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# Agricultural Buffer and Off-site Impacts Assessment Cobaki Lakes Concept Plan

Prepared for
Leda Manorstead Pty Ltd

October, 2008

# Document control

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| Title: | **Agricultural Buffer and Off-site Impacts Assessment, Cobaki Lakes Concept Plan** | |
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| Client Contact: | Mr Reg van Rij / Mr Franz van den Brink | |
| Client Reference: | | |
| Synopsis: | This report addresses Environmental Assessment Requirements specified by the Director General of the NSW Department of Planning (DGRs) in relation to the proposed Cobaki Lakes development, Cobaki. Specifically, this report identifies potential off-site impacts from the proposed development of Cobaki Lakes in accordance with the Concept Plan. Mitigation of these impacts is proposed using buffers where appropriate as well as implementation of the Concept Plan in accordance with management plans addressing specific impacts. | |

## Revision History

| Revision # | Date | Edition By | | Approved By | |
|---|---|---|---|---|---|
| 1 | 13/07/07 | AJR | | | |
| 2 | 15/04/08 | NTZ | | PLM | LJV |
| 3 | 12/05/08 | NTZ | | NTZ | NMS |
| 4 | 14/10/08 | NTZ | | NTZ | NMS |

## Distribution

| | Revision Number | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Distribution | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Leda Manorstead Pty Ltd | | 2 | 1 | 1 | | | | | | |
| G&S library and file | 2 | 2 | 1 | 1 | | | | | | |
| JBA Urban Planning | | 1 | 1 | 1 | | | | | | |
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# Summary

Gilbert & Sutherland Pty Ltd (G&S) was commissioned by Leda Manorstead Pty Ltd to undertake specialist studies and assessments in support of a concept plan of development for the Cobaki Lakes site at Cobaki, New South Wales. This report represents a consideration of impacts to adjacent land, including agricultural land, from development at the site in accordance with the Cobaki Lakes Concept Plan.

Lodgement of a concept plan for the proposed Cobaki Lakes Development was authorised by the New South Wales Minister for Planning on January 24, 2007. Following consultation with various state government departments and Tweed Shire Council (TSC) the Director General of the Department of Planning issued Environmental Assessment Requirements (DGRs) for the Cobaki Lakes Concept Plan on March 5, 2007.

The DGRs require the Cobaki Lakes Concept Plan to demonstrate how impacts from the proposed Cobaki Lakes Development to adjoining areas with dissimilar land use, including agricultural enterprises, will be managed. This report identifies potential impacts from the proposed development and recommends appropriate management measures, including buffer zones to reduce the potential for conflict between typically incompatible land use practices.

The mitigation of land use conflict and off-site impacts associated with the Cobaki Lakes Concept Plan has been addressed in this report with reference to the Tweed Shire Council's Development Control Plan Part 5A (Subdivision Manual), Tweed Shire Council's Local Environmental Plan, New South Wales Department of Agriculture recommendations and the Queensland Planning Guidelines for Separating Agricultural and Residential Land Uses. In addition, a number of specific studies have been undertaken to address the potential for off-site impacts including water quality and quantity, erosion and sedimentation and bushfire. Specific reports and management plans have been prepared separately to address these issues.

The recommendations are in preliminary form for the purpose of the Concept Plan and further detail on the most appropriate mitigation measures, including buffer zones as appropriate, would be provided to support future project applications and detailed design.

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# 1) Introduction

Leda Manorstead Pty Ltd commissioned Gilbert & Sutherland Pty Ltd (G&S) to undertake specialist studies and assessments in support of a concept plan of development for the Cobaki Lakes site at Cobaki, New South Wales. The location of the site is shown on Drawing No. GJ0640.1.1.

The Director General of the Department of Planning issued Environmental Assessment Requirements (DGRs) for the Cobaki Lakes Concept Plan on March 5, 2007. This report addresses the potential for off-site impacts from development proposed by the Concept Plan and the appropriate management of such impacts.

## 1.1 Development concept

The Cobaki Lakes Concept Plan proposes the creation of a master planned community integrating residential development and ancillary commercial, retail, recreational and educational facilities. Large areas of open space will be provided for environmental enhancement and for recreational purposes. The development concept is shown on Drawing No. GJ0640.1.0.

## 1.2 Background

The investigation area is approximately 596 hectares and is situated in Cobaki, approximately 2km west of the coastal township of Kirra. The location of the site is shown on Drawing No.GJ0640.1.1.

The Tweed Local Environmental Plan (LEP) 2000 establishes appropriate zoning for the site and the land will be developed in accordance with the LEP zoning. The LEP zones significant portions of the site as '2(c) Urban Expansion', foreshadowing the use of large areas of the site for residential purposes. The zoning of the site and surrounding areas is shown on Drawing No. GJ0640.1.2.

Urban expansion adjacent to farmland may cause conflict. Therefore, buffer zones are often required to separate residential zones from agricultural land. The responsibility lies with the residential developer to avoid conflict through the provision and maintenance of these buffers.[1]

Such conflict may arise from the use of agricultural chemicals, noise, dust and odour generating activities.[2] The buffer may incorporate separation distances, vegetation and/or natural features such as ridge lines or steeply sloping ground.[3] Certain facilities and uses, such as public open spaces, road reserves and golf courses may also be located and designed to act as buffer areas.

Similarly, urban development adjacent to other sensitive land areas such as environmental reserves or riparian zones must be carefully managed to minimise potential impacts to and from the residential area.

## 1.3 Scope of report

This report describes the potential off-site impacts and means for managing such impacts for the Cobaki Lakes Concept Plan addressing the following March 5, 2007 DGRs:

> *1.3 Where land proposed for development adjoins land that is currently used for agriculture, a conflict assessment will be required including investigating measures to avoid landuse conflict, consistent with the principles of the Northern Rivers Farmland Protection Project.*
>
> *14.1 Demonstrate that the development will not have any adverse impacts on adjoining lands. This is to include consideration of adjacent land uses, water quality, water quantity, erosion, sedimentation, fire management, fencing, and access.*

The management of off-site impacts from the Cobaki Lakes Concept Plan has been addressed in this report with reference to the Tweed Shire Council's Development

[1] New South Wales Department of Infrastructure, Planning and Natural Resources 2005, *Northern Rivers Farmland Protection Project*, NSW Department of Primary Industries.

[2] Queensland Department of Local Government and Planning 1997, *Planning Guidelines - Separating Agricultural and Residential Land Uses*, Department of Natural Resources Queensland.

[3] New South Wales Department of Infrastructure, Planning and Natural Resources 2005, *Northern Rivers Farmland Protection Project*, NSW Department of Primary Industries.

