

PLANNING PROPOSAL REQUEST - CALEDONIA

**CALEDONIA  
REQUEST FOR A PLANNING PROPOSAL  
BENSLEY ROAD, INGLEBURN  
PLANNING REPORT**



Prepared for **Billbergia Group**

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<b>Annexure A</b>	<b>Caledonia - Engineering Report &amp;Traffic and Access Assessment Report</b>
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<b>Annexure D</b>	<b>Caledonia bushfire constraints report</b>
<b>Annexure E</b>	<b>Edge Lands Planning Proposal - Odour</b>
<b>Annexure F</b>	<b>Caledonia Concept Master Plan 16-12-2015 (superseded)</b>



## CALEDONIA PLANNING PROPOSAL

### 1 Executive Summary

This application for a planning proposal is submitted to Campbelltown City Council to request that the subject lands, referred to in this report as 'Caledonia', be rezoned for residential and open space purposes.

The Caledonia site adjoins existing residential land in the eastern part of Ingleburn and is bounded by Bensley Road, Mercedes Road and Oxford Road. The 17.5ha site is currently zoned E4 - Environmental Living with a minimum of 2ha for subdivision. It is proposed that the land be rezoned to a mix of R5 Large Lot Residential, R2 Low Density Residential and RE1 Open Space with a mixture of lot sizes.

This area has been the subject of a number of investigations and form part of lands known as the East Edge Scenic Protection Lands. These lands generally form in part the western edge of the 'planned' Georges River Parkway, the reservation for which crosses over the north eastern part of the Caledonia site. Council has described this area as area EEC2.

On 21 June 16, the Campbelltown City Council adopted the following policy position in relation to the Eastern Edge land area EEC2.

*Any future developments should reflect a transition from the existing residential density (generally 500sqm) to large lot residential development of 1,000sqm and 2,000sqm allotments. Retention/management of remnant woodland and reinstatement of an informal rural /woodland verge character of perimeter roads should be pursued where practical.*

Council also discussed that development in this area should be delivered via planning proposal funded by landowners. The revised proposal outlined in this report has been modified to reflect the planning position outlined by Council and represents a direct translation of these principles.

This revised proposal has been subject to extensive consultation with Council officers and their valuable feedback has informed the revised proposal.

In addition, Billbergia is proposing the establishment of a fund to maintain the open space in perpetuity and is open to further discussion on the opportunities via a VPA to provide funds to construct walking trails, bush regeneration or similar enhancements through Georges river nature reserve.

#### **Caledonia - Vision and Concept Plan**

The original concept at Annexure F details the surrounding context and a proposal for a range of lot sizes up to a total of approximately 250. This was substantially revised to be consistent with Councils preferred and adopted position.

Through a change of land uses and a new planning framework, the revised Caledonia Planning Proposal presents an opportunity provides a lasting solution that maintains the semi rural appearance to Bensley and Oxford roads and provides a transition into the scenic hills area consistent with Councils vision for the area.

The vision for Caledonia is to:

*Create a new village community that responds sensitively to the scenic landscape character, whilst connecting seamlessly with the existing community of Ingleburn and providing a mix of new housing*

*that can meet the changing needs of a growing community.*

The name 'Caledonia' has been chosen as a reference to the name of the historic village subdivision planned for the area, but never built.

A revised concept plan supports the Caledonia Planning Proposal. This revised concept plan provides for a maximum of 170 residential dwellings in a mix of lot sizes and building typologies, integrated with new public parklands.

The Caledonia concept plan embodies best practice urban and landscape design principles that seek to:

1. Retain and embellish of the existing scenic landscape character of the Edge Lands, and conservation of key vegetation communities
2. Retain a low-density rural edge character to the Georges River Regional Open Space Parklands that is low impact, sensitive and defensible and deliver complementary repair and renewal strategies for trees and vegetation that enhance the Edge Lands scenic landscape character
3. Establish a connected street network that integrates with and complements the existing street pattern and is designed to function in pre and post Georges River Parkway modes and enable existing public bus services to easily service the main part of the site
4. Create new public open spaces that reinforce the Edge Lands parkland character at the interface Georges River Regional Open Space parklands and establish structured street tree planting that is complementary to the scenic landscape character
5. Establish a robust and adaptable development structure that can be developed comprehensively or in an integrated series of stages that respects lot existing lot boundaries.

The Caledonia Planning Proposal rezoning proposes an amendment of the *Campbelltown Local Environmental Plan 2015 (LEP)* and will provide for the future zoning of the land to a mix of:

- part R2 - Low Density Residential
- part R5 - Large Lot Residential
- part RE1 Public Recreation

As mentioned above the revised proposal has lot sizes that allow for a transition from the existing 500m<sup>2</sup> low density area, transitioning up to 2000m<sup>2</sup> on Bensley Rd frontage and 1000m<sup>2</sup> on Oxford Rd frontage are proposed. These, combined with the proposed landscaping and open space will maintain the rural character of these road frontages and provide an appropriate buffer to the Georges River bushland area.

A set of maps illustrating the proposal are provided below;



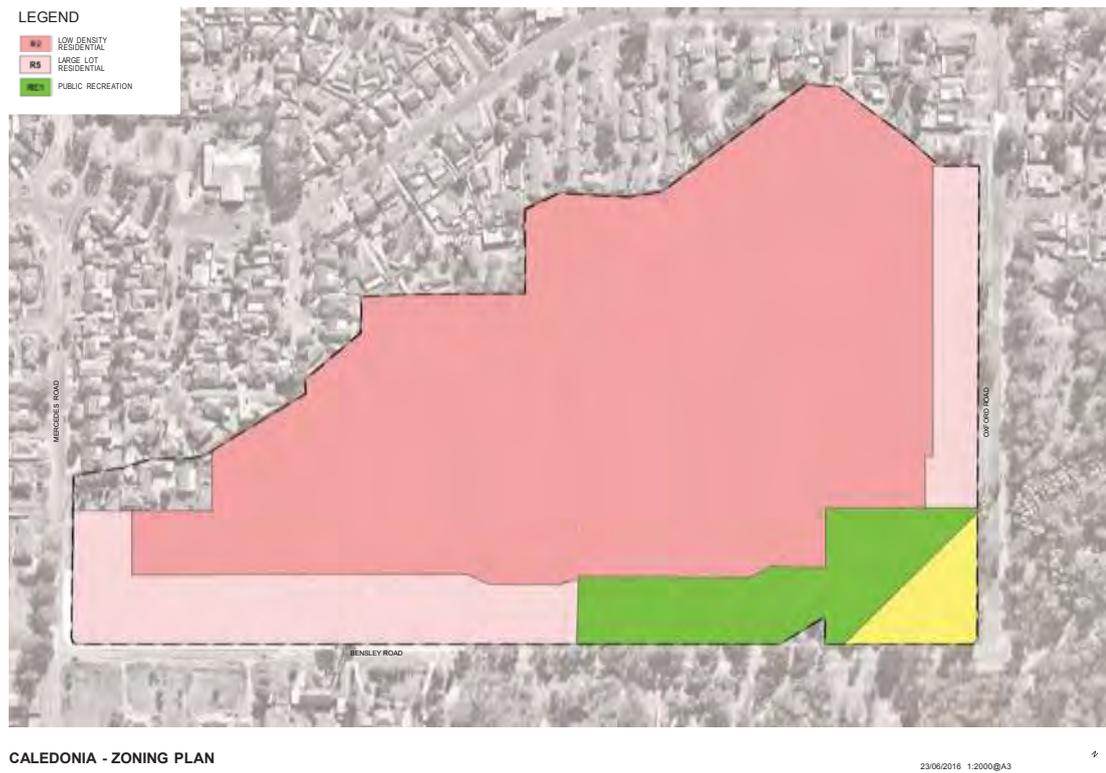
CALEDONIA - PRELIMINARY CONCEPT PLAN

23/06/2016 1:2000@A3



CALEDONIA - ZONING PLAN

23/06/2016 NTS@A3



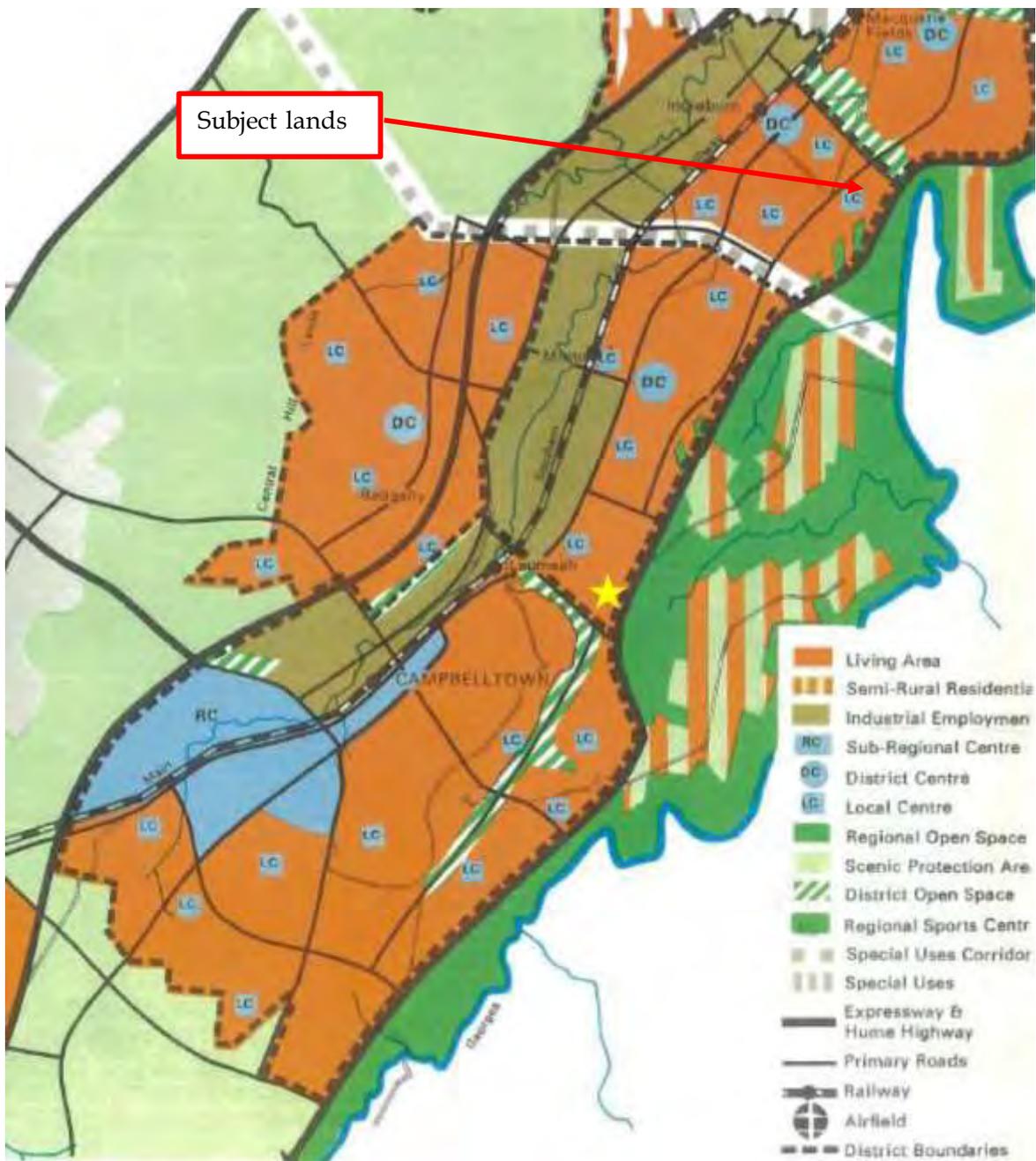
\*note Georges River Parkway reservation in yellow

### 1.1 BACKGROUND

The Campbelltown LGA has been the subject of a number of planning documents and studies. The first of these documents was the basis of three Councils; namely Campbelltown, Camden and Wollondilly planning for the growth that would occur in the Macarthur Region.

The document was titled “New Cities of Campbelltown Camden Appin - State Planning Authority of New South Wales 1973” and was prepared following the publication of the Sydney Regional Outline Plan (SROP) 1968. The New Cities Plan identified Campbelltown as a future growth area, including Ingleburn and the subject land was included within the document as ‘living area’, as shown below in **Figure 1**.

FIGURE 1 - CAMPBELLTOWN CITY STRUCTURE PLAN



## 1.2 PREAMBLE

This submission identifies a number of strategic documents which have been prepared by State and local government that are generally applicable to the south west subregion of Sydney and/or Campbelltown Council itself. It is emphasised that these reports are only summarised as a contextual reference to the development that may occur at Ingleburn.

A number of State and local strategic plans have been prepared to address future urban development and growth in the south-west sub-region of Sydney. The South West sub-region includes the Liverpool, Campbelltown, Camden and Wollondilly local Government areas and is one of the few significant, unconstrained greenfield areas available for new urban development in the south west portion of the Sydney Basin.

Existing strategic plans and strategies were generally prepared prior to the 2011 'Land Review of the Metropolitan Plan for Sydney'. This review included a general invitation by the Minister to landowners to submit expressions of interest for the development of their land for housing. The Review was established to identify sites in appropriate locations and with adequate service and infrastructure provision that will increase dwelling production in the short term at no additional cost to government. The Program applied to greenfield sites of 100 hectares or more proposed predominantly for housing. The subject land was not included as it did not meet the criteria.

The subject site was also addressed as part of a later planning report - *An Environmental Study to Determine Possible Future Controls on Development in the Scenic Protection Area Generally West of the Georges River Parkway* (Ref: 861883-ID (150), dated: July 1987). This document was prepared by Wellings Smith and Byrnes for Campbelltown Council. It was prepared at the request of Council to identify the status of lands within the Georges River Scenic Protection Area; for which numerous applications had been received by Council for a reduction in lot size.

However, over a period of time, several submissions have been made to Council to rezone the land that forms part of lands known as the "East Edge Scenic Protection Lands" (refer to **Figure 2** below). The submissions stated that the lands generally bounded by Mercedes Road, Bensley Road and Oxford Road and comprising the following properties, formed the basis of the submissions:

- Nos. 28 -302 Bensley Road;
- No.26 Mercedes Road; and
- Lot 4 Oxford Street (adjacent to No.233 Oxford Street and abutting the Bensley Road Properties).

The last submission made was in July 2014 to the then draft Local Environmental Plan 2014 that was placed on public exhibition from June to August 2014. Presentations were made to Councillors in series of workshops and on 28 April 2015, the Council resolved in respect of the subject lands that *'the precinct be identified as a priority area for further investigation.'* In the interim, the area was included in the draft LEP as an E4 zone which was effectively a translation of the current zone. The Draft LEP 2014 was referred to the Department of Planning & Environment to make.

Following this resolution, the proponent commenced the preparation of a concept master plan, with supporting technical studies to support the rezoning of these lands for mainly residential purposes. The Campbelltown LEP 2015 was made on 11 December 2015.

On 21 June 16 Campbelltown City Council endorsed a report on the areas identified for priority investigation including the lands which are the subject of this proposal.

The report recommended the following position in relation to the Eastern Edge land area EEC2.

*Any future developments should reflect a transition from the existing residential density (generally 500sqm) to large lot residential development of 1,000sqm and 2,000sqm allotments. Retention/management of remnant woodland and reinstatement of an informal rural /woodland verge character of perimeter roads should be pursued where practical.*

Council also discussed that development in this area should be delivered via planning proposal funded by landowners. The revised proposal outlined in this report has been modified to reflect the planning position adopted by Council and represents a direct translation of these principles.

Consistent with Councils preference for a whole of sub precinct approach, the lands subject to this proposal include parcels under number of different ownerships, referred as Caledonia, as shown in **Figure 3** below.

**FIGURE 2 – EAST EDGE SCENIC PROTECTION LANDS**



FIGURE 3 – CALEDONIA STUDY AREA



The Visual Landscape Analysis report prepared by Paul Davies describes the site as located within E-LU3 – Mercedes Road landscape unit, stating that:

*Landscape Unit 3 in the East Edge Scenic Protection Area (E-LU3) is a predominantly cleared area with stands of significant vegetation, particularly at its southern end. The Unit is centred around the intersection of Mercedes and Bensley Roads, being situated below the line of the main ridge when viewed from the Scenic Hills. The western edge of the Unit is bordered by the residential subdivision of Ingleburn and the eastern edge by the sweeping curve of the reservation for the proposed Georges River Parkway. A major electricity transmission corridor separates the Unit from E-LU4 to the south.*



**E-LU3 – Mercedes Road landscape unit**

*The scenic values of the Landscape Unit 3 are derived from the interlacing of its non-urban and bushland areas. Largely cleared areas are bordered by towering bushland and contrast with the more vegetated areas. The north-western area and the properties near the south-western corner of Mercedes and Bensley Roads demonstrate an open Cumberland Plain Woodland character with houses scattered beneath. Much of the middle sector of the Landscape Unit is substantially cleared and includes traditional non-urban uses such as the poultry farm, low-impact grazing and other small rural activities.*

*Other development such as the recent medium-density development on the eastern edge near Mercedes Road is less sympathetic to the Unit's visual qualities and is inconsistent with its value as a rural landscape.*

*The character of the landscape on the western side of Bensley Road north of Mercedes Road is of a generally good quality, with areas of cleared grazing land contrasting with pockets of more densely planted areas around the dwelling houses, each of which is situated towards the western end of its lot (furthest from the road).*

Council's recent strategic investigations of the East Edge Scenic Protection Lands has proposed that whilst some development and subdivision could be appropriate, it would need respect to the area's scenic landscape character.

The Billbergia have been working cooperatively with Campbelltown City Council to prepare the required technical studies that would support the rezoning of the land in a manner consistent with Council's strategic vision for the area and of the view that the current proposal represents a lasting solution that satisfies these aims.

### **1.3 CHRONOLOGY OF THE PROPOSAL**

A brief summary is provided below which shows the evolution of this planning proposal following consultation with Council and other stakeholders.

- 25 September 15 - preliminary meeting with Council officers to discuss proposal
- 23 October 15 - follow up meeting with Council officers to discuss revised proposal (approx. 250 lots)
- 2 December 15 - meeting with Council officers to present more detailed concept.
- 2 February 16 - presentation to elected Campbelltown Councillors
- 4 February 16 - formal feedback letter from Council. Highlighting key issues arising from Council meeting.
- 17 February 16 a response was provided to Council (213 lots), which it is understood was presented to Councillors by Council officers.
- 26 February 16 - meeting with Council officers
- 7 March 16 - revised scheme submitted (199 lots)
- 29 March 16 meeting with Council officers and advised that scheme was still not capable of being supported as its was not meeting appropriate transition principles. The planning proposal was withdrawn to allow for further revision.
- On 12 April 16, a meeting was held with Council officers to agree on appropriate transition principle from the existing low density residential area to both the Oxford and Bentley Road frontages. Subsequent advice confirmed Council officer's preference for the use of the large lot residential zone to provide an interface or transition area.
- 14 June 16 - presentation to Council planning committee of future of Eastern Edge Lands.

This revised proposal is the outcome of these meetings and the ongoing consultation with Council staff.

#### 1.4 SCOPE OF REPORT

The Caledonia Planning Proposal, has been prepared in accordance with section 55 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and relevant Department of Planning and Infrastructure Guidelines including “*A Guide to Preparing Local Environmental Plans*” and “*A Guide to Preparing Planning Proposals*”, as amended.

As outlined in ‘*A Guide to Preparing Planning Proposals*’ the Planning Proposal will evolve throughout the course of preparing the amending LEP as relevant sections will be updated and amended in response to the outcomes of technical investigations and consultation.

The latter document requires the Planning Proposal to be provided in six (6) parts, being:

- Part 1 - A statement of the objectives or intended outcomes of the proposed instrument;
- Part 2 - An explanation of the provisions that are to be included in the proposed instrument;
- Part 3 - The justification for those objectives, outcomes and provisions and the process for their implementation;
- Part 4 - Maps, where relevant, to identify the intent of the Planning Proposal and the area to which it applies
- Part 5 - Details of the community consultation that is to be undertaken on the Planning Proposal.
- Part 6 - Project Timeline.

This report confirms that the Caledonia Planning Proposal can provide a number of benefits for

Campbelltown LGA, which are addressed throughout the report.

The justification for the Caledonia Planning Proposal can also be appreciated when viewed in the context of recent trends towards population growth in South West Sydney and Campbelltown, the changing demographics of the area and decreasing household sizes. The need for the greater provision of housing is reflected in State Government strategies and targets requiring an increased supply of housing.

## 1.5 REPORT STRUCTURE

This report, in preparing an outline Planning Proposal (PP), is structured in the following manner:

- Section A - Need for the Planning Proposal.
- Section B - Relationship to strategic planning framework.
- Section C - Environmental, social and economic impact.
- Section D - State and Commonwealth interests.

These Guidelines will be addressed below under the various headings. This report is the initial Planning Proposal report to be submitted to enable Council to formally resolve to proceed with the rezoning of the land in accordance with the requirements of the EP& A Act.

## 2 The Subject Land

### 2.1 LAND DESCRIPTION

The site comprises lands generally bounded by Mercedes Road, Bensley Road and Oxford Road and comprising the following properties:

- No.'s 28 -302 Bensley Road;
- No.26 Mercedes Road; and
- Lot 4 Oxford Street (adjacent to No.233 Oxford Street and abutting the Bensley Road Properties).

### 2.2 CONTEXT

The lands have evolved to be known as the “Edge Lands” and have a unique position between existing urban development and the ‘planned’ Georges River Parkway. The Parkway is shown on **Figure 4** below. The Parkway provides a clear edge to development between residential land (zoned and potential) and rural residential land. This is discussed in detail in this submission.

The subject lands are located to the south east of the Ingleburn Town Centre and the railway station. Notwithstanding Ingleburn’s strategic position and the industrial estate, Ingleburn has ‘suffered’ from a lack of residential development in the form of redevelopment of housing stock. Most of Ingleburn was developed in the early 1950’s on a linear pattern following the railway line.

FIGURE 4 -LOCATION OF SUBJECT SITE- AERIAL PHOTOGRAPH



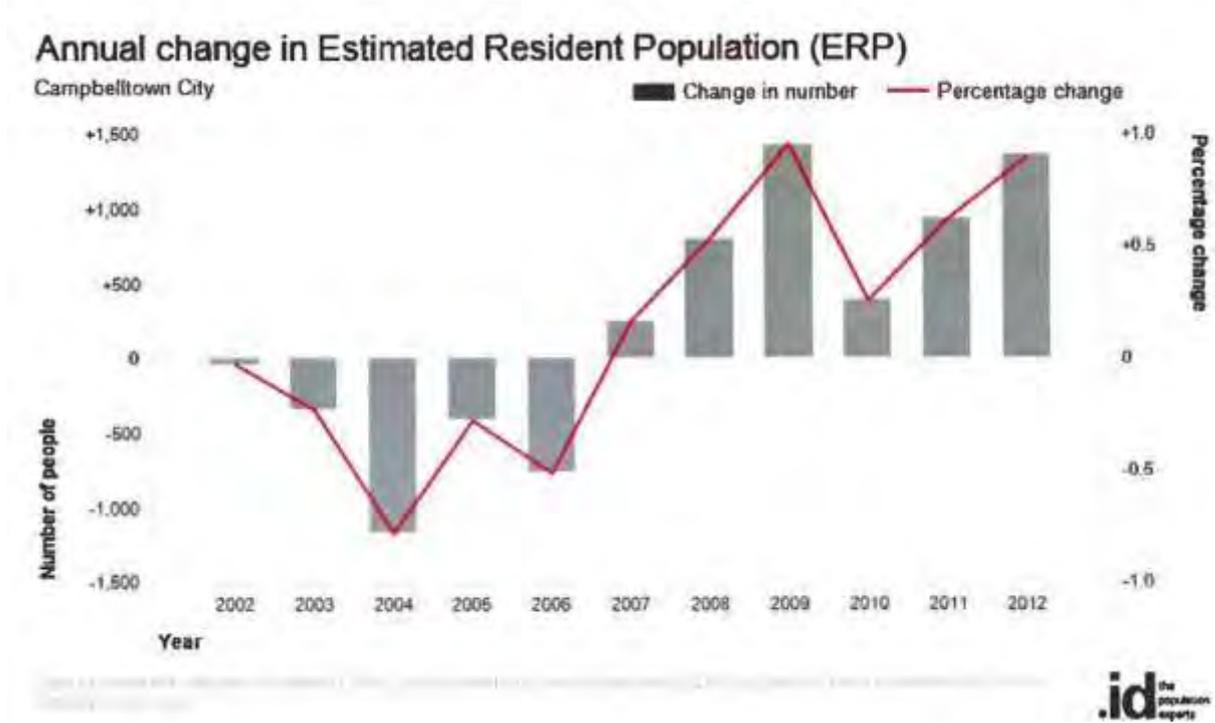
Figure 1 This oblique aerial photograph is taken looking north over the Caledonia Planning Proposal site. It shows the site outlined in red and Bensley Road visible as the diagonal road from bottom left to top right.

### 2.3 EXISTING POPULATION

At 30 June 2012, there were 152,584 people living in the Campbelltown LGA (up from 147,440 in 2006).

The population decreased from 2001 (150,154) until 2009 (149,902). From 2010 (150,288) until 2012 there has been an increase of 2296 persons, with the largest increase from 2011 until 2012 of 1363 or percentage of +0.90<sup>1</sup>. This is shown in **Figure 5** below.

FIGURE 5 - POPULATION CHANGE



#### 2.3.1 AGE PROFILE

Analysis of the age structure of Campbelltown Council area in 2006 compared to the Sydney Statistical Division (SSD) shows that there was a similar proportion of people in the older age groups (60+). This is shown in **Figure 6** below.

<sup>1</sup> Source Australian Bureau of Statistics - Campbelltown Community Profile

FIGURE 6 - AGE PROFILE

### Change in age structure, 2006 to 2011

Campbelltown City

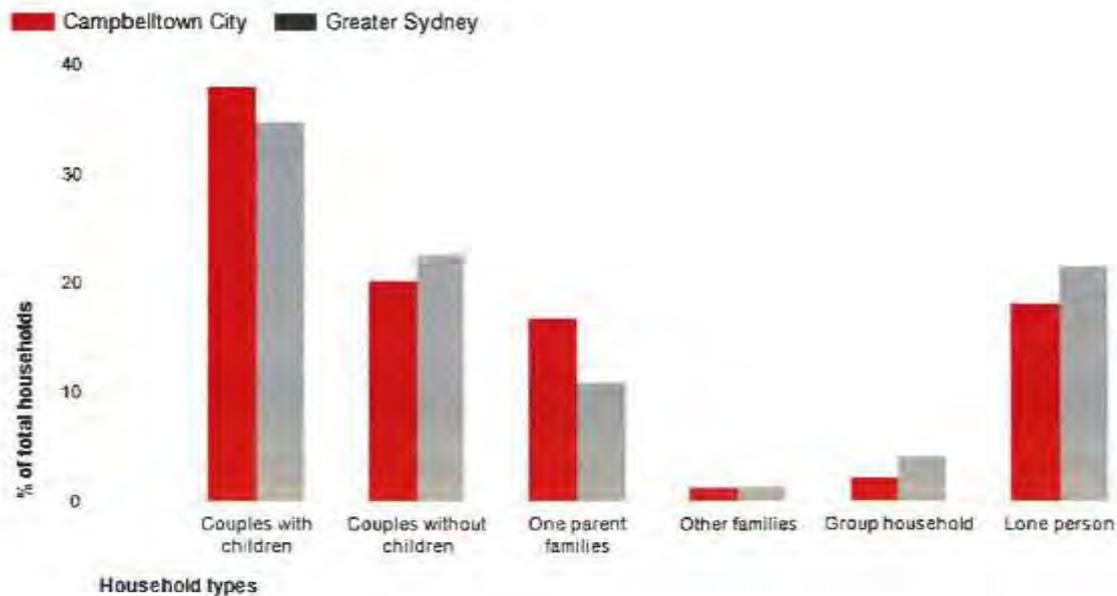


### 2.3.2 DWELLING OCCUPANCY

Campbelltown City's household and family structure is one of the most important demographic indicators. It reveals the area's residential role and function, era of settlement and provides key insights into the level of demand for services and facilities as most are related to age and household types. This is shown in **Figure 7**.

FIGURE 7 - HOUSEHOLD TYPES

### Household types, 2011



Source: Australian Bureau of Statistics, Census of Population and Housing, 2011 (Enumerated data)  
Compiled and presented in profile.id by id: the population experts

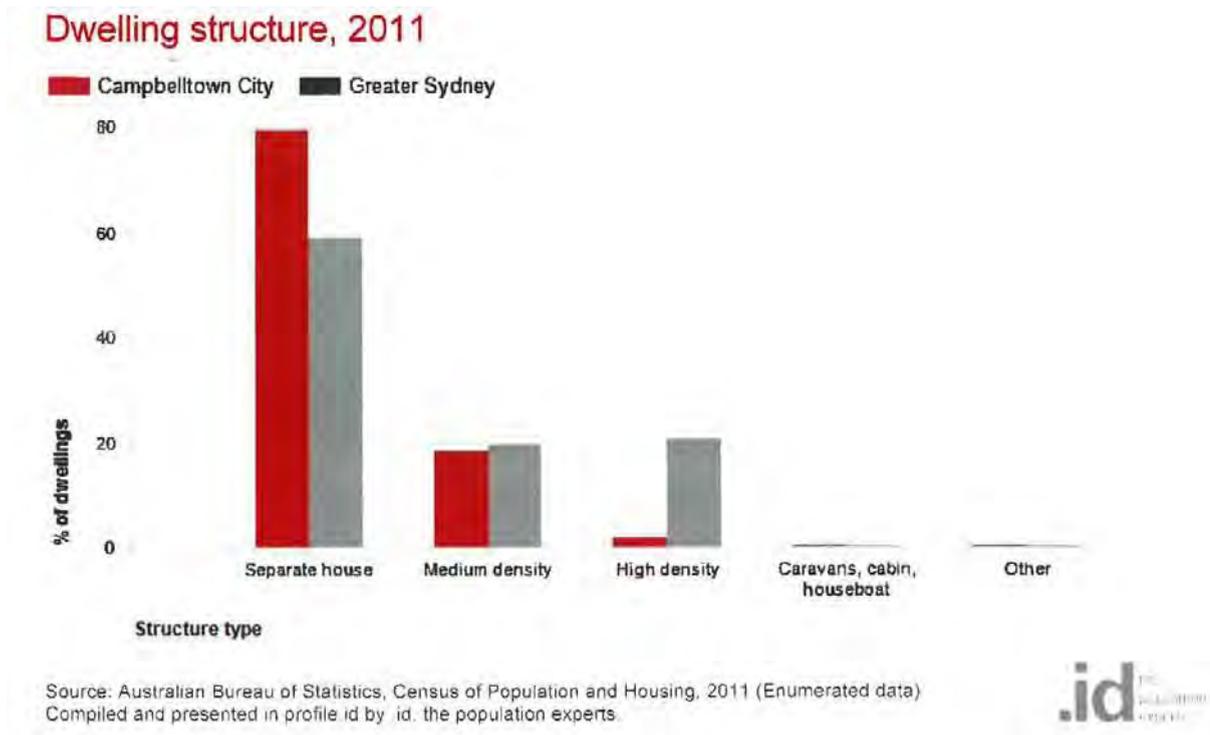


### 2.3.3 HOUSING TYPES

Dwelling Type is an important determinant of Campbelltown City's residential role and function. A greater concentration of higher density dwellings is likely to attract more young adults and smaller households, often renting. Larger, detached or separate dwellings are more likely to attract families and prospective families.

The residential built form often reflects market opportunities or planning policy, such as building denser forms of housing around public transport nodes or employment centres (refer to **Figure 8**).

FIGURE 8 – DWELLING TYPES



### 2.3.4 PROJECTIONS TO 2031

#### 2.3.4.1 POPULATION

By 2031, the population of the Campbelltown LGA is expected to increase to 188,321 an annual growth rate in the order of 1.19%, which is higher than average for the Inner West of Sydney (1.2%).

Campbelltown City comprises a variety of residential role and functions. The majority of suburbs are expected to have relatively little change in population due to lack of opportunity for new housing development. Central Campbelltown plays a unique role within the City, providing a focus for employment and education. This area attracts a younger population and has a higher proportion of private rental dwellings and higher density forms of housing, similar to inner urban areas. Some older suburbs, such as Glenfield and Ingleburn are expected to experience significant levels of new development, attracting family age groups. The variety of function and role of the small areas in Campbelltown City means that population outcomes differ significantly across the LGA.

