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Agricultural Buffer Zone Assessment
Proposed RISE Development (MP08-0234)
Bilambil Heights, West Tweed New South Wales

Prepared for:
Terranora Group Management
C/- Steve MacRae Development Services

September, 2010

Document control

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Title:	**Agricultural Buffer Zone Assessment Proposed RISE Development (MP08-0234) Bilambil Heights, West Tweed New South Wales**	Originating Office: Robina
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Synopsis:	This report addresses Environmental Assessment Requirements specified by the Director General of the NSW Department of Planning (DGRs) in relation to buffer zones at the proposed RISE development (Major Project Application No. MP08-0234 – RISE Concept Plan), Bilambil Heights, New South Wales.	

Revision History

Revision #	Date	Edition By		Approved By	
1	13/03/09	MLF	PLM	LJV	NTZ
2	01/09/10	MLF	PLM	LJV	NTZ
3					
4					

Distribution

	Revision Number								
Distribution	1	2	3	4	5	6	7	8	9
Terranora Group	1	1							
G&S library & file	2	2							

Summary

Gilbert & Sutherland Pty Ltd (G&S) was commissioned by Terranora Group Management to conduct an Agricultural Buffer Zone Assessment (ABZA) for the proposed RISE Development (Major Project Application No. MP08-0234 – RISE Concept Plan), Bilambil Heights, New South Wales.

The scope of this report is to recommend potential separation distances and buffer elements (collectively known as buffer zones) between the proposed RISE Development and adjoining areas with dissimilar land use. Agricultural enterprises are one example of dissimilar land use. The provision of buffer zones would reduce the potential for conflict between typically incompatible land use practices.

The application of buffer zones to the proposed RISE development has been addressed in this report with reference to the Tweed Shire Council's Development Control Plan (Subdivision Manual), Tweed Shire Council's Local Environmental Plan, North Coast Living and Working in Rural Areas handbook and the Queensland Planning Guidelines.

As part of this ABZA, a preliminary assessment was undertaken by G&S including a review of available aerial imagery and previous studies undertaken in the region. In addition, a field investigation was conducted involving a site visit on March 18, 2009.

This report specifically addresses clause 15 (1) of the Director General's Environmental Assessment Requirements (DGEAR's) which form part of the MP08-0234 application process.

This report has been revised to be consistent with the terms of the Rise Concept Plan Approval No. 08_0234 issued by the Minister for Planning on 29 June 2010. Precinct J and the fire trail to this precinct have been deleted. This revised assessment report forms part of the consolidated concept plan, required by Condition A3 of the approval.

Table of contents

1) Introduction

Gilbert & Sutherland Pty Ltd (G&S) was commissioned by Terranora Group Management to conduct an Agricultural Buffer Zone Assessment (ABZA) for the proposed RISE Development, Bilambil Heights, New South Wales.

The location of the MP08-0234 development footprint is shown on Drawing No. GJ0495.2.1.

The RISE project is the subject of a major project application (reference: MP08-0234). This reference number, together with the term 'site', is used throughout this report to refer to the RISE major project application area (approximately 110ha).

This report provides a brief overview of the site soils and a boundary assessment including historical, current and potential land use practices. Buffer zones for each sub-section of the site boundary have been recommended in Section 5 of this report.

The concept plan application No. 08_0234 was approved by the Minister for Planning on 29 June 2010. The conditions of the Concept Plan Approval required no amendments to this report as it is consistent with the approved development.

1.1 Aims

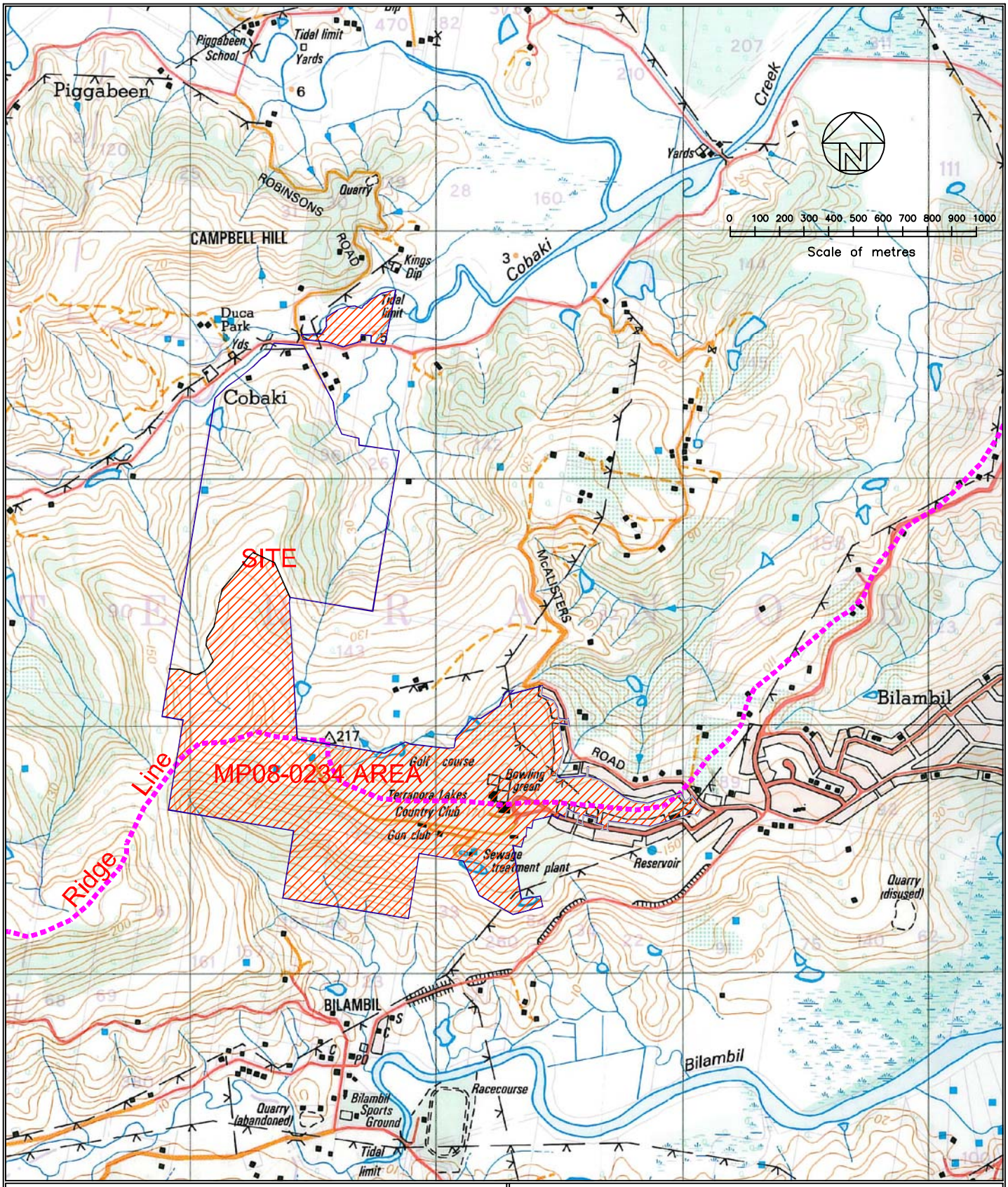
The aims of this report are as follows.