Control Plan Part A5 (Subdivision Manual),[4] Tweed Shire Council's Local Environmental Plan,[5] New South Wales Department of Agriculture recommendations,[6] Northern Rivers Farmland Protection Project[7] and the Queensland Planning Guidelines.[8]

This report is divided into Sections dealing with the proposal, a description of the physical characteristics of the site, a land use and conflict assessment and recommendations for the management of potential impacts.

## 1.4 Aims

The aims of this report are as follows:

- Identify historical, current and potential future land use practices of the properties and land adjoining the Cobaki Lakes site.
- Identify how development in accordance with the Concept Plan may affect the adjacent land, land users and future residents of the Cobaki Lakes site.
- Recommend management measures to mitigate the identified off-site impacts, including where appropriate the adoption and management of buffer zones, which would incorporate specific separation distances and buffer elements relevant to the individual characteristics of adjacent land use.

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[4] Tweed Shire Council Development Services Division 2007, *Development Control Plan Part A5 Subdivision Manual*, Tweed Shire Council.

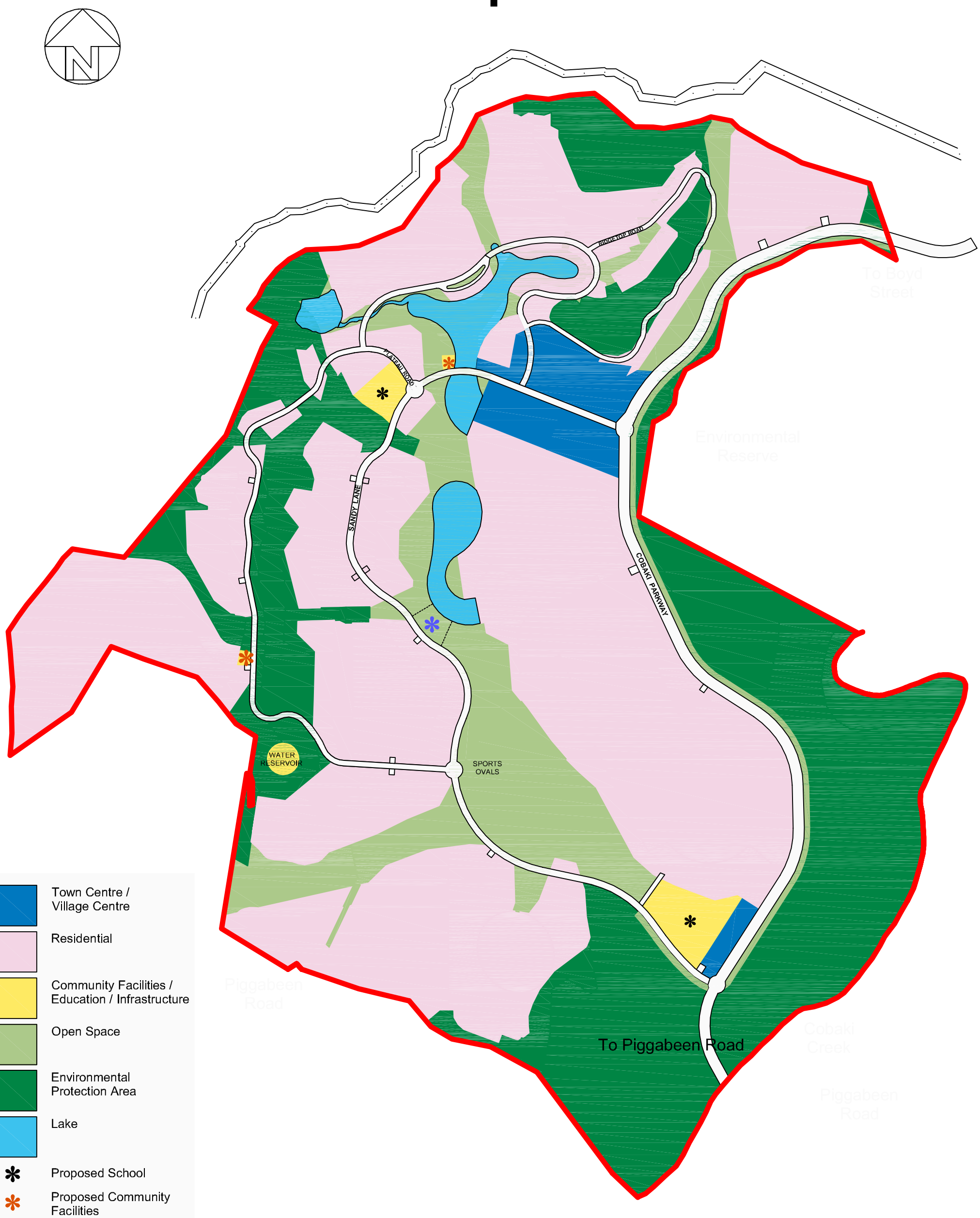
[5] Tweed Shire Council 2000, *Local Environmental Plan 2000.*

[6] New South Wales Agriculture June 5 2001, *Draft Tweed Local Environmental Plan – Amendment No 20 Cobaki Lakes, Duranbah.*

[7] New South Wales Department of Infrastructure, Planning and Natural Resources 2005*, Northern Rivers Farmland Protection Project*, NSW Department of Primary Industries.

[8] Queensland Department of Natural Resources 1997, *Planning Guidelines - Separating Agricultural and Residential Land Uses*, Department of Natural Resources Queensland.

# Concept Plan




- Town Centre / Village Centre
- Residential
- Community Facilities / Education / Infrastructure
- Open Space
- Environmental Protection Area
- Lake
- Proposed School
- Proposed Community Facilities
- Proposed Restaurant

0 100 200 300 400 500 600 700 800 900 1000

Scale of metres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PROJECT
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COBAKI LAKES
CONCEPT PLAN

Source: DFA Architects

| FIGURED DIMENSIONS TO BE READ IN PREFERENCE TO SCALING. | APPROVED | SCALE AS SHOWN | DRAWN J.J.T | DRAWING No. |
|---|---|---|---|---|
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AGRICULTURAL BUFFER AND OFF-SITE IMPACTS ASSESSMENT