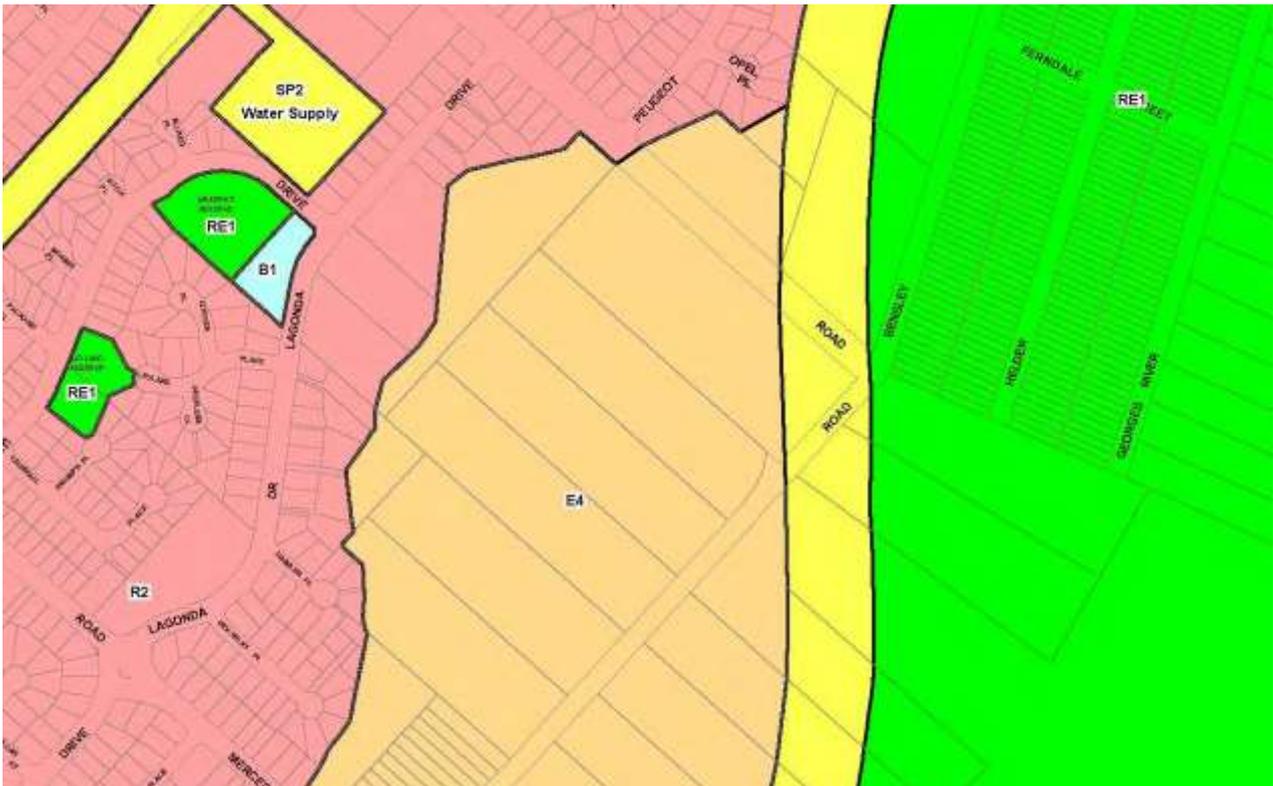
There are also significant differences in the supply of residential property within the LGA which will also have a major influence in structuring different population and household futures within

the City over the next five to ten years. New development opportunities have been identified in Menangle Park, Ingleburn, Glenfield and central Campbelltown while many established areas have low amounts of new dwellings expected over the forecast period, in some cases resulting in overall population decline.

#### 2.4 CURRENT ZONING UNDER LEP 2015

Under LEP 2015, the land is zoned E4 - Environmental Living, essentially a like-for-like of previous zoning (refer to **Figure 10**).

FIGURE 10 -LAND USE ZONING - LEP 2015



### 3 Part 1 - Statement of Objectives or Intended Outcomes of the Caledonia Planning Proposal

This section of the Caledonia Planning Proposal sets out the objectives and intended outcomes of the proposed amendment to Campbelltown LEP 2002.

This planning proposal seeks to facilitate the development of the subject land for urban purposes generally in accordance with the Caledonia Concept Master Plan. The intended outcome of the Planning Proposal is to be incorporated into Campbelltown LEP 2015, when gazetted.

#### **Caledonia - Project objective**

The Caledonia project objective is to:

*To achieve the responsive development of the land for low-density and low impact residential development that is sensitive the scenic landscape and environmental character, whilst connecting with the adjacent urban area in an integrated manner that optimises existing infrastructure and services.*

#### **Caledonia - Project outcomes**

In delivering this objective, it is intended that the Caledonia Planning Proposal can achieve the following outcomes:

- Delivery of a mix of new housing and that can improve diversity and choice, increase local population and improve viability of the nearby neighbourhood centre and contribute to subregional and metropolitan housing targets
- Retention and embellishment of the existing Edge Lands scenic landscape character through the preservation of an appearance of a landscaped edge to Bentley and Oxford Roads.
- Conservation of key vegetation communities
- Retention of a low density rural edge to the Georges River Regional Open Space Parklands that is low impact, sensitive and defensible
- New public open spaces that reinforce and complement the Georges River Regional Open Space Parklands
- Connected street network integrating with the existing street pattern and designed to function with or without Georges River Parkway
- Optimisation and extension of existing public bus services
- Structured and complementary street tree planting
- Existing physical and human infrastructure and services optimised

## 4 Part 2 – Caledonia Planning Proposal - Explanation of provisions

### 4.1 CALEDONIA VISION

The vision for Caledonia is to:

*“create a new village community that responds sensitively to the scenic landscape character, whilst connecting seamlessly with the existing community of Ingleburn and providing a broad mix of new housing that can meet the changing needs of a growing community”.*

The name ‘Caledonia’ has been chosen as a reference to the name of the historic village subdivision planned for the area, but never built. The historic paper subdivision on the corner of Bensley Road and Mercedes Road is an unbuilt remnant of the original *Caledonia village*. *Caledonia* originates from the Roman name for part of northern Britain, later applied to all of Scotland.

### 4.2 CALEDONIA - CONCEPT MASTER PLAN AND DESIGN PRINCIPLES

Saturday Studio and Taylor Brammer Landscape Architects have collaborated to design a concept master plan that illustrates the vision and the potential of *Caledonia*.

The Caledonia concept master plan embodies best practice urban and landscape design principles that seek to:

- *Retain and embellish of the existing scenic landscape character of the Edge Lands and conserve of key vegetation communities*
- *Retain a low density rural edge character to the Georges River Regional Open Space Parklands that is low impact, sensitive and defensible*
- *Establish a connected street network that integrates with and complements the existing street pattern and is designed to function in pre and post Georges River Parkway modes*
- *Enable existing public bus services to easily service the main part of the the site*
- *Deliver complementary repair and renewal strategies for trees and vegetation that enhance the Edge Lands scenic landscape character*
- *At the interface Georges River Regional Open Space parklands, create new public open spaces that reinforce the Edge Lands parkland character*
- *Establish structured street tree planting that is complementary to the scenic landscape character*
- *Optimise the use of existing physical infrastructure and services*
- *Establish a robust and adaptable development structure that can be developed comprehensively or in an integrated series of stages that respects lot existing lot boundaries.*

. **Figures 12 to 15** illustrate the concept master plan proposal and 3D perspectives for Caledonia. **Annexure A** provides the Caledonia Concept Master Plan Report.

#### FIGURE 11 - DESIGN STRATEGY

**The design strategy illustrates the overarching concept design principles for Caledonia.**

FIGURE 12 - CONCEPT MASTER PLAN



CALEDONIA - PRELIMINARY CONCEPT PLAN

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The illustrative concept plan supporting the Caledonia Planning Proposal (note Georges River Parkway reservation in bottom right)

FIGURE 13 - CALEDONIA - 3D PERSPECTIVE - OXFORD ROAD



A 3D perspective view of the Caledonia Planning Proposal concept plan illustrates the proposed view looking down Oxford Road.

FIGURE 14 - CALEDONIA - 3D PERSPECTIVE - OXFORD AND BENSLEY ROADS



A 3D perspective view of the Caledonia Planning Proposal concept plan illustrating the proposed view looking across the Bensley Road / Oxford Road intersection towards the proposed Caledonia Woodlands public open space.

FIGURE 15 - CALEDONIA - 3D PERSPECTIVE - BENSLEY ROAD



A 3D perspective view of the Caledonia Planning Proposal concept plan illustrating the proposed view looking across Bensley Road towards the proposed Bensley Park.

### 4.3 PROPOSED LAND USE ZONING - CALEDONIA PLANNING PROPOSAL

The Caledonia concept master plan has informed the preparation of land use zoning controls to implement the Caledonia Planning Proposal.

The Caledonia Planning Proposal requests that the subject land be rezoned to a mix of:

- **Low Density Residential R2**- Generally low density dwellings with associated services and facilities
- **Large lot residential R5** - Large lots in a rural setting
- **Public Recreation RE1** - Public recreational uses and open space appropriate for the natural environment

Figure 16 below illustrates the proposed land use zoning plan for Caledonia in its surrounding context.

FIGURE 16 - CALEDONIA PLANNING PROPOSAL - LAND USE ZONES



CALEDONIA - ZONING PLAN

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## 5 Part 3 – Justification

### 5.1 INTRODUCTION

This overview establishes the case for the zoning change proposed in the LEP amendment. It should be noted that the level of justification is commensurate with the impact of the rezoning proposal and an acknowledgement of the need for future preparation of the specific studies required by the Gateway Determination.

### 5.2 SECTION A – NEED FOR THE PLANNING PROPOSAL

#### 5.2.1 IS THE PLANNING PROPOSAL A RESULT OF ANY STRATEGIC STUDY OR REPORT

##### 5.2.1.1 CAMPBELLTOWN 2025 LOOKING FORWARD

*Campbelltown 2025: Looking Forward* was developed by Campbelltown Council in September 2004 as a broad town planning intent that lays the foundations for achieving the desired social and economic future for the Campbelltown LGA.

As with the most recent social plan, it identifies issues raised by the community which are perceived to be impacting the future development of the Campbelltown LGA and outlines desired key outcomes designed to work towards achieving the desired ‘look and feel’ of Campbelltown in 2025, as follows:

Protect and enhance the city’s key environmental assets, including an improved community recognition of the contribution that biodiversity, natural resources and natural environmental features make towards quality of life;

- § Secure ongoing investment by the private and public sectors in new enterprises and public infrastructure, to assure the longer term sustainability of both amenities and jobs growth within the ‘Campbelltown Regional City Centre’;
- § Create a sense of place where Campbelltown promotes itself as a place that is distinctive, relaxed, safe and independent, with a strong civic pride;
- § Maximise accessibility to business centres and other nodes of activity within Campbelltown City through the development of a safe, convenient, affordable and environmentally sustainable transport network;
- § Develop a coherent and efficient regional road network that permits convenient connections from other locations within the Macarthur region, including the Camden and Campbelltown LGAs;
- § Build and maintain quality public infrastructure that has the capability and capacity to meet the needs of the existing and future community;
- § Plan and develop urban environments that are safe, healthy, exhibit a high standard of urban design and are environmentally sustainable;
- § Create education, employment and entrepreneurial opportunities concentrated in the Regional City Centre precinct, nominated employment lands and in business centres.

The Campbelltown Social Plan 2004-2009 identifies the need to create a more positive image of the area from the perspective of both residents, the workforce and visitors to the area, both from other parts of Sydney and beyond.

The Social Plan addresses a number of key issues that have been identified in the Campbelltown LGA, including:

- § The opportunities and challenges associated with Campbelltown's projected population growth;
- § Housing becoming increasingly less affordable;
- § Education and employment profiles that require improvement;
- § A mismatch between local residents' skill sets and local employment opportunities;
- § Serious education and employment challenges faced by young people; and
- § The role that participation in recreation, cultural and community events play in contributing to quality of life in Campbelltown.

A series of 'desired outcomes' have been outlined for a number of focus areas within the Campbelltown relating to recreation, urban development and employment opportunities are also contained in the Plan, including:

- § Develop recreational facilities that are not only accessible, but positively contribute to community well-being, local identity, sense of place and social connections;
- § Create urban development that leads to high quality and sustainable housing and employment environments that accommodate and service population growth;
- § Create full employment and high educational attainment in a prosperous local economy; and
- § Establish a vibrant, flourishing city that is an attractive place to live, work and visit.

The Caledonia Planning Proposal is considered consistent with this document by providing a mix of residential accommodation that provides a diversity of housing styles and lifestyles while respecting the existing landscape character.

#### **5.2.2 IS THE PLANNING PROPOSAL THE BEST MEANS OF ACHIEVING THE OBJECTIVES OR INTENDED OUTCOMES, OR IS THERE A BETTER WAY?**

The current zoning permits rural activities. The proposed Caledonia Planning Proposal can be achieved as an amendment to draft Campbelltown LEP 2014, notably adopting relevant zoning, minimum lot size and maximum height of building provisions, etc.

This approach represents the most logical way of achieving the intended objectives and outcomes under the prevailing legislation to amend the zoning of the land.

Overall, the Caledonia Planning Proposal will provide a community benefit for the following reasons:

- It constitutes a balanced and appropriate use of land and is in keeping with the emerging residential character for housing in the Campbelltown LGA and adjoins existing residential land.
- Campbelltown has been sought for housing due to its proximity to Sydney and other regional centres.
- The proposal will contribute to Council's requirement to facilitate new dwelling growth in accordance with the Subregional Strategy targets.
- The proposal will provide a diversity of housing choice and lifestyle to meet the needs of the community, provision of larger lots in particular will provide a kind of housing that is not available in the more urban parts of the LGA.
- The proposal will not result in any significant adverse environmental impacts and can maintain and improve the scenic landscape character of the Edge Lands.

### 5.2.3 IS THERE A NET COMMUNITY BENEFIT?

A Guide to Preparing Planning Proposals recommends the conducting of a Net Community Benefit Test to help assess the merits of a planning proposal. This test is adapted from the Draft Centres Policy.

The guideline recognises that because of the difficulty in assigning values to certain costs and benefits associated with planning proposals, the Net Community Benefit Test will not be a purely quantitative test. Nevertheless, carried out diligently and in a manner proportionate to the likely impact of the planning proposal, the guideline considers it an extremely useful tool to inform debate and help decision-making on planning proposals.

The guideline outlines that the assessment should only evaluate the external costs and benefits of the proposal (i.e. the externalities). The assessment should generally assume that any private costs would be cancelled out by any private benefits.

In summary, it is considered that the proposal to rezone Caledonia would offer a Net Community Benefit by facilitating the development of additional residential land for a growing community.

This is consistent with a number of Strategies discussed below.

## 5.3 SECTION B – RELATIONSHIP TO STRATEGIC PLANNING FRAMEWORK

### 5.3.1 IS THE PLANNING PROPOSAL CONSISTENT WITH THE OBJECTIVES AND ACTIONS CONTAINED WITHIN THE APPLICABLE REGIONAL OR SUB-REGIONAL STRATEGY

#### 5.3.2 A PLAN FOR GROWING SYDNEY 2014

This Plan was announced on 14 December 2014. A Plan for Growing Sydney updates and replaces the Draft Metropolitan Strategy for Sydney to 2031. A Plan for Growing Sydney updates and replaces the Draft Metropolitan Strategy for Sydney to 2031 and seeks to:

- develop a competitive economy with world-class services and transport
- guide land use planning decisions for Sydney for the next 20 years
- deliver greater housing choice to meet changing needs and lifestyle and make it easier for Sydney's residents to move between their homes, their jobs, the centres where they shop and use local services and their open spaces and create communities that have a strong sense of wellbeing
- make a wider variety of housing available to suit the changing make-up of the population more than one million people will be over the age of 65 years and almost the same number under the age of 15 years by 2031
- deliver new infrastructure which supports our community as it grows, and strategic infrastructure that also strengthens the economy and
- recognise and safeguard natural environment – the harbour, coast, mountains, parks and open spaces

### Western Sydney – Key to Sydney's success

*A Plan for Growing Sydney* states that over the next 20 years, the number of people in Western Sydney will grow faster than other parts of Sydney and estimates that almost one million more

people will live west of Homebush by 2031. The plan sets out a vision for Western Sydney to secure the city’s productivity into the future, so that Western Sydney can meet its full potential, build strong centres and be good place to live. Western Sydney is projected to drive the future productivity of Sydney and NSW and seen to be the key to Sydney’s success.

The Western Sydney vision is structured across broad strategies of:

- Building new housing and urban renewal around centres in Western Sydney;
- Fostering economic development in strategic centres and transport gateways in Western Sydney; and
- Connecting centres in Western Sydney to support their development.

The following outlines the key metropolitan and regional strategies that affect Campbelltown LGA and the Caledonia Planning Proposal.

FIGURE 17 – SOUTH WEST SUBREGION MAP



**GOAL 2: A CITY OF HOUSING CHOICE, WITH HOMES THAT MEET OUR NEEDS AND LIFESTYLE**

Through Goal 2 of A Plan for Growing Sydney, the NSW Government plans to accelerate the delivery of new housing in Sydney to meet the needs of a bigger population and to satisfy a growing demand for different types of housing.

Goal 2 and the relevant directions and actions, are closely aligned with the redevelopment objectives of the Caledonia Planning Proposal and are addressed in following section.

**DIRECTION 2.1: ACCELERATE HOUSING SUPPLY ACROSS SYDNEY****ACTION 2.1.1: ACCELERATE HOUSING SUPPLY AND LOCAL HOUSING CHOICES**

The Government is working to achieve its housing target of an additional 664,000 new dwellings by 2031. Increasing housing supply and addressing housing affordability and choice, requires the NSW Government to:

- work with councils to identify where development is feasible
- identify where investments in local infrastructure can create housing supply
- target locations which deliver homes closer to jobs
- directly facilitate housing supply and choice through the projects of UrbanGrowth NSW and Priority Precincts and
- direct the Greater Sydney Commission to work with councils over the long-term with a requirement that councils review housing needs when preparing their Local Environmental Plans.

The Government anticipates that these actions will increase housing supply across the whole metropolitan area, particularly in and around centres and greenfield areas. The most suitable areas for significant urban renewal are those areas best connected to employment and include areas in and around centres that are close to jobs and are serviced by public transport services that are frequent and capable of moving large numbers of people and strategic centres.

The Caledonia Planning Proposal is capable of being consistent with this direction and action, as it seeks to:

- increase the supply of local housing;
- deliver well located housing take advantage of easy access to the Ingleburn Town Centre services and to public transport; and
- improve housing choice with a diverse mix of townhouses and low density dwellings that can meet local housing needs.

**DIRECTION 2.3 - IMPROVE HOUSING CHOICE TO SUIT DIFFERENT NEEDS AND LIFESTYLES**

The NSW Government states that Sydney's population is changing and the city's stock of homes needs to adapt to suit. The fastest growing households in Sydney are single person households. Couples with children will grow at a slower rate than both couple and single person households over the next 20 years.

As the population ages, people will choose to downsize their homes but many people will prefer to remain in their communities, with around 50 per cent of people looking to purchase a new house stay within their current Local Government Area. Housing choice is also about 'universal housing'

that allows people to stay in their home and on their community as they age.

In a trend that reflects consumer demand for housing to meet budget and lifestyle requirements, demand for inner city living is increasing and more apartments are being built closer to public transport and centres.

Research also indicates a current shortage of semi-detached houses across Sydney and a shortage of apartments in the middle and outer areas of the city, which affects the capacity of people to buy or rent a home.

In response, the NSW Government proposes to:

- introduce planning controls that increase the number of homes in established urban areas to take advantage of public transport, jobs and services;
- encourage further innovative, well-designed, smaller homes to suit lifestyles and budgets;
- support housing choice and diversity through the private sector and community groups providing more ‘universal housing’

### **ACTION 2.3.1: REQUIRE LOCAL HOUSING STRATEGIES TO PLAN FOR A RANGE OF HOUSING TYPES**

The NSW Government states that Councils can use local housing strategies to identify housing needs and plan for a range of housing types and identify the local infrastructure to support the needs of their local communities. In 2014 Campbelltown City Council prepared the Campbelltown Residential Development Strategy, it is discussed later in this report.

## **5.3.3 SUB REGIONAL PLANNING**

### **5.3.3.1 SOUTH WEST SUBREGION**

*A Plan for Growing Sydney* states that the South West subregion is the fastest growing subregion in Sydney. The Badgerys Creek Airport will be a catalyst for investment in infrastructure and jobs in the subregion, enhancing connections to other cities across Australia and around the world. Liverpool, Campbelltown-Macarthur, Leppington and the Western Sydney Employment Area will also contribute to the growth and diversification of the subregion’s economy. The South West Growth Centre will continue to play a key role in providing housing and jobs for future residents. The subregion will benefit from improved access including a potential extension of the South West Rail Link.

#### **Subregional policy framework**

A new subregional policy framework for the South West sub region forms part of *A Plan for Growing Sydney* (2014). The Greater Sydney Commission is to commence further strategic planning for the South West sub region, which will in turn update the region’s housing and employment targets in accordance with the metropolitan objectives of the *A Plan for Growing Sydney*.

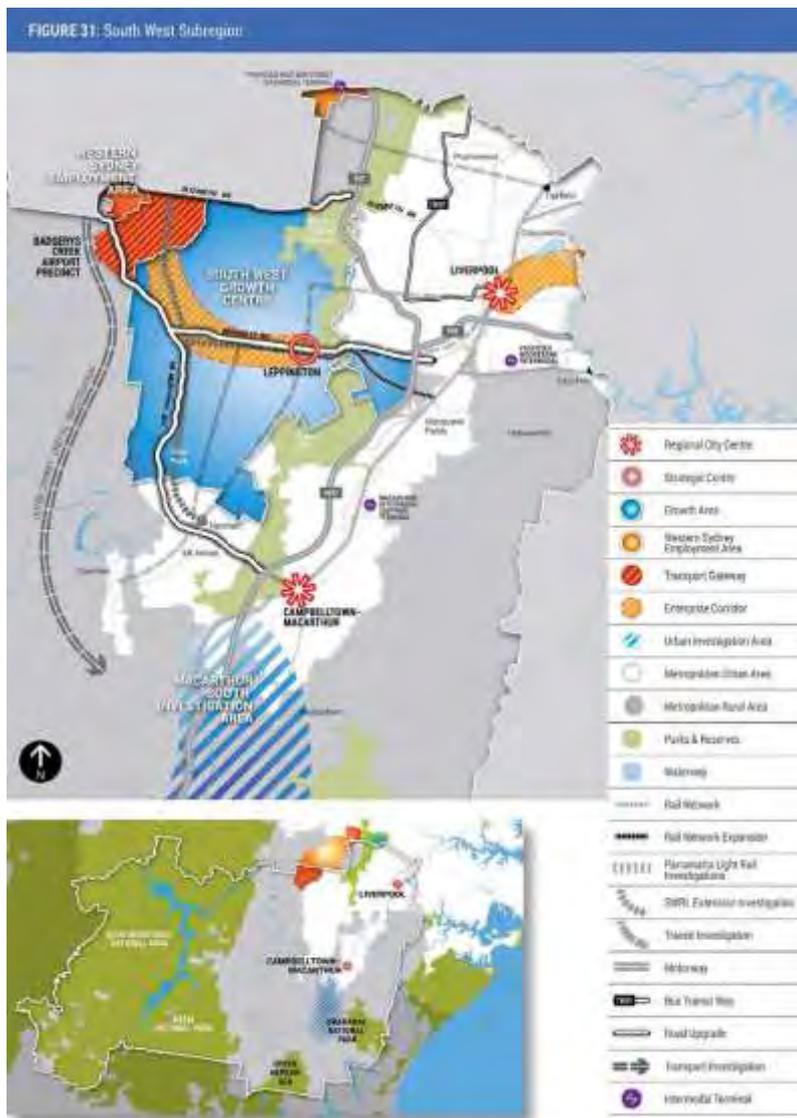
#### **Priorities for South West subregion**

To implement the directions in *A Plan for Growing Sydney*, *A Plan for Growing Sydney* states that the following priorities will be considered and addressed in subregional planning for the South West subregion (refer to **Figure 18**):

#### **A competitive economy**

- Investigate the long-term potential to locate a major enterprise corridor between Leppington and Bringelly, linked to the extension of the South West Rail Link.
- Protect infrastructure of metropolitan significance including freight corridors, intermodal terminals, and Sydney’s drinking water supply catchment, key water storage facilities and the Upper Canal.
- Further develop the subregion’s productive agricultural and mineral resources.
- Protect land to serve Sydney’s future transport needs, including intermodal sites and associated corridors.
- Recognise and strengthen the subregion’s role in Sydney’s manufacturing, construction and wholesale/logistics industries by maximising existing employment lands particularly in Fairfield and Liverpool.
- Investigate pinch-point connections between north-south and east-west road links.
- Identify and protect strategically important industrial-zoned land.
- Strengthen the diverse benefits to the economy proposed by Badgerys Creek Airport.

FIGURE 18 - SOUTH WEST SUBREGION KEY PRIORITIES



This key priorities plan for the South West subregion (Figure 31 from *A Plan for Growing Sydney*) illustrates the significant focus for subregional infrastructure investment and growth

#### Accelerate housing supply, choice and affordability and build great places to live

- Identify suitable locations for housing, employment and urban renewal – particularly around established and new centres and along key public transport corridors including the Cumberland Line;
- South West Rail Link and the Liverpool-Parramatta T-Way;
- Continue delivery of the South West Growth Centre through greenfield housing development and the expansion of local employment;
- Capitalise on the subregion’s vibrant cultural diversity and global connections;
- Implement the Western Sydney Parklands Plan of Management.

#### Protect the natural environment and promote its sustainability and resilience

- Provide environmental, recreation and tourism opportunities in the Nattai National Park, Dharawal National Park as well as the Georges River and Western Sydney Parklands.
- Work with councils to improve the health of the South Creek sub-catchment of the Hawkesbury- Nepean Catchment.
- Work with councils to protect and maintain the social, economic and environmental values of the Hawkesbury-Nepean River and Georges River, and their aquatic habitats.
- Work with councils to implement the Greater Sydney Local Land Services *State Strategic Plan* to guide natural resource management.

Campbelltown Council has maintained that the dwelling targets in the Metro Strategy and the Draft South West Sub-regional Strategy 2007 are insufficient to accommodate growth forecasts. Consistency with this Draft Strategy is provided below in **Table 3**.

TABLE 3 – CONSISTENCY

Action	Compliance
Economy and Employment	Not inconsistent – provides additional residential land close to services and facilities.
Centres and Corridors	Not inconsistent – land located within an existing residential area.
Housing	Consistent – provides opportunities for the development of new and additional housing.
Transport	Consistent – located close to transport services.
Environment, Heritage and Resources	Consistent – protects the heritage item on the land.
Parks, Public Places and Culture	Not inconsistent – parks are located within the immediate area and proposed on the lands.
Implementation and Governance	Consistent – the proposal has been prepared in accordance with the Standard Instrument.

### 5.3.4 IS THE PLANNING PROPOSAL CONSISTENT WITH LOCAL COUNCIL'S LOCAL STRATEGY OR OTHER LOCAL STRATEGIC PLAN?

The local strategic planning context was summarised at 5.2.1.1 and 5.2.1.2 above and clearly identifies the growth that will occur in the Campbelltown LGA in the ensuing years, as a result of the studies and growth action plans that have been undertaken for the south west subregion in recent times.

The subject planning framework has importantly identified opportunities for the development in Campbelltown, leveraging off the existing infrastructure and the prevailing sense of community, but does not identify the subject land given the location outside nominated growth areas.

#### 5.3.4.1 RESIDENTIAL DEVELOPMENT STRATEGY AND LOCAL PLANNING STRATEGY

The Campbelltown Residential Development Strategy (RDS) and Local Planning Strategy accompany a suite of planning documents that were prepared as part of the preparation of the Campbelltown LEP 2015.

#### Residential Development Strategy (RDS)

The subject land is contained within the area described in the RDS as the East Edge Scenic Protection Lands (EESPLs), an analysis against the relevant objectives of this plan is below;

*Protect the urban bushland setting.*

The provision of a mix of open space and large lot residential interface to Oxford and Bensley Roads will maintain the transition that is experienced as one moves from the urban parts of Campbelltown through this area into the scenic Hills

*Maintain the small-scale generally "subservient" built form character of the area.*

The transition from the existing low density residential area into the large lot area, interspersed with areas of vegetation and open space will give the impression of a rural urban fringe area, consistent with this objective.

*Prevent opportunities for development which would be out of character with the area.*

There has been consistent pressure on this area for redevelopment, the transition proposed through the mix of zoning and lot sizes recommended will provide a lasting solution that is consistent with the character of the Edgelands area.

*Balance requests for smaller lot residential/rural-residential/lifestyle housing development with the need to protect the existing rural character and prevailing environmental quality of the area*

The proposal provides a mix of exactly these housing types, these areas will become increasingly valued as the inner/central parts of the LGA become increasingly urbanised.

*Ensure new development does not threaten the viability of traditional rural land uses.*

The proposal through its transition of larger lot sizes up to a major road will provide a buffer to the western environmental and rural areas.

*Protect the visual quality of the ridgeline at the edge of the main Campbelltown LGA valley by preventing development from protruding beyond the ridge.*

The subject site is not on the ridge and will provide a transition into the elevated rural areas.

*Ensure new development does not adversely impact the important scenic and*

*ecological values of the Georges River Valley.*

The transition provided by the larger lots and the sensitively laced open space areas combined with the buffer of Bensley Rd provide an appropriate edge to these important areas. Additionally, the proponent in open to further discussion on making a contribution to the maintenance and improvement of these areas.

**Local Planning Strategy**

It is considered that the proposed development is consistent with the intent for the development of the eastern edge lands as it provides a lasting solution to the treatment of this area and a transition that preserves the values espoused by the local planning strategy and residential development strategy.

With regards to the transition area and the use of the Large lot residential zone the strategy has the following to say;

*“Any large lot residential development of the subject nature would not contribute significantly to meeting future dwelling targets. It would, however, contribute to residentially focused lifestyle choice.”*

This is a recognition of the role that different residential types play in preserving the character of the area. This proposal provides for this range and respects the character of the area.

**5.3.5 IS THE PLANNING PROPOSAL CONSISTENT WITH APPLICABLE STATE ENVIRONMENTAL PLANNING POLICIES?**

The lands are subject to the provisions of a raft of State Environmental Planning Policies. The subject policies are noted below in **Table 4** and importantly do not prohibit and/or significantly constrain the Planning Proposal.

**TABLE 4 - APPLICABLE STATE POLICIES**

SEPP	Aims	Assessment
SEPP 44 - Koala Habitat Protection	This Policy aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas.	While SEPP 44 is triggered at the DA stage Ecologica Australia have conducted an assessment of the subject area, no critical habitat is present, no colonies have been recorded in the vicinity and 92% of the significant vegetation is retained in open space areas.
SEPP 55 - Remediation of Land	SEPP 55 - Requires a Planning Authority to consider is the land can be remediated to accommodate the proposed future use.	The land is currently zoned E4 and used for a range of rural and residential purposes. Appropriate evidence will be provided to ensure the land is capable of accommodating the future use.
SEPP No 60 - Exempt and Complying Development	The SEPP aims to provide for exempt and complying development for types of development.	The proposal will be based on the Standard Instrument. Clause 1.9 - Application of SEPPs is a compulsory clause within the Standard LEP. It states that SEPP 60 will not apply to land to which SI based LEPs apply.

SEPP	Aims	Assessment
SEPP (Building Sustainability Index: BASIX) 2004	This Policy achieves its aim by overriding provisions of other environmental planning instruments and development control plans that would otherwise add to, subtract from or modify any obligations arising under the BASIX scheme.	The relevant principles will inform building design.
SEPP (Exempt and Complying Codes) 2008	This Policy aims to streamline the assessment process.	The proposal would not contain any provisions that would be inconsistent with the SEPP.
SEPP (Housing for Seniors or People with a Disability) 2004	This Policy aims to encourage the provision of housing to meet the needs for seniors or persons with a disability.	Seniors housing would be permissible on the land.
SEPP (Affordable Rental Housing) 2009	This Policy aims to provide opportunities for affordable housing.	Affordable housing would be permissible.

#### SEPP - GEORGES RIVER CATCHMENT 1999

Deemed SEPP No 2 (SREP 2) - Georges River Catchment 1999	The main objectives of this instrument are to maintain and improve water quality and the environment in the catchment. The SEPP outlines a number of specific principles to be used in assessing proposals in the area.	An assessment against the key principles is below, the assessment concludes the proposal is broadly consistent with the SEPP.
	Minimising disturbance and protection of acid sulfate soil areas	The subject land is not identified as having acid sulphate soils
	Reduction of bank or foreshore disturbance	Not relevant
	Recognition of benefits and costs of flooding	Not relevant
	Reduction of industrial discharges into the Georges River and its tributaries	Not relevant
	Avoiding, where possible, or minimising land degradation processes within the Catchment	The redevelopment of the subject site into a mix of large lot and low density housing with a significant amount of open space should provide a

		sustainable land management solution.
	Encouragement of on-site sewage management in unreticulated areas	Not relevant
	Retention of vegetated buffer areas	The proposal provides a vegetated buffer through the use of setbacks to Bensley and Oxford Roads, the use of open space in vegetated areas and a transition of lot sizes to the Bensley and Oxford Road boundaries.
	Public access along the foreshores	Not relevant
	Addressing the relationship between use of the water and foreshore activities	Not relevant
	The adverse impacts of sewer overflows within the Catchment	The area will be serviced
	Impacts arising from urban stormwater run off and appropriate mitigation measures to address these impacts	The transition of lot sizes and the use of vegetated buffer to Bensley Road will assist in minimising urban runoff to the Georges river catchment, the proposal is also bounded by Bensley and Oxford Roads providing an appropriate edge treatment to the area.
	Development of new housing in accordance with the Metropolitan Strategy	Consistent , discussed further above.
	Improvement of water quality and river flows within the Catchment	Only relevant as far as impact minimisation
	Protecting the ecological integrity of wetlands.	As above

**5.3.6 IS THE PLANNING CONSISTENT WITH APPLICABLE MINISTERIAL DIRECTIONS (S 117 DIRECTIONS)?**

The planning proposal is consistent with the applicable Ministerial Directions (s.117 Directions) see **Table 5** below.

