-style-type: none"> to restore and maintain the environmental integrity, functions and values of the Swan and Canning Rivers system, consistent with the objectives of the Environmental Protection (Swan and Canning Rivers) Policy 1997; and to ensure that nutrient levels in waters that drain into the Peel-Harvey Estuarine system are such that the objectives and criteria of the Environmental Protection (Peel Inlet-Harvey Estuary) Policy 1992 and latest water quality standards agreed by the EPA and Water and Rivers Commission, are met. <p>The Amendment site comprises cleared, flat to gently undulating low-lying grazing land. It is within an extensive area of palusplain. Urban development of low-lying areas is of concern to the EPA since there is the potential for drainage schemes to mobilise nutrients in the soil and the groundwater and adversely impact on the hydrological and ecological values and functions of significant waterways and wetlands in the region.</p> <p>The site is in the Southern River-Forrestdale-Brookdale-Wungong Structure Plan area. In its recent advice on the Draft Southern River-Forrestdale-Brookdale-Wungong Draft Structure Plan, the EPA identified drainage, nutrient and flood management as a key environmental issue for this area.</p> <p>Part of the site is in the Southern River sub-catchment which has been identified as the third highest contributor of phosphorus to the Swan and Canning Rivers system.</p> <p>The EPA has recommended the development of a detailed drainage and nutrient management strategy for the Southern River study area, prior to finalising landuse decisions, to demonstrate that the changes in landuse proposed in the draft Southern River Structure Plan can be adequately managed to meet the objectives and targets of the Environmental Protection (Swan and Canning Rivers) Policy 1997 and the Swan Canning Cleanup Program. An Urban Water Management Strategy has accordingly been initiated.</p> <p>The Water and Rivers Commission as the authority with primary responsibility for protection of the State's water resources, will be overseeing the preparation of the overall Urban Water Management Strategy for the Southern River Structure Plan area. The Water and Rivers Commission has not opposed development on the subject site subject to requirements that include:</p> <ul style="list-style-type: none"> a Drainage and Nutrient Management Plan to be prepared to the satisfaction of the Water and Rivers Commission; incorporation of Water Sensitive Urban Design principles and best management practices; future development with all drainage systems located either at or above the Average Annual Maximum Groundwater Level (AAMGL); and connection to sewerage. <p>The planning process for Residential "Development Area" zones requires a structure planning phase before development may occur. The City of Armadale expects the structure plan for the area that includes Lot 1 to address any strategic land requirements for implementation of a drainage strategy.</p> <p>Scheme provisions to address environmental management proposed by the City of Armadale include the requirement that the Local Structure Plan address strategic land requirements for drainage management; and that an Integrated Stormwater Drainage and Nutrient Stripping Strategy for the site be prepared and implemented.</p>	<p>Having regard to:</p> <ul style="list-style-type: none"> the advice of the Water and Rivers Commission; the Amendment site characteristics, and history; the steps in the planning process; and the ability to impose environmental conditions requiring that the Structure Plan that includes Lot 1 shall address regional drainage water management to the satisfaction of the EPA; and that an Integrated Stormwater and Nutrient Management Strategy for the site shall be prepared and implemented; <p>it is the opinion of the EPA that the Amendment if implemented is able to meet the EPA's objectives provided that there is satisfactory implementation of the environmental conditions.</p> <p>The EPA confirms that it does not support the initiation of further Amendments in the Southern River Structure Plan area for urban development, ahead of the finalisation of an Urban Water Management Strategy that inter alia demonstrates that urban development in the Southern River Structure Plan area can be managed so as not to cause unacceptable impacts on wetlands, waterways and the relevant river and estuarine systems, due to changes in hydrology.</p>