SITE LOCATION

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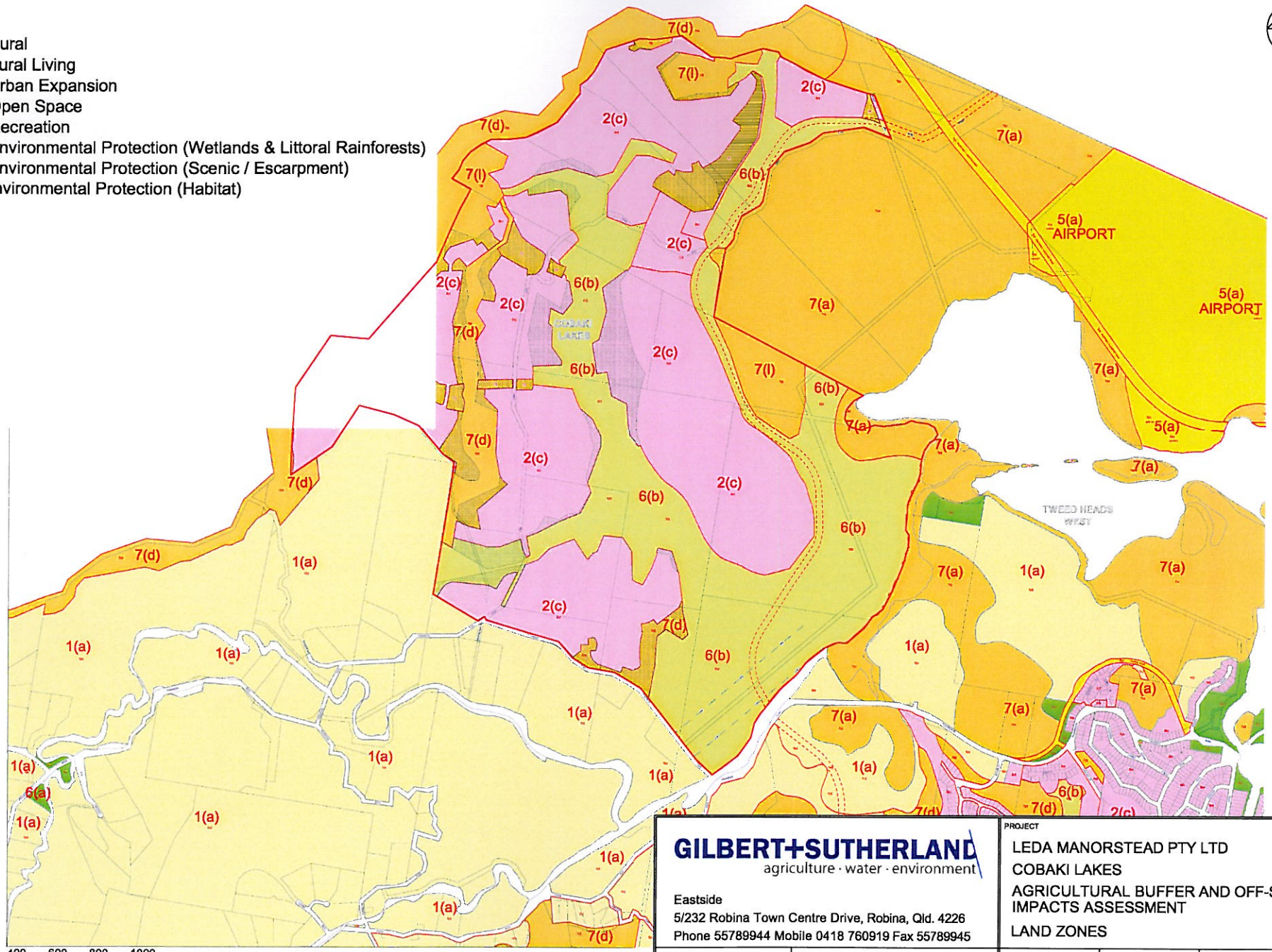
| FIGURED DIMENSIONS TO BE READ IN PREFERENCE TO SCALING. | APPROVED | SCALE AS SHOWN | DRAWN K.T. | DRAWING No. |
| | | DATE 14/10/08 | CHECKED | GJ0640.1.1 |

Legend

1 (a) - Rural
1 (c) - Rural Living
2 (c) - Urban Expansion
6 (a) - Open Space
6 (b) - Recreation
7 (a) - Environmental Protection (Wetlands & Littoral Rainforests)
7 (d) - Environmental Protection (Scenic / Escarpment)
7 (l) - Environmental Protection (Habitat)

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SCALE OF METRES


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LAND ZONES

| | | |
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| SCALE AS SHOWN | DRAWN K.T. | DRAWING No. |
| DATE 14/10/08 | CHECKED | GJ0640.1.2 |

# 2) Methods

The agricultural buffer and off-site impacts assessment was undertaken by:

- A preliminary assessment including a review of aerial photography and previous studies undertaken in the region.
- A field investigation involving a site visit on June 29, 2007.

The guidelines and reports used to identify potential off-site impacts and the appropriate management of such impacts were:

- Hulme T., Grosskopt T. & Hindle J. 2002, AGFACTS – *Agricultural Land Classification*. NSW Department of Agriculture.
- Tweed Shire Council 2007, *Tweed Local Environmental Plan 2000*.
- Morand, D.T. 1996*, Soil Landscapes of the Murwillumbah-Tweed Heads 1:100 000 Sheet* Report, Department of Land and Water Conservation, Sydney.
- Queensland Department of Local Government and Planning 1997, *Planning Guidelines - Separating Agricultural and Residential Land Uses*, Department of Natural Resources Queensland.
- New South Wales Department of Infrastructure, Planning and Natural Resources 2005*, Northern Rivers Farmland Protection Project*, NSW Department of Primary Industries.
- Tweed Shire Council Development Services Division 2007, *Development Control Plan No 16 A5 -Subdivision Manual*, version 1.3, Tweed Shire Council.

Land use zones for the site and surrounding lands have been specified by the Tweed Shire Council in the Tweed Local Environmental Plan 2000.[9] In order to identify potential conflict and off-site impacts, the different land zones for the site and surrounding land were identified. Following a document review and site investigation, each zone was then divided into sub-sections (A through to G) as shown on Drawing No. GJ0640.1.3a and GJ0640.1.3ab. The principal criteria for the division of the property boundary were the current and most likely future land use of the adjoining land.

The relevant historical, current and potential land use practices, within each zone and sub-section, are discussed briefly in sections 4.3 and 4.5.

[9] Tweed Shire Council 2000, *Tweed Local Environmental Plan 2000*.