**TABLE 5 - CONSIDERATION OF MINISTERIAL DIRECTIONS**

<b>s.117 Direction Title</b>	<b>Applicable</b>	<b>Consistent</b>	<b>Comments</b>
<b>1. Employment &amp; Resources</b>			
1.5. Rural lands	Not Applicable	Not applicable	Not applicable.
<b>2. Environment &amp; Heritage</b>			
2.1 Environment Protection Zones	Yes	Yes	The site contains areas of vegetation, which are

s.117 Direction Title	Applicable	Consistent	Comments
			<p>largely conserved through the use of the RE1 zone.</p> <p>The proposal is not inconsistent with Direction 2.1 and is justified in this instance as the site has been considered for residential purposes for a number of years and is not inconsistent with the prevailing Draft Sub-Regional Strategy.</p> <p>The proposed mix of large lot housing, low density and public recreation zones provides a long term solution to preserving the character of this area.</p>
2.3 Heritage Conservation	Yes	Yes	The site contains a stone cottage as a built heritage item (Item 69) and an historic paper subdivision.
<b>3. Housing Infrastructure &amp; Urban Development</b>			
3.1 Residential Zones	Yes	<p>The objectives of this direction are:</p> <ul style="list-style-type: none"> <li>to encourage a variety and choice of housing types to provide for existing and future housing needs,</li> <li>to make efficient use of existing infrastructure and services and ensure that new housing has appropriate access to infrastructure and services, and</li> <li>to minimise the impact of residential development on the environment and resource lands.</li> </ul> <p>3.1 (5) (b) states a Planning Proposal must not contain provisions which will reduce the permissible residential density of land.</p>	<p>It is proposed to rezone land to low density residential, large lot housing and public recreation to permit the development of the land for residential purposes.</p> <p>The proposal does not seek to reduce the amount of residential land but rather contribute to additional land that may assist in reaching housing targets.</p> <p>It is located adjoining existing residential land and close to services.</p> <p>The rezoning will permit the development of a range of housing types. The Planning Proposal is not inconsistent with Direction 3.1.</p>

s.117 Direction Title	Applicable	Consistent	Comments
3.3 Home Occupations	Yes	The objective of this direction is to encourage the carrying out of low-impact small businesses in dwelling houses.	Yes, home occupations will be permissible.
3.4 Integrating Land Use & Transport	Y	<p>The objective of this direction is to ensure that urban structures, building forms, land use locations, development designs, subdivision and street layouts achieve the following planning objectives:</p> <ul style="list-style-type: none"> <li>• improving access to housing, jobs and services by walking, cycling and public transport,</li> <li>• increasing the choice of available transport and reducing dependence on cars,</li> <li>• reducing travel demand including the number of trips generated by development and the distances travelled, especially by car,</li> <li>• supporting the efficient and viable operation of public transport services, and</li> <li>• providing for the efficient movement of freight.</li> </ul>	<p>The land is located close to existing transport networks. The site is accessible to public bus services and to rail services.</p> <p>The Planning Proposal site is well serviced by existing roads and the nature of the proposal is unlikely to generate significant traffic.</p>
<b>4.Hazard &amp; Risk</b>			
4.1 Acid Sulphate Soils	Yes		Subject land not identified as being subject to acid soils.
4.4 Planning for Bush Fire Protection	Yes	<p>The objectives of this direction are:</p> <ul style="list-style-type: none"> <li>• to protect life, property and the environment from bush fire hazards, by discouraging the establishment of</li> </ul>	Planning for bushfire protection has been considered and addressed during the initial concept master planning stage.

s.117 Direction Title	Applicable	Consistent	Comments
		incompatible land uses in bush fire prone areas, and <ul style="list-style-type: none"> <li>• to encourage sound management of bush fire prone areas.</li> </ul>	
<b>6. Local Plan Making</b>			
6.1 Approval and Referral Requirements	Yes	The objective of this direction is to ensure that LEP provisions encourage the efficient and appropriate assessment of development.	The Planning Proposal does not seek to include further provisions to CLEP 2002 in respect to the concurrence, consultation or referral of development applications to a Minister of public authority. The Planning Proposal is not inconsistent with Direction 6.1.
6.3 Site Specific Provisions	N/A	The objective of this direction is to discourage unnecessarily restrictive site specific planning controls.  6.3 (4) (c) states a Planning Proposal that will amend another environmental planning instrument in order to allow a particular development proposal to be carried out must either: <ul style="list-style-type: none"> <li>• allow that land use to be carried out in the zone the land is situated on, or</li> <li>• rezone the site to an existing zone already applying in the environmental planning instrument that allows that land use without imposing any development standards or requirements in addition to those already contained in that zone, or allow that land use on the relevant land without imposing any development standards or requirements in</li> </ul>	It is not proposed to introduce controls for these lands.

s.117 Direction Title	Applicable	Consistent	Comments
		addition to those already contained in the principal environmental planning instrument being amended.	
<b>7. Metropolitan Planning</b>			
Implementation of A <i>Plan for Growing Sydney</i> .	Y	<p>A Plan for Growing Sydney is supportive of the provision of a variety of housing styles.</p> <p>ACTION 1.7.4: Continue to grow Penrith, Liverpool and Campbelltown-Macarthur as regional city centres supporting their surrounding communities.</p>	The planning proposal is consistent with <i>A Plan for Growing Sydney</i> as it provides for a range of housing styles, preserves the existing character of the area and provides an opportunity for modest growth in the area.

#### 5.4 SECTION C - ENVIRONMENTAL, SOCIAL AND ECONOMIC IMPACT

##### 5.4.1 IS THERE ANY LIKELIHOOD THAT CRITICAL HABITAT OR THREATENED SPECIES, POPULATIONS OR ECOLOGICAL COMMUNITIES, OR THEIR HABITATS, WILL BE ADVERSELY AFFECTED AS A RESULT OF THE PROPOSAL?

###### 5.4.1.1 FLORA AND FAUNA

Eco Logical Australia (ELA) undertook an assessment of the flora and fauna on the subject lands (refer to **Annexure C**). The following provides a summary of the assessment.

#### Identification of Constraints

ELA confirmed the presence of one endangered ecological community, Cumberland Plain Woodland, which is present in two condition states. Cumberland Plain Woodland (CPW) is listed as a Critically Endangered Ecological Community (CEEC) under both the NSW *Threatened Species Conservation Act 1995* (TSC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Several patches of CPW were present along Bensley Road. All patches meet the definition as CPW under the TSC Act but only the patch of CPW on the corner of Bensley and Oxford Roads meets the criteria for listing under the EPBC Act. Preparation of a Referral to the Commonwealth may be required if impacts to this area are planned. It is recommended that impacts to this area are avoided.

The majority of the grassland areas throughout the study area were exotic pasture. The grassland areas were dominated by exotic pasture species and may have been ploughed and or fertilised for routine agricultural purposes in the past. This has likely removed the soil stored seed bank and therefore the ability of the land to recover unassisted.

Vegetation within the study area consisted of a primarily grassy understorey with little leaf litter and extremely limited habitat for *Meridolum corneovirens* (Cumberland Plain Land Snail). Brief searches were conducted under the few trees where leaf litter was present but it is considered

unlikely that this species would be present within the study area. This species has been recorded outside the study area and is associated with thick leaf litter primarily from *Eucalyptus tereticornis*.

There was only one hollow bearing tree found in the areas that were accessed. The hollow was in a *Eucalyptus tereticornis*. The hollow was occupied by a Rainbow Lorikeet. Given this, it is unlikely that this hollow would provide habitat for threatened bats. However, the woodland areas provide foraging habitat for threatened microbat species. There are database records for the following threatened microbats in the locality: *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), *Miniopterus schreibersii oceanensis* (Eastern Bentwing Bat), *Mormopterus norfolkensis* (Eastern Freetail Bat) and *Scoteanax rueppellii* (Greater Broad-nosed Bat).

Ecological constraints have been prepared to guide the development footprint. Results of the constraints, and recommendations on how to address the constraints are illustrated in **Figure 19** below.

### **Impact on Koala Habitat**

The Cumberland Plain Woodland referenced above contained individuals of *Eucalyptus tereticornis* and *Eucalyptus moluccana*. The presence of *Eucalyptus tereticornis* in the better quality Cumberland Plain Woodland was limited to regenerating trees which were about 1-2 m high. Cover of this species elsewhere was limited, however, greater than 15% of the number of trees present are *Eucalyptus tereticornis*.

This species is listed on Schedule 2 of SEPP44 as a koala feed tree species. Therefore, the areas containing Cumberland Plain Woodland could be considered as potential koala habitat.

Therefore, on that basis, the site would not meet the definition of core koala habitat. The land does not meet the definition of core koala habitat but is potential koala habitat and according to clause 8(3)(a) of the SEPP, Council is not prevented from granting development consent on this land.

It is worth noting that SEPP 44 is intended to apply at development application stage however it is appropriate to have regard for any potential impact created through a planning proposal.

### **Targeted Koala survey**

As per request of Campbelltown City Council in response to the consideration of vegetation within the study area to be potential Koala habitat, targeted Koala surveys were performed to ascertain the presence of any individuals. The survey took place on 14 and 15 June 2016 by two ELA ecologists and involved two components, diurnal and nocturnal surveys.

In order to take a cautious and precautionary approach the majority of the high value vegetation has been protected by the placement of public open space on the corner of Bensley and Oxford Road, a 1.3 hectare area of open space will ensure that there are opportunities for passive retention and retention of significant vegetation.

Figure 19 - ecological constraints



### Potential Impacts

The areas of highest ecological value are associated with the CPW located on the corner of Bensley and Oxford Roads. The remaining vegetation on the site is of lesser value. The draft masterplan for the site incorporates the retention of this area of vegetation with a local park. This approach would realise the retention of 92% of high constraint vegetation and 8% of moderate constraint vegetation. It may be possible to retain a slightly higher percentage of the existing moderate vegetation given the addition of 2000m<sup>2</sup> of RE1 zoned land along Bensley Rd beyond that envisaged in the Ecological report, however detailed drainage design may also impact on this additional area.

Is proposed for this land to be dedicated to council, an RE1 zone would enable some passive recreation to be undertaken whilst retaining the biodiversity values.

This assessment has identified that if the draft master plan was developed, that only minor impacts would occur to matters protected under the TSC or EPBC Acts. It is likely that due to the minor nature of these impacts that the proposal would not be considered to cause a 'significant impact'.

### Waterfront Land Constraints Assessment - Caledonia

Under the *Water Management Act 2000* (WM Act) all land within 40 m of a defined watercourse is classed as 'waterfront land'. Waterways include all drainage lines mapped on the 1:25,000 scale topographic map for this region (Campbelltown 9029-1N). Proposed works on waterfront land may trigger Controlled Activity Approvals (CAA) with DPI Water (formally NSW Office of Water) and require vegetated riparian corridors specified for the waterway category (i.e. per Strahler stream order, e.g. 1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup> etc). There is one 1<sup>st</sup> order waterway within the site that is shown on the topographic map. In accordance with DPI Water's *Riparian Guidelines*, a 1<sup>st</sup> order stream usually requires a 10 m vegetated riparian zone on each side measured from the top of bank. Also, proposals to excavate land with 40 m of the waterway would trigger a CAA. This is unless the waterway does not meet the definition of a 'river' under the WM Act and support is granted by DPI Water.

Our field inspection of the 1<sup>st</sup> order stream within the site found that it does not meet the definition of a 'river' under the WM Act because it has no defined channel, bed, bank or have evidence of geomorphic processes. Therefore, it would be possible to request DPI Water to remove the 'waterfront land' requirements for this waterway. They will require photographic evidence along the waterway (available). Until this process is accomplished, the waterway is identified as a 'moderate' constraint, but this constraint would be removed upon provisional support from DPI Water to remove the 'waterfront land' requirement.

#### 5.4.1.2 VISUAL IMPACT

The Caledonia Planning Proposal is designed as low-density and low impact residential development that is sensitive the scenic landscape and environmental character, whilst seamlessly connecting with the adjacent urban area. There are currently a number of dwellings on the lands, essentially within a partial open grassland and partial landscape setting.

The site has been identified in the draft report entitled "Visual Analysis of Campbelltown's Scenic Hills and East Edge Scenic Protection Lands" prepared in 2011 for Campbelltown City Council by Paul Davies Pty Ltd in association with Geoffrey Britton (referred to herein as East Edge Visual Study). The site is part of Unit 5 (E-LU5) in the East Edge Scenic Protection Lands.

The subject site was also addressed as part of a later planning report - *An Environmental Study to Determine Possible Future Controls on Development in the Scenic Protection Area Generally West of the Georges River Parkway* (Ref: 861883-ID (150), dated: July 1987). This document was prepared by Wellings Smith and Byrnes for Campbelltown Council. It was prepared at the request of Council to identify the status of lands within the Georges River Scenic Protection Area; for which numerous applications had been received by Council for a reduction in lot size.

The lands are currently open grassland, with scattered trees within stands or along the road verges. The open grassland is regularly mown by owners to maintain the lands. The terrain is undulating with a riparian corridor traversing the lands. The lands have existing residential lands to the north and northwest. To the south and east rural land is the predominant use of these lands with generally dwellings on large parcels. A poultry farm is located on the corner of Bensley and Mercedes Roads.

Views from the lands are mainly to the south to the bushland within the Georges River environs. Views into the site are from residential lands to the north that essentially overlook the lands. In addition, there are ‘glimpses’ of filtered views from Oxford, Bensley and Mercedes Roads into the lands due to scattered stands of trees within the various properties and the vegetation within the road verge.

**Figure 20** provides an extract of Landscape Unit E-LU3, which extends to areas outside the Caledonia Planning Proposal

**Figures 21 and 22** shows the existing streetscape of Bensley Road looking north towards the corner with Oxford Road and the corner of Bensley Road with Oxford Road. It would be noted that the cement rendered and palisade fence is a dominant feature within the streetscape, given the length and height of the fence.

### **Visual Analysis of Campbelltown’s Scenic Hills and East Edge Scenic Protection Lands (East Edge Visual Study)**

The investigations divided the lands into different ‘landscape units’, as each landscape unit had a different character, and the subject lands are described as E-LU3 – Mercedes Road. The Visual Landscape Analysis report by Paul Davies stated in respect of these lands that:

*“Landscape Unit 3 in the East Edge Scenic Protection Area (E-LU3) is a predominantly cleared area with stands of significant vegetation, particularly at its southern end. The Unit is centred around the intersection of Mercedes and Bensley Roads, being situated below the line of the main ridge when viewed from the Scenic Hills. The western edge of the Unit is bordered by the residential subdivision of Ingleburn and the eastern edge by the sweeping curve of the reservation for the proposed Georges River Parkway. A major electricity transmission corridor separates the Unit from E-LU4 to the south.*

*The scenic values of the Landscape Unit 3 are derived from the interlacing of its non-urban and bushland areas. Largely cleared areas are bordered by towering bushland and contrast with the more vegetated areas. The north-western area and the properties near the south-western corner of Mercedes and Bensley Roads demonstrate an open Cumberland Plain Woodland character with houses scattered beneath. Much of the middle sector of the Landscape Unit is substantially cleared and includes traditional non-urban uses such as the poultry farm, low-impact grazing and other small rural activities.*

*Other development such as the recent medium-density development on the eastern edge near Mercedes Road is less sympathetic to the Unit’s visual qualities and is inconsistent with its value as a rural landscape.*

*The character of the landscape on the western side of Bensley Road north of Mercedes Road is of a generally good quality, with areas of cleared grazing land contrasting with pockets of more densely planted areas around the dwelling houses, each of which is situated towards the western end of its lot (furthest from the road).*

The lands, which are the subject of E-LU3, are shown below. It is noted that this landscape unit included other lands outside this planning proposal, which are more vegetated. In this regard, the Caledonia Planning Proposal has undertaken of the landscape character, which has analysed the character to be more related to the street tree planting within part of the road reserve of Bensley and Oxford Roads. This issue has been addressed in the flora and fauna assessment to essentially ground truth the quality of the vegetation on the lands. This is depicted below, whereby the road reserve plantings and the woodland character have been preserved and incorporated within the subdivision. In this regard future dwellings are nestled into the vegetation in a way that the landscape character has been preserved to address the Visual Landscape Analysis report.

FIGURE 20 - EXTRACT OF LANDSCAPE UNIT E-LU3



FIGURE 21 - EXISTING STREETScape - BENSLEY ROAD



FIGURE 22 - EXISTING STREETScape - BENSLEY & OXFORD ROADS



### **Landscape and concept design response**

To respond appropriately to the scenic landscape character of the 'Edge Lands', the Caledonia Planning Proposal has been designed to:

- Retain and embellish the visual qualities of the existing Edge Lands scenic landscape character and conserve of key vegetation communities.
- Deliver complementary repair and renewal of trees and vegetation to enhance the Edge Lands scenic landscape character.
- Retain a low impact and sensitive rural edge character to the Georges River Regional Open Space Parklands.
- Deliver a structured landscape framework of new public open spaces that reinforce and complement the Georges River Regional Open Space parklands.
- Create structured and complementary street tree planting through a connected street network.
- Bensley Road frontage renewed with bioswale and native tree planting to reinforce local 'rural verge' character.
- Bensley Park - existing trees retained with open grassed areas for recreation.
- Caledonia Woodland - existing Cumberland Plain Woodland retained as site feature.
- 'Rural verge' character to Oxford Road is retained and repaired with additional native tree planting.
- Proposed Georges River Parkway with existing trees retained to reinforce the 'rural verge' character.
- Ensure minimal new road connections to the three roads; namely Oxford, Bensley and Mercedes Roads.
- Provide for future dwellings to have access to an internal road and not the abovementioned roads to create 'bushland interface' lots.

### 5.4.1.3 HERITAGE

Eco Logical Australia (ELA) undertook a preliminary heritage advice the subject lands (refer to **Annexure D**), having regard to the fact that a heritage item (Stone Cottage) is located within the study area. The following provides a summary of the assessment.

There is a stone cottage within the study area at 28 Mercedes Road (Lots 55-68 Section 2 DP 2189). The cottage has historic, architectural and aesthetic significance and is possibly the oldest building in Ingleburn, dating to 1890. The early settlement of this block suggests that there will also be archaeological relics associated with domestic and agricultural activities. Therefore, archaeological sensitivity (potential) of this portion of the study area has been assessed as high.

#### **Summary assessment of archaeological potential**

The potential for the survival of archaeological relics in a particular place is significantly affected by activities which may have caused ground disturbance. These processes include the physical development of the site and the activities that occurred there. The likelihood for the survival of these relics (i.e. their archaeological potential) is distinct from the archaeological/heritage significance of these remains, should any exist. For example, there may be 'low potential' for certain relics to survive, but if they do, they may be assessed as being of 'high significance'.

#### **Recommendations**

##### **Conservation of Stone Cottage and historical allotments**

Conservation of the historical integrity of the Stone Cottage and Lots 55-68 Section 2 DP 2189. Merit should be given to the conservation of this significant historical cottage, area of archaeological sensitivity and historical allotment integrity.

### 5.4.1.4 BUSHFIRE

Eco Logical Australia (ELA) undertook an assessment of the potential bushfire impacts on the subject lands (refer to **Annexure E**). The following provides a summary of the assessment.

#### *Vegetation*

The predominant vegetation has been determined within the subject land and for a distance of at least 140 m on adjoining land using desktop analysis, a review of background information and data gathered during the field investigations undertaken for the Flora and Fauna Constraints Assessment.

Vegetation within the subject land predominantly consists of grassland areas with several patches of Cumberland Plain Woodland (CPW) occurring along Bensley Road. The FFCA has identified the patch of CPW on the corner of Bensley Road and Oxford Road as a high constraint with smaller disturbed patches throughout the site identified as moderate constraint. An assumption has been made that the high constraint vegetation will be retained, along with the larger patches of moderate constraint. This is considered the bushfire hazard, along with other areas of woodland vegetation to the east of Bensley Road and north of Oxford Road.

#### **Construction standards**

The building construction standard is based on the determination of the Bushfire Attack Level (BAL) in accordance with Method 1 of Australian Standard AS 3959-2009 '*Construction of buildings*

*in bushfire-prone areas'* (Standards Australia 2009). The BAL is based on the identified vegetation type, effective slope, and APZ managed separation distance between the development and the bushfire hazard. Using AS3959, separation distances (APZ) have also been identified for BAL-29 construction.

## Conclusion

The subject land is capable of supporting residential development and the relevant bushfire protection measures outlined in PBP. APZ, construction, access and utility requirements are to be refined during the planning and design stages of future development in accordance with PBP.

### 5.4.1.5 TRAFFIC

Positive Traffic (**Annexure B**), working with Northrop, prepared a report that reviewed the potential traffic impacts of the Caledonia Planning Proposal in Ingleburn.

#### Traffic Generation

Whilst the development includes a range of residential lot types, for the purpose of assessing future traffic impacts, all residential lots have been assumed to function as single dwelling houses as defined in the RTA Guide to Traffic Generating Developments.

Therefore, at a potential peak hour rate specified by the guide of 0.85 trips per dwelling, the previously proposed 241 lots have the potential to generate 205 peak hour vehicle trips two way. 80% of these trips (164) would travel outbound in the AM peak and 20% (41) would travel inbound. The reverse would occur in the PM peak. Under the revised scheme this would be reduced to 145 trips in the peak or 115 outbound and 29 inbound.

#### Trip Distribution

The potential routes of travel of new residents of the sub division have been developed considering both the proposed access connections to existing surrounding roads and existing traffic flows by direction.

Collins Promenade included a 3:2 proportion of traffic flows northbound / southbound respectively with the reverse occurring in the PM peak. Bensley Road included an approximate 50 / 50 split of northbound / southbound traffic flows in both peak periods.

Bensley Road would provide a direct access north and would be attractive for residents of the sub division.

The overall finding of this review is that the traffic impacts of the Caledonia Planning Proposal are considered acceptable, and with the following specific findings:

- The traffic impacts of the development would be minimal with future traffic flows on surrounding roads within acceptable limits.
- Intersections surrounding the development would continue to operate at levels of service to that which currently occurs.
- The internal road network has been designed to facilitate a future bus route if deemed viable with all proposed residential lots within 400m of the internal bus route.

#### 5.4.1.6 INFRASTRUCTURE

To support the Caledonia Planning Proposal, Northrop has undertaken preliminary engineering investigations and concepts for stormwater/water cycle management, electricity and telecommunications and water and sewer (**Annexure B**).

Northrop's research and engineering design work indicates that it is feasible to service the proposed Caledonia development and also achieve compliance with regulator and authority requirements.

#### 5.4.1.7 WATER QUALITY

In respect of water quality. Northrop has developed a strategy largely developed to achieve the Stream Erosion Index (SEI). The SEI requires a combination of water detention measures to throttle flow rates, and water retention measures to create 'losses' where water is diverted from the site drainage, e.g. infiltration, reuse.

The biobasin that has been proposed is similar to several systems that have been designed and built in NSW and the ACT. They are known as Stormwater Exfiltration Measures where Stormwater is both detained and treated in a combined underground/above-ground basin.

They function with the following sequence:

- Flow first enters Gross Pollutant Traps where coarse sediment and debris is filtered (two are proposed in easily accessible locations for ease of maintenance).
- Flow then enters a HydroCon pipe network. These are 'leaky' pipes with a permeable wall which is impregnated with zeolite. Fine sediment, Phosphorus and Heavy Metals are retained in the HydroCon pipe and walls.
- The treated water then enters a sand matrix where further filtering can occur. The sand supports a bacterial population to provide biological treatment of the water.
- This basin leaks to groundwater.
- When flows exceed the capacity of the basin to leak, it will fill with water under the ground surface.
- When flows exceed the 2-year ARI event, flow will surcharge onto the top of the basin. The top of the basin will be designed as an open space landscaped area. Water will pond to 300mm depth. After a storm finishes, water percolates back down into the underground basin. Thus it is predominantly a dry system.
- During this process, the flow that exits the basin will achieve the SEI 1 rate.

The modelling results have demonstrated that the above treatment devices are effective at reducing total pollutant loads, peaks flows and total volume of flows generated across the proposed site in accordance with Council's requirements. The proposed stormwater management strategy can effectively manage stormwater runoff to ensure that under proposed conditions, the residential subdivision will not result in an increase in pollutants or stormwater flows and result in any detrimental impacts to receiving waterways or downstream infrastructure.

#### 5.4.1.8 ODOUR

Council officers raised a concern regarding a poultry farm operation located on the corner of Bensley Road and Mercedes Road at 315-317 Bensley Road, Ingleburn (herein referred to as the "poultry farm").

The sheds of the poultry farm are located approximately 100 m from the southern boundary of the development. Given the relative proximity, the ability of the poultry farm to cause odour impacts at the development is required to be evaluated.

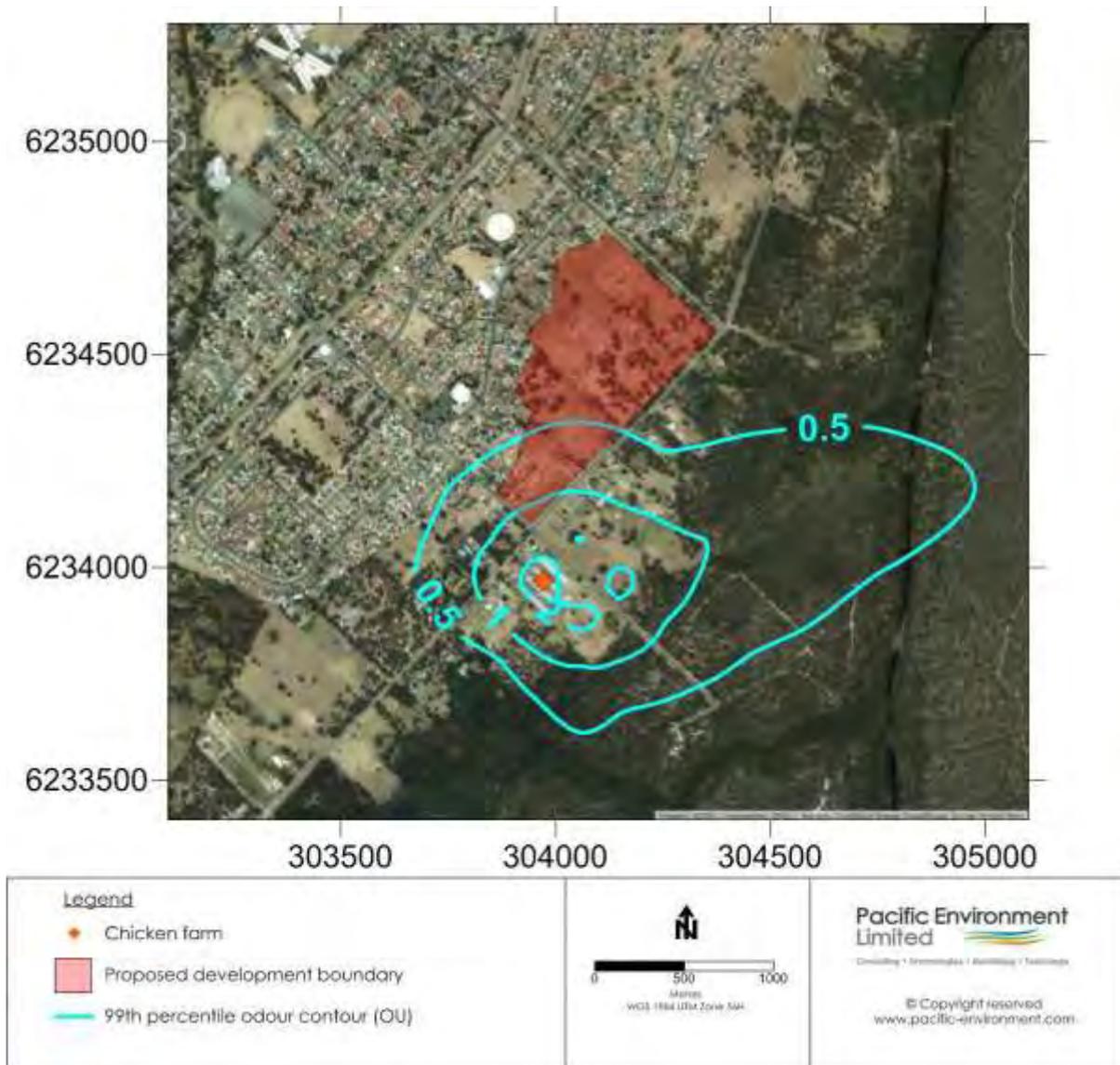
Pacific Environment undertook an odour assessment of the poultry farm to ascertain the potential impact of odours from this operation on the proposed development (refer to **Annexure F**). The following summaries the assessment:

**5.4.1.8.1 ASSESSMENT IMPACTS**

**Figure 23** shows the 99<sup>th</sup> percentile 1-second peak odour concentrations resulting from the anticipated operation of the poultry farm.

Worst-case odour concentrations were predicted to be less than 2 OU across the entire of the development, and less than 1 OU across the majority of the site, except for the southern corner. Thus predicted odour concentrations at the development are less than the adopted odour assessment performance criterion of 2 OU.

**FIGURE 23 - AVERAGE ODOUR CONCENTRATIONS**



#### 5.4.1.8.2 CONCLUSIONS

An investigation has been conducted to identify and develop an understanding of potential odour impacts that may affect the development at the Caledonia Planning Proposal in Ingleburn, NSW.

A Level 2 Odour Assessment has been undertaken, consistent with the requirements outlined in the NSW EPA Approved Methods (2005), *Technical framework: assessment and management of odour from stationary sources in NSW* (NSW EPA, 2006a) and the associated Technical Notes (NSW EPA, 2006b).

The results of the odour assessment indicate that, under the conservative assumptions adopted, the predicted odour concentrations are anticipated to be below the adopted odour performance goal for the assessment of 2 OU. In this regard the 0.5 OU does not affect the Caledonia Planning Proposal lands.

#### 5.4.2 ARE THERE ANY OTHER LIKELY ENVIRONMENTAL EFFECTS AS A RESULT OF THE PLANNING PROPOSAL AND HOW ARE THEY PROPOSED TO BE MANAGED?

The Planning Proposal will adopt the local provisions to the Standard Instrument Local Environmental Plan (SI LEP) to minimise the likely environmental impacts of future development. In this regard, the R5 Large Lot residential zone and a RE1 Public recreation Zone are proposed to provide a buffer and transition to the Bensley Road frontage and the Georges River area beyond, it is proposed to adopt the provisions within LEP 2015 in respect of minimum lot size for the R2 zone. In respect of the heights of buildings, floor space ratio and other relevant maps, these will also be adopted.

#### 5.4.3 HOW HAS THE PLANNING ADEQUATELY ADDRESSED ANY SOCIAL AND ECONOMIC EFFECTS?

The Caledonia Planning Proposal has addressed the current land supply limitations and seeks to fulfil the accommodation needs attached to the subregional population and housing projections.

The Caledonia Planning Proposal has positive social and economic contributions as discussed above in the various strategies by providing much needed housing choice in the Campbelltown LGA. Indeed, under the proposed development scenario, no adverse social and/or economic impacts are foreshadowed, but rather positive impacts will accrue in this regard.

### 5.5 SECTION D – STATE AND COMMONWEALTH INTERESTS

#### 5.5.1 IS THERE ADEQUATE PUBLIC INFRASTRUCTURE FOR THE PLANNING PROPOSAL?

Public infrastructure will be required to be augmented to support the development of the Caledonia Planning Proposal.

The nature and extent of augmentation will be finally determined having regard to more detailed investigations as part of the continued evolution of the Caledonia Planning Proposal. As a minimum, the existing reticulated water and sewerage systems in the area will need to be extended. Detailed liaison will need to occur with the service provider in this regard, namely Sydney Water. The nature of the land is such that a stormwater management plan predicated upon the principles of Water Sensitive Urban Design can be readily designed and implemented as part of the envisaged development scheme. Reticulated electricity and telecommunications facilities will also be provided as service infrastructure.

To support the Caledonia Planning Proposal, Northrop has undertaken preliminary engineering

investigations and concepts for:

- Stormwater/Water Cycle Management
- Traffic and roads
- Electricity and telecommunications
- Water and sewer

Northrop’s research and engineering design work indicates that it is feasible to service the proposed Caledonia development and also achieve compliance with regulator and authority requirements. The indicative costs of infrastructure elements are summarised in the following **Table 6**.

**TABLE 6 - INFRASTRUCTURE COSTS**

Infrastructure Element	Indicative Costs \$
Stormwater / Water Cycle Management Strategy	5,531,800
Roads	4,800,000
Electricity substations	4,291,500
NBN	361,500
Water supply	1,330,000
Sewer	2,365,000
<b>Indicative Total</b>	<b>\$18,679,800</b>

Any enhancement of offsite infrastructure, including community infrastructure, may involve relevant contributions pursuant to Section 94 (EP&A Act). Such contributions will be determined in response to more detailed planning actions should the Caledonia Planning Proposal progress.

**5.5.2 WHAT ARE THE VIEWS OF STATE AND COMMONWEALTH PUBLIC AUTHORITIES CONSULTED IN ACCORDANCE WITH THE GATEWAY DETERMINATION?**

The Gateway determination will identify any consultation required with State or Commonwealth Public Authorities. This will include:

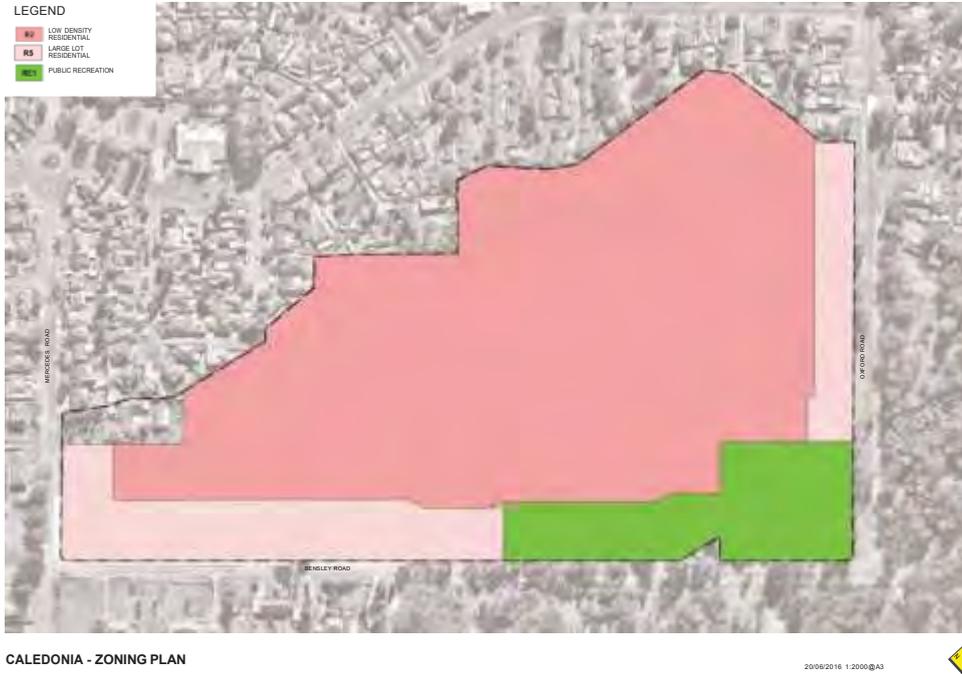
- Consultation required in accordance with a Ministerial Direction under section 117 of the EP&A Act: and
- Consultation that is required because in the opinion of the Minister (or delegate), a State or Commonwealth public authority will or may be adversely affected by the proposed LEP.