- Identify the historical, current and potential future land use practices of the properties adjoining the proposed RISE development.
- Broadly determine the quality of surrounding agricultural lands with reference to the New South Wales Department of Agriculture's Land Classification System or any relevant studies.
- Identify those issues applicable to agricultural enterprises and other land use practices which could potentially cause conflict.
- Recommend buffer zone options incorporating separation distances and buffer elements relevant to the individual characteristics of each sub-section of the site boundary.

1.2 Objectives

The objectives of the buffer zones are:

- To provide adequate separation between potentially conflicting land use practices.
- To provide a visual barrier and screen from nuisance-causing elements produced by agricultural activities including noise, odour and spray drift.
- To provide acceptable environmental conditions for future occupants of residential areas located adjacent to agricultural production areas.
- To minimise the potential impact(s) from residential development to adjacent agricultural activities and environmentally sensitive areas.



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PROJECT

TERRANORA GROUP MANAGEMENT

RISE - MP08-0234

BILAMBIL HEIGHTS, NSW

SITE LOCATION

FIGURED DIMENSIONS TO BE READ IN PREFERENCE TO SCALING.	APPROVED	SCALE AS SHOWN	DRAWN A.J.F.
		DATE 27/03/09	CHECKED

DRAWING No. GJ0495.2.1

2) Method

The application of buffer zones to the proposed RISE development has been addressed in this report with reference to:

- Tweed Shire Council's Development Control Plan (Subdivision Manual).[1]
- Tweed Shire Council's Local Environmental Plan.[2]
- North Coast Regional Environment Plan.[3]
- Far North Coast Regional Strategy.[4]
- Section 117(2) of the Environmental Planning and Assessment Act.[5]
- North Coast Living and Working in Rural Areas handbook.[6]
- Queensland Planning Guidelines.[7]
- NSW Agricultural Land Classification.[8]

As part of the ABZA, a preliminary assessment was undertaken by G&S including a review of available aerial imagery and previous soil surveys carried out by qualified G&S staff.

A field investigation involving a site visit was conducted on March 18, 2009. However due to limited site access at this time, the assessment of some parts of the site boundary was restricted to visual confirmation (at distance) of elements previously identified using aerial imagery. Where sections of site boundary and adjoining land use were not visible during the inspection, the assessment was based entirely on the available aerial imagery.

Land use zones for the site and surrounding lands have been specified by the Tweed Shire Council in the Tweed Local Environmental Plan. To define appropriate buffer zones, the different land zones for the site and surrounding land were identified, as shown in Drawing No. GJ0495.2.2.

Following a document review and site investigation, each zone was then divided into sub-sections (A through to Q). The primary criteria for the division of the property boundary were the current and most likely future land uses of the adjoining land. The location and extent of each sub-section is shown on Drawing No. GJ0495.2.3.

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[1] Tweed Shire Council Development Services Division 2008, *Development Control Plan (Subdivision Manual)*, Tweed Shire Council.

[2] Tweed Shire Council 2008, *Local Environmental Plan 2000, Tweed Shire Council.*

[3] NSW Department of Planning 2008, *North Coast Regional Environment Plan (1998-51),* NSW Department of Planning (viewed March 31, 2009).

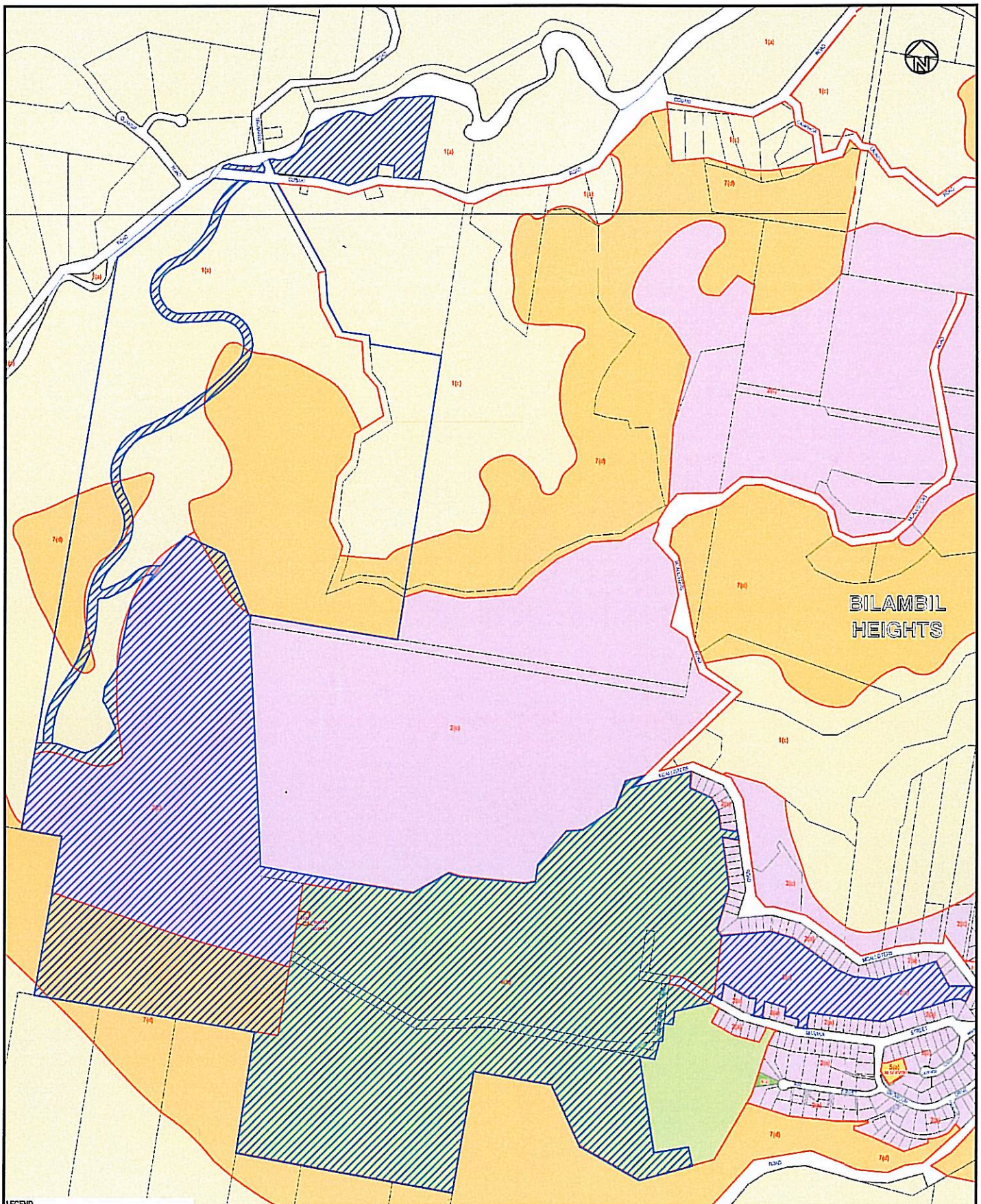
[4] NSW Department of Planning 2006, *Far North Coast Regional Strategy 2006-31,* NSW Department of Planning.