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SUB-SECTIONS

| | | | |
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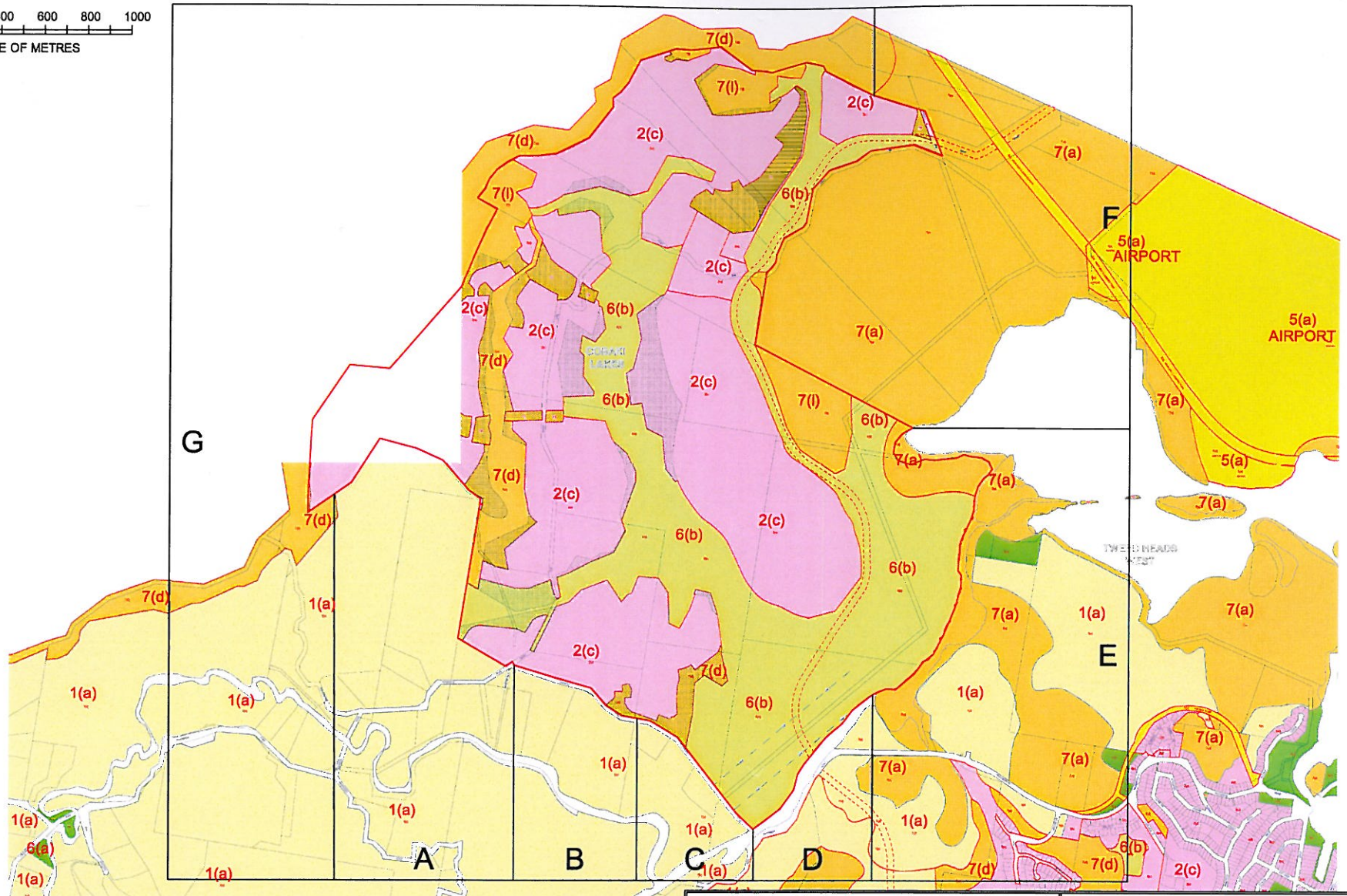
| FIGURED DIMENSIONS TO BE READ IN PREFERENCE TO SCALING. | APPROVED | SCALE AS SHOWN | DRAWN K.T. | DRAWING No. |
| | | DATE 14/10/08 | CHECKED | GJ0640.1.3a |

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SUB-SECTIONS AND LAND ZONES

| FIGURED DIMENSIONS TO BE READ IN PREFERENCE TO SCALING. | APPROVED | SCALE AS SHOWN | DRAWN K.T. | DRAWING No. |
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# 3) Site Description

## 3.1 Site location

The site location is shown on Drawing No GJ0640.1.1 included in Section 1. The site covers approximately 596 hectares and is located immediately south of the Queensland/NSW border and approximately 2km west of the coastal township of Kirra.

## 3.2 Proposed development

The Cobaki Lakes Concept Plan proposes the creation of a master planned community integrating residential development and ancillary commercial, retail, recreational and educational facilities. Large areas of open space will be provided for environmental enhancement and for recreational purposes.

## 3.3 Site topography

The land ranges in elevation from approximately RL0m Australian Height Datum (AHD) to approximately RL100m AHD. The site generally slopes in a south-easterly direction towards Cobaki Creek.

The site is generally flat, with slopes ranging from level (0-1%) to moderately inclined (10-20%). The steepest slopes are associated with the western and northern sections of the site, facing Cobaki Creek and Broadwater. The site topography and slope analysis is shown on Drawing No. GJ0640.1.4.

## 3.4 Topography of land surrounding the site

Land situated to the east of the site is generally low lying with elevations ranging from RL0m AHD to approximately RL10m AHD with slopes mostly varying from level to gently inclined (3-10%). The ridge bordering the site from the north around to the west ranges in elevation from RL10m AHD to RL100m AHD and mainly consists of moderately inclined (10-20%) slopes.

## 3.5 Vegetation on site

The majority of the site is an extensively cleared closed-swamp complex with areas of grass, sedge and rushland. Some open Eucalyptus forest is concentrated around sections of the south-west edge and northern ridge and there is a scattering of scribbly gums around the natural low sand ridge in the middle and lower eastern part of the site.

There are also areas within the site zoned environmental protection. Small areas of open, wet sclerophyll forest in the north, east and north-west are zoned habitat and the ridge in the west of the site is zoned scenic/escarpment and mainly consists of open Eucalypt forest.

The flora and fauna of the site has been described in detail by James Warren and Associates.

## 3.6 Vegetation surrounding the site

Land surrounding the site on the eastern border is mainly vegetated by reedy swamp. Areas of open Eucalypt forest stretch from the north around to the west of the site. Land surrounding the south of the site has mainly been cleared and consists of native pasture and scattered Eucalypts.

## 3.7 Geology

A review of the Soil Landscapes of the Murwillumbah-Tweed Heads 1:100 000 Sheet Map[10] indicates that the majority of the site is underlain by Quaternary estuarine alluvium formations consisting of Holocene and Pleistocene in-fill materials. Clay, silt, sand and gravel occur, but organic materials dominate the surface.