Consultation is required with relevant public authorities under section 56(2)(d) of the EP&A Act 1979, as amended.

## 6 Mapping

The following two maps are proposed to be added to the LEP;

### Zoning



### Minimum Lot Size Map



## 7 Part 5 - Community Consultation

Community consultation remains an important element of the Plan making process. The companion document "A Guide to Preparing Local Environmental Plans" outlines community consultation parameters. The subject provisions in respect of notification and the exhibition materials to support the consultation will be observed.

Before proceeding to public exhibition, the Secretary of Planning (or delegate) must approve the form of the Planning Proposal as being consistent with the "Gateway" determination (EP&A Act 57(2)).

It is envisaged that further community consultation would occur through the public exhibition of detailed documents lodged with the development application for the development proposal.

This further consultation will, at a minimum include, advertising in local papers, exhibition material provided at Campbelltown Council administration buildings and libraries and Campbelltown Council's webpage and the required written notifications that would ordinarily be required.

Once Council is satisfied with the amended Planning Proposal following determination at the Gateway, it is recommended that it will be publicly exhibited for a period of 28 days, as it is considered that the PP falls within the definition of "low impact" Planning Proposals. The exhibition would include letters to nearby and adjoining landowners.

The written notice will:

- Give a brief description of the objectives and intended outcomes of the Planning Proposal;
- Identify the land the subject of the Planning Proposal;
- Provide information of when and where the details of the Planning Proposal can be inspected;
- Give the contact details of Council for the receipt of submissions and for any enquiries;
- Indicate the last date for submissions to be received by Council; and
- Include any other information as instructed by the Gateway process.

Any submissions received in response to the community consultation would need to be fully considered, in accordance with the prevailing statutory provisions. Should there emerge any issues which occasion a significant amendment/s to the Caledonia Planning Proposal and proposed LEP amendment, re-exhibition and further consultation may be required.

## 8 Indicative Project Timeline

An indicative project timeline for the Caledonia Planning Proposal is provided in **Table 7** below.

**TABLE 7 - PROJECT TIMELINE**

Project Detail	Timeframe	Timeline
Latest Revised Caledonia Planning Proposal lodged		June 2016
Council Meeting		19 July 2016
Gateway determination	3-4 weeks	August 2016
Anticipated timeframe for the completion of any required technical information - after specialist study requirements determined	3 month period	November 2016
Commencement and completion dates for public exhibition period & government agency consultation - after amending Planning Proposal, if required	6 weeks	November/December 2016
Date of submission to the Department to finalise the LEP (including 8 week period for finalisation)	2 months	February 2017
Anticipated date for notification	1 month	February 2017

Based on the project timeline above and the extensive consultation completed with Council thus far, it is anticipated that a timeframe of approximately 7-8 months would provide sufficient time for the completion of the project and finalisation of the LEP amendments.

## 9 Conclusion

This planning report for the Caledonia Planning Proposal establishes a clear case for the limited review the planning provisions. A number of technical studies have been prepared to support an initial consideration to have these lands rezoned for mainly residential purposes. Further studies may be required post Gateway Determination.

The Caledonia Planning Proposal seeks to rezone land to a mix of R5 - Large Lot Residential, R2 - Low Density Residential and RE1 - Public Recreation, whilst retaining part of the land as the SP2 Infrastructure zone.

We are of the opinion that the Caledonia Planning Proposal presents a logical and feasible planning outcome for the future growth of Ingleburn, by providing residential development with proposed lot sizes, which mirrors the planning outcomes of the already established residential areas of Ingleburn. When taking into account the site context the proposal presents the opportunity for a development that is complementary to its context as the rural-urban interface of Ingleburn and respects the visual character of the streets and the landscape setting.

In terms of policy and the strategic context we do not consider that the proposal submitted would be contrary with the visions and actions for the relevant state, sub-regional and local planning strategies. A continuance of the status quo would serve no planning benefit and would forgo the opportunity to provide for orderly and economic development.

Council is accordingly requested to take the necessary steps to commence the process of rezoning the subject lands as detailed in this submission.

Detailed environmental and infrastructure investigations will need to be undertaken and broad commitments to infrastructure provision made.

Council, as the Responsible Planning Authority, is requested to support the Caledonia Planning Proposal and forward it to the Department of Planning and Environment for progressing through the planning 'Gateway'.

## Annexures

<b>Annexure A</b>	<b>Caledonia - Engineering Report &amp; Traffic and Access Assessment Report</b>
<b>Annexure B</b>	<b>Caledonia Flora Fauna Initial Constraints Report</b>
<b>Annexure C</b>	<b>Preliminary Heritage Advice - Caledonia</b>
<b>Annexure D</b>	<b>Caledonia bushfire constraints report</b>
<b>Annexure E</b>	<b>Edge Lands Planning Proposal - Odour Assessment</b>
<b>Annexure F</b>	<b>Caledonia Concept Master Plan 16-12-2015 (superseded)</b>

## Annexure "A"

### Caledonia Engineering Report & Traffic and Access Assessment Report

## Annexure "B"

### Caledonia – Flora & Fauna Initial Constraints Report

## *Annexure "C"*

### **Caledonia - Preliminary Heritage Advice**

*Annexure "D"*

**Caledonia – Preliminary Bushfire Hazard Advice**

## Annexure "E"

### Edge Lands Planning Proposal – Odour Assessment

*Annexure "F"*

**Caledonia- Original Concept and Urban Design Analysis**















these component parts holistically in order to derive a good development, community and environmental outcome.

The strategy that we have developed is driven largely by the need to achieve a Stream Erosion Index (SEI) of 1. The Stream Erosion Index risk assessment procedure relies on calculating the increase in the relative frequency of flows from the site greater than the “stream forming flow”. The stream forming flow is defined as 50% of the 2-year ARI flow rate estimated for the catchment under natural flow conditions. Achieving a value at or below 1 is considered to represent an appropriate means of ensuring the impacts of site hydrology are mitigated such that the downstream watercourse remains stable.

It is very challenging to achieve an SEI of 1 for a newly proposed development. It requires a combination of water detention measures to throttle flow rates, and water retention measures to create “losses” where water is diverted from the site drainage, e.g. infiltration, reuse. It also requires a treatment train approach where water is incrementally managed in the urban water cycle. The treatment train approach that we have adopted as our WCMS is described in Table 1.

*Table 1: Water Cycle Management Strategy shown as a Treatment Train*

<b>Treatment Train hierarchy</b>	<b>WCM element</b>	<b>Function</b>
Source Controls, or On lot measures	Rain tanks, overflowing to 10m <sup>2</sup> infiltration trenches <sup>#</sup>	Detention* Retention
Conveyance Controls, or streetscape measures	Bioswales	Retention Treatment
End of pipe controls	Gross Pollutant Traps (2 required) Biobasin – HydroCon exfiltration system (unlined), and with extended detention	Treatment Detention Retention

<sup>#</sup>infiltration trenches not on smallest lots, i.e. 225m<sup>2</sup> area

<sup>\*</sup>detention effect discounted in the hydraulic modelling

The biobasin that has been proposed is similar to several systems that have been designed and built in NSW and the ACT. They are known as Stormwater Exfiltration Measures where Stormwater is both detained and treated in a combined underground/above-ground basin. They function with the following sequence:

- Flow first enters Gross Pollutant Traps where coarse sediment and debris is filtered (two are proposed in easily accessible locations for ease of maintenance).
- Flow then enters a HydroCon pipe network. These are “leaky” pipes with a permeable wall which is impregnated with zeolite. Fine sediment, Phosphorus and Heavy Metals are retained in the HydroCon pipe and walls.
- The treated water then enters a sand matrix where further filtering can occur. The sand supports a bacterial population to provide biological treatment of the water.
- This basin leaks to groundwater.
- When flows exceed the capacity of the basin to leak, it will fill with water under the ground surface.
- When flows exceed the 2-year ARI event, flow will surcharge onto the top of the basin. The top of the basin will be designed as an open space landscaped area. Water will pond to 300mm depth. After a storm finishes, water percolates back down into the underground basin. Thus it is predominantly a dry system.
- During this process, the flow that exits the basin will achieve the SEI 1 rate.











## 5. ELECTRICITY AND TELECOMMUNICATIONS SERVICING

A concept electrical infrastructure drawing is shown in Appendix 4. The detailed report from which the following information is summarized is in Appendix 5.

### 5.1. Maximum Power Demand Calculations

As shown in Table 6, the anticipated maximum demand is approximately 2,343 Amps with an additional 234 Amps for future allowance. Therefore, the maximum demand including the spare capacity is 2674 Amps in total. The proposed development maximum demand is based on AS/NZS 3000:2007.

Table 6: Maximum Power Demand

Edge Lands, Ingleburn				
	Blocks	VA	KVA	TOTAL Amps
241 residences	241	7000	1687	2,343
Future allowance				234 (10%)

### 5.2. Substations

Five substations are required to feed this development. These kiosks will provide power to pillars which in turn will supply houses.

The substation will have four distributors dedicated to provide power to pillars which will be connected in series and/or parallel configuration supplying up to 4 houses. The substations need to be located strategically to optimize the cost-effective solution while keeping in mind the sensitivity towards the aesthetics of such pieces of equipment.

### 5.3. Preliminary Electrical Cost Estimates

Referring to the preliminary details provided by Endeavour energy, we have assessed the cost of the substation to as shown in Table 7.:

Table 7: Substation costs

Substation Preliminary Budget Estimate		
Detail	Costs	Total
5 x Pad Mount Kiosk Substations	\$200,000	\$1,000,000
Pillars (89 @ \$3,500)	\$311,500	\$311,500
HV Cabling (approximately 500m)	\$1,000/m	\$ 500,000
LV Cabling (approximately 4300m)	\$500/m	\$2,150,000
Low voltage Pillars x 90	\$3,000	\$ 270,000
Additional HV costs due to the substation location being unknown (50m)-	\$1500/m	\$ 60,000
<b>TOTAL</b>		<b>4,291,500</b>
Excludes Street lights and Street lighting reticulation		







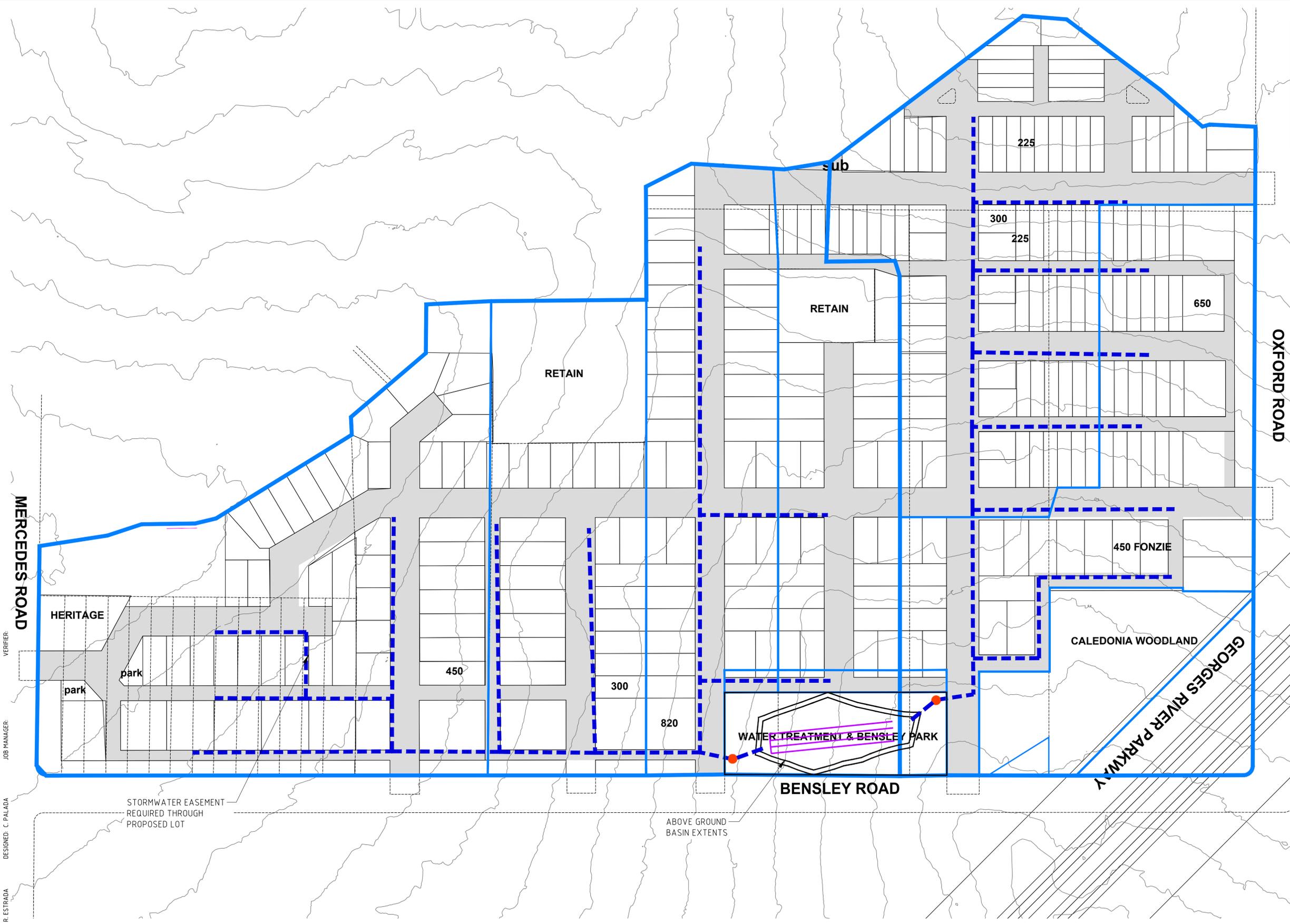






**STORMWATER LEGEND**

- SUBCATCHMENT BOUNDARY
- - - STORMWATER PIPE
- GROSS POLLUTANT TRAP
- = = = HYDROCON PIPE SYSTEM



DRAWN: R. ESTRADA  
 DESIGNED: C. PALADA  
 JOB MANAGER:  
 VERIFIER:

**FOR PLANNING PROPOSAL**

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	ISSUED FOR PLANNING PROPOSAL	CP		CP	08.12.15

CLIENT

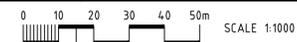


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PROJECT

**EDGELANDS PLANNING**

DRAWING TITLE

**PLANNING CIVIL DESIGN**

**STORMWATER CONCEPT PLAN**

JOB NUMBER	
<b>151459</b>	
DRAWING NUMBER	REVISION
<b>SK3.01</b>	<b>1</b>
DRAWING SHEET SIZE = A1	



























# Caledonia Planning Proposal Ingleburn

## **Traffic and Access Assessment Report**

Prepared for: Billbergia

December 2015

Report No: PT15044r01\_Final

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Table 2 – Level of Service Criteria

Table 3 – Existing Weekday Intersection Operating Conditions

Table 4 – Future Weekday Peak Period Volumes in vicinity of site (veh/hr)

Table 5 – Future Weekday Intersection Operating Conditions

## List of Charts



## 1. Introduction

This report has been prepared on behalf of Billbergia Pty Ltd to present findings of a traffic and access assessment of the proposed residential sub division known as Caledonia in Ingleburn to provide 241 residential development lots.

The study has assessed existing traffic conditions, access arrangements, potential traffic impacts and includes a design assessment of the road network for compliance with relevant Council policies.

The remainder of the report is set out as follows:

- Section 2 summarises the adopted data collection strategies
- Section 3 describes the existing traffic conditions; and
- Section 4 summarises the proposed development
- Section 5 analyses potential traffic impacts of the proposal; and
- Section 6 presents findings of this assessment.



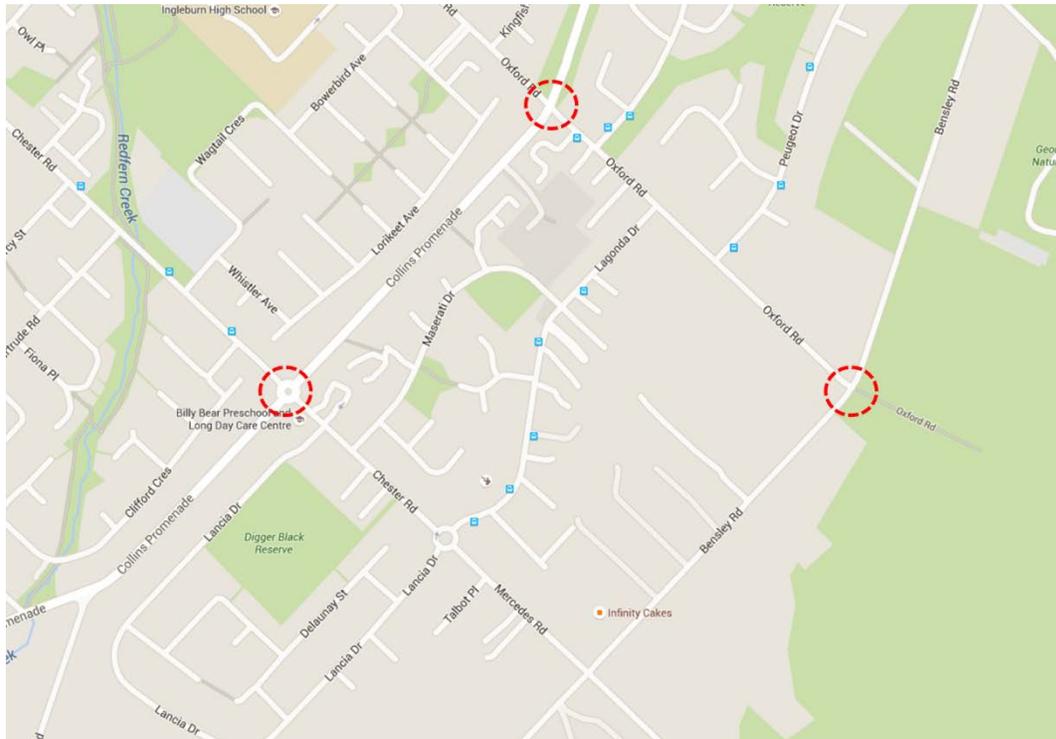
## 2. Data Collection Strategy

Following a site inspection of the location and surrounding road network, the following presents a summary of data collection strategy to inform this report.

### 2.1 Intersection Counts

The intersections which were identified for morning and afternoon peak hour intersection counts are shown in **Figure 1** below.

**Figure 1 – Intersection Count Locations**



The identified count locations would provide a measure of existing intersection operating conditions and capacity and would more than likely be used by traffic generated by the planning proposal.

### 3. Existing Traffic / Parking Conditions

#### 3.1 Site Location

The location of the development site is shown in [Figure 2](#).

Figure 2 - Site Location



Source: Google maps

The land is bounded by Oxford Road in the north, Bensley Road in the east, Mercedes Road in the south and existing residential dwellings in the west. The site consists of a small number of rural residential dwellings on large blocks.

### 3.2 Classification Criteria

It is usual to classify roads according to a road hierarchy in order to determine their functional role within the road network. Changes to traffic flows on the roads can then be assessed within the context of the road hierarchy. Roads are classified according to the role they fulfil and the volume of traffic they should appropriately carry. The RTA has set down the following guidelines for the functional classification of roads.

- Arterial Road – typically a main road carrying over 15,000 vehicles per day and fulfilling a role as a major inter-regional link (over 1,500 vehicles per hour)
- Sub-arterial Road – defined as secondary inter-regional links, typically carrying volumes between 5,000 and 20,000 vehicles per day (500 to 2,000 vehicles per hour)
- Collector Road – provides a link between local roads and regional roads, typically carrying between 2,000 and 10,000 vehicles per day (250 to 1,000 vehicles per hour). At volumes greater than 5,000 vehicles per day, residential amenity begins to decline noticeably.
- Local Road – provides access to individual allotments, carrying low volumes, typically less than 2,000 vehicles per day (250 vehicles per hour).

### 3.3 Existing Road Network

Oxford Road – is a local street connecting Collins Promenade (a major north / south collector road) in the west with Bensley Road in the east. The street has a posted speed limit of 50km/hr and generally includes a single travel lane in each direction with unrestricted parallel parking on either side of the street. The intersection of Oxford Road / Collins Promenade is controlled by traffic signals whereas the intersection of Oxford Road / Bensley Road is a priority controlled intersection.

Bensley Road – is a local rural residential road forming a cul-de-sac at its southern end and connecting Harold Street (Collins Promenade) in the north via a dual land roundabout. Across the frontage of the development site the road includes an 80km/hr speed zone with a single lane of travel in each direction and unformed shoulders. Properties which front Bensley Road consist of rural residential properties.

Mercedes Road / Chester Road - is a local street linking Bensley Road in the east with Collins Promenade in the west. The intersection of Chester Road / Collins Promenade is controlled by a single lane roundabout whereas the intersection of Mercedes Road / Bensley Road is a priority controlled intersection. The street includes a single lane of travel in each direction and generally unformed shoulders across the frontage of the development site. The posted speed limit of 50km/hr.

### 3.4 Existing Traffic Flows

As stated above, intersection counts were undertaken at three (3) locations. Copies of the intersection counts can be found in **Appendix A** of this report. The peak flows by direction in each street at each intersection are summarised below for a weekday and Saturday conditions.

**Table 1 - Summary of Weekday Peak Period Volumes in vicinity of site (veh/hr)**

Road	Location	AM		PM	
		NB/EB	SB/WB	NB/EB	SB/WB
Oxford Road	East of Collins Promenade	98	286	232	160
Oxford Road	West of Collins Promenade	183	301	157	149
Collins Promenade	South of Oxford Road	694	512	474	852
Harold Street	North of Oxford Road	723	471	481	923
Oxford Road	West of Bensley Road	39	25	51	47
Bensley Road	South of Oxford Road	45	39	43	54
Bensley Road	North of Oxford Road	73	53	84	91
Mercedes Road	East of Collins Promenade	100	238	243	184
Chester Road	West of Collins Promenade	128	172	223	193
Collins Promenade	South of Chester Road	646	625	511	880
Collins Promenade	North of Chester Road	616	501	430	828

\*West of College Road South

From **Table 1** it can be seen that existing flows on surrounding roads are in generally in line with their classification.

### 3.5 Existing Conditions Intersection Analysis

All intersections surveyed have been analysed using the Sidra Intersection analysis program. Sidra Intersection determines the average delay that vehicles encounter, the degree of saturation of the intersection, and the level of service. The degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Sidra Intersection provides analysis of the operating conditions which can be compared to the performance criteria set out in **Table 2**.

**Table 2 – Level of Service Criteria**

Level of Service	Average Delay per Vehicle (secs/veh)	Signals & Roundabouts	Give Way & Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & Spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	> 70	Extra capacity required	Extreme delay, traffic signals or other major treatment required

Adapted from RTA Guide to Traffic Generating Developments, 2002.

For roundabouts and priority intersections, the reported average delay is for the individual movement with the highest average delay per vehicle. At signalised intersections, the reported average delay is over all movements.

The existing weekday and weekend day intersection operating conditions are presented in [Table 3](#). Average delay is expressed in seconds per vehicle.

**Table 3 – Existing Weekday Intersection Operating Conditions**

Intersection	Control	Morning Peak		Evening Peak	
		Av Delay	LOS	Av Delay	LOS
Oxford Road / Collins Promenade	Signals	32.3	C	24.1	B
Oxford Road / Bensley Road	Give Way	5.8	A	5.9	A
Chester Road / Collins Promenade	Roundabout	12.6	A	15.5	B

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From [Table 3](#), it can be seen that all intersections in the vicinity of the development site currently operate at a satisfactory level of service with adequate spare capacity for increased demands.

#### 4. The Proposed Development

The key elements of the proposed development in terms of yield, traffic and access matters are presented below:

1. The development would yield a total of 241 residential development lots.
2. Construction of an internal road network which would include one (1) intersection connection with Mercedes Road, four (4) intersection connections to Bensley Road and two (2) intersection connections to Oxford Road.
3. An internal road network which would facilitate a bus service with all residential lots within a 400m walking distance to the service.
4. Internal road widths which comply with Liverpool Council's DCP for Residential Development.

For the area as a whole, the current plan would achieve the following total lot yield:

- 225m<sup>2</sup> lots - 84
- 300m<sup>2</sup> lots 116
- 450m<sup>2</sup> lots 24
- 600m<sup>2</sup> lots 17
- Total 241 lots

Plans of the proposed sub division can be found in [Appendix B](#) of this report.



## 5. Traffic and Access Assessment

The following presents an analysis of potential future traffic impacts of the proposed development.

### 5.1 Traffic Generation

Whilst the development includes a range of residential lot types, for the purpose of assessing future traffic impacts, all residential lots have been assumed to function as single dwelling houses as defined in the RTA Guide to Traffic Generating Developments.

Therefore, at a potential peak hour rate specified by the guide of 0.85 trips per dwelling, the proposed 241 lots have the potential to generate 205 peak hour vehicle trips two way. 80% of these trips (164) would travel outbound in the AM peak and 20% (41) would travel inbound. The reverse would occur in the PM peak.

### 5.2 Trip Distribution

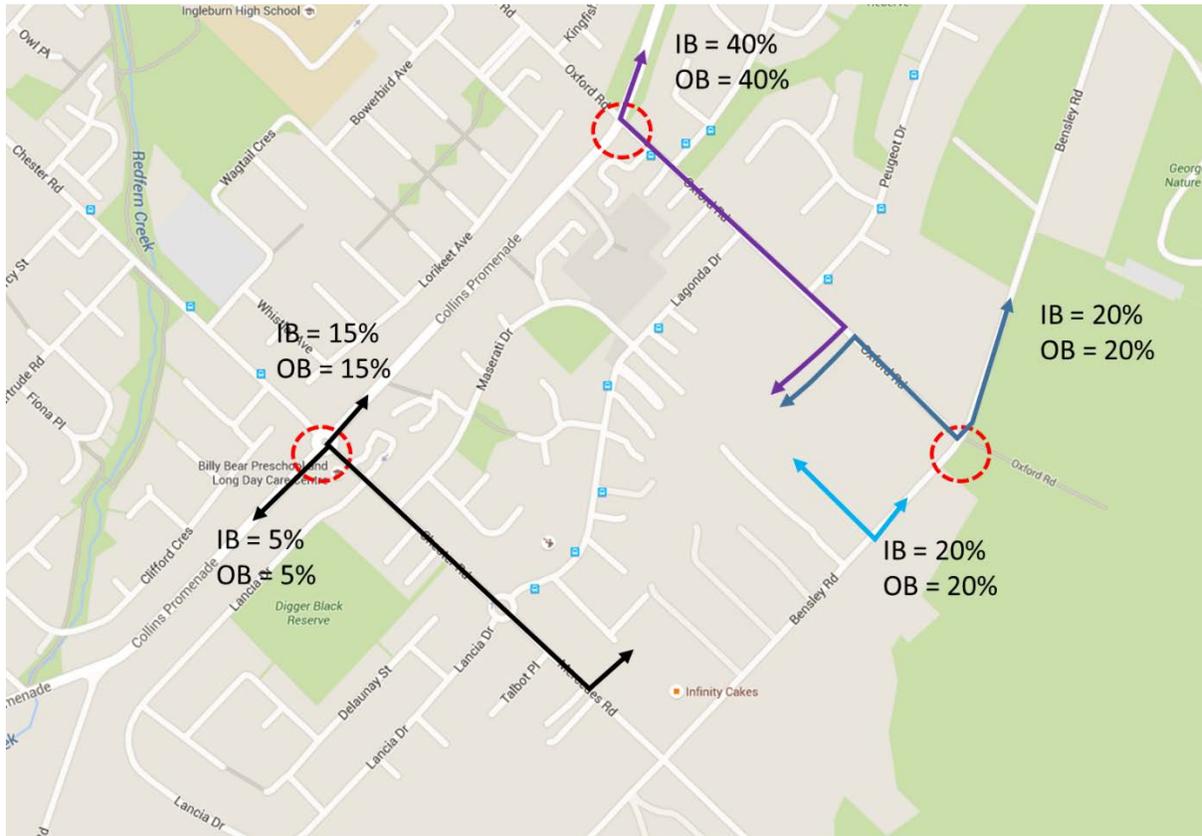
The potential routes of travel of new residents of the sub division have been developed considering both the proposed access connections to existing surrounding roads and existing traffic flows by direction.

Collins Promenade included a 3:2 proportion of traffic flows northbound / southbound respectively with the reverse occurring in the PM peak. Bensley Road included an approximate 50 / 50 split of northbound / southbound traffic flows in both peak periods.

Bensley Road would provide a direct access north and would be attractive for residents of the sub division.

Based on the above, the following trips distribution has been adopted which shows the percentage of the total inbound / outbound trips by direction.





### 5.3 Future Traffic Flows

The traffic generated by the proposal has been added to the surrounding road network as per the adopted trip distribution detailed above. The resulting future traffic flows are presented below.

**Table 4 – Future Weekday Peak Period Volumes in vicinity of site (veh/hr)**

Road	Location	AM		PM	
		NB/EB	SB/WB	NB/EB	SB/WB
Oxford Road	East of Collins Promenade	164	302	248	226
Oxford Road	West of Collins Promenade	183	301	157	149
Collins Promenade	South of Oxford Road	694	512	474	852
Harold Street	North of Oxford Road	799	487	497	999
Oxford Road	West of Bensley Road	47	58	84	55
Bensley Road	South of Oxford Road	78	47	51	87
Bensley Road	North of Oxford Road	139	65	100	157
Mercedes Road	East of Collins Promenade	133	246	251	217
Chester Road	West of Collins Promenade	128	172	223	193
Collins Promenade	South of Chester Road	648	633	519	882
Collins Promenade	North of Chester Road	641	507	436	853

\*West of College Road South

From **Table 4** it can be seen that traffic flows in the future on the surrounding road network would remain in line with their respective classification.

#### 5.4 Future Intersection Operation

The future traffic flows on the surrounding road network have been assessed in SIDRA. The resulting future intersection operation is presented below.

**Table 5 – Future Weekday Intersection Operating Conditions**

Intersection	Control	Morning Peak		Evening Peak	
		Av Delay	LOS	Av Delay	LOS
Oxford Road / Collins Promenade	Signals	39.0	C	27.6	B
Oxford Road / Bensley Road	Give Way	5.9	A	6.2	A
Chester Road / Collins Promenade	Roundabout	12.5	A	15.8	B

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From **Table 5** it can be seen that at full development of the sub division, all intersections surveyed would continue to operate at satisfactory levels of service.

Overall the potential traffic impacts of the development are considered satisfactory.

## 6. Summary of Findings

This report has reviewed the potential traffic impacts of the 241 lot residential development known as Caledonia in Ingleburn. The findings of this review are presented below:

1. The traffic impacts of the development would be minimal with future traffic flows on surrounding roads within acceptable limits.
2. Intersections surrounding the development would continue to operate at levels of service to that which currently occurs.
3. The internal road network has been designed to facilitate a future bus route if deemed viable with all proposed residential lots within 400m of the internal bus route.

Overall the traffic impacts of the proposal are considered acceptable.