[5] NSW Department of Planning 2009, *Environmental Planning and Assessment Act 1979,* NSW Department of Planning.

[6] Centre for Coastal Agriculture Landscapes & Northern Rivers Catchment Management Authority 2007, *Living and Working in Rural Areas – A handbook for managing conflict issues on the NSW North Coast.* NSW Department of Primary Industries.

[7] QLD Department of Natural Resources 1997, *Planning Guidelines - Separating Agricultural and Residential Land Uses*, Department of Natural resources QLD.

[8] Hulme, T., Grosskopt, T. & Hindle J 2002, AGFACTS – *Agricultural Land Classification*. NSW Department of Agriculture.



Base Image: Tweed LEP (2000)

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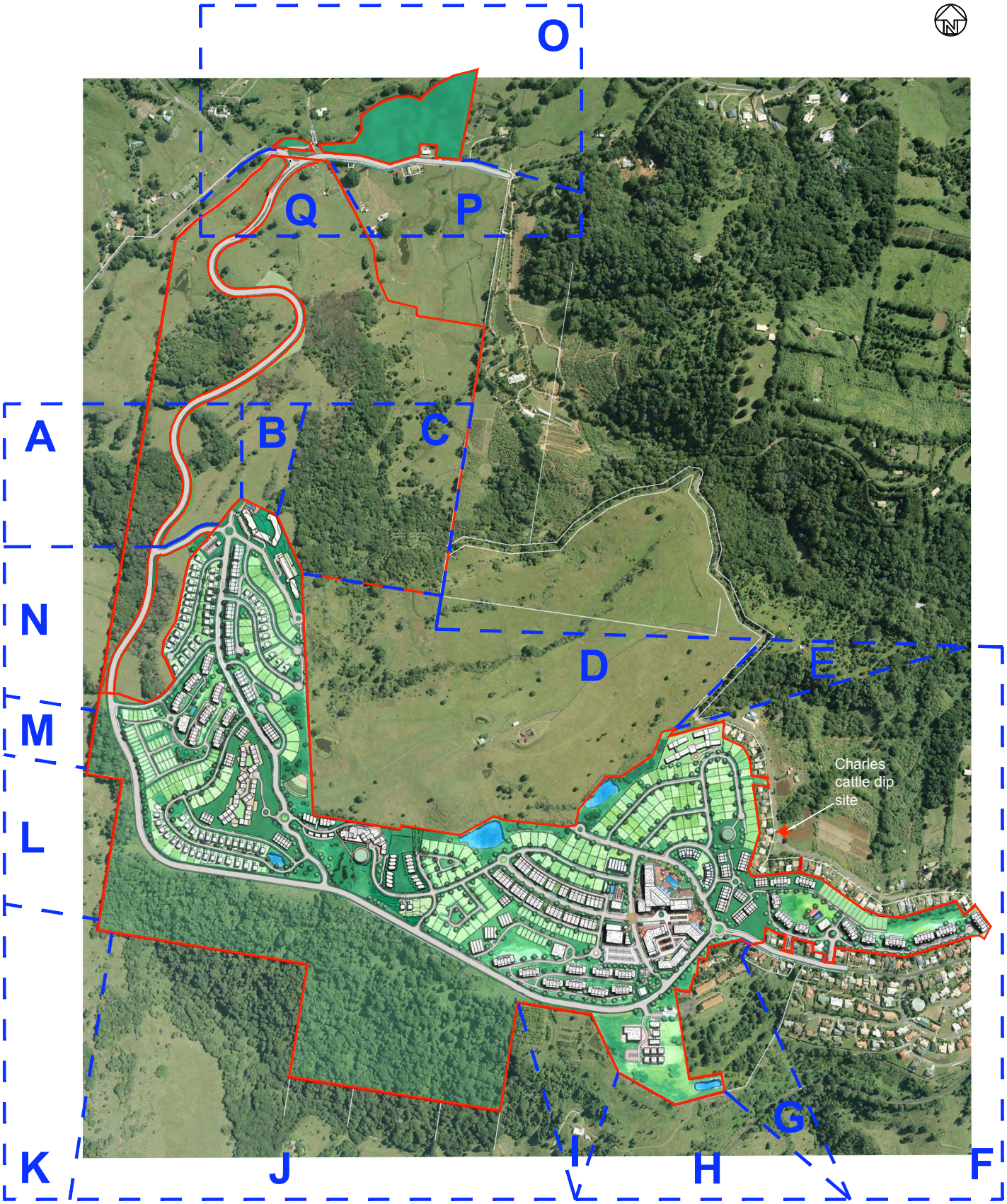
FIGURED DIMENSIONS TO BE READ IN PREFERENCE TO SCALING.

APPROVED . . . . . .

PROJECT
TERRANORA GROUP MANAGEMENT
RISE - MP08-0234
BILAMBIL HEIGHTS, NSW
LAND ZONES

SCALE AS SHOWN	DRAWN MLF	DRAWING No.
DATE 13/03/09	CHECKED	GJ0495.2.2



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Scale of metres

Base Image: ML DESIGN (2009)

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PROJECT

TERRANORA GROUP MANAGEMENT

RISE - MP08-0234

BILAMBIL HEIGHTS, NSW

SUB-SECTIONS

FIGURED DIMENSIONS TO BE READ IN PREFERENCE TO SCALING.	APPROVED	SCALE AS SHOWN	DRAWN M.L.F
		DATE 16/03/09	CHECKED

DRAWING No. GJ0495.2.3

3) Site characteristics

3.1 Site description

The RISE site is located in New South Wales just south of the border between NSW and Queensland, approximately 10km south-west of Tweed Heads in the township of Bilambil.