Relevant Environment -al Factor	EPA Preliminary Objectives; Relevant Area	EPA Assessment	EPA Advice
<p>Enhancement of Wungong Brook</p>	<p>The preliminary EPA objectives for Wungong Brook are:</p> <ul style="list-style-type: none"> • to protect the environmental values of watercourses by the provision of an adequate buffer; and • to maintain existing water flow through Wungong Brook. <p>Relevant area considered for assessment of this factor</p> <p>Wungong Brook and its foreshore</p>	<p>The EPA objectives for this environmental factor are updated as follows:</p> <ul style="list-style-type: none"> • to restore and maintain the environmental integrity, functions and values of Wungong Brook. <p>Wungong Brook currently is in a disturbed condition, and is within a Parks and Recreation reserve under the Metropolitan Region Scheme.</p> <p>Protection measures applicable to Wungong Brook under the Environmental Protection (Swan and Canning Rivers) Policy 1998 include its restoration and maintenance:</p> <ul style="list-style-type: none"> • as habitat for fauna and flora; • as a biologically productive and genetically diverse natural environment; • for ecological processes; and • as an important element of the natural landscape. <p>Under the Policy, wastewater disposal, drainage and recreation need to be planned to avoid adverse impacts on the beneficial uses of the Policy area.</p> <p>EPA draft guidelines for the protection of the watercourses of the State require that the watercourse, the 1 in 100 year floodway and a suitable vegetated buffer are protected (EPA 1997).</p> <p>The Water and Rivers Commission is the authority with primary responsibility for advising on the protection of the State's water resources. With respect to the development on Lot 1 Hilbert Road, the Commission has recommended a 50 metre buffer for flood protection, the preparation of a foreshore management plan, any crossing of the Wungong Brook to be subject to approval by the Commission, and erosion and drainage controls.</p> <p>The City of Armadale proposes environmental management through scheme provisions that require setbacks for development from Wungong Brook, a street pattern that encourages surveillance of the public open space, and the preparation of a Foreshore Management Plan.</p>	<p>Having regard to:</p> <ul style="list-style-type: none"> • the Environmental Protection (Swan and Canning Rivers) Policy 1997; • the advice of the Water and Rivers Commission; • the potential for improvement of the degraded Wungong Brook foreshore under the rezoning; and • the ability to impose environmental conditions requiring foreshore buffers and preparation and implementation of a Foreshore Management Plan; <p>it is the EPA's opinion that the Amendment if implemented can meet the EPA's objective for protection of Wungong Brook, provided that there is satisfactory implementation of the environmental conditions.</p>

Appendix 5

Recommended environmental conditions

RECOMMENDED ENVIRONMENTAL CONDITIONS

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

CITY OF ARMADALE TOWN PLANNING SCHEME NO. 2 AMENDMENT NO. 134
(RESIDENTIAL “DEVELOPMENT AREA” ZONE, LOT 1 HILBERT ROAD,
BROOKDALE)

Scheme Purpose:

- (a) to rezone part of Lot 1 Hilbert Road, Brookdale, from Rural “X” to Residential “Development Area”; and
- (b) to introduce provisions associated with the development of Lot 1 Hilbert Road into the Scheme Text.

Responsible Authority: City of Armadale

Responsible Authority Address: 7 Orchard Avenue, Armadale WA 6992
(Locked Bag No. 2, Armadale WA 6992)

Assessment Number: 1094

Report of the Environmental Protection Authority: Bulletin 1009

Subject to the following conditions, there is no known environmental reason why the town planning scheme amendment to which the above report of the Environmental Protection Authority relates should not be implemented:

CONDITIONS TO BE INCORPORATED INTO THE SCHEME BY INSERTION OF PROVISIONS IN SCHEME TEXT

1 Wungong Brook

- 1-1 In the event that urban subdivision of Lot 1 Hilbert Road, Brookdale, is approved by the Western Australian Planning Commission, the subdivision in the vicinity of Wungong Brook shall provide for:
- (1) a buffer of at least 50 metres in width from the top of the defined Brook channel bank to all private development on land adjacent to Wungong Brook to provide for flood plain storage;
 - (2) a foreshore reserve to be not less than 35 metres in width from the top of the defined Brook channel bank and not less in width than the Parks and Recreation reserve;
 - (3) the foreshore reserve referred to in (2) above to be vested in the Crown upon subdivision of the land; and
 - (4) the foreshore reserve referred to in (2) above to be predominantly bound by road frontages, to the satisfaction of the City of Armadale.