## 7. Appendix A – Intersection / Parking Counts





Oxford Rd & Bensley Rd

To

**Dean Brodie**

at **Positive Traffic**

your results for

**Ingleburn - Oxford Rd Counts**

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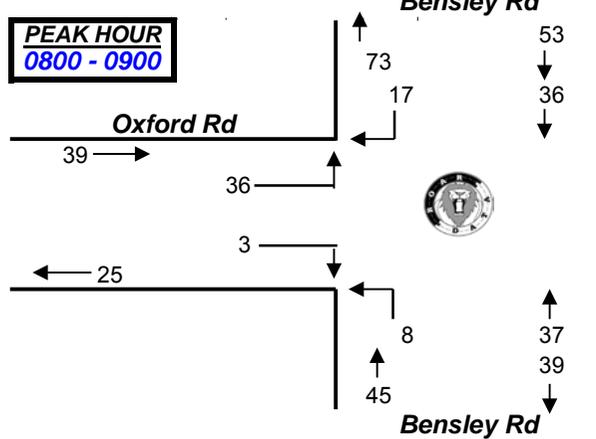
Ph.88196847, Fax 88196849, Mob.0418-239019

All Vehicles

Time Per	NORTH Bensley Rd		WEST Oxford Rd		SOUTH Bensley Rd		TOTAL
	R	I	L	R	L	I	
0600 - 0615	3	2	5	1	2	4	17
0615 - 0630	1	4	8	0	0	4	17
0630 - 0645	2	3	6	0	1	1	13
0645 - 0700	0	5	3	1	1	4	14
0700 - 0715	3	4	8	1	1	2	19
0715 - 0730	2	8	7	0	0	5	22
0730 - 0745	4	5	7	0	1	7	24
0745 - 0800	1	2	8	1	0	5	17
0800 - 0815	1	9	15	0	2	8	35
0815 - 0830	7	9	7	2	4	7	36
0830 - 0845	3	11	7	0	1	12	34
0845 - 0900	6	7	7	1	1	10	32
Period End	33	69	88	7	14	69	280

Peak Per	NORTH Bensley Rd		WEST Oxford Rd		SOUTH Bensley Rd		TOTAL
	R	I	L	R	L	I	
0600 - 0700	6	14	22	2	4	13	61
0615 - 0715	6	16	25	2	3	11	63
0630 - 0730	7	20	24	2	3	12	68
0645 - 0745	9	22	25	2	3	18	79
0700 - 0800	10	19	30	2	2	19	82
0715 - 0815	8	24	37	1	3	25	98
0730 - 0830	13	25	37	3	7	27	112
0745 - 0845	12	31	37	3	7	32	122
0800 - 0900	17	36	36	3	8	37	137

PEAK HR	17	36	36	3	8	37	137
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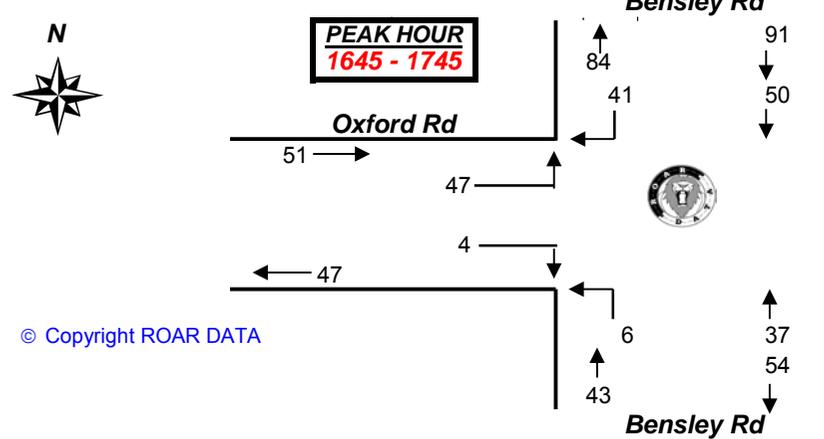
Client : Positive Traffic  
 Job No/Name : 5803 Ingleburn Oxford Rd Counts  
 Day/Date : Thursday 15th October 2015

All Vehicles

Time Per	NORTH Bensley Rd		WEST Oxford Rd		SOUTH Bensley Rd		TOTAL
	R	I	L	R	L	I	
1500 - 1515	6	7	3	0	1	7	24
1515 - 1530	9	8	4	1	2	8	32
1530 - 1545	10	12	4	2	1	10	39
1545 - 1600	10	13	4	2	0	12	41
1600 - 1615	3	11	7	1	2	6	30
1615 - 1630	6	15	4	0	1	4	30
1630 - 1645	9	8	8	1	0	11	37
1645 - 1700	9	11	8	1	2	6	37
1700 - 1715	6	12	18	0	1	4	41
1715 - 1730	14	12	12	1	1	11	51
1730 - 1745	12	15	9	2	2	16	56
1745 - 1800	10	8	3	1	1	6	29
Period End	104	132	84	12	14	101	447

Peak Per	NORTH Bensley Rd		WEST Oxford Rd		SOUTH Bensley Rd		TOTAL
	R	I	L	R	L	I	
1500 - 1600	35	40	15	5	4	37	136
1515 - 1615	32	44	19	6	5	36	142
1530 - 1630	29	51	19	5	4	32	140
1545 - 1645	28	47	23	4	3	33	138
1600 - 1700	27	45	27	3	5	27	134
1615 - 1715	30	46	38	2	4	25	145
1630 - 1730	38	43	46	3	4	32	166
1645 - 1745	41	50	47	4	6	37	185
1700 - 1800	42	47	42	4	5	37	177

PEAK HR	41	50	47	4	6	37	185
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Client : Positive Traffic

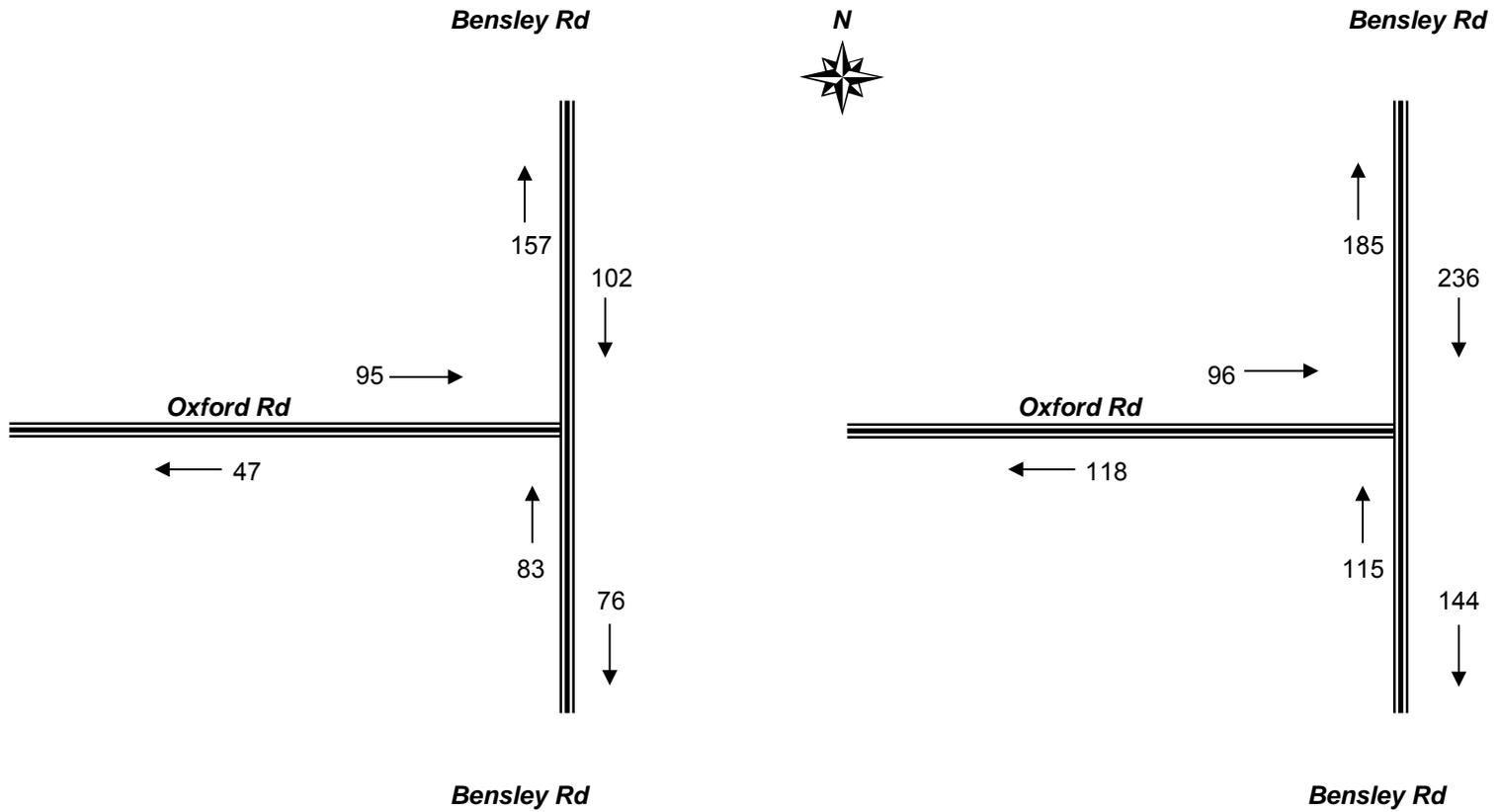
Job No/Name : 5803 Ingleburn Oxford Rd Counts

Day/Date : Thursday 15th October 2015

TOTAL VOLUMES  
FOR PERIOD  
COUNTED

AM

PM





# R.O.A.R DATA

**Reliable, Original & Authentic Results**

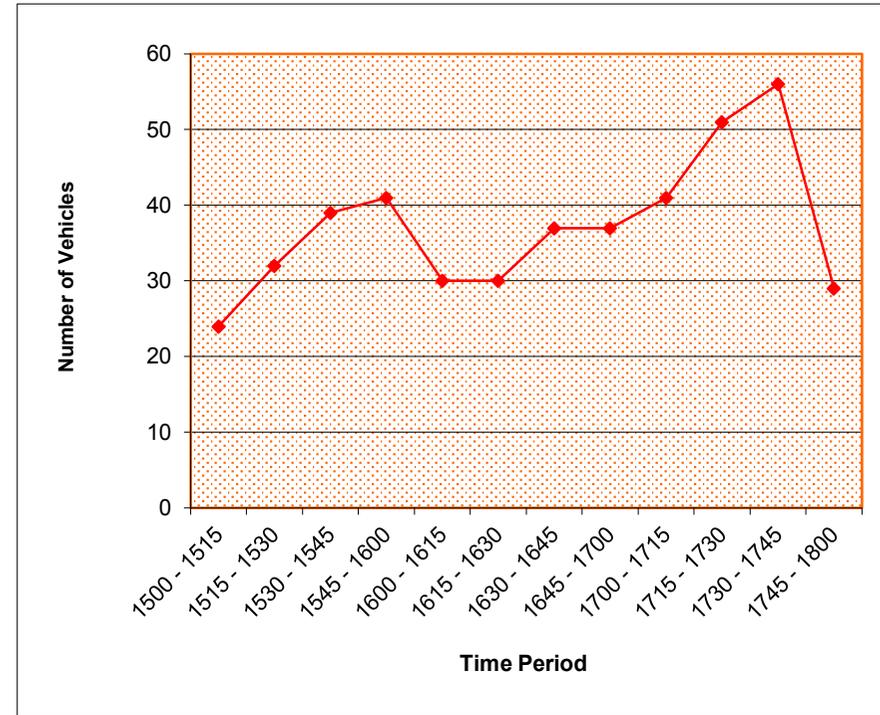
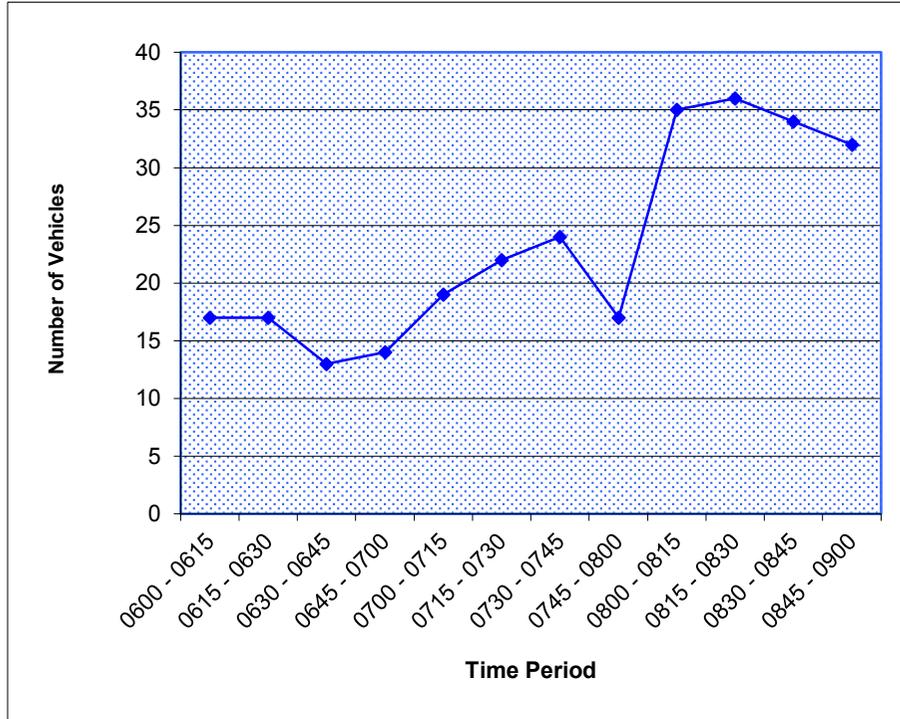
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Positive Traffic  
Job No/Name : 5803 Ingleburn Oxford Rd Counts  
Day/Date : Thursday 15th October 2015

AM

## Oxford Rd & Bensley Rd

PM





# R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Positive Traffic  
Job No/Name : 5803 Ingleburn Oxford Rd Counts  
Day/Date : Thursday 15th October 2015

### Intersection Details

Obtained via satellite

May be incorrect



**AM PEAK HOUR**  
0800 - 0900

Oxford Rd

Bensley Rd



R	T	
17	36	AM
41	50	PM

36	47	L
3	4	R
		AM
		PM

6	37	
8	37	
		L
		T

**PM PEAK HOUR**  
1645 - 1745

Weather >>>



Bensley Rd



Chester Rd Rd & Collins Prm

To

**Dean Brodie**

at **Positive Traffic**

your results for

**Ingleburn - Oxford Rd Counts**

supplied by

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Client : Positive Traffic  
Job No/Name : 5803 Ingleburn Oxford Rd Counts  
Day/Date : Thursday 15th October 2015

All Vehicles Time Per	NORTH Collins Prm			WEST Chester Rd			SOUTH Collins Prm			EAST Chester Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
	0600 - 0615	3	16	0	6	4	4	2	83	6	10	6	
0615 - 0630	5	37	0	7	8	0	5	106	4	16	6	12	206
0630 - 0645	1	54	3	3	6	4	1	109	2	11	10	11	215
0645 - 0700	2	53	8	11	6	5	8	108	9	14	13	14	251
0700 - 0715	3	40	6	16	11	7	7	111	2	11	25	8	247
0715 - 0730	3	52	3	5	9	6	11	116	12	16	22	12	267
0730 - 0745	5	64	10	15	15	8	15	113	4	15	26	7	297
0745 - 0800	5	62	3	9	10	7	15	155	4	18	18	17	323
0800 - 0815	3	71	3	12	9	6	17	122	10	27	18	12	310
0815 - 0830	6	116	13	6	11	16	14	142	7	31	16	11	389
0830 - 0845	2	131	3	15	6	21	13	145	20	34	23	8	421
0845 - 0900	4	133	16	7	4	15	11	127	18	24	25	9	393
Period End	42	829	68	112	99	99	119	1437	98	227	208	129	3467

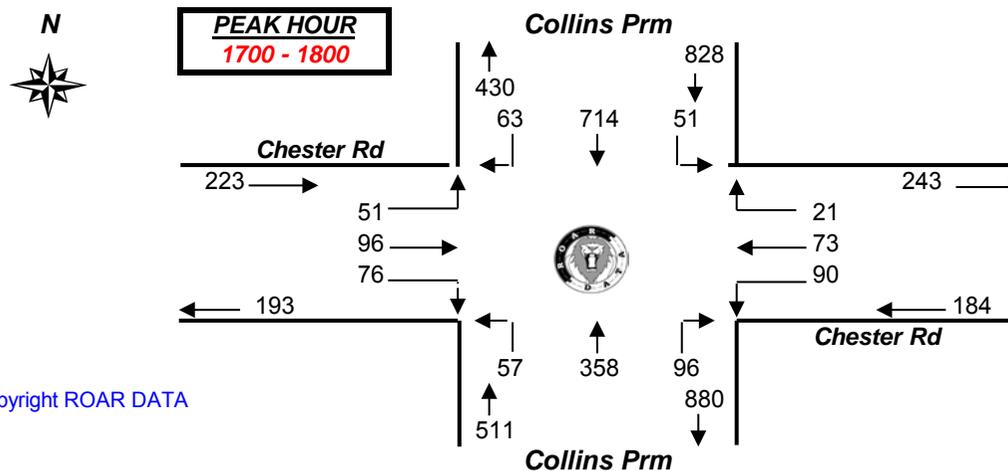
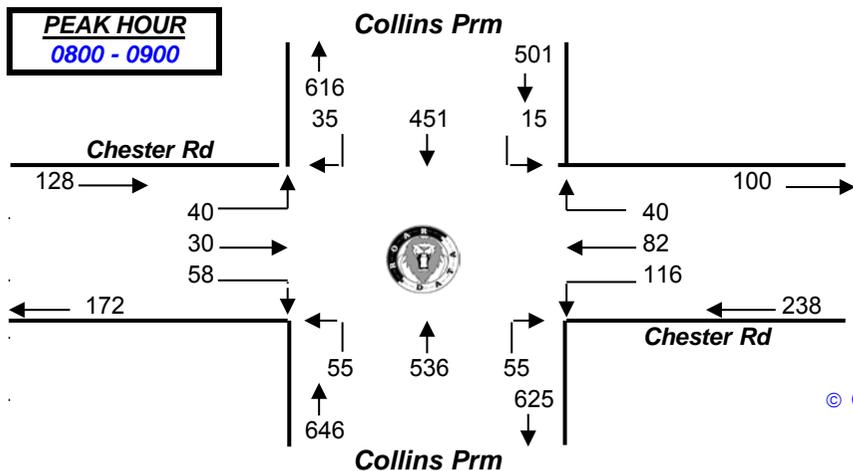
All Vehicles Time Per	NORTH Collins Prm			WEST Chester Rd			SOUTH Collins Prm			EAST Chester Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
	1500 - 1515	8	162	13	14	20	27	12	99	37	22	15	
1515 - 1530	15	170	9	8	20	14	9	113	35	18	13	7	431
1530 - 1545	9	165	12	7	10	9	11	95	22	20	9	7	376
1545 - 1600	5	139	10	12	26	8	14	104	19	23	16	5	381
1600 - 1615	12	172	15	6	12	22	9	107	20	17	9	7	408
1615 - 1630	7	170	11	12	10	20	12	96	26	18	11	5	398
1630 - 1645	10	171	6	8	17	19	7	90	23	28	12	6	397
1645 - 1700	11	160	13	12	19	24	12	94	21	20	12	7	405
1700 - 1715	8	151	13	11	24	19	19	100	30	27	20	3	425
1715 - 1730	12	163	21	18	21	22	14	100	23	21	17	5	437
1730 - 1745	19	175	17	13	30	18	8	76	26	22	20	7	431
1745 - 1800	12	225	12	9	21	17	16	82	17	20	16	6	453
Period End	128	2023	152	130	230	219	143	1156	299	256	170	72	4978

Peak Time	NORTH Collins Prm			WEST Chester Rd			SOUTH Collins Prm			EAST Chester Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
0600 - 0700	11	160	11	27	24	13	16	406	21	51	35	45	820
0615 - 0715	11	184	17	37	31	16	21	434	17	52	54	45	919
0630 - 0730	9	199	20	35	32	22	27	444	25	52	70	45	980
0645 - 0745	13	209	27	47	41	26	41	448	27	56	86	41	1062
0700 - 0800	16	218	22	45	45	28	48	495	22	60	91	44	1134
0715 - 0815	16	249	19	41	43	27	58	506	30	76	84	48	1197
0730 - 0830	19	313	29	42	45	37	61	532	25	91	78	47	1319
0745 - 0845	16	380	22	42	36	50	59	564	41	110	75	48	1443
<b>0800 - 0900</b>	15	451	35	40	30	58	55	536	55	116	82	40	1513

Peak Time	NORTH Collins Prm			WEST Chester Rd			SOUTH Collins Prm			EAST Chester Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
1500 - 1600	37	636	44	41	76	58	46	411	113	83	53	26	1624
1515 - 1615	41	646	46	33	68	53	43	419	96	78	47	26	1596
1530 - 1630	33	646	48	37	58	59	46	402	87	78	45	24	1563
1545 - 1645	34	652	42	38	65	69	42	397	88	86	48	23	1584
1600 - 1700	40	673	45	38	58	85	40	387	90	83	44	25	1608
1615 - 1715	36	652	43	43	70	82	50	380	100	93	55	21	1625
1630 - 1730	41	645	53	49	81	84	52	384	97	96	61	21	1664
1645 - 1745	50	649	64	54	94	83	53	370	100	90	69	22	1698
<b>1700 - 1800</b>	51	714	63	51	96	76	57	358	96	90	73	21	1746

PEAK HOUR	15	451	35	40	30	58	55	536	55	116	82	40	1513
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PEAK HOUR	51	714	63	51	96	76	57	358	96	90	73	21	1746
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# R.O.A.R DATA

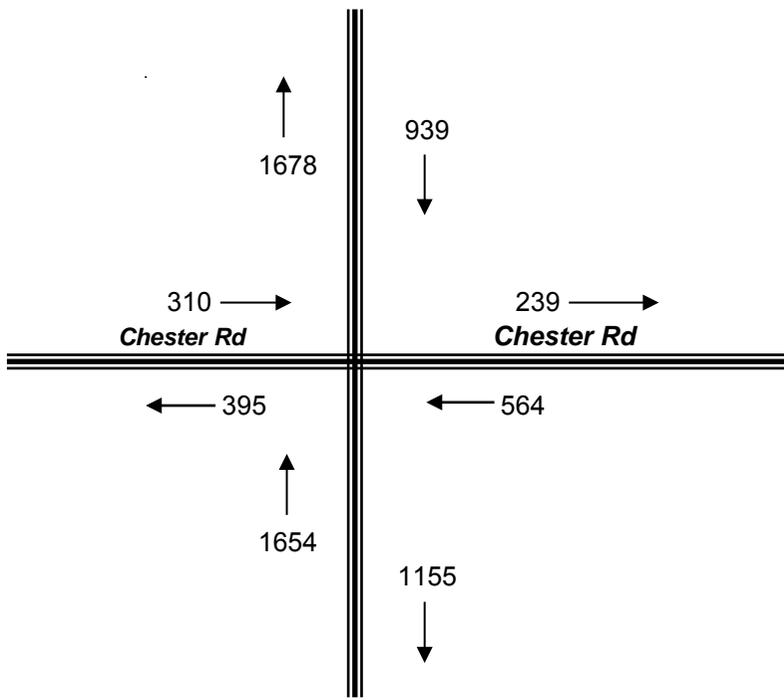
**Reliable, Original & Authentic Results**

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Positive Traffic  
Job No/Name : 5803 Ingleburn Oxford Rd Counts  
Day/Date : Thursday 15th October 2015

AM

*Collins Prm*

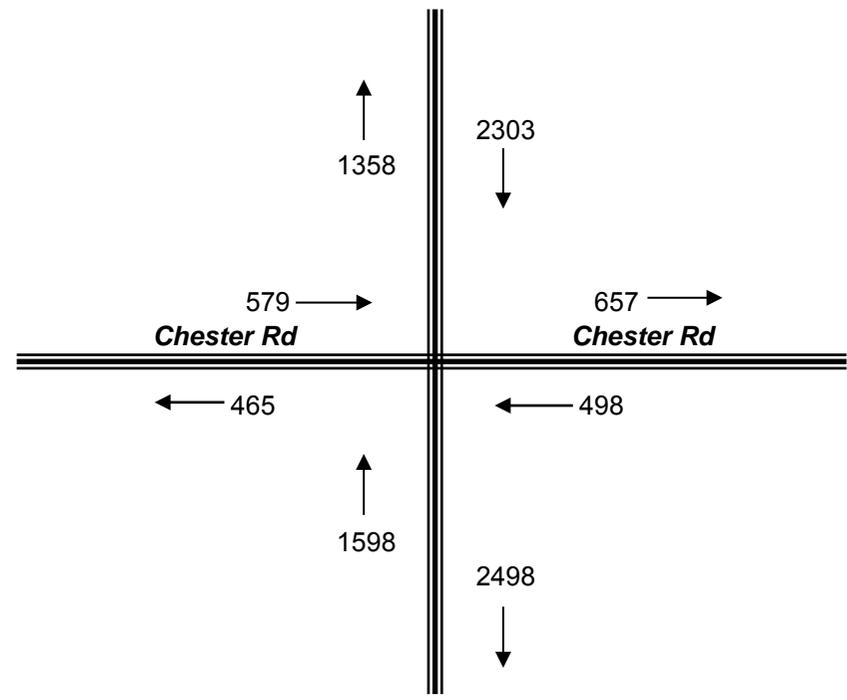


TOTAL VOLUMES  
FOR COUNT  
PERIOD



PM

*Collins Prm*



*Collins Prm*



# R.O.A.R DATA

**Reliable, Original & Authentic Results**

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Positive Traffic

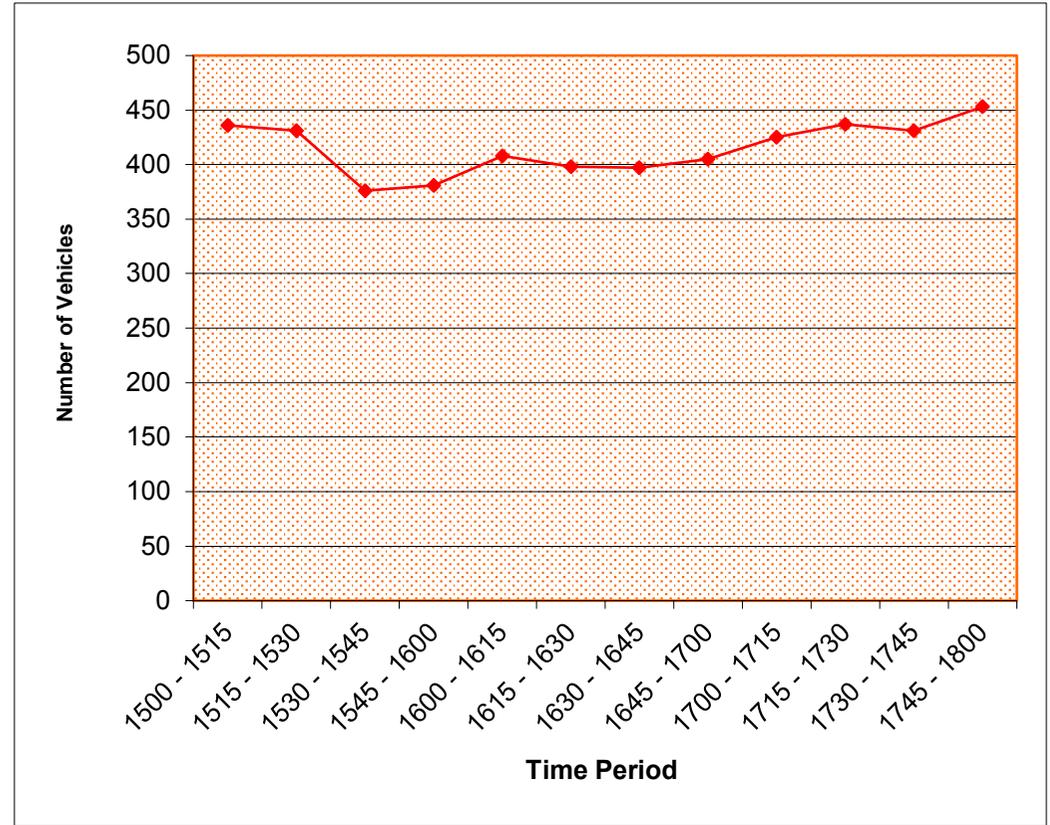
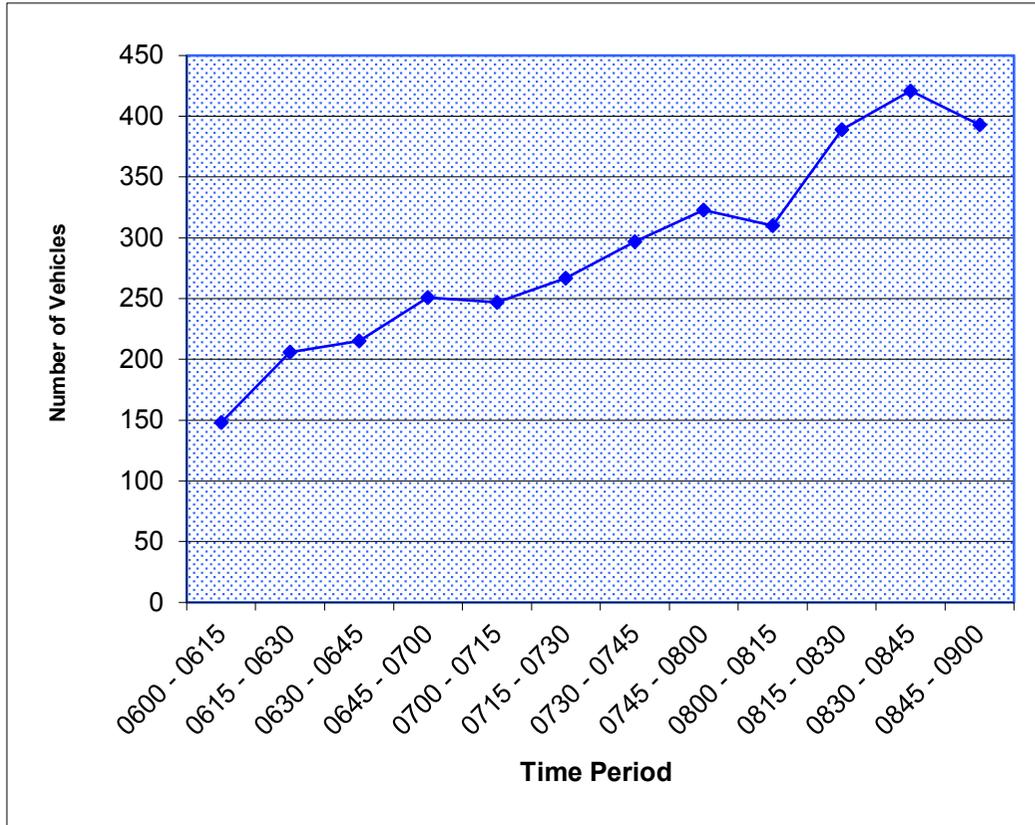
Job No/Name : 5803 Ingleburn Oxford Rd Counts

Day/Date : Thursday 15th October 2015

AM

Chester Rd & Collins Prm

PM





# R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Positive Traffic  
Job No/Name : 5803 Ingleburn Oxford Rd Counts  
Day/Date : Thursday 15th October 2015

### Intersection Layout

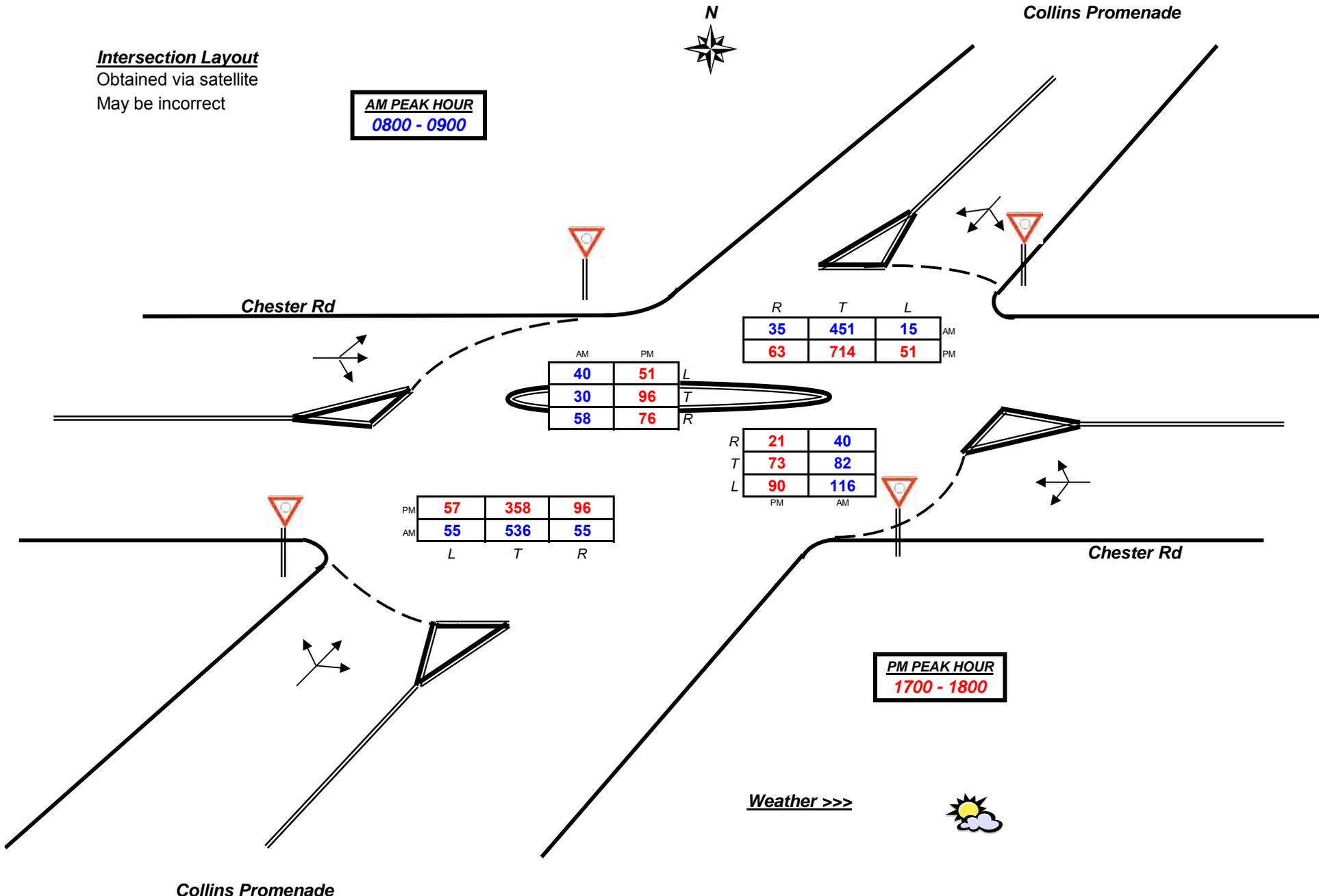
Obtained via satellite

May be incorrect



**AM PEAK HOUR**  
**0800 - 0900**

**PM PEAK HOUR**  
**1700 - 1800**



R	T	L	
35	451	15	AM
63	714	51	PM

AM	PM	
40	51	L
30	96	T
58	76	R

R	21	40
T	73	82
L	90	116
	PM	AM

PM	57	358	96
AM	55	536	55
	L	T	R

Weather >>>



Collins Promenade



Oxford Rd & Collins Prm

To

**Dean Brodie**

at **Positive Traffic**

your results for

**Ingleburn - Oxford Rd Counts**

supplied by

R.O.A.R. DATA Pty. Ltd.