The site comprises; Lots 32 & 33 on DP1085109, Lot 31 on DP850230, Lot2 on DP867486 and Lot 4 on DP822786 under the ownership of Terranora Group Management Pty. Ltd.; Lot 1 on DP1033810, Lot 1 on DP1033811 and Lot 1 on DP595529 owned by Tweed Shire Council; and Crown Road separating Lot 2 on DP867486, Lot 33 on DP1085109 and Lot 2 on DP555026. The site location is shown on Drawing No. GJ0495.2.1.

With a total land area of approximately 184ha owned by the applicant, the subject site contains an area of some 110ha of development footprint (the area described by MP08-0234) and is characterised by undulating land ranging from 2m to 216m Australian Height Datum (AHD).

3.2 Vegetation

The majority of the proposed development will occur in areas that have been cleared of native vegetation for past agricultural activities and a golf course (which currently occupies the south-eastern portion of the development footprint) as shown on the aerial photograph in Drawing No. GJ0495.2.3.

For a detailed description of the vegetation on site, refer to the report by James Warren & Associates which forms part of the MP08-0234 application.

3.3 Geology

A review of the Geological Survey of Queensland Geology, 1:100,000 series - Murwillumbah indicates that the site is underlain by soils of the Cainozoic period which largely comprise of Lamington Group, basalt flows.

3.4 Soil Landscapes

Soils in the region have been mapped and described in 'Soil landscapes of the Murwillumbah – Tweed Heads 1:100,000 Sheet'[9] (Morand 1996). The relevant section is shown on drawing No. GJ0495.2.4 attached. This mapping indicates that MP08-0234 will be within the Carool (ca) and Disturbed (xx) landscapes while the playing fields to the north of Cobaki Creek Road are on the Crabbes Creek (cr) soils landscape.

The general soil profile over the site was described by Morand as friable clays overlying light medium to medium heavy clays or sandy clays.

3.5 Soil Classification

G&S undertook a soil survey of the site in 1997 and again in 2005 incorporating a total of 15 detailed boreholes and additional soil observations to an average depth of 0.6m in order to characterise the site soils.

Soil sampling and profile description was undertaken according to the Australian Soil and Land Survey Field Handbook (McDonald et al, 1990) with the soils classified according to the Australian Soil Classification (Revised) (Isbell, 1996;2002).

Soils within the MP08-0234 area were identified predominantly as Ferrosols, with a smaller portion of Kurosols and Dermosols also present.

Ferrosols are described by Isbell (2002) as soils other than Vertosols, Hydrosols and Calcarosols that:

(i) Have B2 horizons in which the major part has a free iron oxide content greater than 5% Fe in the fine earth fraction (<2mm); and

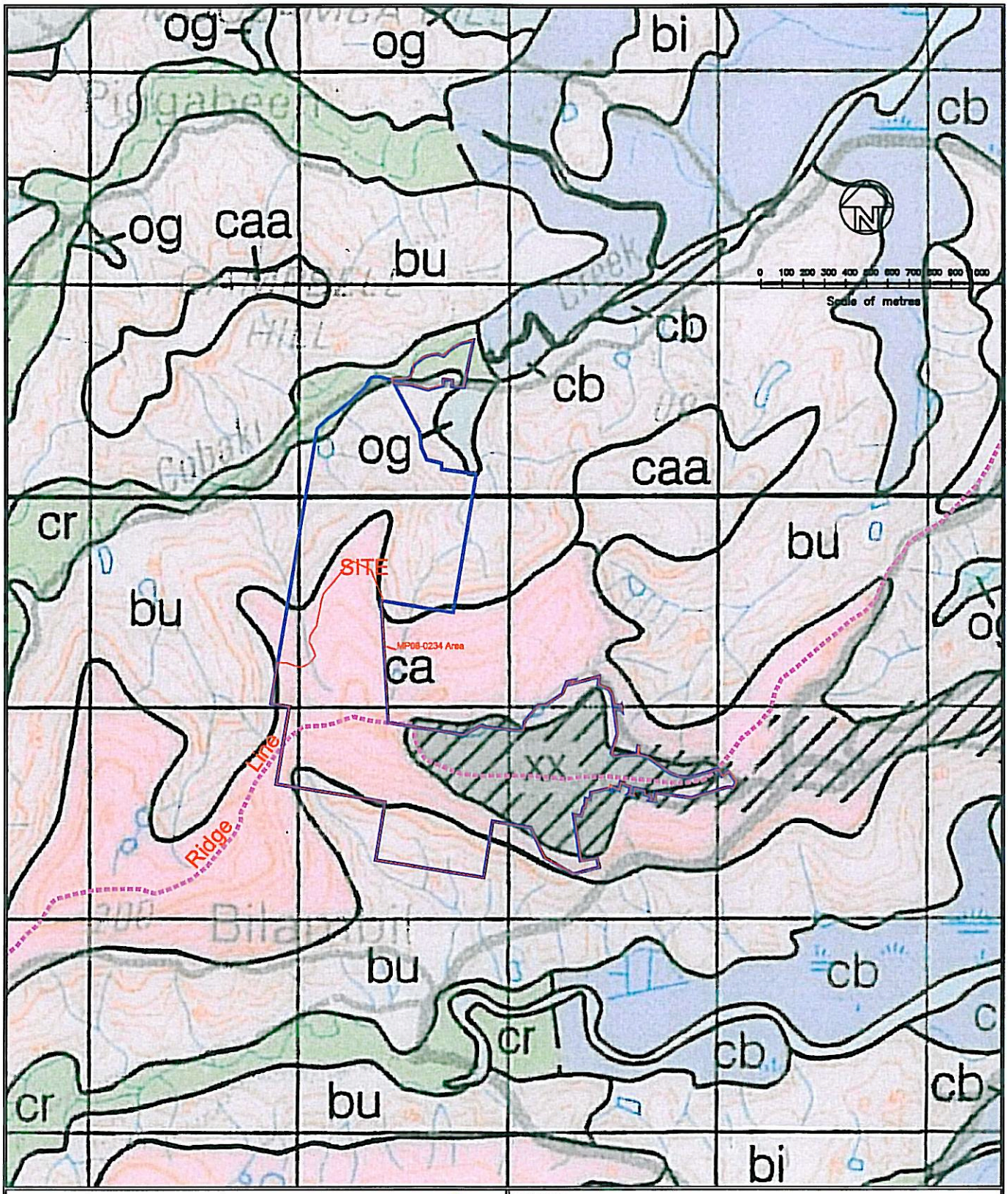
(ii) Do not have clear or abrupt textural B horizons or a B2 horizon in which at least 0.3m has vertic properties.