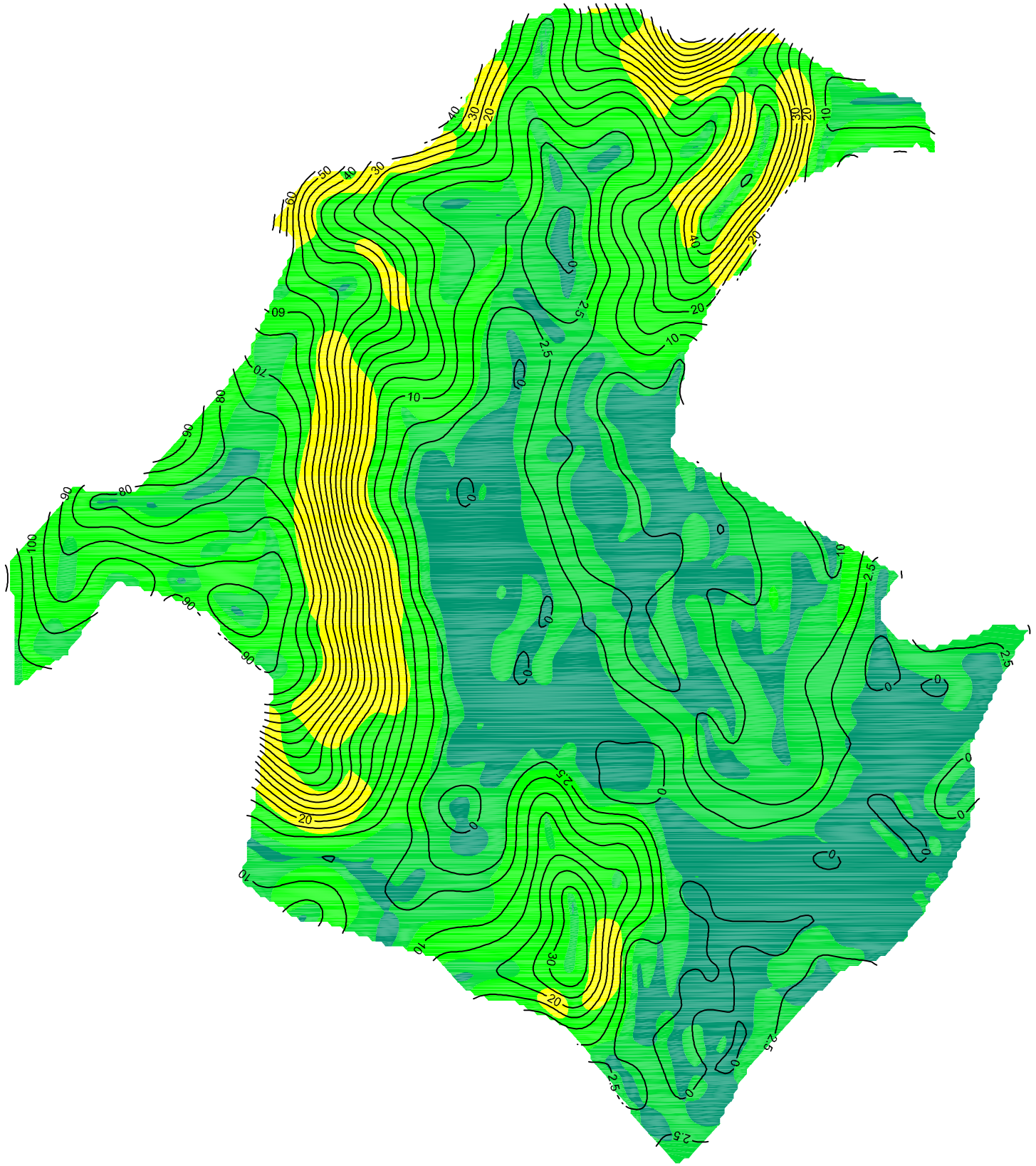
The Palaeozoic Neranleigh-Fernvale Group is generally present on the north and north-western edges of the site and in an area in the south-west. The rocks of this group are thinly bedded fissile shales, siltstones and sandstones with occasional more massive greywackes, volcanic tuffs, agglomerates, sandstones and massive cobble conglomerates.

Sediments and outwash derived from the Neranleigh-Fernvale Group, generally occurring as sheet flow deposits, comprise an area in the northern tip of the site. Greywacke, argillite, quartzite, chert, shale, sandstone and slate are the dominant rock types providing sediment. Much of this soil landscape may also consist of Pleistocene valley in-fills.

[10] Morand, D.T. 1996, *Soil Landscapes of the Murwillumbah-Tweed Heads 1:100 000 Sheet* Map, Department of Land and Water Conservation, Sydney.

The geology and soils of the site have been described in detail in Gilbert & Sutherland's report titled '*Soil Survey, Geotechnical Review, Acid Sulfate Soil Assessment & Management Plan – Cobaki Lakes Concept Plan*'.[11]

[11] Gilbert & Sutherland. April 2008. *Soil Survey, Geotechnical Review, Acid Sulfate Soil Assessment & Management Plan – Cobaki Lakes Concept Plan*. Prepared for Leda Manorstead Pty Ltd.



LEGEND

- 0% - 1% (LEVEL)
- 1% - 3% (VERY GENTLY INCLINED)
- 3% - 10% (GENTLY INCLINED)
- 10% - 20% (MODERATELY INCLINED)
- 20% - 32% (MODERATELY STEEP)
- 32% - 56% (STEEP)

0 200 400 600 800 1000

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PROJECT

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AGRICULTURAL BUFFER AND OFF-SITE IMPACTS ASSESSMENT

SITE TOPOGRAPHY AND SLOPE ANALYSIS

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# 4) Adjacent land uses and associated impacts

The Cobaki Lakes Concept Plan covers an area of approximately 596 hectares which is located immediately west of the Cobaki Broadwater, and approximately two kilometres west of the coastal township of Kirra. The property is currently managed as a grazing enterprise, with some bulk earthworks being undertaken under an existing development consent.

## 4.1 Land use zones

The different land zones for the site and surrounding land were identified in order to define the most relevant off-site impacts to each different land use. Each zone was then divided into sub-sections, the locations of which are shown on Drawing Nos. GJ0640.1.3a & b.

To establish the most appropriate methods for mitigating potential off-site impacts, relevant historical, current and potential land use practices and the potential impacts from the Cobaki Lakes site are described in more detail below.

## 4.2 Generic impacts

A number of potential off-site impacts could affect any adjacent land, regardless of its current or future use, however, the sensitivity of the adjacent land will obviously influence the significance of the impact. For example, an environmental reserve is likely to be more adversely affected by sedimentation than rural land used for horticulture.

The DGR's specifically seek to address potential off-site impacts including water quality, water quantity, erosion, sedimentation, fire management, fencing and access.

### 4.2.1 Water quality and quantity

The quality and quantity of stormwater runoff from the site is prone to potential impacts from the development proposed by the Concept Plan. The proposed development of the site has the potential, if unmitigated, to adversely impact upon the quality of runoff from the site and the timing and volume of water discharged.