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Client : Positive Traffic  
Job No/Name : 5803 Ingleburn Oxford Rd Counts  
Day/Date : Thursday 15th October 2015

All Vehicles Time Per	NORTH Harold St			WEST Oxford Rd			SOUTH Collins Prm			EAST Oxford Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
	0600 - 0615	1	19	0	9	0	2	2	87	3	1	9	
0615 - 0630	3	37	1	7	2	2	2	124	2	3	10	19	212
0630 - 0645	5	44	9	9	3	4	1	119	2	6	12	26	240
0645 - 0700	4	53	4	7	7	6	6	128	3	3	12	31	264
0700 - 0715	6	47	3	5	6	5	4	134	6	6	12	34	268
0715 - 0730	7	46	1	6	8	5	4	116	1	4	23	29	250
0730 - 0745	8	61	0	8	10	5	5	138	4	6	23	29	297
0745 - 0800	5	61	5	12	11	8	14	140	5	6	21	32	320
0800 - 0815	12	68	6	12	8	10	17	143	3	10	26	32	347
0815 - 0830	10	102	11	6	10	15	38	147	2	23	19	19	402
0830 - 0845	11	122	19	26	14	26	46	145	3	10	55	29	506
0845 - 0900	7	89	14	18	15	23	18	129	3	14	32	17	379
Period End	79	749	73	125	94	111	157	1550	37	92	254	318	3639

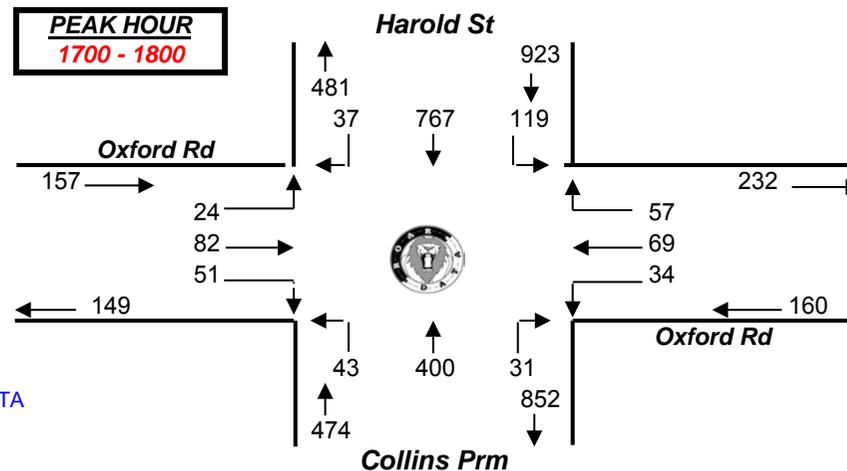
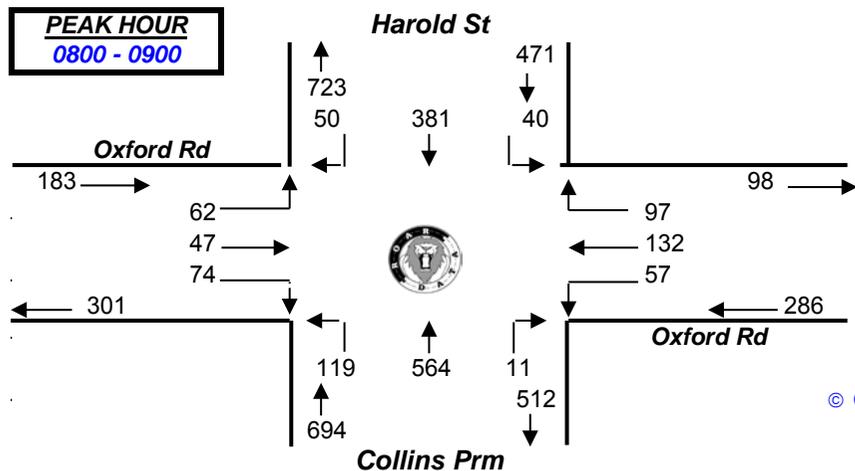
All Vehicles Time Per	NORTH Harold St			WEST Oxford Rd			SOUTH Collins Prm			EAST Oxford Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
	1500 - 1515	19	150	19	32	41	49	20	103	3	8	12	
1515 - 1530	15	162	9	17	16	15	16	114	5	9	9	16	403
1530 - 1545	30	173	10	7	11	14	20	101	6	12	12	14	410
1545 - 1600	28	135	6	5	7	14	15	100	5	5	12	8	340
1600 - 1615	25	199	9	5	19	8	8	90	10	7	8	8	396
1615 - 1630	26	178	16	7	21	18	14	95	5	14	9	12	415
1630 - 1645	32	185	16	10	23	9	13	84	8	7	11	10	408
1645 - 1700	34	162	6	8	14	20	9	96	8	7	14	16	394
1700 - 1715	27	163	10	6	19	8	11	100	10	10	18	14	396
1715 - 1730	37	192	12	5	14	14	8	115	11	6	14	17	445
1730 - 1745	36	177	5	5	25	18	13	86	5	10	20	14	414
1745 - 1800	19	235	10	8	24	11	11	99	5	8	17	12	459
Period End	328	2111	128	115	234	198	158	1183	81	103	156	146	4941

Peak Time	NORTH Harold St			WEST Oxford Rd			SOUTH Collins Prm			EAST Oxford Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
0600 - 0700	13	153	14	32	12	14	11	458	10	13	43	97	870
0615 - 0715	18	181	17	28	18	17	13	505	13	18	46	110	984
0630 - 0730	22	190	17	27	24	20	15	497	12	19	59	120	1022
0645 - 0745	25	207	8	26	31	21	19	516	14	19	70	123	1079
0700 - 0800	26	215	9	31	35	23	27	528	16	22	79	124	1135
0715 - 0815	32	236	12	38	37	28	40	537	13	26	93	122	1214
0730 - 0830	35	292	22	38	39	38	74	568	14	45	89	112	1366
0745 - 0845	38	353	41	56	43	59	115	575	13	49	121	112	1575
<b>0800 - 0900</b>	40	381	50	62	47	74	119	564	11	57	132	97	1634

Peak Time	NORTH Harold St			WEST Oxford Rd			SOUTH Collins Prm			EAST Oxford Rd			TOT
	L	I	R	L	I	R	L	I	R	L	I	R	
1500 - 1600	92	620	44	61	75	92	71	418	19	34	45	43	1614
1515 - 1615	98	669	34	34	53	51	59	405	26	33	41	46	1549
1530 - 1630	109	685	41	24	58	54	57	386	26	38	41	42	1561
1545 - 1645	111	697	47	27	70	49	50	369	28	33	40	38	1559
1600 - 1700	117	724	47	30	77	55	44	365	31	35	42	46	1613
1615 - 1715	119	688	48	31	77	55	47	375	31	38	52	52	1613
1630 - 1730	130	702	44	29	70	51	41	395	37	30	57	57	1643
1645 - 1745	134	694	33	24	72	60	41	397	34	33	66	61	1649
<b>1700 - 1800</b>	119	767	37	24	82	51	43	400	31	34	69	57	1714

PEAK HOUR	40	381	50	62	47	74	119	564	11	57	132	97	1634
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PEAK HOUR	119	767	37	24	82	51	43	400	31	34	69	57	1714
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© Copyright ROAR DATA



# R.O.A.R DATA

**Reliable, Original & Authentic Results**

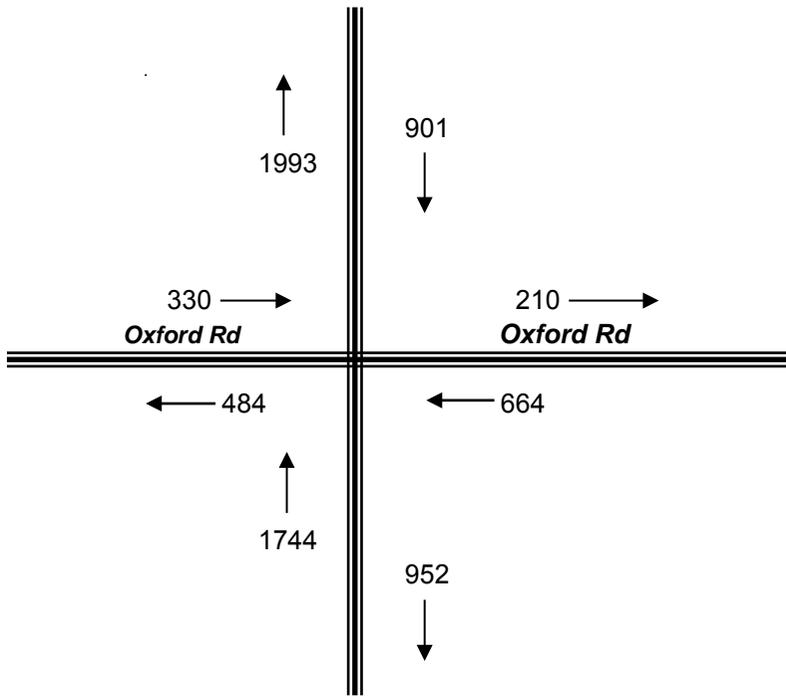
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Positive Traffic  
Job No/Name : 5803 Ingleburn Oxford Rd Counts  
Day/Date : Thursday 15th October 2015

**AM**

**Harold St**

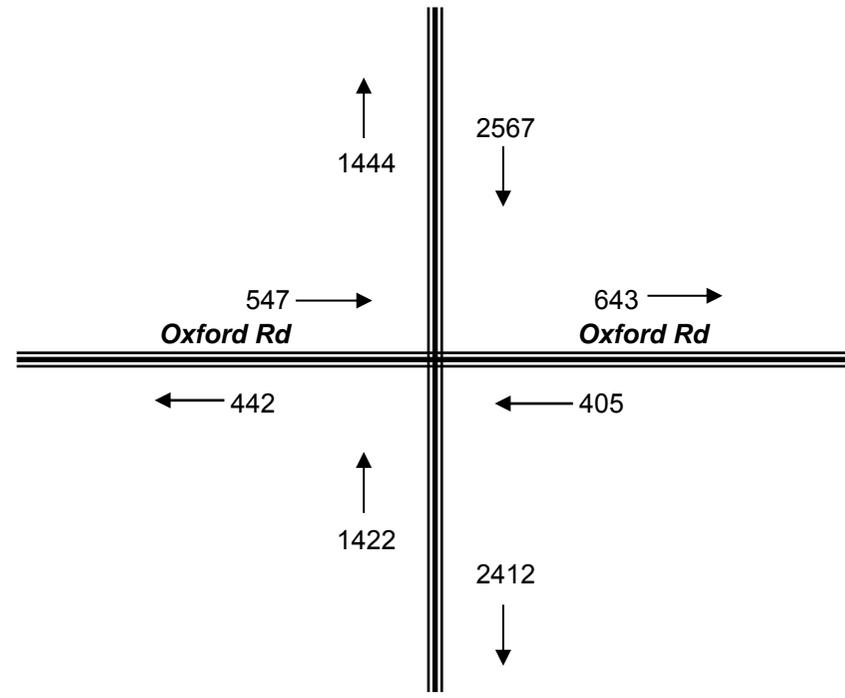
**TOTAL VOLUMES  
FOR COUNT  
PERIOD**



**Collins Prm**

**PM**

**Harold St**



**Collins Prm**



R.O.A.R DATA

**Reliable, Original & Authentic Results**

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Positive Traffic

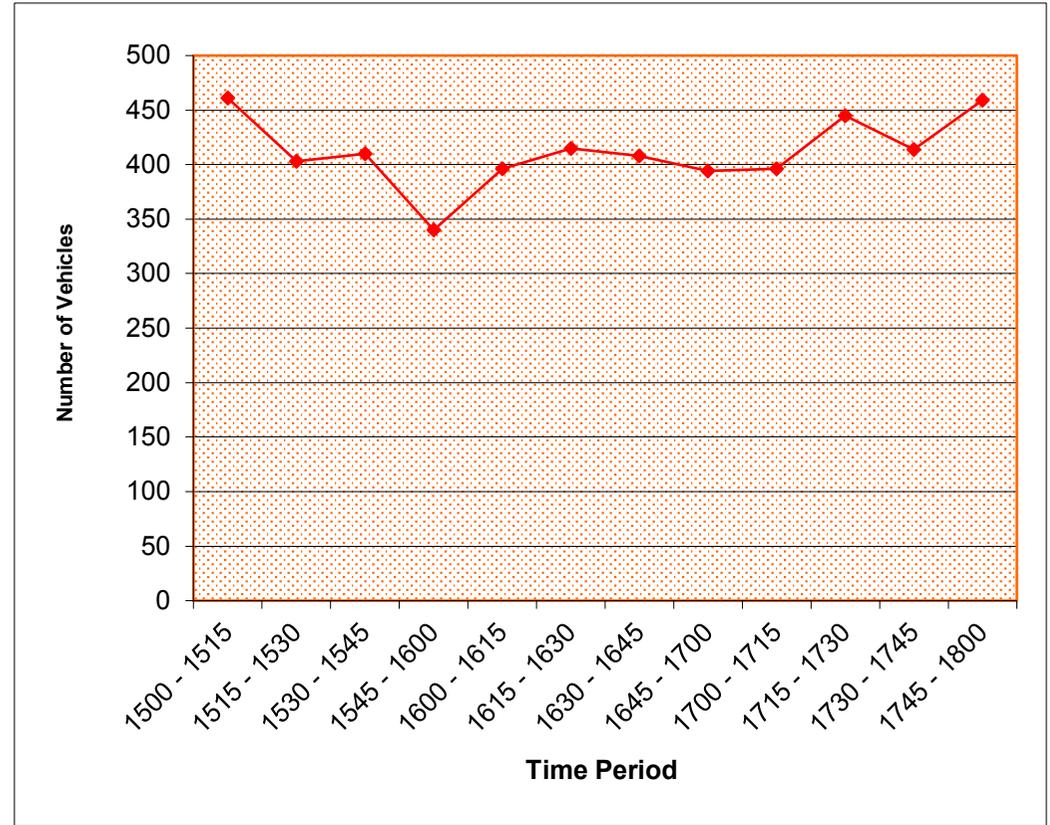
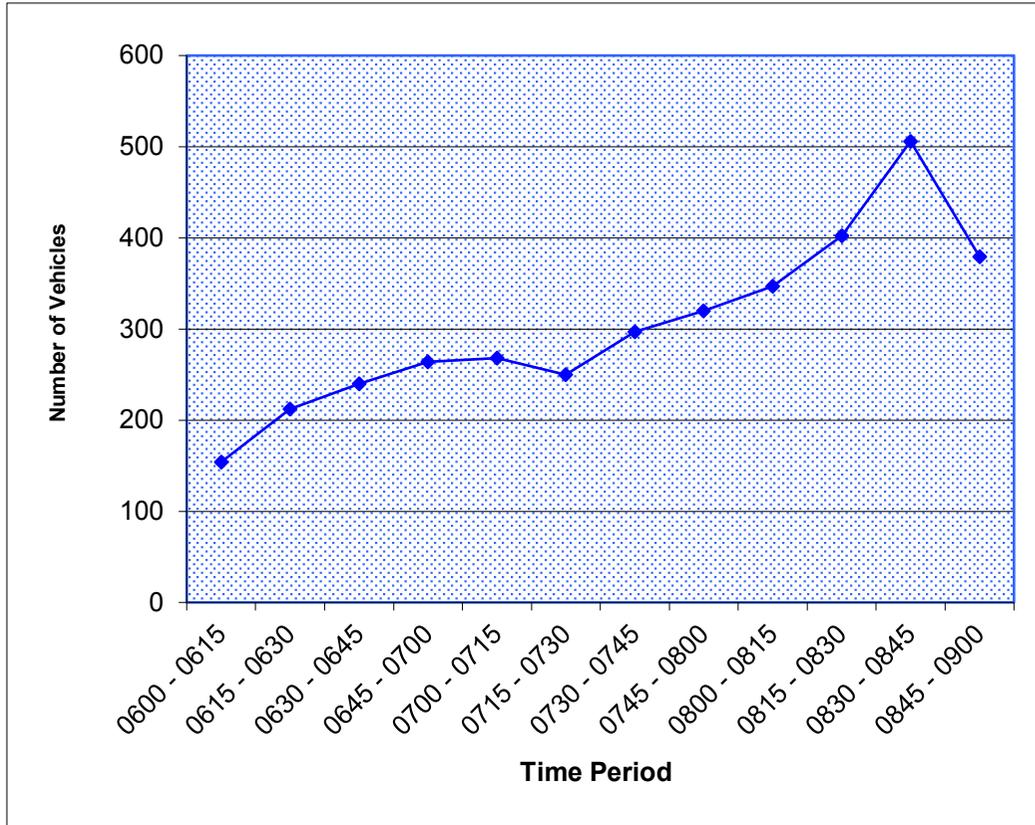
Job No/Name : 5803 Ingleburn Oxford Rd Counts

Day/Date : Thursday 15th October 2015

**AM**

**Oxford Rd & Collins Prm**

**PM**





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Client : Positive Traffic  
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Day/Date : Thursday 15th October 2015

### Intersection Details

Obtained via satellite

May be incorrect

**AM PEAK HOUR**  
0800 - 0900



Harold St

Oxford Rd

	AM	PM	
L	62	24	L
T	47	82	T
R	74	51	R

	R	T	L	
AM	50	381	40	AM
PM	37	767	119	PM

	R	T	L	
AM	57	97		AM
PM	69	132		PM
	34	57		

	L	T	R	
AM	43	400	31	AM
PM	119	564	11	PM

Oxford Rd

**PM PEAK HOUR**  
1700 - 1800

Weather >>>



Collins Prm

## 8. Appendix B Plans of Proposed Sub Division



DESIGN NOTES

- 1 Sandstone cottage retained with appropriate curtilage.
- 2 Mercedes Road entry with pocket parks and marker tree.
- 3 Bensley Road frontage renewed with bioswale and native tree planting to reinforce local "rural verge" character.
- 4 Existing Bunya Pine potential as a historic marker.
- 5 Minor Streets identified with medium size native trees
- 6 Bensley Park. Existing trees retained with open grassed areas for recreation.
- 7 Existing residence retained.
- 8 Caledonia Woodland. Existing Cumberland Plain Woodland retained as site feature.
- 9 Proposed Georges River Parkway with existing trees retained to reinforce of "rural verge" character.
- 10 "Rural verge" character to Oxford Road is retained and repaired with additional native tree planting.
- 11 Potential vehicular entry is an extension of the existing road network.
- 12 Main road access identified with wider verge and large native canopy trees



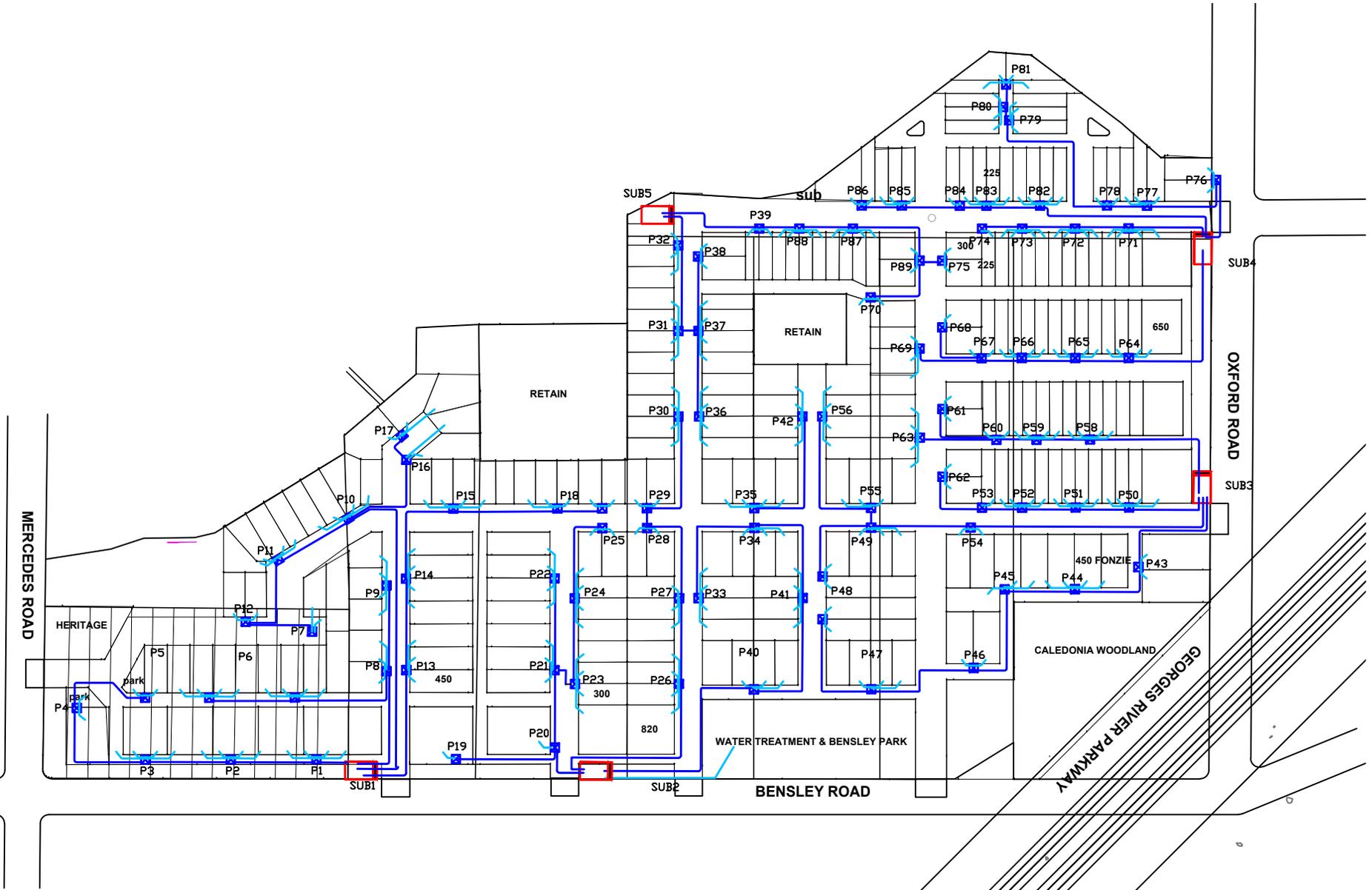


VERIFIER:

JOB MANAGER:

DESIGNED:

DRAWN:



REV	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
					08/12/15

**NORTHROP**

CLIENT **Billbergia Development Team**

PROJECT  
**Caledonia Subdivision**

DRAWING TITLE  
**Electrical supply**

JOB NUMBER <b>151459</b>	
DRAWING NUMBER <b>E01</b>	REVISION <b>3</b>
DRAWING SHEET SIZE = A3	





## ELECTRICAL SERVICES SPECIFICATION

### Activity schedule

Date	Revision	Issue	Initial
21.09.14	A	Preliminary Issue	SB



## 2 ELECTRICAL SERVICES

### 2.1 Maximum Demand Calculations

The anticipated maximum demand is approximately 2431 Amps with an additional 243 Amps for future allowance. Therefore, the maximum demand including the spare capacity is 2674 Amps in total. The proposed development maximum demand is based on AS/NZS 3000:2007.

<b>Edge Lands, Ingleburn</b>				
<b>AREA</b>	<b>Blocks</b>	<b>VA</b>	<b>KVA</b>	<b>TOTAL Amps</b>
<b>Land</b>				
250 Houses	250	7000	1750	2431
<b>Total</b>			<b>1750</b>	<b>2431</b>
				10%
<b>FINAL LOAD</b>				<b>2674</b>

### 2.2 Substation

The most cost effective and flexible solution for providing power of this magnitude to the site would be via pad mounted kiosk substations. There will be 5 off substation required to feed this development. These kiosks will provide power to pillars which in turn will supply houses.

The substation will have four distributors dedicated to provide power to pillars which will be connected in series and/or parallel configuration supplying up to 4 houses. The substation needs to be located strategically to optimize the cost effective solution while keeping in mind the sensitivity towards the aesthetics of such pieces of equipment.

The following key points should be noted as they relate to the substation:

Pad mount Substations;

- The substation must locate inside of the property boundary not on the footpath, dimensions of the easement are 5500 (W) x 2750 (D). Additionally, a 2000 (W) easement is required from the site boundary to the kiosk substation for HV cabling and 24hr, 7 day a week unimpeded 27 ton truck access with dimensions 4000 (W) x 4000 (H).

The kiosk must not be located within;

- 1:100 flood level or in stormwater paths
- 10000 of an external fire hydrant/fire pumps etc
- 6000 of any ventilation opening
- 3000 of any part of a building unless it is 120/120/120 FRL & 2000kPa blast
- 3000 from site boundary unless provided with 120/120/120 FRL & 2000kPa blast wall
- 3000 of any glazing and fire exits
- 5000 to water tanks
- 10000 of a Telstra pit (dependant on equipment within pit)







**YIELD**

225 m <sup>2</sup>	84
300 m <sup>2</sup>	60
450 m <sup>2</sup>	10
600 m <sup>2</sup>	6
<b>TOTAL</b>	<b>160</b>

**RAJPARA LAND**

225 m <sup>2</sup>	84
300 m <sup>2</sup>	27
450 m <sup>2</sup>	14
600 m <sup>2</sup>	5
<b>TOTAL</b>	<b>46</b>

**LOT 306**

300 m <sup>2</sup>	39
450 m <sup>2</sup>	1
600 m <sup>2</sup>	1
<b>TOTAL</b>	<b>40</b>

**TOTAL YIELD**

225 m <sup>2</sup>	84
300 m <sup>2</sup>	126
450 m <sup>2</sup>	24
600 m <sup>2</sup>	12
<b>TOTAL</b>	<b>246</b>

NOT IN C RETAINED

Position Subject to Final Subdivision

**RIISING MAIN CONNECTION TO EXISTING SYDNEY WATER GRAVITY SEWER**

**EASEMENT REQUIREMENTS SUBJECT TO FINAL ADOPTED DESIGN**

**APPROX. 165,000L SYDNEY WATER SEWER PUMP STATION. APPROX. 6,500L WORKING VOLUME, 155,000L EMERGENCY STORAGE VOLUME**

**NOTES:**  
 - ALL WORKS SUBJECT TO SYDNEY WATER APPROVAL UNDER A SECTION 73 APPLICATION.  
 - WATER, FIRE, AND GAS SERVICES NOT SHOWN. GIVEN THE SIZE OF THE INFRASTRUCTURE AVAILABLE (PRIMARILY TRUNK MAINS) IT IS ASSUMED THESE WILL BE ADEQUATE TO SERVICE THE DEVELOPMENT.

<b>Date:</b>	19.11.2015	<b>Project No:</b>	151459
<b>Project:</b>	EDGES LANDS PLANNING		
<b>Title:</b>	SEWER SERVICING CONCEPT		
<b>Drawing No:</b>	HSK-01	<b>Revision:</b>	2
<b>Drawn:</b>	SM	<b>Scale:</b>	1:2000 @ A1

TaylorBrammer

CALEDONIA

02 SITE CLEAN  
 16/11/15 F 1:2000@A3



Billbergia Pty Ltd c/o  
Grahame Edwards  
URBAN Futures  
20 Alfred Street, Rozelle NSW 2039

Ref/Job No: 2539

17 June 2016

Dear Grahame,

### **Flora and Fauna Constraints Assessment - Caledonia**

Eco Logical Australia Pty Ltd (ELA) has prepared a constraints assessment for the Caledonia planning proposal at Ingleburn. Urban Futures working on behalf of Billbergia Pty Ltd engaged ELA to provide the constraints assessment to guide the master planning of the proposed development.

This constraints assessment has been iterative process that has involved identifying the constraints on the site and working with the Urban Designers to develop a planning proposal that minimises impacts to these constraints. This assessment therefore includes;

1. Identification of constraints
2. Provision of recommendations on how to address constraints
3. An assessment of potential impacts to constraints of the proposed masterplan.

### **Identification of Constraints**

ELA confirmed the presence of one endangered ecological community, Cumberland Plain Woodland, which is present in two condition states. Cumberland Plain Woodland (CPW) is listed as a Critically Endangered Ecological Community (CEEC) under both the NSW *Threatened Species Conservation Act 1995* (TSC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Several patches of CPW were present along Bensley Road. All patches meet the definition as CPW under the TSC Act but only the patch of CPW on the corner of Bensley and Oxford Roads meets the criteria for listing under the EPBC Act. Preparation of a Referral to the Commonwealth may be required if impacts to this area are planned. It is recommended that impacts to this area are avoided.

The majority of the grassland areas throughout the study area were exotic pasture. The grassland areas were dominated by exotic pasture species and may have been ploughed and or fertilised for routine agricultural purposes in the past. This has likely removed the soil stored seed bank and therefore the ability of the land to recover unassisted.

A series of biometric quadrats was undertaken to identify the condition classes of the vegetation. This enabled the vegetation to be classified into one of three constraints categories:

- High
- Medium
- Low.

The study area was traversed in search of threatened flora. None were recorded and it is unlikely that any would be present given the historical site disturbance and level of weed invasion over the majority of the site. However

the relatively intact patch on the corner of Bensley and Oxford Roads may contain habitat for threatened flora that are cryptic such as *Pterostylis saxicola*, which is known from the Ingleburn area.

The literature and data review indicated that no threatened species had previously been recorded in the study area. During the field surveys, one migratory species was recorded. *Ardea ibis* (Cattle Egret) is listed as a migratory species under the EPBC Act and was observed in the grassland areas in the south west of the area. Habitat for this species was present in the exotic grassland.

Vegetation within the study area consisted of a primarily grassy understorey with little leaf litter and extremely limited habitat for *Meridolum corneovirens* (Cumberland Plain Land Snail). Brief searches were conducted under the few trees where leaf litter was present but it is considered unlikely that this species would be present within the study area. This species has been recorded outside the study area and is associated with thick leaf litter primarily from *Eucalyptus tereticornis*.

There was only one hollow bearing tree found in the areas that were accessed. The hollow was in a *Eucalyptus tereticornis*. The hollow was occupied by a Rainbow Lorikeet. Given this, it is unlikely that this hollow would provide habitat for threatened bats. However the woodland areas provide foraging habitat for threatened microbat species. There are database records for the following threatened microbats in the locality: *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), *Miniopterus schreibersii oceanensis* (Eastern Bentwing Bat), *Mormopterus norfolkensis* (Eastern Freetail Bat) and *Scoteanax rueppellii* (Greater Broad-nosed Bat).

#### **SEPP 44 – Koala habitat**

The Cumberland Plain Woodland present in both condition states contained individuals of *Eucalyptus tereticornis* and *Eucalyptus moluccana*. The presence of *Eucalyptus tereticornis* in the better quality Cumberland Plain Woodland was limited to regenerating trees which were about 1-2 m high. Cover of this species elsewhere was limited, however, greater than 15% of the number of trees present are *Eucalyptus tereticornis*. This species is listed on Schedule 2 of SEPP44 as a koala feed tree species. Therefore the areas containing Cumberland Plain Woodland could be considered as potential koala habitat.

In terms of core koala habitat, the definition in SEPP44 is as follows:

**core koala habitat** means an area of land with a resident population of koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historical records of a population.

There have been no recent sightings and no historic records of a population within the study area. The closest records are within dense vegetation south of the Georges River Nature Reserve and in the Holsworthy Military Area. A recorded road kill from 2004 was about 500 m south and on the south-eastern side of Bensley Road in an area of higher vegetation cover than is present in the study area.

The majority of other recent sightings have been made from areas of dense vegetation on the eastern side of Bensley Road and none near the study area. The closest known population of the species is at Wedderburn, some 12 km south of the study area. Therefore on that basis, the site would not meet the definition of core koala habitat. The land does not meet the definition of core koala habitat but is potential koala habitat and according to clause 8(3)(a) of the SEPP, Council is not prevented from granting development consent on this land.

#### **Targeted Koala survey**

As per request of Campbelltown City Council in response to the consideration of vegetation within the study area to be potential Koala habitat, targeted Koala surveys were performed to ascertain the presence of any individuals.

Survey took place on 14 and 15 June 2016 by two ELA ecologists Dr Meredith Henderson and Alex Gorey and involved two components: diurnal and nocturnal surveys. The methodology is consistent with the *Draft Threatened Species Survey Guidelines* (DEC 2004). Due to access restrictions in the study area, survey effort

was limited to the good quality Cumberland Plain Woodland on the corner of Bensley Road and Oxford Road and any trees accessible from along Bensley Road.

Weather conditions were ideal for fauna call playback and spotlighting. Conditions were clear with no rain or severe winds on both survey days (**Table 1**).

**Table 1: Weather conditions during targeted Koala surveys on 14 and 15 June 2016**

Survey Date	Minimum Temperature (°C)	Maximum Temperature (°C)
14 June 2016	4	20.2
15 June 2016	5.5	19

Diurnal survey was performed on 14 June 2016 for a total of 4 person hours to search potential feed trees for signs of use, including scratches and scats. No signs of use were found on any potential feed trees within the survey area.

Nocturnal surveys were performed after dusk on 14 and 15 June 2016 for a total of 6 person hours in total. Limited access to the study area allowed for only one call play back site in the good quality Cumberland Plain Woodland on the corner of Bensley Road and Oxford Road. An initial 10 minute listening period followed by a 10 minute spotlight search was performed prior to call play back to ascertain the presence of any individuals. The Koala call was then broadcast intermittently over a five minute period, followed by 10 minutes of listening. This process was repeated three times. Following the call playback session all trees within the survey area were spotlighted for any Koala individuals. Potential feed trees that were accessible from Bensley Road were also spotlighted. No return calls or individuals were found within the survey area on 14 or 15 June 2016.

### Potential Impacts

Ecological constraints have been prepared to guide the development footprint. Results of the constraints, and recommendations on how to address the constraints are tabulated in **Table 3** and illustrated in **Figure 1** below.

The areas of highest ecological value are associated with the CPW located on the corner of Bensley and Oxford Roads. The remaining vegetation on the site is of lesser value. The draft masterplan for the site incorporates the retention of areas of vegetation with a local park.

This approach would realise the retention of 92% of high constraint vegetation and 8% of moderate constraint vegetation (**Table 2, Figure 3** and **Figure 4**).

The area of vegetation proposed for retention is likely to be considered to be too small to be a viable biobanking site. Long term retention would therefore need to be achieved via a suitable zoning for the site. In the event that Biodiversity Certification was sought for the site, an E2 zoning would provide some 'credit', albeit at a discounted rate, for retention of this vegetation. The land could be in public or private ownership.

If however Biodiversity Certification is not sought, and it is proposed for this land to be dedicated to council, an RE zone would enable some passive recreation to be undertaken while retaining the biodiversity values.