These soils correspond with the Carool soil landscape described by Morand (1996) and are predominantly associated with dark

[9] *Soil landscapes of the Murwillumbah – Tweed Heads 1:100,000 Sheet*, NSW Department of Land & Water Conservation, Morand D.T. 1996.

reddish brown clay loams to light medium clays overlying reddish brown medium clays with moderate structure.

Kurosols and Dermosols were differentiated by either a clear and abrupt B horizon (as in the case of Kurosols) or less than 5% Fe in the fine earth fraction, as indicated by colour (in the case of Dermosols). These soils correspond with the disturbed and Burringbar soil landscapes described by Morand (1996).



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PROJECT

TERRANORA GROUP MANAGEMENT

RISE - MP08-0234

BILAMBIL HEIGHTS, NSW

SOIL LANDSCAPES

FIGURED DIMENSIONS TO BE READ IN PREFERENCE TO SCALING.	APPROVED	SCALE AS SHOWN	DRAWN A.G.G.
		DATE 8/04/09	CHECKED

DRAWING No. GJ0495.2.4

4) Boundary assessment

The relevant historical, current and potential land use practices, within each zone and sub-section, are discussed briefly below. The quality of surrounding agricultural lands has been determined with reference to the New South Wales Department of Agriculture's Land Classification System[10] (Agricultural Land (AL) Class 1 to Class 5).

Land adjoining the boundary of sub-sections A, B, C, N and Q is owned by the applicant.

4.1 Rural Zone

Areas zoned as rural comprises land in the vicinity of sub-sections A (north western boundary), K (south-western boundary), M and N (western boundary), O (northern and eastern boundaries of Precinct U – proposed Sports Park) and Q (south-western boundary of Precinct U – Sports Park).

Sub-sections A, K, and M (AL Class 5) have similar characteristics and potential to adjacent lands with active banana plantations (Steep north-east to north-westerly facing slopes consisting mostly of Ferrosols). The boundary of sub-sections K and M is densely vegetated.

The proposed road fragments sub-section N (AL Class 4 and 5) creating an area unsuitable for future agricultural purposes other than grazing.

A Sports Park is proposed for Precinct U which is bound by Cobaki Creek to the north (sub-section O, AL Class 5) and Cobaki Road to the south-west (sub-section Q, AL Class 5). Robinsons Road passes through the south-western section of Precinct U.

4.2 Rural Living Zone

Areas zoned as rural living comprises land in the vicinity of sub-sections E and P. Sub-section E is located on the eastern boundary of the site where a steep gully vegetated primarily with broad-leafed privet and other introduced species is fronted by McAlisters Road. This AL Class 5 land is steeply sloped placing significant constraints on future land use. Sub-section P is located on the southern boundary of Precinct U where AL Class 4 pastoral land is fronted by Cobaki Road.

4.3 Low Density Residential Zone

Areas zoned as low density residential comprises land in the vicinity of the south-eastern boundary of the site (sub-section F). Current land use consists of residencies fronting onto McAlisters Road, Mountain View Esplanade and Marana Street.

4.4 Urban Expansion Zone

Urban expansion zones are located in the vicinity of sub-section D. The land has largely been cleared. Therefore, urban development is likely to be the prominent land use within these areas in the future.

4.5 Recreation Zone

Areas zoned as recreation comprises land in the vicinity of the southern boundary of the site (sub-section G). Tourist accommodation currently adjoins the site boundary with the remaining land sparsely vegetated.

4.6 Environmental Protection (Scenic / Escarpment) Zone

Land in the vicinity of sub-sections B, C, H I, J and L have been zoned as environmental protection (scenic / escarpment). Land adjoining sub-sections B and C (northern boundary) forms part of the total site area. Sub-section B has largely been cleared for pastoral uses while sub-section C is mostly vegetated with areas of cleared land.

Sub-sections H and I are mostly cleared with horticultural enterprises currently taking place. Consequently, it will be necessary to provide adequate buffers within the boundary of these sub-sections.

The boundary of sub-sections J and L is densely vegetated. Adjacent land is partly cleared for pastoral uses (AL Class 4 and 5).

[10] Hulme, T., Grosskopt, T. & Hindle J 2002, AGFACTS – *Agricultural Land Classification*. NSW Department of Agriculture.

5) Buffer zone assessment

As stated, RISE is bounded by a number of land use zones including rural, rural living, low density residential, urban expansion, recreation and environmental protection. Taking into consideration the current and likely future land use of these areas, buffer zones can be determined for each sub-section of the site boundary.

5.1 Buffer zone definition

In accordance with the North Coast Living and Working in Rural Areas handbook[11];

> '*land use buffers are an accepted land use planning tool and have an important role in reducing risk of land use conflict and impacts between incompatible land uses through separation of land uses'.*

The Tweed Shire Development Control Plan (Subdivision manual)[12] defines a buffer area as;

> *'an area of prescribed width and treatment created between two or more landuses (including environmentally sensitive areas) for the purpose of mitigating the impacts of one or more of those landuses'.*

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.

Factors that may cause conflict between agricultural production activities and urban development include:

- agricultural chemical spray drift
- noise
- dust, smoke & ash
- odour,
- vandalism, complaints and danger.

Buffer zones, other than agricultural buffers, may also be applicable to those lands which do not support agricultural production activities. These buffers are generally necessary to ensure the adequate protection of current land uses.

The Tweed Shire Council Development Control Plan (Subdivision Manual), the North Coast Living and Working in Rural Areas handbook, and the Queensland Planning Guidelines were used to determine appropriate separation distances. These separation distances will provide an adequate buffer between the proposed RISE development and neighbouring land-use practices.

A risk assessment was conducted in accordance with the Land Use Conflict Risk Assessment (2008)[13] to determine the risk associated with reducing these recommended buffer widths to accommodate site specific circumstances (tables 5.2.1 to 5.7.4 at the end of this section, method shown in Appendix 1). Proposed buffers are shown in Drawing No. GJ0495.2.5.