### 4.2.2 Erosion and sedimentation

Similar to water quantity and quality, the proposed development of the site could result in erosion and sedimentation in downstream environments and as such, careful planning and management of erosion and sedimentation control is required for construction and operational phases of the development.

### 4.2.3 Fire management

The development of the site would carry an increased risk of bushfires in the adjacent parks and reserves. Careful planning and management is required to mitigate such risks and this will be addressed in a specialist bushfire risk assessment and management report.

### 4.2.4 Fencing and access

Appropriate fencing is necessary to minimise impacts from and to the proposed development, including unauthorised access to surrounding land by persons and animals, as well as weed transfer and illegal dumping.

## 4.3 Rural zone

Land zoned as rural comprises land adjoining sub-sections A, B, C and D of the Cobaki Lakes boundary. Agricultural production on these lands is limited to pastoral-based enterprises on sub-sections A (Plate 1) and C (Plate 2). There is a small area of bananas being grown in sub-section A. The area (approximately 5m X 20m) and number of plants suggest it is not a commercial operation. In addition, it is separated from the Cobaki Lakes site by a stand (approx 10m wide) of tall Eucalypts.

**Plate 1:** Pastoral land in the vicinity of sub-section A

**Plate 2:** Pastoral land in the vicinity of sub-section C

A small seedling nursery is located on the south-western corner of sub-section A (Plate 3). The nursery is in excess of 200m from the development site boundary.

**Plate 3:** Small plant nursery near south west corner of site

Woodlands Lakeside Golf Course and Piggabeen Golf Driving Range are located on the south-western border of the site, in sub-section B (Plate 4). The site is bounded by Cobaki Creek at sub-section D.

**Plate 4:** Golf driving range to south of site in the vicinity of sub-section B (note yellow ranging boards in mid-ground)

Agricultural land classes were estimated using the New South Wales Agriculture Land Classification System.[12] Land in the vicinity of these sub-sections is likely to be classified as Class 4, defined by Hulme (2002) [13] as:

> *"Suitable for grazing but not for cultivation.*
>
> *Agriculture is based on native pastures or improved pastures established using minimum tillage techniques.*
>
> *Production may be seasonally high, but the overall production level is low as a result of major environmental constraints."*

Historically, land in this area has generally been used for beef and dairy cattle grazing on native and voluntary pastures.[14] Class 4 lands generally have moderate to high levels of social, economic or physical limitations, restricting their agricultural productivity. The classification of the land surrounding the development proposal is not in dispute.

Grazing and pastoral pursuits are considered to be the most likely form of agricultural production to be conducted within these areas in the future due to:

- a land class of 4,
- the historical and current use of the land
- its zoning as regionally significant non-contiguous farmland.[15]

## 4.4 Potential conflict with agricultural land use

Agricultural production on the adjoining land is, and probably will continue to be,

[12] Hulme, T., Grosskopt, T. & Hindle J 2002, AGFACTS – *Agricultural Land Classification*. NSW Department of Agriculture.
[13] Hulme, T., Grosskopt, T. & Hindle J 2002, AGFACTS – *Agricultural Land Classification*. NSW Department of Agriculture.
[14] Morand, DT 1996*, Soil Landscapes of the Murwillumbah-Tweed Heads 1:100 000 Sheet* Report, Department of Land and Water Conservation, Sydney.
[15] New South Wales Department of Infrastructure, Planning and Natural Resources 2005*, Northern Rivers Farmland Protection Project*, NSW Department of Primary Industries.

mainly restricted to grazing and pastoral pursuits.

The issues here are sevenfold,[16] namely:

- chemical spray drift
- odour
- noise
- dust
- smoke and ash
- sediment and stormwater run-off
- stock husbandry issues.

**Chemical spray drift**

The adjacent rural land is predominantly used for cattle grazing enterprises and as such, the issue of spray drift is not generally considered an issue. There may be very rare occasions that spot spraying of noxious weeds may occur. Normal poisons application procedures under the *Pesticides Act 1999* will be sufficient to protect the urban community. Chemical drift will be an unlikely source of contention.

**Odour**

It is understood that there are no plans to undertake any intensive animal activities. Small numbers of animals occupying the land adjacent to the urban fringe for short periods of time will pose no odour risk. Given the noise and activity that may come from the urban environment, it is more likely that the farm animals will avoid the land at the rural urban interface. Odour will not be a source of contention.

**Noise**

There is no cultivation of fodder conservation practices that may be applicable to the subject area that would result in prolonged tractor or other machinery operation in the vicinity of the urban area. Noise due to tractor operation will not be a source of contention.

**Dust**

The interface area is not subject to cultivation and has no stock yards or other stock working infrastructure directly adjacent to the urban area, therefore the risk of excessive dust will not be realised. Dust will not be a significant source of contention and may be accommodated by the present Tweed Shire Council requirements.

**Smoke and ash**

Fire is no longer a management practice that is used to any great extent in grazing enterprises in the area. It will pose no significant source of contention between the rural enterprise and the urban area and may be accommodated by the present Tweed Shire Council requirements.

**Sediment and stormwater run-off**

The flow of water is controlled in the urban development. The rural area under the cover of pasture will shed very small amounts of water towards the urban development and there will be no impact on the residential blocks. The flows that may traverse the residential development will be part of the broader drainage system for the development. It will pose no significant source of contention between the rural enterprise and the urban area and may be accommodated by the present Tweed Shire Council requirements.

**Stock husbandry issues**

The main issue will be domestic dogs chasing or killing stock. A buffer has no impact on this and it is more an issue of the use of a dog proof fence. Some limitations and control measures may be needed for urban residents with dogs.

## 4.5 Environmental Protection Areas – Wetlands & littoral rainforest, habitat and scenic escarpment

Lands in the vicinity of the south, central eastern, north and north-western boundaries of the site have been zoned as environmental protection. This includes wetlands and littoral rainforest in sub-sections E and F and scenic/escarpment in sub-section G.

Current land use includes tall, open, wet sclerophyll forest in areas adjoining sub-section G and reedy swamp and areas of grass, sedge and rushland in sub-section D. The site is also bounded by Cobaki Creek and Cobaki Broadwater in the east at sub-section E.

[16] Queensland Department of Local Government and Planning 1997, *Planning Guidelines - Separating Agricultural and Residential Land Uses*, Department of Natural Resources Queensland.

#### 4.5.1 Riparian areas

Cobaki Creek forms a large proportion of the south-eastern boundary of the site and is the main tributary to the Cobaki Broadwater. Cobaki Creek and Broadwater represent environmentally sensitive environments and careful management of impacts to the creek and the broadwater is required.