This assessment has identified that if the draft masterplan was developed, that only minor impacts would occur to matters protected under the TSC or EPBC Acts. It is likely that due to the minor nature of these impacts that the proposal would not be considered to cause a 'significant impact'.

**Table 2: Clearing and retention under draft masterplan**

Ecological Constraint	Cleared	Retained	Grand Total
High	0.1	1.1	1.2
Moderate	2.4	0.2	2.6
Low	9.0	0.3	9.3
No Access	4.9	0.1	5.0
<b>Grand Total</b>	<b>16.3</b>	<b>1.6</b>	<b>18.0</b>

### Waterfront Land Constraints Assessment

Under the *Water Management Act 2000* (WM Act) all land within 40 m of a defined watercourse is classed as 'waterfront land'. Waterways include all drainage lines mapped on the 1:25,000 scale topographic map for this region (Campbelltown 9029-1N). Proposed works on waterfront land may trigger Controlled Activity Approvals (CAA) with DPI Water (formally NSW Office of Water) and require vegetated riparian corridors specified for the waterway category (i.e. per Strahler stream order, e.g. 1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup> etc). There is one 1<sup>st</sup> order waterway within the site that is shown on the topographic map. In accordance with DPI Water's *Riparian Guidelines*, a 1<sup>st</sup> order stream usually requires a 10 m vegetated riparian zone on each side measured from the top of bank. Also, proposals to excavate land with 40 m of the waterway would trigger a CAA. This is unless the waterway does not meet the definition of a 'river' under the WM Act and support is granted by DPI Water.

Our field inspection of the 1<sup>st</sup> order stream within the site found that it does not meet the definition of a 'river' under the WM Act because it has no defined channel, bed, bank or have evidence of geomorphic processes. Therefore, you are in a position to request DPI Water to remove the 'waterfront land' requirements for this waterway. They will require photographic evidence along the waterway (which we have). Until this process is accomplished, we have identified the waterway as a 'moderate' constraint (**Figure 2**), but this constraint would be removed upon provisional support from DPI Water to remove the 'waterfront land' requirement.

Yours sincerely



Meredith Henderson

**Senior Ecologist**

**Table 3: Ecological constraints justification**

Constraint	Value	Justification	Recommendation
High	CPW (EPBC Act – Condition D)	<ul style="list-style-type: none"> <li>• A 1.15 ha stand of woodland abuts the north-eastern corner of the study area and meets the criteria for listing as a Condition D patch of CPW under the EPBC Act. The patch is larger than 0.5 ha, has ≥ 50% native perennials in the understorey and at least one tree with a hollow.</li> <li>• this stand as meets the definition as CPW under the TSC Act</li> <li>• this patch has been previously grazed and mown however this has ceased in the last two to four years. Many of the plants in the mid- and over-storey are present.</li> <li>• the canopy of this vegetation community is structured in two layers but has been combined to estimate Project Foliage Cover (PFC) as both strata contribute the upper layers of the vegetation and will do so in the future</li> <li>• potential foraging habitat for Little Eagle and potential habitat for threatened microbats and Koala</li> </ul>	<ul style="list-style-type: none"> <li>• Impacts to this vegetation are likely to require a Referral to the Commonwealth</li> <li>• This area represents a critically endangered ecological community and impacts should be avoided</li> </ul>
Moderate	CPW	<ul style="list-style-type: none"> <li>• vegetation community classified as an endangered or critically endangered ecological community under the TSC Act</li> <li>• while not pristine, this vegetation supports species characteristic of these communities especially in the overstorey</li> <li>• in a patch that is grazed, there are characteristic plant species in all structural layers</li> <li>• potential foraging habitat for threatened bird species (Little Eagle) and potential habitat for threatened microbats and potential Koala habitat</li> <li>• not all areas of this vegetation condition could be accessed and searches for hollows would need to be done in inaccessible areas</li> </ul>	<ul style="list-style-type: none"> <li>• retain connectivity between stands of vegetation wherever possible</li> <li>• avoid removal of hollow-bearing trees</li> <li>• if any removed, offsets should be provided</li> <li>• minimise impacts during development design and construction phase including establishing a buffer area adjacent to the vegetation</li> </ul>

Constraint	Value	Justification	Recommendation
Low	Hollow-bearing trees	<ul style="list-style-type: none"> <li>• hollow-bearing trees are a limiting habitat attribute for hollow-dependant fauna in the area</li> <li>• confined to woodland area</li> <li>• provide potential roosting and nesting habitat for birds and bats</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid clearing hollow-bearing trees</li> <li>• If clearing is unavoidable, consider supplementing area with nest boxes and conduct pre-clearance surveys</li> </ul>
Low	Exotic vegetation	<ul style="list-style-type: none"> <li>• mixture of native and exotic grasses with tracks throughout or areas dominated by exotic species in all strata</li> <li>• suitable foraging habitat for Little Eagle, microbats and migratory birds such as the Cattle Egret</li> </ul>	<ul style="list-style-type: none"> <li>• development should be confined to these areas wherever possible</li> <li>• suitable for development and passive recreational activities</li> <li>• implement management techniques to prevent the dispersal of weed species into adjacent woodland areas particularly during construction</li> </ul>

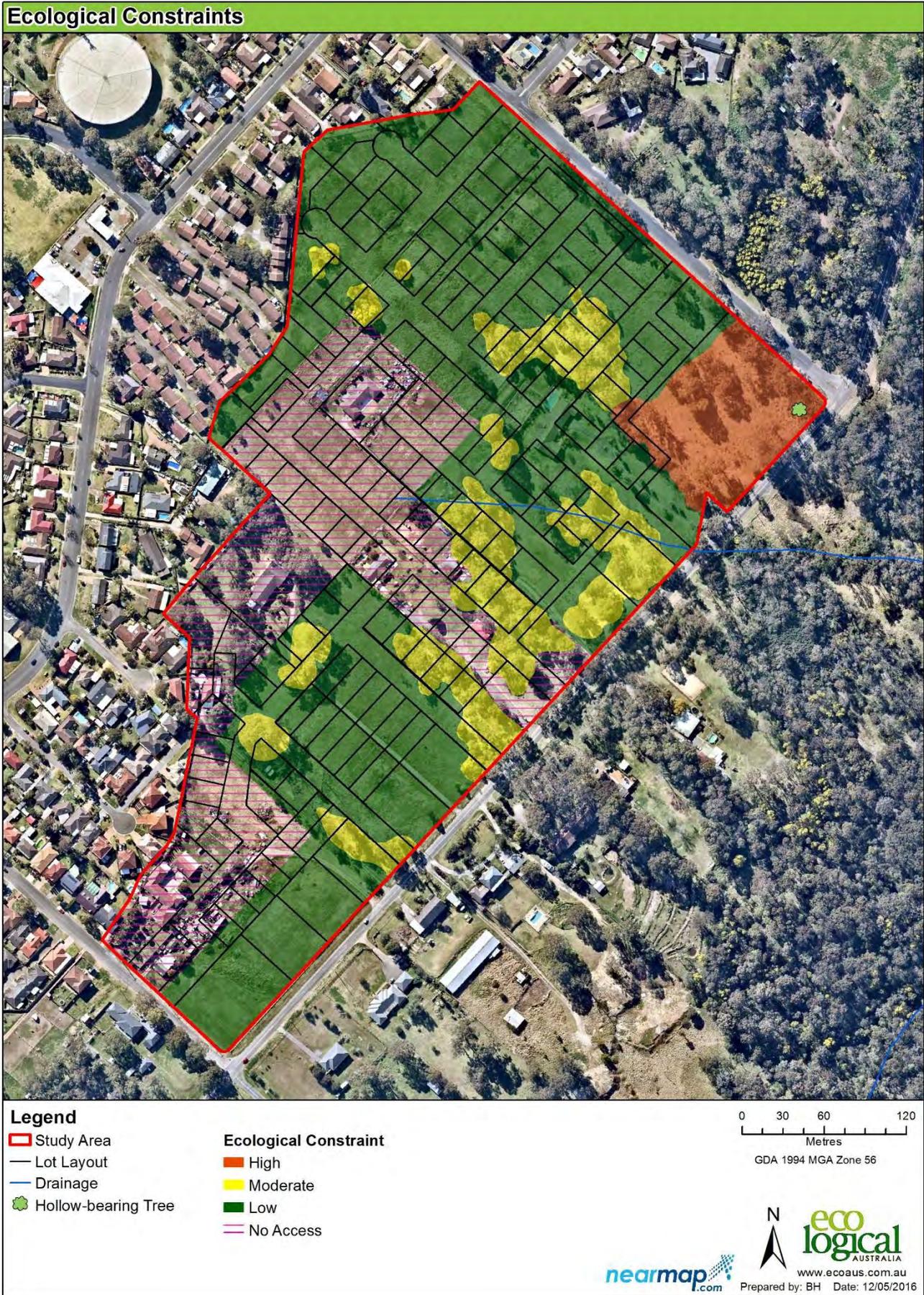


Figure 1: Ecological constraints and development opportunities



Figure 2: Preliminary waterfront land constraint under the WM Act for riparian corridors.

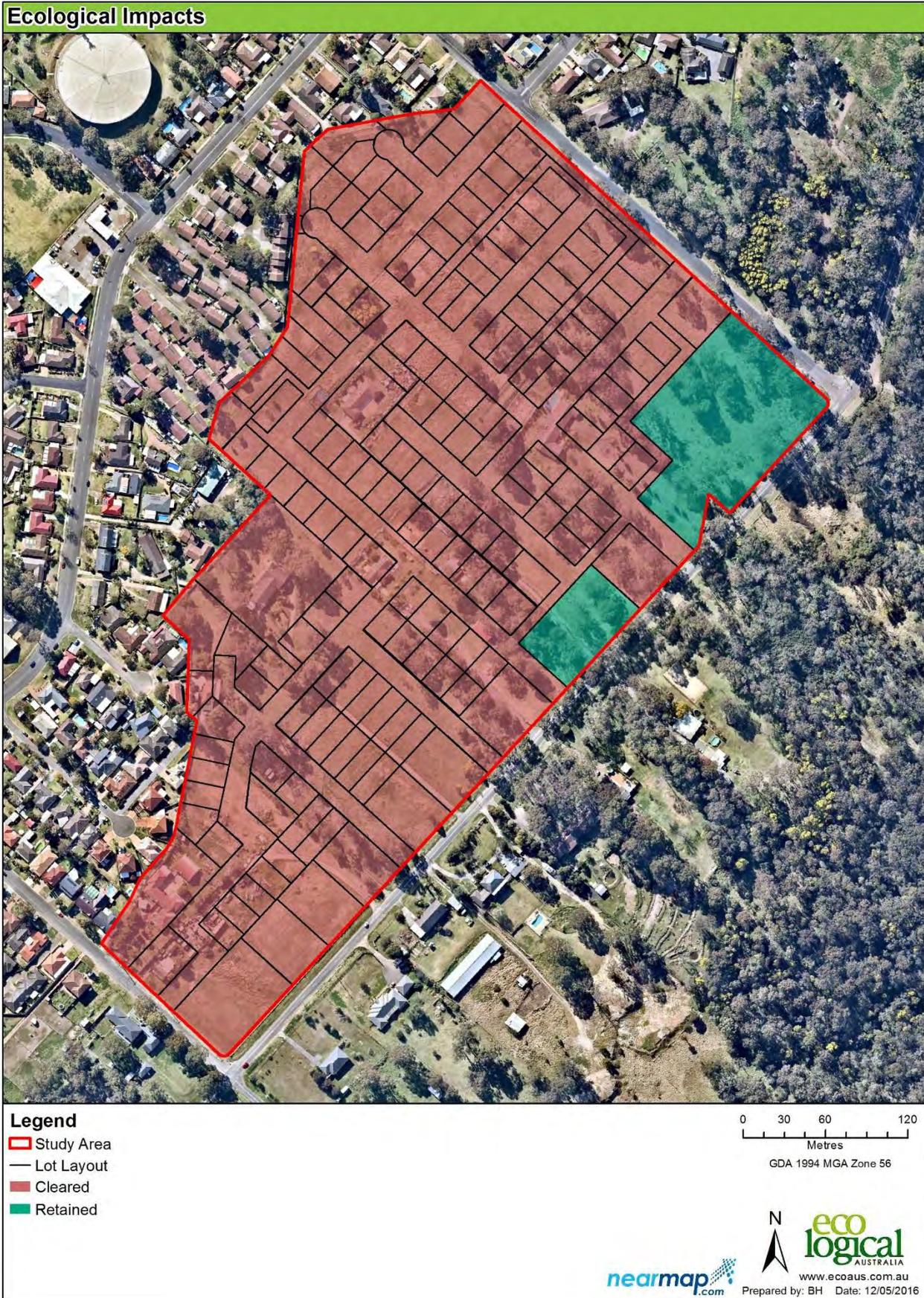


Figure 3 : Areas for retention and clearance under draft Masterplan



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Figure 4: Draft Masterplan

Billbergia Pty Ltd c/o  
Grahame Edwards  
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Ref/Job No: 2539

8 October 2015

Dear Grahame,

## Preliminary Heritage Advice - Caledonia

### EUROPEAN HERITAGE

#### **Register search**

A search of Schedule 5 of the Draft Campbelltown Local Environmental Plan 2014 was conducted on 18 September 2015. One [1] heritage item was identified within the study area:

- Stone Cottage and bushland setting, 28 Mercedes Road, Ingleburn, Item ID# 69

There is a stone cottage within the study area at 28 Mercedes Road (Lots 55-68 Section 2 DP 2189). The cottage has historic, architectural and aesthetic significance and is possibly the oldest building in Ingleburn, dating to 1890. The early settlement of this block suggests that there will also be archaeological relics associated with domestic and agricultural activities. Therefore archaeological sensitivity (potential) of this portion of the study area has been assessed as high.

#### **Summary assessment of archaeological potential**

The potential for the survival of archaeological relics in a particular place is significantly affected by activities which may have caused ground disturbance. These processes include the physical development of the site and the activities that occurred there. The likelihood for the survival of these relics (i.e. their archaeological potential) is distinct from the archaeological/heritage significance of these remains, should any exist. For example, there may be 'low potential' for certain relics to survive, but if they do, they may be assessed as being of 'high significance'. Table 1 presents a summary of the potential archaeological resource within the study area, and Figure 1 indicates the area of highest archaeological sensitivity on detail aerial photographs, and then translated to the current civil design base plan in Figure 2.

**Table 1: Summary of the potential archaeological resource and likelihood of survival across the study area**

Phase	Activity	Potential Relics / Archaeology	Integrity of Archaeological Remains	Archaeological Potential
Early 19 <sup>th</sup> century – Macquarie era land grants	Establishment of William Redfern's 'Campbellfield Estate': wool and viticulture	Evidence of land clearing and land modification relating to levelling, agriculture (irrigation furrows), dams, fence lines, post holes, tracks.	Likely to have been removed / disturbed by 19th and 20th century residential development	Low
Late 19 <sup>th</sup> century - First	Small farm and residential grants, erection of stone	Footings and foundations of outbuildings, underfloor deposits of outbuildings,	Subsurface features or deposits are likely to have been disturbed in discrete locations by installation and	High

Phase	Activity	Potential Relics / Archaeology	Integrity of Archaeological Remains	Archaeological Potential
subdivision land use	cottage at 28 Mercedes Road (1890).	domestic dumps, pits, privy deposits, water management infrastructure (e.g. cisterns, wells). Artefact scatters or isolates. Land modification: dams, tracks, berms, etc).	upgrading of municipal services and/or other underground cables. Otherwise, there is potential for subsurface remains to be good/intact.	



Figure 1: C.1890s stone cottage complex with various outbuildings and structures indicated on historical aerials



Figure 2: Civil Design Base Plan indicating Lots 55-68 Section 2 DP 2189 as having 'high' historical archaeological sensitivity (potential) (Source: Urban Futures)

## ***Recommendations***

### **Conservation of Stone Cottage and historical allotments**

Conservation of the historical integrity of the Stone Cottage and Lots 55-68 Section 2 DP 2189. Merit should be given to the conservation of this significant historical cottage, area of archaeological sensitivity and historical allotment integrity.

### **Requirements for a Statement of Heritage Impact and Conservation Management Plan**

In accordance with clause 2.11.2 ' Non-Indigenous Heritage Design Requirements' in the Campbelltown (Sustainable City) Development Control Plan 2014, a Statement of Heritage Impact will be required in support of a development application made in respect to land that is "(a)(i) i) occupied by a heritage item; or ii) adjoining land occupied by a heritage item". The SOHI will assess the impact of the proposed development on the heritage significance, visual curtilage and setting of the heritage item, building work, archaeological site, tree or place within a conservation area. Any archaeological relics would be covered under the relics provisions of the Heritage Act 1977.

Further to this, "(b) any development on land occupied by an item of heritage...will have regard to the provisions of any relevant study or Conservation Management Plan (CMP)". Unless otherwise advised by council, a Conservation Management Plan (CMP) shall be required for all proposed development involving the adaptive reuse of a heritage item, or major alterations and additions.

### **Historical Archaeological Assessment**

If development is proposed for the Stone Cottage and Lots 55-68 Section 2 DP 2189 a historical archaeological assessment should be prepared. This would entail further historical research to ascertain land ownership, land use and historical connections which may exist. The assessment would include an assessment against the NSW Heritage Act criteria. In areas of predicted archaeological relics, a research design and permit application under the Heritage Act would need to be prepared and archaeological investigation undertaken.

## ABORIGINAL HERITAGE

### Register search

An advanced AHIMS search by ELA brought up no registered Aboriginal object or places in the study area.

### Site inspection

ELA did a walk over of the properties which were accessible and tentatively divided the study area into areas of archaeological sensitivity. The categories identified were no/low sensitivity, low sensitivity, low/moderate sensitivity and moderate sensitivity. There were no areas of high sensitivity.

The area of moderate sensitivity was the forested/wooded area on the corner of Oxford Road and Bensley Road. Aerial photographs from 1947 and 1961 show this area as forested. Although there has probably been some selective tree removal, this area is the least disturbed area.

### Preliminary recommendations

The study area has been divided in a number of zones of archaeological sensitivity. These are described in Table 2 below with further assessment / recommendations identified.

**Table 2: Summary of the Aboriginal archaeological sensitivity in the study area**

Sensitivity	Allotments	General description	Potential site types	Further assessment / recommendations
Low - nil	Current and former house and building sites, access roads and driveways	Highly disturbed. No potential for intact archaeological sites. Low potential for stone artefacts in a disturbed context	Isolated artefacts in a disturbed context, although most or all have probably been removed through historical disturbances.	None identified
Low	Lots 302, 304, 606 DP 597774	Areas of moderate earth disturbance noted.	Aboriginal scarred trees Artefact scatters and isolated artefacts	Field inspection and cultural values assessment by Tharawal Local Aboriginal Land Council and Cubbitch Barta Native Title Claimant group.  Particular focus on identification of any Aboriginal scarred trees.  Further consideration of this area will be given following the field inspection.
Low – moderate	Balance of study area	Some land clearance, vegetation removal.	Aboriginal scarred trees Artefact scatters and isolated artefacts	Field inspection and cultural values assessment by Tharawal Local Aboriginal Land Council and Cubbitch Barta Native Title Claimant group.  Particular focus on identification of any Aboriginal scarred trees.  Further consideration of this area will be given following the field inspection.
Moderate	Wooded area in southern third of Lot 300 DP 595243	Analysis of historical aerials show this area has been vegetated and no evidence of historic	Aboriginal scarred trees Artefact scatters and isolated artefacts	Conservation of this area recommended.  If conservation of this area

Sensitivity	Allotments	General description	Potential site types	Further assessment / recommendations
		building. Least disturbed area.		cannot be achieved a full Aboriginal cultural heritage assessment will be required including consultation with Aboriginal organisations.

Eco Logical Australia Pty Ltd (ELA) has prepared constraints assessment for the planning proposal Caledonia at Ingleburn. Urban Futures working on behalf of Billbergia Pty Ltd engaged ELA to provide the constraints assessment to guide the master planning of the proposed development.

Yours sincerely



Lyndon Patterson  
**Senior Archaeologist**

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Billbergia Pty Ltd  
C/O Grahame Edwards  
URBAN Futures  
20 Alfred Street, Rozelle NSW 2039

Ref No: 2539

13 May 2016

Dear Grahame,

### Re: Bushfire Constraints Assessment - Caledonia

Eco Logical Australia Pty Ltd (ELA) has prepared this bushfire constraint assessment to support a planning proposal for the site known as Caledonia at Ingleburn. Urban Futures working on behalf of Billbergia Pty Ltd engaged ELA to provide the constraints assessment to guide the master planning of the proposed development. A Flora and Fauna Constraints Assessment (FFCA) has also been undertaken by ELA (dated 25 September 2015).

The subject land is identified as bush fire prone by Campbelltown Council as shown in **Figure 1**. Any future development application for subdivision of the subject land will be required to be assessed under Section 100B of the *Rural Fires Act 1997* and will require compliance with the NSW Rural Fire Service document *Planning for Bush Fire Protection 2006* (PBP). PBP outlines bushfire protection measures that new development on bushfire prone land must address including asset protection zones, access requirements, water supply, and construction.

Bushfire is an important consideration for development of the subject land and compliance with PBP is required for a development application to be supported by Campbelltown Council and the NSW Rural Fire Service. This constraints advice is provided in accordance with PBP.

This assessment includes consideration of the existing constraints on the site, and also looking at the constraints that would be present on the site in the case that development proceed in line with the proposed masterplan.

### Bushfire hazard assessment

#### Vegetation

The predominant vegetation has been determined within the subject land and for a distance of at least 140 m on adjoining land using desktop analysis, a review of background information and data gathered during the field investigations undertaken for the FFCA.

Vegetation within the subject land predominantly consists of grassland areas with several patches of Cumberland Plain Woodland (CPW) occurring along Bensley Road (**Figure 2**). The FFCA has identified the patch of CPW on the corner of Bensley Road and Oxford Road as a high constraint with smaller disturbed patches throughout the site identified as moderate constraint (see **Figure 3**). An assumption has been made that the high constraint

vegetation will be retained, along with the larger patches of moderate constraint. This is considered the bushfire hazard, along with other areas of woodland vegetation to the east of Bensley Road and north of Oxford Road.

### **Slope**

The slope that would most significantly influence fire behaviour was determined over a distance of 100 m within the vegetated areas. This assessment was made by analysing 2 m contour intervals. The subject land is gently sloping with slopes ranging from 0-5°. Offsite slopes vary from >0-10° with steeper areas around creeklines.

### **Asset protection zones (APZ)**

Table A2.4 of PBP has been used to determine the width of required Asset Protection Zone (APZ) for the subject land. The APZ requirements of PBP vary across the site and are outlined in **Table 1** and are shown in **Figure 4**.

### **Construction standards**

The building construction standard is based on the determination of the Bushfire Attack Level (BAL) in accordance with Method 1 of Australian Standard AS 3959-2009 'Construction of buildings in bushfire-prone areas' (Standards Australia 2009). The BAL is based on the identified vegetation type, effective slope, and APZ managed separation distance between the development and the bushfire hazard.

Using AS3959, separation distances (APZ) have also been identified for BAL-29 construction.

**Table 1: Threat assessment and asset protection zones**

Direction	Slope <sup>1</sup>	Vegetation <sup>2</sup>	PBP required APZ <sup>3</sup>	APZ for BAL-29 <sup>4</sup>
North	Upslope	Woodland	10 m	16 m
East (subject land)	>0-5 downslope	Woodland	15 m	21 m
East	>5-10° downslope	Woodland	20 m	26 m
All other directions	Managed land			

<sup>1</sup> Slope most significantly influencing the fire behaviour of the site having regard to vegetation found. Slope classes are according to PBP.

<sup>2</sup> Predominant vegetation is identified, according to PBP and "Where a mix of vegetation types exist the type providing the greater hazard is said to be predominate".

<sup>3</sup> Assessment according to PBP for SFPP.

<sup>4</sup> Assessment according to AS3959.

### **Access and utility requirements**

The provision of public roads, reticulated water supply, and utilities (electricity and gas) are to be in accordance with Section 4.3.1 of PBP but are not considered significant constraints to the development.

### **Conclusion**

The subject land is capable of supporting residential development and the relevant bushfire protection measures outlined in PBP. APZ, construction, access and utility requirements are to be refined during the planning and design stages of future development in accordance with PBP.

If you have any questions in regards to this correspondence please contact me on (02) 8536 8605

Yours sincerely,



Danielle Meggos

**Senior Bushfire Planner**

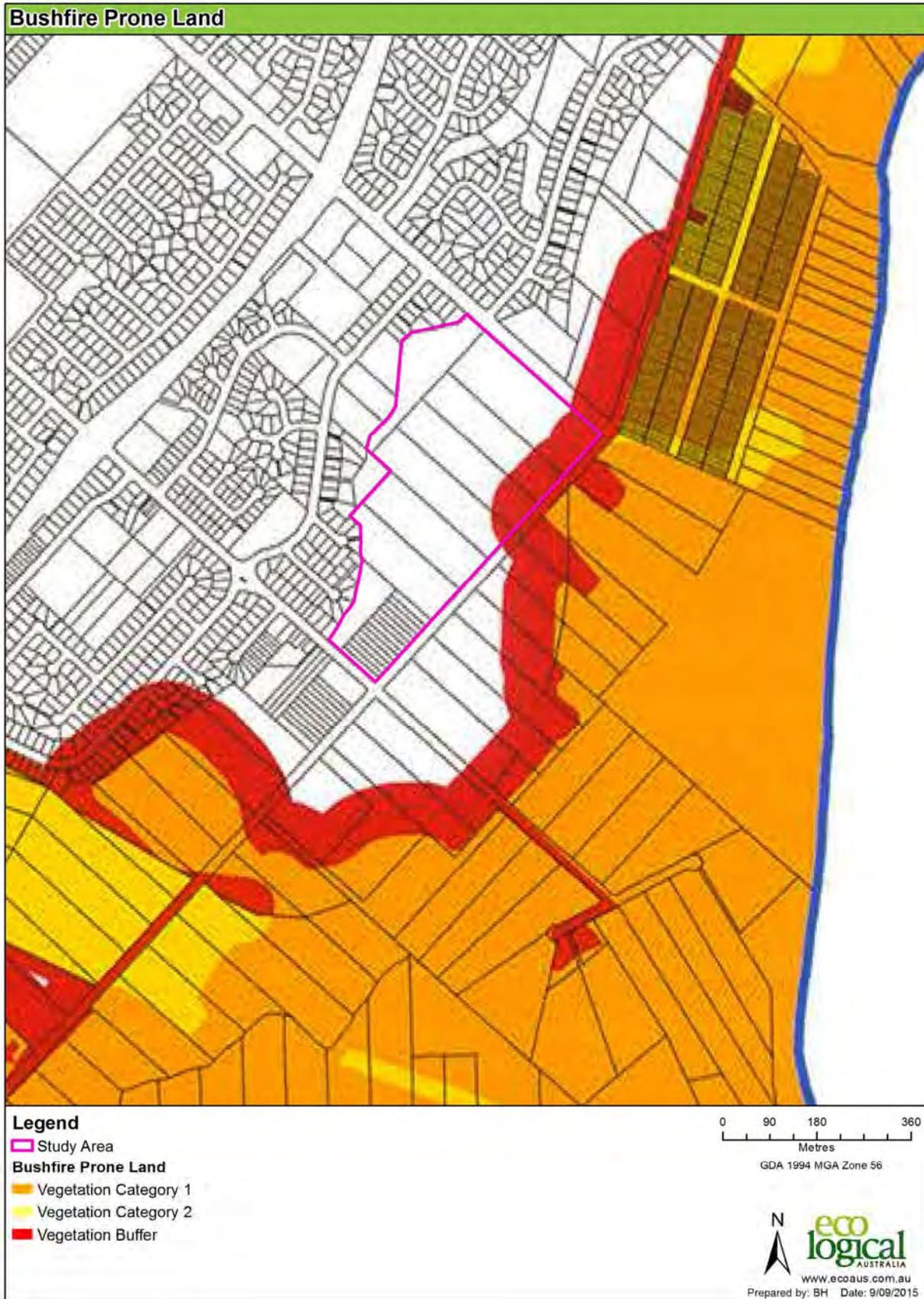


Figure 1: Campbelltown Bush Fire Prone Land Map

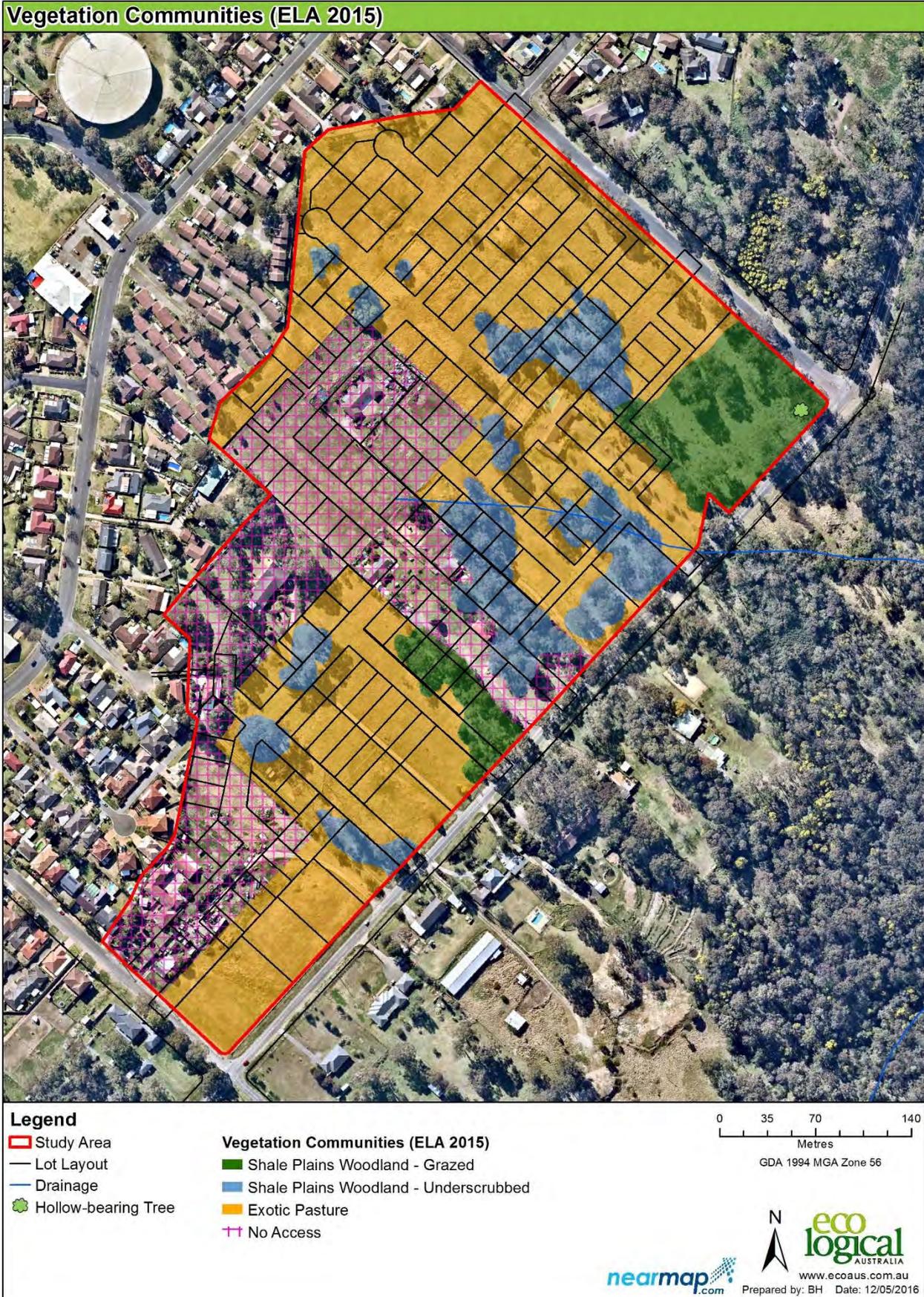


Figure 2: Vegetation communities

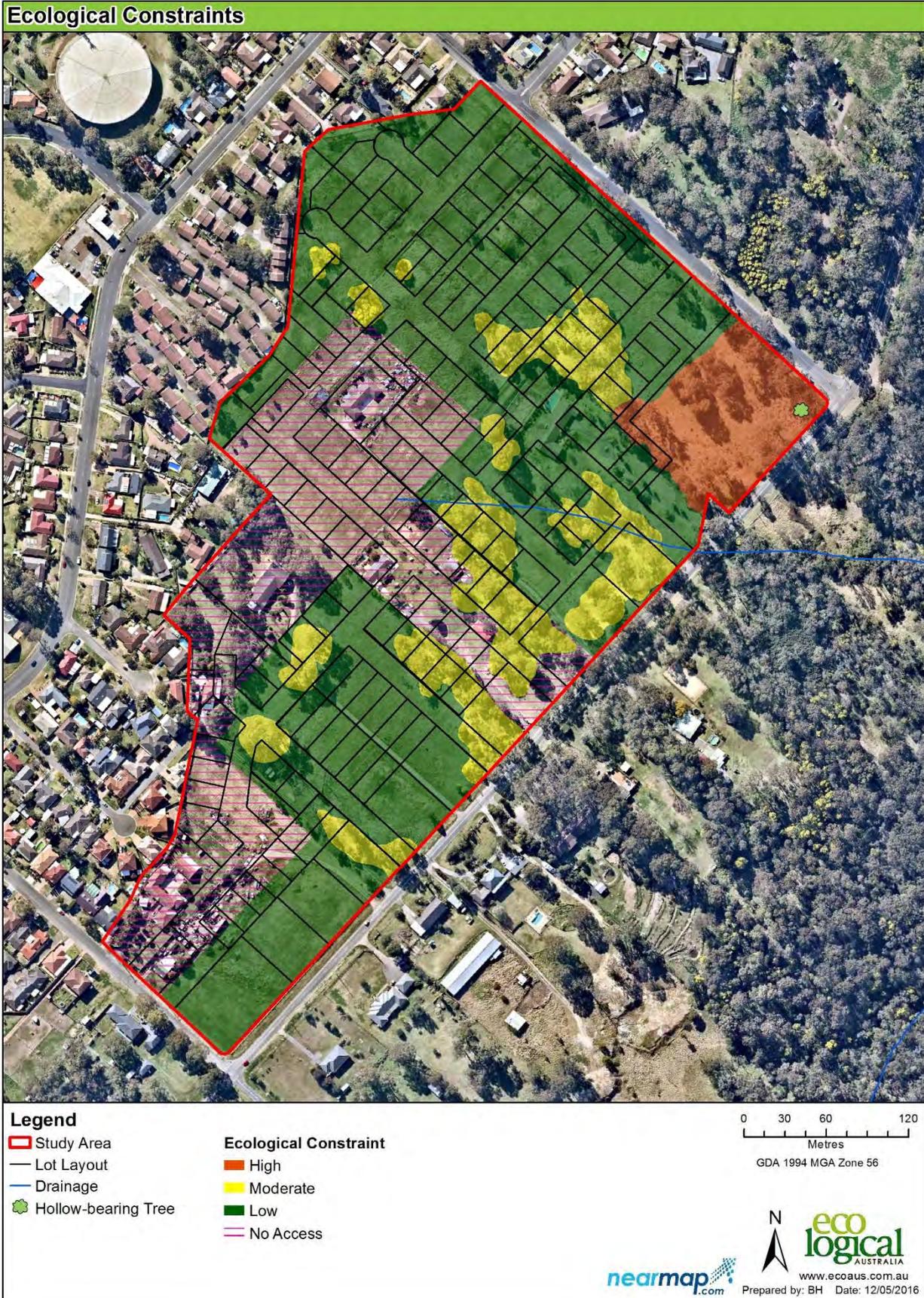


Figure 3: Ecological constraints



Figure 4: Asset protection zones (existing vegetation)



Figure 5: Asset protection zones (based on draft masterplan)



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Figure 5.