5.2 Buffers for rural zones

Sub-section A is adjoined by pastoral land along the north-western boundary of the site with potential land use including banana production. North Coast Living and Working in Rural Areas handbook recommends a 150m buffer between bananas and urban development.

An acceptable risk rating of 18 was calculated for the implementation of a 40m vegetated buffer along the boundary of sub-section A (Table 5.2.1 following page). This buffer may be implemented along the outside of the boundary (within the total site area).

Land adjoining sub-sections K and M also has the potential for banana production. The boundary of these sub-sections is currently densely vegetated. An acceptable risk rating of 18 was calculated for the implementation of a 20m densely vegetated buffer within the boundary of these sub-sections (Table 5.2.2 following page).

[11] Centre for Coastal Agriculture Landscapes & Northern Rivers Catchment Management Authority 2007, *Living and Working in Rural Areas – A handbook for managing conflict issues on the NSW North Coast,* NSW Department of Primary Industries, pp. 87.

[12] Tweed Shire Council Development Services Division 2008, *Development Control Plan (Subdivision Manual),* Tweed Shire Council, pp. A5-116.

[13] Tim Fitzroy & Associates 2008, *Land Use Conflict Risk Assessment Workshop*, Ocean Shores.

Table 5.2.1 Rural zone, sub-section A, 40m vegetated buffer – Risk assessment

Hazard	Mitigating factors	Consequence	Probability	Score
Spray drift	AL Class 5 Restricted access Downgradient of development South-easterly prevailing winds Vegetated buffer (QLD DNR,1997)	Moderate	Unlikely	18
Odour		Negligible	Unlikely	13
Noise		Negligible	Unlikely	13
Erosion & sediment	Sediment & erosion controls Vegetated buffer (QLD DNR,1997)	Moderate	Unlikely	18
Domestic animals (cats & dogs)	Residential fencing	Moderate	Unlikely	18

Table 5.2.2 Rural zone, sub-sections K and M, 20m densely vegetated buffer – Risk assessment

Hazard	Mitigating factors	Consequence	Probability	Score
Spray drift	AL Class 5 Restricted access Downgradient of development South-easterly prevailing winds Densely vegetated buffer (QLD DNR,1997)	Moderate	Unlikely	18
Odour		Negligible	Unlikely	13
Noise		Negligible	Unlikely	13
Erosion & sediment	Sediment & erosion controls Densely vegetated buffer (QLD DNR,1997)	Moderate	Unlikely	18
Domestic animals (cats & dogs)	Residential fencing	Moderate	Unlikely	18

Due to area constraints, land in the vicinity of sub-section N will be unsuitable for future agricultural purposes other than grazing. The Tweed Shire Development Control Plan recommends a 30m separation buffer between grazing land and residential development. This buffer may be implemented along the outside of the boundary (within the total site area).

The proposed Sports Park in Precinct U incurs no buffer requirement however, a proposed 50m separation distance is extended to those riparian areas adjoining sub-section O where the site boundary borders Cobaki Creek (NSW Fisheries, 1999)[14]. The proposed Sports Park places no constraints on this open space buffer. An existing 20m road buffer adjoins sub-section Q.

5.3 Buffers for rural living zones

Steep slopes in sub-section E place significant constraints on potential land use in this area (light grazing at best). The existing McAlisters Road provides a 20m buffer between the development site and adjacent land uses. An acceptable risk rating of 18 was calculated adopting this buffer in favour of the Tweed Shire Development Control Plan's 30m separation buffer (Table 5.3.1 following page).

Landuse in sub-section P currently consists of pastoral use. The proposed Sports Park in Precinct U incurs no buffer requirement. However, an existing 20m road buffer adjoins the southern boundary of sub-section O.

5.4 Buffers for low density residential zones

Sub-section F is adjoined by residencies fronting onto McAlisters Road, Mountain View Esplanade and Marana Street. Buffer zones would not be required separating urban development from areas of current urban land use.

5.5 Buffers for urban expansion zones

Land currently adjoining the proposed development at sub-section D is designated for urban expansion. The land is currently cleared for pastoral purposes. Buffer zones separating urban development from future urban development are not required. The Concept Plan includes two pubic roads that are planned to accommodate the future urban expansion of sub-section D.

[14] NSW Fisheries 1999, *Policy and Guidelines Aquatic Habitat Management and Fish Conservation.* NSW DPI.

Table 5.3.1 Rural living zone, sub-section E, 20m existing road buffer – Risk assessment

Hazard	Mitigating Factors	Consequence	Probability	Score
Erosion & sediment	Sealed diversion (McAlisters Road) Revegetate disturbed area ASAP	Moderate	Unlikely	18
Domestic animals (cats & dogs)	Residential fencing	Moderate	Unlikely	18

5.6 Buffers for recreation zones

Land adjacent to sub-section G of the site boundary is adjoined by tourist accommodation with surrounding land sparsely vegetated. Buffer zones would not be required separating urban development from land zoned for recreation.

5.7 Buffers for environmental protection (scenic/escarpment) zones

Sub-sections B, C, H, I, J and L are located adjacent to areas zoned or proposed to be zoned for environmental protection.

Land in sub-sections H and I is zoned environmental protection but is currently used for horticulture and small crop production. North Coast Living and Working in Rural Areas handbook recommends a 300m buffer between horticulture and urban development.

An acceptable risk rating of 18 was calculated for the implementation of a 40m vegetated buffer along the boundary of sub-section B (Table 5.7.1 following page). This buffer may be implemented along the outside of the MP08-0234 boundary in sub-section B (within the total site area). However, the actual vegetation of this buffer may not be required as the applicant intends to seek future development approval for urban expansion through the review of the Far North Coast Regional Strategy in 2010. The applicant also maintains control of this land in any case.

An acceptable risk rating of 18 was calculated for the implementation of a 40m vegetated buffer along the boundary of sub-sections H and I (Table 5.7.2 following page). This buffer must be implemented within the site boundary in sub-sections H and I but may include landscaping.

Sub-section C is partly densely vegetated. A 50m buffer was recommended in the North Coast Living and Working in Rural Areas handbook (2007) to be established between future urban development and native vegetation/habitat.

An acceptable risk rating of 18 was calculated for the implementation of a 20m densely vegetated buffer along the boundary of this sub-section (Table 5.7.3 following page). This buffer may be placed along the outside of the boundary in sub-section C (within the total site area).

Sub-sections L and J are zoned environmental protection. The boundaries are densely vegetated but land has been cleared for pastoral use. Future land use may include banana production. An acceptable risk rating of 18 was calculated for the implementation of a 20m densely vegetated buffer within the boundary of these sub-sections (Table 5.7.4 following page).