2 Outline Development Plan/Structure Plan

- 2-1 Strategic land requirements for drainage and information on urban water management to

the satisfaction of the Environmental Protection Authority on advice of the Water and Rivers Commission and the Water Corporation shall be incorporated into the Outline Development Plan/Structure Plan that contains Lot 1 Hilbert Road.

- 2-2 The Environmental Protection Authority in considering approval for the strategic land requirements for drainage and information on urban water management as required by 2-1 above, requires demonstration that the drainage/urban water management system will be adequate to prevent unacceptable impacts on groundwater resources, wetlands and the relevant river and estuarine systems.

3 Environmental Management Plans

- 3-1 A Foreshore Management Plan and an Integrated Stormwater and Nutrient Management Strategy shall be prepared in accordance with the specifications set out in Attachment 1 in the Minister for the Environment's "Statement that a Scheme may be Implemented" No. [insert relevant Statement Number] published on [insert date], and shall be subsequently implemented in accordance with the provisions of the Plans, to the satisfaction of the City of Armadale.

CONDITIONS TO BE INCORPORATED INTO THE SCHEME BY MODIFICATIONS TO THE SCHEME MAP

4 Scheme Map

- 4-1 The Scheme Map for the City of Armadale Town Planning Scheme No. 2 shall be amended by inserting the symbol EC and an appropriate modification to the legend of the Scheme Map, to show that environmental conditions apply to Lot 1 Hilbert Road, Brookdale.

NOTE

To introduce environmental conditions into the City of Armadale Town Planning Scheme No. 2, new clauses are required to be inserted in the Scheme Text following on from the existing clauses which deal with "Provisions relating to Specified Areas" and with suitable renumbering of the subsequent clauses of the Scheme. Clauses are numbered below to suit the Scheme as it is Gazetted at 1st January 2001. It is noted that other Scheme Amendments currently being processed may be Gazetted prior to Amendment No. 134 and therefore the Scheme Clauses or Schedules may require renumbering to suit the Scheme as it is Gazetted at the time of finalisation of Amendment No. 134. The following clauses are required to be inserted in the Scheme Text:

- “ 5.10.1 Environmental conditions to which the Scheme is, or amendments to the Scheme are, subject are incorporated into the Scheme by Schedule 2 of the Scheme.
- 5.10.2 The environmental conditions in the 2nd Schedule shall be complied with notwithstanding any other requirements of the Scheme.
- 5.10.3 Where appropriate, the environmental conditions are indicated on the Scheme Map by the symbol EC to indicate that environmental conditions apply to the land.
- 5.10.4 The City of Armadale is to-
- (a) maintain a register of all relevant statements published under sections 48F and 48G of the Environmental Protection Act; and
 - (b) make the statements available for public inspection at the offices of the City of Armadale.”

ATTACHMENT 1

OF STATEMENT THAT A SCHEME MAY BE IMPLEMENTED, CITY OF ARMADALE TOWN PLANNING SCHEME NO. 2 AMENDMENT NO. 134

1 Foreshore Management Plan

- 1-1 The preparation of a Foreshore Management Plan for the foreshore reserve referred to in environmental conditions 1-1(2) and 1-1(3) and initial implementation of the Plan shall be required as a condition of subdivision in the event that a subdivision application for urban development of Lot 1 Hilbert Road, Brookdale, is approved by the Western Australian Planning Commission.
- 1-2 The Foreshore Management Plan shall be prepared to the satisfaction of the Western Australian Planning Commission on advice of the City of Armadale, the Environmental Protection Authority, the Water and Rivers Commission and the Water Corporation.
- 1-3 The Foreshore Management Plan shall include:
- (1) provision for rehabilitation of the watercourse banks and foreshore reserve;
 - (2) provision for the movement of riparian fauna; and
 - (3) details of responsibilities and schedules for implementation of the Plan, including ongoing maintenance.