## 4.6 Potential conflict with environmental protection areas

Significantly, much of the ridge area zoned for environmental protection to the west of the site is so zoned for scenic protection. Provided development of the adjacent urban areas is undertaken in accordance with approvals to be obtained from Tweed Shire Council at the detailed design stage, it is not envisaged that development would have an adverse impact on the scenic amenity of these reserves. As these areas are upslope from the proposed urban development, they will benefit from immunity to stormwater and erosion and sedimentation related impacts.

Impacts from the Cobaki Lakes site to the environmental protection areas may include disturbance of native flora and fauna by humans and domestic and feral animals, increased fire risk, rubbish dumping, weed invasion and vegetation clearing.

These potential impacts are identified here for completeness of the off-site impacts assessment. Management of these impacts will be undertaken in accordance with the recommendations of the ecologists and are documented in various management plans by James Warren and Associates.

# 5) Management of off-site impacts

The perimeter of the proposed Cobaki Lakes development is adjoined by land zoned as rural and environmental protection. To ensure disturbance to residents of future urban development is minimised and the intrinsic values of the adjacent land uses are maintained, appropriate mitigation or management of off-site impacts would be necessary. This may be achieved by the provision and management of buffer zones. Any buffers would be designed taking into consideration the current and likely future land use of these areas.

A buffer area is defined[17,18] as an area of land separating adjacent land uses that is managed for the purpose of mitigating impacts of one use on another. Buffer areas consist of:

1. Separation distances, defined as the total linear distance between a source and a sensitive receptor including a dwelling or other residential place in a residential development; and
2. One or more buffer elements, including natural or artificial features such as open ground, a vegetation buffer and/or acoustic barrier, that mitigates adverse impacts.

Agricultural buffer zones should ensure an acceptable level of amenity is maintained for future occupants of residential areas, while limiting the disturbance to and/or from agricultural production activities.

Buffer zones, other than agricultural buffers, may also be applicable to those lands which do not support agricultural production activities. These buffers may be necessary to minimise the potential impacts of residential development to and from environmentally sensitive areas.

The specific details of buffer widths and the proposed management of any buffers would be provided at the detailed design stage.

## 5.1 Generic impacts

### 5.1.1 Water quality and quantity

Water quality and quantity will be managed in accordance with the Integrated Water Cycle Management Strategy[19] and Stormwater Management Plan.[20]

The IWCM strategy assesses the use of stormwater quality treatment devices specified in Tweed Shire Council's Development Design Specification D7. Stormwater treatment trains would be incorporated into the detailed design to ensure that off-site water quality impacts are avoided. Treatment trains comprise a combination of constructed wetlands, lot-based rainwater tanks or infiltration systems, and vegetated swales or bioretention trenches.

The performance of these stormwater treatment trains have been assessed by modelling which shows that, provided the recommended water quality management measures are properly installed and maintained, the water quality of runoff from the proposed development would achieve Council's desired objectives.

The Stormwater Management Plan provides procedures aimed at achieving site specific stormwater quality objectives during the construction and operational phases. Ideally it would be included in the contract documents for the earthworks, roadworks and drainage construction works in this project.

### 5.1.2 Erosion and sedimentation

Erosion and sedimentation control measures are specifically addressed in the conceptual Stormwater Management Plan for the site. More specific measures could be incorporated into detailed management plans, to support the detailed design.

[17] Queensland Department of Natural Resources 1997, *Planning Guidelines - Separating Agricultural and Residential Land Uses*, Department of Natural Resources Queensland.

[18] Note: The NSW guidelines on agricultural buffers makes reference to and uses the provisions in the Queensland guidelines to determine buffer widths.

[19] Gilbert & Sutherland. April 2008. *Integrated Water Cycle Management Strategy, Cobaki Lakes Concept Plan.* Prepared for Leda Manorstead Pty Ltd.

[20] Gilbert & Sutherland. April 2008. *Stormwater Management Plan, Cobaki Lakes Concept Plan.* Prepared for Leda Manorstead Pty Ltd.

#### 5.1.3 Fire management

Bushfire will be managed in part by the implementation and maintenance of buffers between existing bushland and future urban development.

Bushfire management is addressed in detail in a Bushfire Management Plan prepared by others.

#### 5.1.4 Fencing

Fencing would be managed by covenants enforcing the construction of appropriate fencing on allotments adjoining buffers and or adjacent lands.

Fencing between public or community land and adjacent land will be established in accordance with the detailed design, which will ensure that the buffers function as intended.

#### 5.1.5 Access

Access to adjacent lands will be controlled via covenants enforcing the construction of appropriate fencing on allotments adjoining buffers and or adjacent lands.

Access to the buffer areas, where present, shall be provided to facilitate maintenance if required. However, these access points shall be appropriately secured to prevent unauthorised or unwanted access.

## 5.2 Management of impacts to rural zones

Pastoral enterprises are likely to be the prominent future agricultural production on land adjacent to sub-section A and C of the site boundary. Tweed Shire Council's Development Control Plan No 16 Subdivision Manual (2007) identifies that a 30m primary biological buffer is adequate to screen noise, dust and odours produced by grazing practices from urban development.[21]

The buffer zone may be allocated as public open space or incorporated into large residential allotments so long as the agreed separation distance is maintained between the source (boundary of pastoral properties) and the sensitive receptor (dwelling).

Therefore, where proposed urban development is immediately adjacent to rural land used for grazing, a minimum 30m buffer zone would generally be recommended. However, the Concept Plan does not include urban development adjacent to rural land (nor within 30m) in section C. As such, no buffers are considered necessary in this section.

Road reserve, outside the property boundary, separates the proposed urban land and rural land in the majority of section A. This is considered an adequate buffer, particularly when combined with the ridge upon which the boundary runs, which forms a natural barrier between the land uses. Where no road reserve is present a 30m biological buffer is recommended as illustrated in Drawing GJ0640.1.5.

The existing Piggabeen Road separates the proposed urban use from rural land within Section B, which is currently being used as a golf driving range. As such, no buffer is considered necessary in this section.

The site boundary along sub-section D borders Cobaki Creek. The rural land to the south of Cobaki Creek is separated from the site by the creek itself, and from the nearest urban land use by approximately 150m of open space. Therefore, no specific buffer treatment is considered necessary.

## 5.3 Management of impacts to environmental protection areas

#### 5.3.1 Environmental protection zones

Small parcels of land in sub-sections E, and more substantial areas in sub-section F and G of the site boundary are located adjacent to land zoned environmental protection.