Table 5.7.1 Environmental protection zone, sub-sections B, 40m vegetated buffer – Risk Assessment

Hazard	Mitigating factors	Consequence	Probability	Score
Spray drift	AL Class 4 Restricted access Downgradient of development South-easterly prevailing winds Vegetated buffer (QLD DNR,1997)	Moderate	Unlikely	18
Odour		Negligible	Unlikely	13
Noise		Negligible	Unlikely	13
Erosion & sediment	Sediment & erosion controls Vegetated buffer (QLD DNR,1997)	Moderate	Unlikely	18
Domestic animals (cats & dogs)	Residential fencing	Moderate	Unlikely	18

Table 5.7.2 Environmental protection zone, sub-sections H and I, 40m vegetated buffer – Risk Assessment

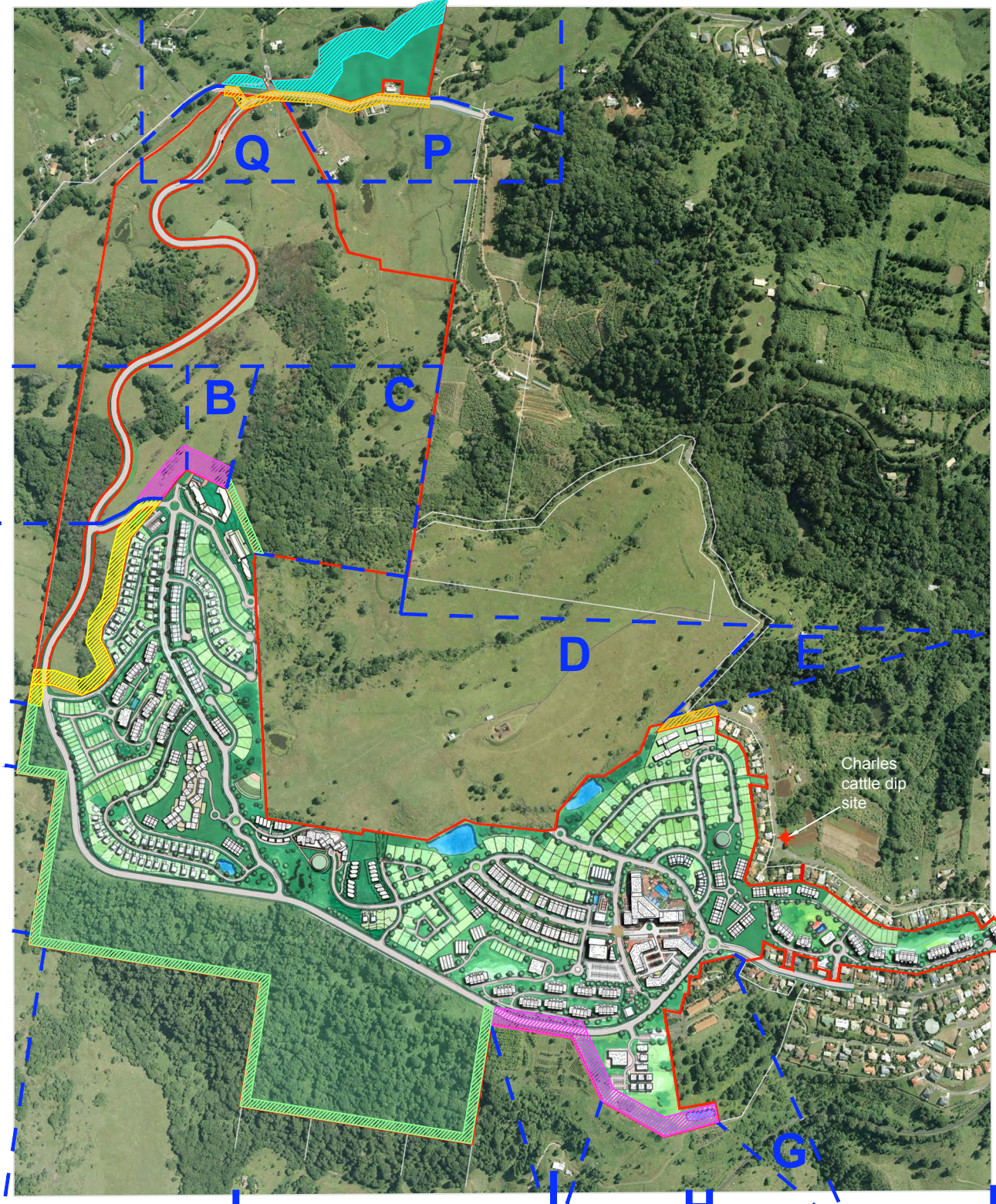
Hazard	Mitigating factors	Consequence	Probability	Score
Spray drift	AL Class 5 Downgradient of development Vegetated buffer (QLD DNR,1997)	Moderate	Unlikely	18
Odour		Negligible	Unlikely	13
Noise		Negligible	Likely	17
Erosion & sediment	Sediment & erosion controls Vegetated buffer (QLD DNR,1997)	Moderate	Unlikely	18
Domestic animals (cats & dogs)	Residential fencing	Moderate	Unlikely	18

Table 5.7.3 Environmental protection zone, sub-section C, 20m densely vegetated buffer – Risk Assessment

Hazard	Mitigating factors	Consequence	Probability	Score
Erosion & sediment	Sediment & erosion controls	Moderate	Unlikely	18
Light	Densely vegetated buffer (QLD DNR,1997)	Moderate	Unlikely	18
Weeds	Residential fencing	Moderate	Unlikely	18
Paper, plastic, bottles etc.	Residential fencing	Negligible	Unlikely	13
Domestic animals (cats & dogs)	Residential fencing	Moderate	Unlikely	18

Table 5.7.4 Environmental protection zone, sub-section J and L, 20m densely vegetated buffer – Risk Assessment

Hazard	Mitigating factors	Consequence	Probability	Score
Spray drift	AL Class 4 and 5 Restricted access Downgradient of development Densely vegetated buffer (QLD DNR,1997)	Moderate	Unlikely	18
Odour		Negligible	Unlikely	13
Noise		Negligible	Unlikely	13
Erosion & sediment	Sediment & erosion controls Densely vegetated buffer (QLD DNR,1997)	Moderate	Unlikely	18
Weeds	Residential fencing Densely vegetated buffer (QLD DNR,1997)	Moderate	Unlikely	18
Paper, plastic, bottles etc.	Residential fencing	Negligible	Unlikely	13
Domestic animals (cats & dogs)	Residential fencing	Moderate	Unlikely	18



LEGEND

- 40m vegetated buffer
- 20m densely vegetated buffer
- 20m existing road buffer
- 50m riparian buffer (open space)
- 30m open space buffer

0 100 200 300 400 500

Scale of metres

Base Image: ML DESIGN (2009)

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FIGURED DIMENSIONS TO BE READ IN PREFERENCE TO SCALING.