2 Integrated Stormwater and Nutrient Management Strategy

- 2-1 Prior to the commencement of works to develop land or to subdivide land for urban purposes, an Integrated Stormwater and Nutrient Management Strategy shall be prepared by the subdivider/developer and approved by the City of Armadale with the concurrence of the Environmental Protection Authority on advice of the Water and Rivers Commission, and the Water Corporation; and the City of Armadale may, if considered necessary, require this Strategy to be subject to an independent audit undertaken to the City's satisfaction by suitably qualified consultant professionals who have been approved by the City and at the expense of the subdivider/developer.
- 2-2 The objectives of the Integrated Stormwater and Nutrient Management Strategy are to ensure that the subdivision/development meets the environmental objectives defined in the Environmental Protection Authority's Report on Amendment No. 134, and that the overall development protects, preserves and wherever possible, enhances the beneficial uses defined under the relevant catchment, environmental protection and state planning policies.
- 2-3 The Integrated Stormwater and Nutrient Management Strategy shall define the responsibilities of the developer, any third parties and the City of Armadale on matters including the following:
- (1) ongoing management and maintenance which shall include provision by the developer of a guarantee and/or bond for a period of time being two years following endorsement of final approval of subdivision for the final stage of subdivision in the developer's landholding within the Development Area as surety for the maintenance and monitoring of the Integrated Stormwater Drainage and Nutrient Stripping Systems;
 - (2) ongoing monitoring of water quality and performance of nutrient stripping systems;
 - (3) refurbishment when monitoring shows a reduction in the systems' performances;
 - (4) implementation of contingency plans; and
 - (5) periodic review of the Integrated Stormwater and Nutrient Management Strategy.
- 2-4 The Integrated Stormwater and Nutrient Management Strategy shall include designs and

details addressing the following matters and performance criteria:

- (1) consistency with regional urban water management planning;
- (2) identification of predevelopment baseline water quality standards and post-development water quality targets, and methods of measuring the performance of the stormwater drainage and nutrient stripping systems;
- (3) the operational costs of maintaining, monitoring and refurbishment of the stormwater drainage and nutrient stripping systems;
- (4) contingency plans, included as part of management best practice which may be implemented in the event that the nutrient stripping system does not perform within the appropriate range of water quality targets;
- (5) sufficient details of roads, drainage and subsoil drainage design to demonstrate that the Integrated Stormwater Drainage, Nutrient Stripping Systems and Contingency Plans are workable and incorporating kerbed roads and piped stormwater road drainage;
- (6) erosion controls during and after construction;
- (7) minimisation of mosquito and midge breeding opportunities;
- (8) flood mitigation and protection, including provision for adequate separation from Average Annual Maximum Groundwater Level such that building floor levels are a minimum of 0.3 metres above the 100 year flood level or 1.2 metres above the post - development Average Annual Maximum Groundwater Level, whichever is the higher, unless the City of Armadale approves a variation;
- (9) implementation and staging of the strategy;
- (10) performance such that the Average Annual Maximum Groundwater Level as determined by the Water and Rivers Commission is not altered as a result of the development unless the Water and Rivers Commission approves a variation; and
- (11) performance such that post-development hydrograph and outflow volumes to the Wungong Brook are similar to pre-development conditions, unless it can be demonstrated that modified flows would enhance the beneficial uses of the Wungong Brook.

2-5 Subject to all required clearances and approvals, relevant components of an Integrated Stormwater Drainage and Nutrient Stripping System and any other matters related to the subdivision development that are included in the Integrated Strategy, shall be constructed and implemented to the satisfaction of the City of Armadale in consultation with the Water and Rivers Commission, Department of Environmental Protection and Water Corporation prior to the clearance of the relevant subdivision condition of any Diagram of Survey by the City of Armadale or the occupation of any newly created lot.

Appendix 6

Summary of submissions and Responsible Authority's response to submissions

(Extract from the minutes of the meeting of the Council of the City of Armadale
of 18th December 2000)