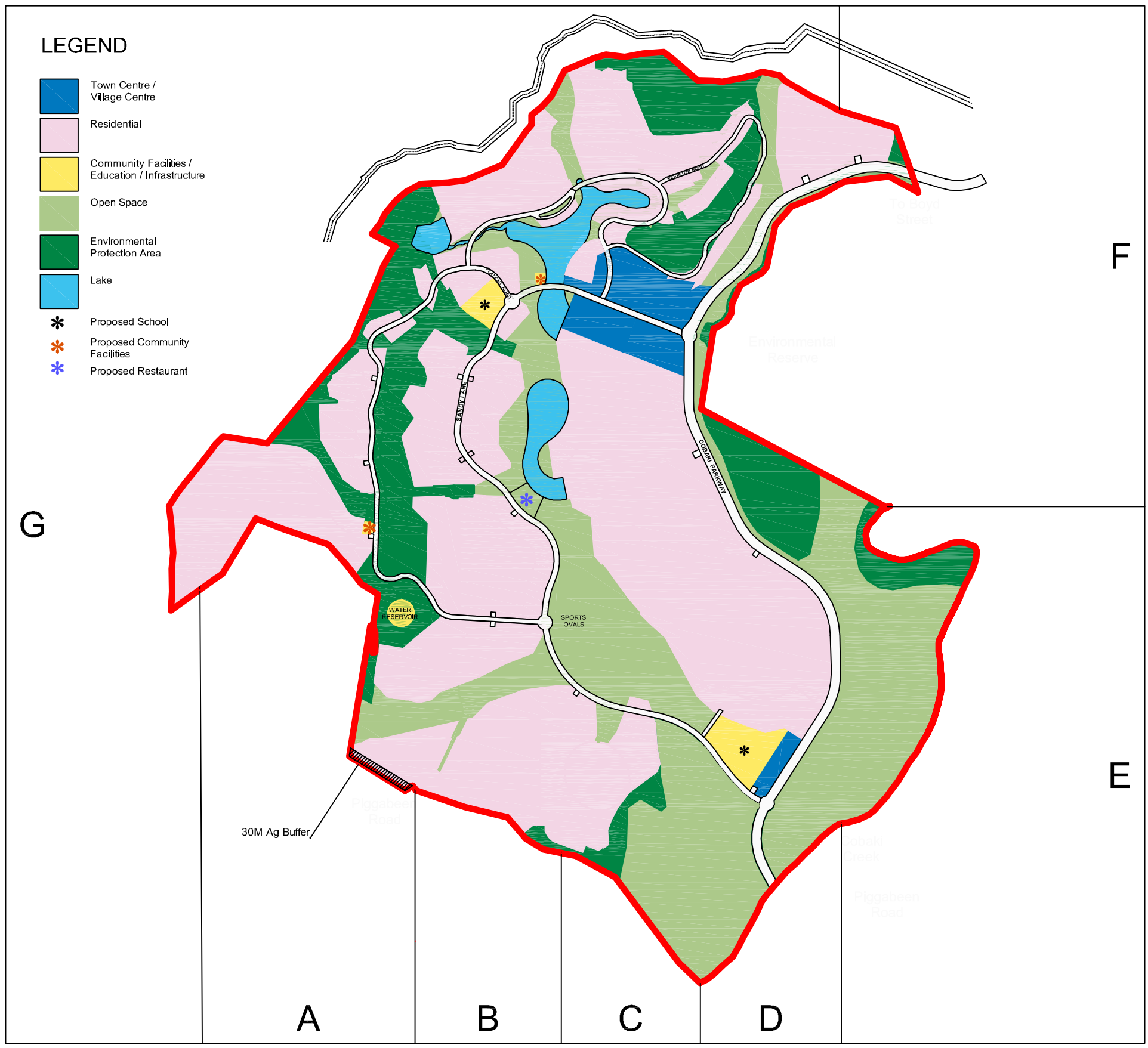
Impacts to the environmental protection areas will be managed in accordance with various management plans prepared by James Warren and Associates.

[21] Tweed Shire Council Development Services Division 2007, *Development Control Plan No 16 A5 - Subdivision Manual*, version 1.3, Tweed Shire Council. Recommended Buffer table, Page A5-115.

### 5.3.2 Riparian zones

The Tweed DCP suggests that a riparian buffer of 50m be provided to all major streams. Under the Concept Plan, a large area of open space would be provided adjacent to Cobaki Creek, forming a natural separation distance of at least 150m between the creek and the nearest urban development. This area of open space would be enhanced and managed in accordance with a rehabilitation and management plans prepared by James Warren and Associates.

Revegetation and rehabilitation around the central drainage channel would be undertaken as part of the Concept Plan, providing significant buffers to this water feature. All water entering this feature would be treated in accordance with the Integrated Water Cycle Management Strategy and Stormwater Management Plan, ensuring that the quality of water discharged from the site is suitable to prevent downstream impacts.




0 100 200 300 400 500 600 700 800 900 1000

Scale of metres

Base Plan supplied by LEDA Manorstead Pty Ltd

GILBERT+SUTHERLAND
agriculture · water · environment

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PROJECT

LEDA MANORSTEAD PTY LTD

COBAKI LAKES

AGRICULTURAL BUFFER AND OFF-SITE IMPACTS ASSESSMENT

PROPOSED AGRICULTURAL BUFFERS

| FIGURED DIMENSIONS TO BE READ IN PREFERENCE TO SCALING. | APPROVED | SCALE AS SHOWN | DRAWN K.T. | DRAWING No. |
|---|---|---|---|---|
| | | DATE 14/10/08 | CHECKED | GJ0640.1.5 |

# 6) Conclusions

The Tweed Shire Council's Development Control Plan Part 5A Subdivision Manual (2007) and Tweed Local Environmental Plan (2000) recommend the provision of buffer areas between potentially conflicting landuses including urban development on land adjoining pastoral activities and environmentally significant ecosystems. Open space buffers can be used to achieve this objective and can incorporate public open space, road reserves and/or natural features such as watercourses.

As all of the land identified by the Concept Plan for urban development is separated from adjacent pastoral landuse by existing roads, road reserves and geographical features, it is not considered that additional buffers need to be provided, except in a small portion of the southern boundary illustrated on Drawing No. GJ0640.1.5.

The concept plan provides open space between land adjoining riparian zones, wetlands and littoral rainforest. The management of impacts to these areas would be undertaken in accordance with the various ecological management and reahabilitation plans prepared by James Warren and Associates.

The Tweed DCP does not require buffers between areas zoned as habitat or scenic escarpment, however it does contain additional controls to maintain these values, and these controls would be addressed during the detailed design phase.

The specific separation distance (applicable within the Cobaki Lakes site) and buffer element proposed for each sub-section of the site's boundary would be subject to further definition and justification which would most appropriately be provided during the detailed design phase.