APPROVED . . . . . .

PROJECT

TERRANORA GROUP MANAGEMENT

RISE - MP08-0234

BILAMBIL HEIGHTS, NSW

PROPOSED BUFFERS

SCALE AS SHOWN	DRAWN M.L.F	DRAWING No.
DATE 6/09/10	CHECKED	GJ0495.2.5

6) Agricultural issues impacting on development within the site

6.1 Cattle dip sites

NSW Department of Primary Industries' Dip site locator was used to determine the location, history and status of any nearby cattle dip sites (shown in Appendix 2). Five dip sites were located within the Terranora/Bilambil area. The closest dip site to the RISE development site (Charles) is located on the eastern side of McAlisters Road, within sub-section F (as shown in Drawing No. GJ0495.2.3).

6.2 Other contamination issues

Contamination issues for the entire site are addressed separately in the Gilbert & Sutherland report titled *'Contamination Assessment Summary, Proposed RISE Development (MP08-0234), Bilambil Heights, West Tweed, New South Wales'* (April 2009) which forms part of the MP08-0234 application. The following general advice relates to all agricultural sites and the specific advice in the Contamination Assessment Summary should be preferred.

The NSW Department of Primary Industries' agnote[15] identifies chemical residues which may be present in agricultural lands.

Historical cropping practices on the site should be investigated to determine the likelihood of any chemical residues in the soil. Organochlorines (OCs) including DDT, dieldrin and heptachlor were used for a number of years to control pests on fruit and vegetable crops. Soils treated with phosphatic fertilisers often contain high levels of Cadmium.

The likelihood of the presence of arsenic in soil (used in the past on bananas and deciduous fruits) should be determined. Historical livestock practices which may have resulted in soil arsenic contamination should also be investigated.

Timber buildings, yards or fences treated for termites should be assessed to determine the presence or not of OC residues. Evidence of pesticide storage sheds, used chemical drums or disposal sites should also be investigated.

The location of any workshops on-site should be determined to identify the presence of any Polychlorinated biphenyls (PCBs). Leakage from equipment containing transformer oils, hydraulic oils and electrical capacitors can leave contaminated 'hot spots'.

[15] Byrne, D., McNeil, H. & Hawke, J. 2004, *Agnote ISSN 1034-6848 - Some precautions when buying rural land,* NSW Department of Primary Industries.

7) Recommendations

The perimeter of the proposed RISE development is adjoined by land zoned as rural, rural living, low density residential, urban expansion, recreation 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, buffer zones are recommended.

The specific separation distance (applicable within the RISE development site) and buffer element proposed for each sub-section of the site's boundary is outlined in Table 7.1.

Contamination issues for the entire site have been addressed in the Gilbert & Sutherland report titled *'Contamination Assessment Summary, Proposed RISE Development (MP08-0234), Bilambil Heights, West Tweed, New South Wales'* (April 2009) which forms part of the MP08-0234 application. An assessment consistent with the National Environmental Protection (Assessment of Land Contamination) Measures - Schedules B(1) – (10) and SEPP 55 would be required in the event that possible sources of contamination are identified on the development site.

7.1 Vegetated buffer zones

Vegetated buffer zones are an alternative to dedicating large tracts of land to achieve adequate separation distances. In accordance with the Queensland Planning Guidelines, the vegetated buffers proposed would have a total minimum separation distance of 40m, incorporating a 20m-wide tree and shrub planting, and 10m areas clear of vegetation to either side of the vegetation.

7.2 Open Space buffer zones

Open space buffers can incorporate public open space, road reserves and/or natural features such as watercourses. Additionally, similar to vegetated buffers, they can be incorporated into large residential allotments so long as the specified separation distance is maintained between the source and sensitive receptor.

Table 7.1 Recommended Buffer Zones

Land Use Zone	Land Use	Sub-section	Separation Distance	Buffer Element
Rural	Pastoral land	A	40m	Vegetated
	Pastoral land	K & M	20m	Densely vegetated
	Pastoral land	N	30m	Open space
	Pastoral land	O	50m	Open space
	Pastoral land	Q	20m	Existing road
Rural Living	Vegetated	E	20m	Existing road
	Pastoral land	P	20m	Existing road
Low Density Residential	Residential	F	0m	n/a
Urban Expansion	Pastoral land	D	0m	n/a
Recreation	Tourist accommodation	G	0m	n/a
Environmental Protection	Pastoral land	B	40m	Vegetated
	Horticulture	H & I	40m	Vegetated
	Partly densely vegetated	C	20m	Densely vegetated
	Pastoral land	J & L	20m	Densely vegetated

8) Appendix 1 – Risk assessment

Measures of Consequence[16] (Severity of Environmental Impact)

Level	Descriptor	Description	Examples/Implications
1	Major	• Serious and/or long-term impact to the environment/public health and/or amenity • Long term management implications	• Water, soil or air impacted seriously, possibly in the long term • Limited damage to animals fish or birds or plants • Many public complaints including odour and noise • Contravenes the conditions of Councils licences, permits and the POEO Act • Likely prosecution
2	Moderate	• Moderate and/or medium-term impact to the environment/public health and/or amenity • Some ongoing management implications	• Water , soil or air known to be affected, probably in the short term • No damage to plants or animals • Public unaware and no complaints to Council • May contravene the conditions of Council's Licences and the POEO Act • Unlikely to result in prosecution
3	Negligible	• Very minor impact to the environment/public health and/or amenity • Can be effectively managed as part of normal operations	• No measurable or identifiable impact on the environment/public health and /or amenity

Probability (Measure of Likelihood of Risk)

Level	Descriptor	Description
A	Very Likely	Common or repeating occurrence
B	Likely	Known to occur, or it has happened
C	Unlikely	Could occur in some circumstances, but not likely to occur

Risk Ranking Table

PROBABILITY	A	B	C
Consequence			
1	25	24	22
2	23	21	18
3	20	17	13

A risk ranking of 25-20 would normally be deemed as an unacceptable risk.
A risk ranking of less than 20 would normally be deemed as an acceptable risk.

[16] Tim Fitzroy & Associates 2008, *Land Use Conflict Risk Assessment Workshop*, Ocean Shores.

9) Appendix 2 – Cattle dip sites