# Report

## EDGE LANDS PLANNING PROPOSAL — ODOUR ASSESSMENT

BILLBERGIA

Job ID. 20899B

01 December 2015

## Annexure E

Sydney

Brisbane

Perth

Adelaide

Melbourne

**PROJECT NAME:** Edge Lands Planning Proposal — Odour Assessment

**JOB ID:** 20899B

**DOCUMENT CONTROL NUMBER** AQU-NW-02-20899B

**PREPARED FOR:** Billbergia

**APPROVED FOR RELEASE BY:** Damon Roddis

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VERSION	DATE	COMMENT	PREPARED BY	REVIEWED BY
Final	01/12/2015	Final issue	Ashley Martin	Damon Roddis

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Where site inspections, testing or fieldwork have taken place, the report is based on the information made available by the client or their nominees during the visit, visual observations and any subsequent discussions with regulatory authorities. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Pacific Environment is both complete and accurate. It is further assumed that normal activities were being undertaken at the site on the day of the site visit(s), unless explicitly stated otherwise.

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## GLOSSARY OF TERMS

Term	Definition
Air dispersion modelling	Mathematical simulation of how air quality parameters, including odour, disperse in the atmosphere.
CALPUFF	A multi-layer, multi-species, non-steady state puff dispersion model that can simulate the effects of time- and space-varying meteorological conditions on pollutant transport, transformation and removal.
Emissions	Release of air quality parameters to air.
Gaussian	The assumption that air dispersion model predictions have a Gaussian distribution, meaning that the pollutant distribution has a normal probability distribution
Mixing height	The depth of the atmospheric mixed layer, the height to which the air is mixed.
OU	Odour unit
Percentile	A value on a scale that indicates the percent of a distribution that is equal to it. For example, the 99 <sup>th</sup> percentile indicates that there are one percent of all predicted values that are greater than this value, and 99 percent that are lower
Sensitive receptor	A location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area. An air quality impact assessment should also consider the location of known or likely future sensitive receptors
Stability class	A measure of the ability of the atmosphere to mix or disperse a plume. One method of classifying varying stability classes is the Pasquill-Gifford scheme where A-B-C refer to unstable (well mixed) atmospheric conditions, D refers to neutral and E-F refer to stable (unmixed).
Wind rose	A graphical representation showing the frequency of occurrence of winds by direction and strength

# 1 INTRODUCTION

Billbergia wish to prepare and lodge a planning proposal with Campbelltown City Council for the Edge Lands Planning Proposal at Bensley Road, Ingleburn (herein referred to as "The development").

The first stage of the planning gateway/rezoning process requires a planning proposal to be prepared and presented/submitted to Campbelltown City Council. For the planning proposal to be successful at this first stage and to proceed to planning gateway, this requires Campbelltown City Council to support the rezoning of the land.

Council officers have raised a concern regarding a poultry farm operation located on the corner of Bensley Road and Mercedes Road at 315-317 Bensley Road, Ingleburn (herein referred to as the "poultry farm"). The sheds of the poultry farm are located approximately 100 m from the southern boundary of the development. Given the relative proximity, the ability of the poultry farm to cause odour impacts at the development is required to be evaluated.

Billbergia has commissioned Pacific Environment to assess potential adverse odour impacts on the proposed rezoning at the development resulting from the poultry farm operations.

An initial Level 1 (screening) Odour Assessment carried out by Pacific Environment deemed that further detailed evaluation (a Level 2 Odour Assessment) was required.

This report documents the process and outcomes of a Level 2 Odour Assessment, completed in accordance with the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW developed by the NSW EPA (2005) (herein referred to as the "Approved Methods").

## 1.1 Project description

The location of the development is shown in **Figure 1-1**. The land is generally bounded by Mercedes Road, Bensley Road and Oxford Road in Ingleburn and also some existing residences to the north.



Figure 1-1: Location of proposed development site

## 1.2 Poultry Farm Operations

The chicken sheds operated by the nearby poultry farm are located at 315 Bensley Road, Ingleburn. Information regarding this poultry farm was sourced from minutes of a Campbelltown Council Planning and Environment Committee Meeting (**PEC, 2015**). The property contains two dwellings and four naturally-ventilated poultry sheds behind the dwellings. The chicken sheds have a capacity of 62,500 birds at a stocking rate of 15 birds per square metre of shed space.

The farm receives day-old chicks, where they are kept and fed within sheds for 54 days. After this 54-day period, the birds are removed from the farm for off-site processing. The sheds are then cleaned and made ready for the next batch of chicks. In between batches, the sheds are empty for two weeks. The farm accommodates approximately 5½ batches per year.

## 1.3 Objectives of the study

The study objectives are to:

- Investigate the potential odour impact on future dwellings associated with the ongoing operation of the poultry farm;
- Perform a Level 2 Odour Assessment in accordance with the Approved Methods;
- Determine the potential odour impacts and make recommendations for controlling impact on the development, as required.

## 1.4 Scope of work

As discussed above, an initial Level 1 (screening) Odour Assessment was conducted for the development by Pacific Environment. As a result of the outcomes from this assessment (results are typically highly conservative), a Stage 2 Odour Assessment was deemed necessary. The scope of work conducted included provision of a Level 2 Odour Assessment report, guided by the following documentation:

- *Assessment and management of odour from stationary sources in NSW (NSW EPA, 2006a)* and its *Technical Notes (NSW EPA, 2006b)*;
- *Approved Methods (NSW EPA, 2005)*.

## 2 ODOUR LEGISLATION AND GUIDELINES

### 2.1 Legislation

The three most important pieces of legislation for preventing and controlling odour in NSW are:

- Environmental Planning and Assessment Act 1979 (EP&A Act);
- Protection of the Environment Operations Act 1997 (POEO Act); and
- Local Government Act 1993 (LG Act).

The EP&A Act deals with land-use planning, development, assessment and approvals. The POEO Act requires that no occupier of any premises causes air pollution (including odour) through a failure to maintain or operate equipment or deal with materials in a proper and efficient manner. The operator must also take all practicable means to minimise and prevent air pollution (sections 124, 125, 126 and 128 of the POEO Act).

The POEO Act includes the concept of "offensive odour" (section 129) and states it is an offence for scheduled activities to emit "offensive odour".

The LG Act gives local councils the power to deal with public nuisance, including odour emissions.

### 2.2 Guidelines

Odour is probably the most widespread and complex local air quality issue in Australia. It often accounts for the majority of complaints received by regulatory authorities and can be a major source of annoyance and stress in affected communities.

In November 2006, the NSW EPA released two guidance documents: *Technical framework for the Assessment and Management of Odour from Stationary Sources in NSW* and its associated *Technical notes for the Assessment and Management of Odour from Stationary Sources in NSW*. These documents require the user to follow the dispersion modelling requirements in the **Approved Methods (NSW EPA, 2005)**.

The discussion in this report draws extensively from those documents, which outline the NSW EPA's proposed approach for the assessment of odour emissions, using a three-level system of odour impact assessment of increasing complexity and detail. Depending on the individual characteristics of a new development and its proposed location, a varying degree of investigation into the potential for odour impacts may be required.

- Level 1 is a screening-level technique based on generic parameters for the type of activity and site. It requires minimal data and uses simple equations to provide a broad estimate of the extent of any odour impact. It may be used to identify the potentially affected zone and site suitability for a proposed facility or new neighbouring development or expansion of an existing facility.
- Level 2 is a screening-level dispersion modelling technique, using worst-case input data (rather than site-specific data). It is more rigorous and more realistic than a Level 1 assessment. It may be used to assess site suitability and odour mitigation measures for new, modified or existing activities. This approach has been taken in this assessment.
- Level 3 is a refined-level dispersion modelling technique using site-specific input data. This is the most comprehensive and most realistic level of assessment available. It may be used to assess site suitability and odour mitigation measures for new, modified or existing activities.

#### 2.2.1 Odour performance criteria

Odour impacts are determined by several factors. The most important factors (the so-called **FIDOL** factors) are:

- The **F**requency of the exposure;
- The **I**ntensity of the odour;
- The **D**uration of the odour episodes;
- The **O**ffensiveness of the odour; and
- The **L**ocation of the source.

In determining the offensiveness of an odour it needs to be recognised that for most odours the context in which an odour is perceived is also relevant. Some odours, for example the smell of sewage, hydrogen sulfide, butyric acid, landfill gas etc., are likely to be judged offensive regardless of the context in which they occur. Other odours such as the smell of jet fuel may be acceptable at an airport, but not in a house, and diesel exhaust may be acceptable near a busy road, but not in a restaurant.

In summary, whether or not an individual considers an odour to be a nuisance will depend on the FIDOL factors outlined above and although it is possible to derive formulae for assessing odour annoyance in a community, the response of any individual to an odour is still unpredictable.

The Approved Methods and NSW EPA framework documents include some recommendations for odour criteria. The criteria have been refined by NSW EPA to take account of population density in the area.

The difference between odour criteria is based on considerations of risk of odour impact rather than differences in odour acceptability between urban and rural areas. For a given odour level there will be a wide range of responses in the population exposed to the odour. In a densely populated area there will therefore be a greater risk that some individuals within the community will find the odour unacceptable than in a sparsely populated area.

The criteria assumes that 7 odour units (OU) at the 99<sup>th</sup> percentile would be acceptable to the average person, but as the number of exposed people increases there is a risk that sensitive individuals would be exposed. The criterion of 2 OU at the 99<sup>th</sup> percentile is considered to be acceptable for a large population group with a variety of sensitivities to odours.

**Table 2-1** lists the odour criteria, to be exceeded not more than 1% of the time, for different population densities.

**Table 2-1: Odour assessment performance criteria**

Population of affected community	Odour Units (OU)
Rural single residence ( $\leq \sim 2$ )	7
~10	6
~30	5
~125	4
~500	3
Urban (~2000) and/or schools and hospitals	2

Sources: **NSW EPA, 2005, p.38, NSW EPA, 2006a, p.21**

Based on the number of residential dwellings proposed for the development, the number of people potentially affected by odour is likely to be approximately 500. The appropriate odour criterion for the assessment of odour impacts upon the development is therefore 3 OU. However, for conservatism, an odour impact criterion of 2 OU has been used in this assessment.

### 2.2.1 Peak-to-mean ratios

It is common practice to use dispersion models to determine compliance with odour criteria. This introduces a complication because conventional dispersion models are only able to directly predict concentrations over an averaging period of 3 minutes or greater. The human nose, however, responds

to odours over periods of the order of a second or so. During a 3-minute period, odour levels can fluctuate significantly above and below the mean depending on the nature of the source.

To determine more rigorously the ratio between the one-second peak concentrations and three-minute and longer period average concentrations (referred to as the peak-to-mean ratio) that might be predicted by a dispersion model, the NSW EPA commissioned a study by **Katestone Scientific Pty Ltd (1995, 1998)**. This study recommended peak-to-mean ratios for a range of circumstances. The ratio is also dependent on atmospheric stability and the distance from the source. For this assessment peak-to-mean ratios have been applied to each source type accordingly.

The Approved Methods take account of this peaking factor and the criteria shown in **Table 2-1** are based on nose-response time. **Table 2-2** shows the NSW EPA Approved Methods peak-to-mean factors to be used for odour impact assessments. As dispersion modelling for this study used wake-affected point sources, a peak-to-mean factor of 2.3 was applied.

**Table 2-2: Factors for estimating peak concentrations on flat terrain**

Source Type	Pasquill-Gifford stability class	Near field P/M60*	Far field P/M60
Area	A, B, C, D	2.5	2.3
	E, F	2.3	1.9
Line	A – F	6	6
Surface point	A, B, C	12	4
	D, E, F	25	7
Tall wake-free point	A, B, C	17	3
	D, E, F	35	6
Wake-affected point	A – F	2.3	2.3
Volume	A – F	2.3	2.3

\*Ratio of peak 1-second average concentrations to mean 1-hour average concentrations

### 3 ODOUR MODEL SET-UP

The dispersion model chosen for this odour impact assessment was *CALPUFF* – a multi-layer, multi species, non-steady-state puff dispersion model<sup>a</sup> that can simulate the effects of time-varying and space-varying meteorological conditions on pollutant transport, transformation and removal. The model contains algorithms for near-source effects such as building downwash, partial plume penetration, sub-grid scale interactions as well as longer range effects such as pollutant removal, chemical transformation, vertical wind shear and coastal interaction effects. The model employs dispersion equations based on a Gaussian distribution of pollutants across released puffs and takes into account the complex arrangement of emissions from point, area, volume and line sources (**Scire et al, 2000**).

Site specific inputs to the odour emissions modelling were sourced from a Campbelltown Council report (**PEC, 2015**), as discussed in **Section 1.2**. Consistent with current industry standards, as the chicken sheds are naturally ventilated, the sheds were modelled as large point sources in *CALPUFF* to preserve plume mass.

A modelling domain of 3 km by 2 km was chosen to incorporate the development and the chicken sheds. Odour sources and emission rates are described in more detail in **Section 3.4**. Model predictions were made across the domain at gridded receptors at a spacing of 100 m x 100 m.

The model requires meteorological data (e.g. wind speed, wind direction, atmospheric stability and mixing height) together with odour emission rates from the chicken shed sources.

#### 3.1 Meteorology

Odour impacts in the proposed development area will be influenced by local meteorology. Meteorological conditions, such as wind speed, wind direction and atmospheric turbulence affect how often receptors are likely to be downwind of an odour source as well as how well the odour disperses in the atmosphere.

Ground-level meteorological data for the site was obtained from Holsworthy Control Range (**BOM, 2015**), which is located approximately 6 km northeast of the development. The calendar year 2013 was chosen as the station was moved in 2014 and the meteorological data for that year is incomplete.

The annual wind-rose for 2013 is shown in **Figure 3-1**. Wind roses show the frequency of occurrence of winds by direction and strength.

In 2013, the winds were predominantly west-southwesterly, and there was less than 1% frequency of calm wind conditions (defined as <0.5 m/s).

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<sup>a</sup> Gaussian plume models are considered steady-state because the plume equation is independent of time, that is, dispersion from the source to receptor is instantaneous for each hour of meteorological data. *CALPUFF* however, 'remembers' the plume from the previous hour taking into account residual concentrations at each grid point from the hours before and is therefore non-steady-state.

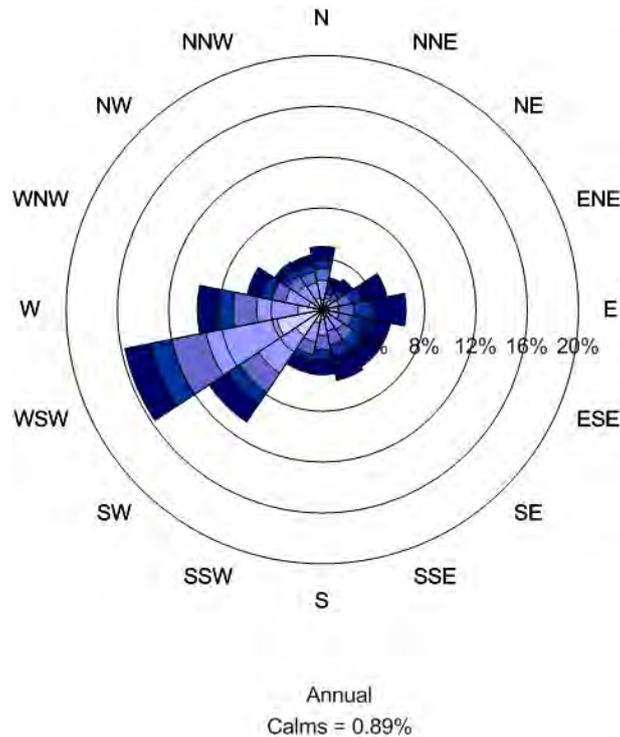


Figure 3-1 Annual wind rose for 2013 at the Holsworthy Control Range

### 3.2 Atmospheric stability

An important aspect of pollutant dispersion is the level of turbulence in the lowest 1 km or so of the atmosphere, known as the planetary boundary layer (PBL). Turbulence controls how effectively a plume is diffused into the surrounding air and hence diluted. It acts by increasing the cross-sectional area of the plume due to random motions. With stronger turbulence, the rate of plume diffusion increases. Weak turbulence limits diffusion and contributes to high plume concentrations downwind of a source.

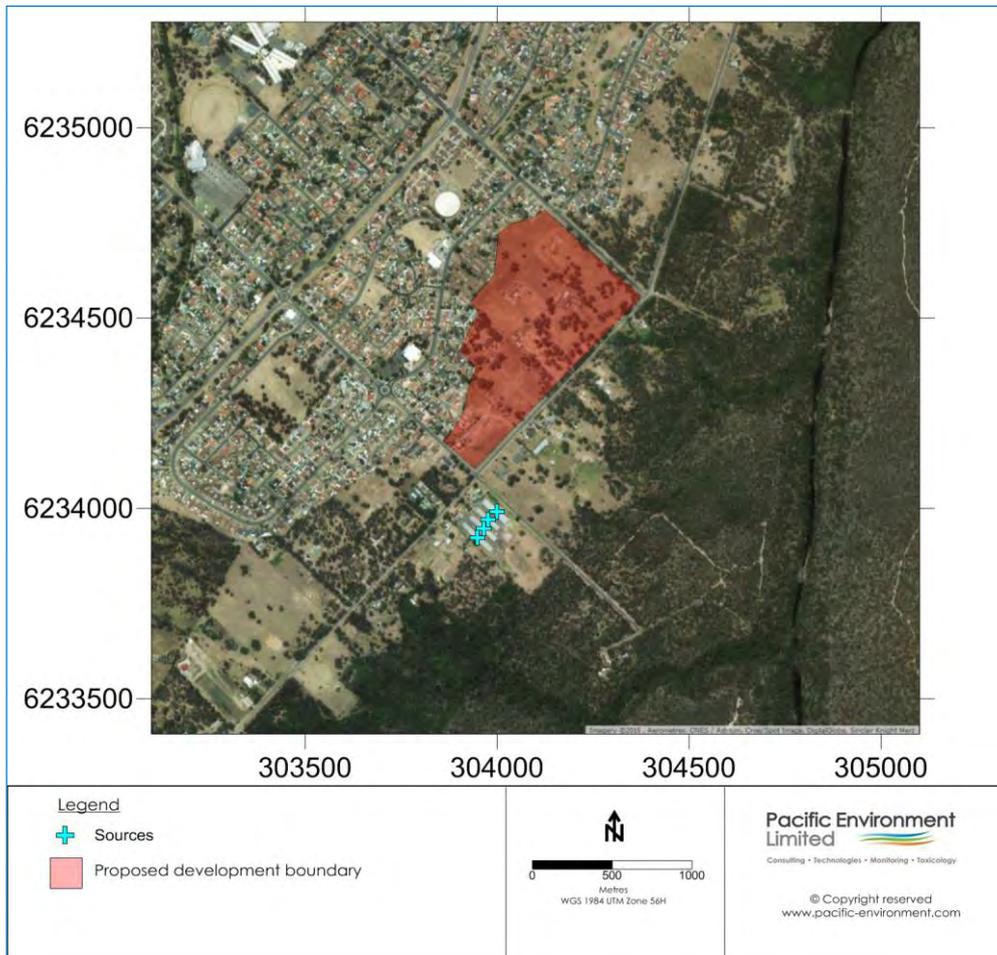
Turbulence in the boundary layer is influenced by the vertical temperature gradient, which is one of several indicators of stability. Plume models use indicators of atmospheric stability in conjunction with other meteorological data to estimate the dispersion conditions in the atmosphere.

Hourly cloud content data from Camden Airport was used to represent upper-level meteorological conditions (**BOM, 2015**). This station is located approximately 17 km southwest of The Development.

### 3.3 Odour sources and receptors

The odour sources are based on emission inputs documented in a Campbelltown Council Report and are shown in **Figure 3-2**. The locations of the four chicken sheds at 315 Bensley Road were identified from satellite imagery and chosen to represent odour sources in the dispersion model.

Gridded receptors were chosen to assess predicted odour impacts across the entire modelling domain at a resolution of 0.1 x 0.1 km.



**Figure 3-2: Odour sources for The Development**

### 3.4 Odour emission rates

Odour emission rates (OERs) for this assessment have been estimated using a modelling approach based on data from a variety of meat chicken farms in Queensland and New South Wales, as well as theoretical considerations.

The approach generates hourly varying emission rates from each shed based on the following factors:

- The number of birds, which varies later in the batch as harvesting takes place.
- The stocking density of birds, which is a function of bird numbers, bird age and shed size.
- Ventilation rate, which depends on bird age and ambient temperature.
- Design and management practices, particularly those aimed at controlling litter moisture.

The dataset is based on data from existing tunnel ventilated sheds and chicken batches at approximately five weeks of age or more.

The predicted OER from a shed at any given stage of the growth cycle is given by **Equation 1**:

$$OER = 0.025 K A D V^{0.5} \quad (1)$$

where:

OER = odour emission rate (ou.m<sup>3</sup>/s);

A = total shed floor area (m<sup>2</sup>);

D = average bird density (in kg/m<sup>2</sup>);

V = ventilation rate (m<sup>3</sup>/s); and

K = scaling factor between 1 and 5 where 1 represents an extremely well designed and managed shed, i.e., state of the art (see below for more information).

Bird density (D) is related to the age of the birds and the stocking density (i.e. the number of birds placed per unit area). It is common practice within the meat chicken industry to vary the stocking density with the time of year and market demands. Lower ambient temperatures during the winter months allow for higher bird densities. For this assessment, a maximum stocking density of approximately 15 birds/m<sup>2</sup> was used for the sheds based on site-specific data given in **PEC (2015)**. With a known stocking density, a value of the mass per unit area can be estimated.

The ventilation rate (V) used at any given time is a function of the age of the birds, wind speed and the ambient temperature and humidity. Given the lack of available data on naturally ventilated sheds it has been assumed that the ventilation requirements for a tunnel ventilated shed may be used to approximate those of naturally ventilated sheds. Such an approach represents common industry practice for the evaluation of naturally ventilated sheds.

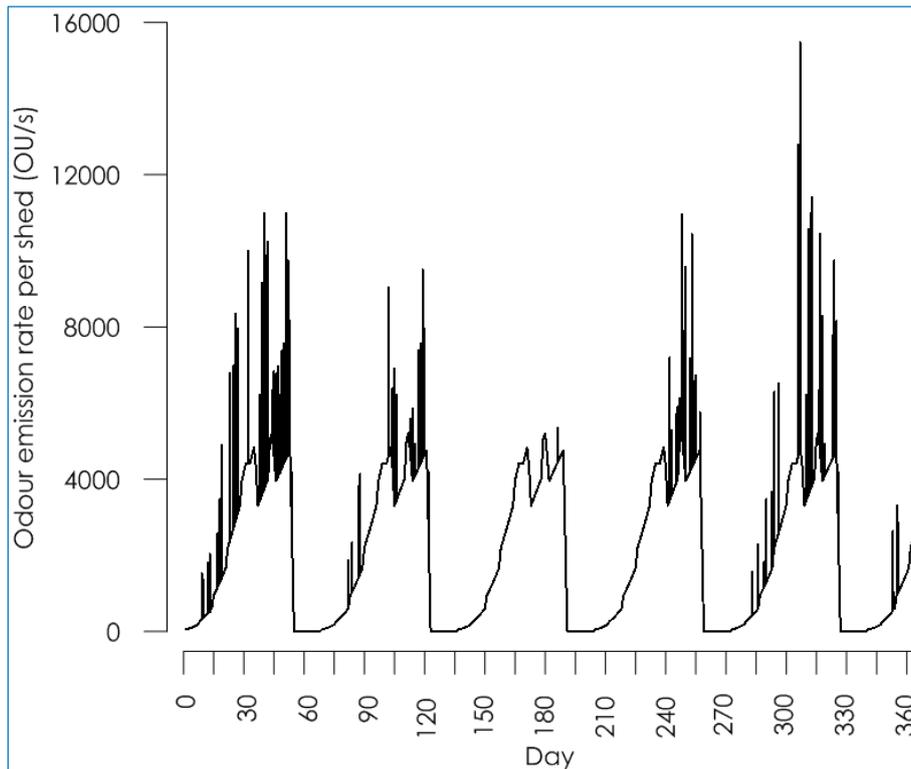
Parameters used for the chicken sheds in the emissions model are shown in **Table 2-1**.

**Table 3-1 Parameters used within the chicken shed odour emissions model**

Parameter	Value	Units
Assumed maximum ventilation	10	m <sup>3</sup> /hr/bird
Birds per shed	15625	birds
Shed length	65	m
Shed width	16	m
Shed Area	1040	m <sup>2</sup>
Density	15	Birds/m <sup>2</sup>
Ventilation Rate	156250	m <sup>3</sup> /hr
Maximum vertical velocity stack	0.22	m/s
Assumed number of fans	10	fans
K Factor	4	n/a
Total length	54	days
Days cleanout	14	days
Thinning 1 (day 32)	90	% chickens remaining
Thinning 2 (day 36)	52	
Thinning 3 (day 45)	37	

Hourly odour emission rates for the chicken sheds are shown in **Figure 3-3**, which were calculated using the inputs in **Table 3-1** and the meteorological data for the modelling period.

OERs gradually increase over the 54 day growth cycle and peak towards the end of the cycle. OERs then decrease to zero once the chickens are removed and the sheds are cleaned for two weeks. OERs were predicted to be lower for the cycle starting around day 130 as this represents winter in which temperatures were lower and less ventilation is required.



**Figure 3-3 Hourly odour emission rates for the chicken sheds**

## 4 ASSESSMENT OF IMPACTS

Figure 4-1 shows the 99<sup>th</sup> percentile 1-second peak odour concentrations resulting from the anticipated operation of the poultry farm.

Worst-case odour concentrations were predicted to be less than 2 OU across the entire of the development, and less than 1 OU across the majority of the site, except for the southern corner. Thus predicted odour concentrations at the development are less than the adopted odour assessment performance criterion of 2 OU.

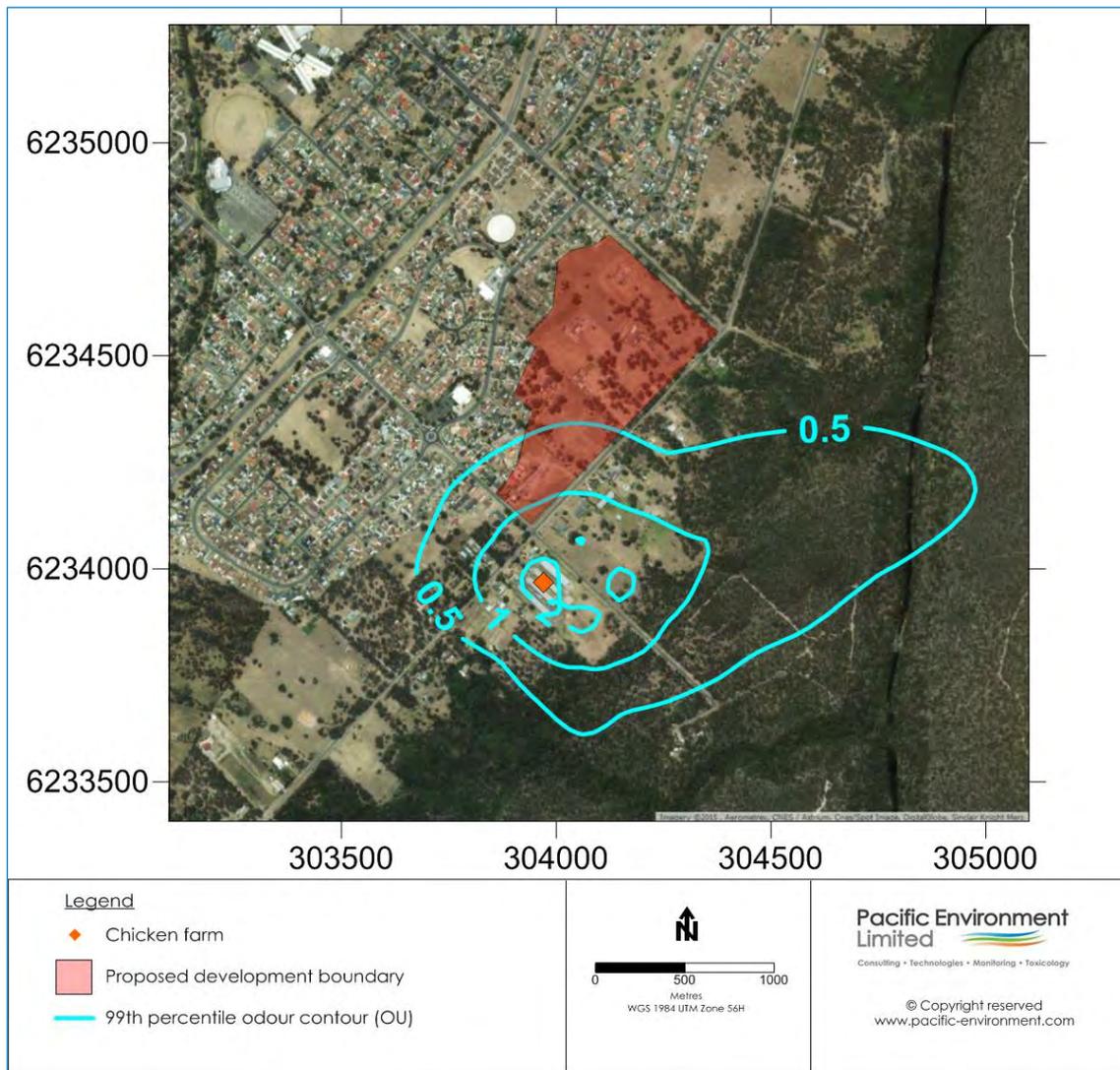


Figure 4-1: 99<sup>th</sup> percentile 1-second average odour concentration contours (OU) associated with operation of the nearby poultry farm

## 5 CONCLUSIONS

An investigation has been conducted to identify and develop an understanding of potential odour impacts that may affect the development at the Edge Lands Planning Proposal in Ingleburn, NSW.

A Level 2 Odour Assessment has been undertaken, consistent with the requirements outlined in the NSW EPA Approved Methods (2005), *Technical framework: assessment and management of odour from stationary sources in NSW* (NSW EPA, 2006a) and the associated Technical Notes (NSW EPA, 2006b).

The results of the odour assessment indicate that, under the conservative assumptions adopted, the predicted odour concentrations are anticipated to be below the adopted odour performance goal for the assessment of 2 OU.

Notwithstanding the above conclusions, recommendations to limit odour impacts are given in **Section 6**.

## 6 RECOMMENDATIONS

### 6.1 Potential development control provisions

Whilst the odour assessment predicts no adverse odour impacts, the following are considered good practice development controls to manage the potential for odour impacts on the proposed development:

- Plan a transition of land use zones that locates sensitive uses (i.e. residential dwellings) in areas that are not immediately adjacent to odour generating activities;
- Consider removing separation buffers and removing development restrictions if an odour source ceases operation and has no prospect of restarting;
- Plan compatible land uses in the areas closest to existing odour sources, e.g. car parks or recreational areas.
- Implement continuous dense landscaping on the boundary of the subject site to assist in screening the site from odorous activities.
- Orientate buildings to provide adequate air flow, i.e. no dead end courtyards, long narrow spaces, or areas where air may stagnate. Design buildings to encourage air flow;
- Consider ventilation and air conditioning and design buildings so living and work areas of buildings do not directly face the poultry farm operation.

## 7 REFERENCES

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*A User's Guide for the CALPUFF Dispersion Model (Version 5)*, Earth Tech, Inc., Concord, MA, 2000

# CALEDONIA

Concept Master Plan Report

Superseded

Date: 16.12.2015



Annexure F





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## 1.0 Context

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- 1.2 Regional context
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## 1.0 CONTEXT

The proposed Caledonia residential project is located to the east of Ingleburn, defined by Bensley Road, Oxford Road and Mercedes Road.

The Caledonia project seeks to achieve the responsive development of the land for low-density and low impact residential development that is sensitive the scenic landscape and environmental character, whilst connecting with the adjacent urban area in an integrated manner that optimises existing infrastructure and services.

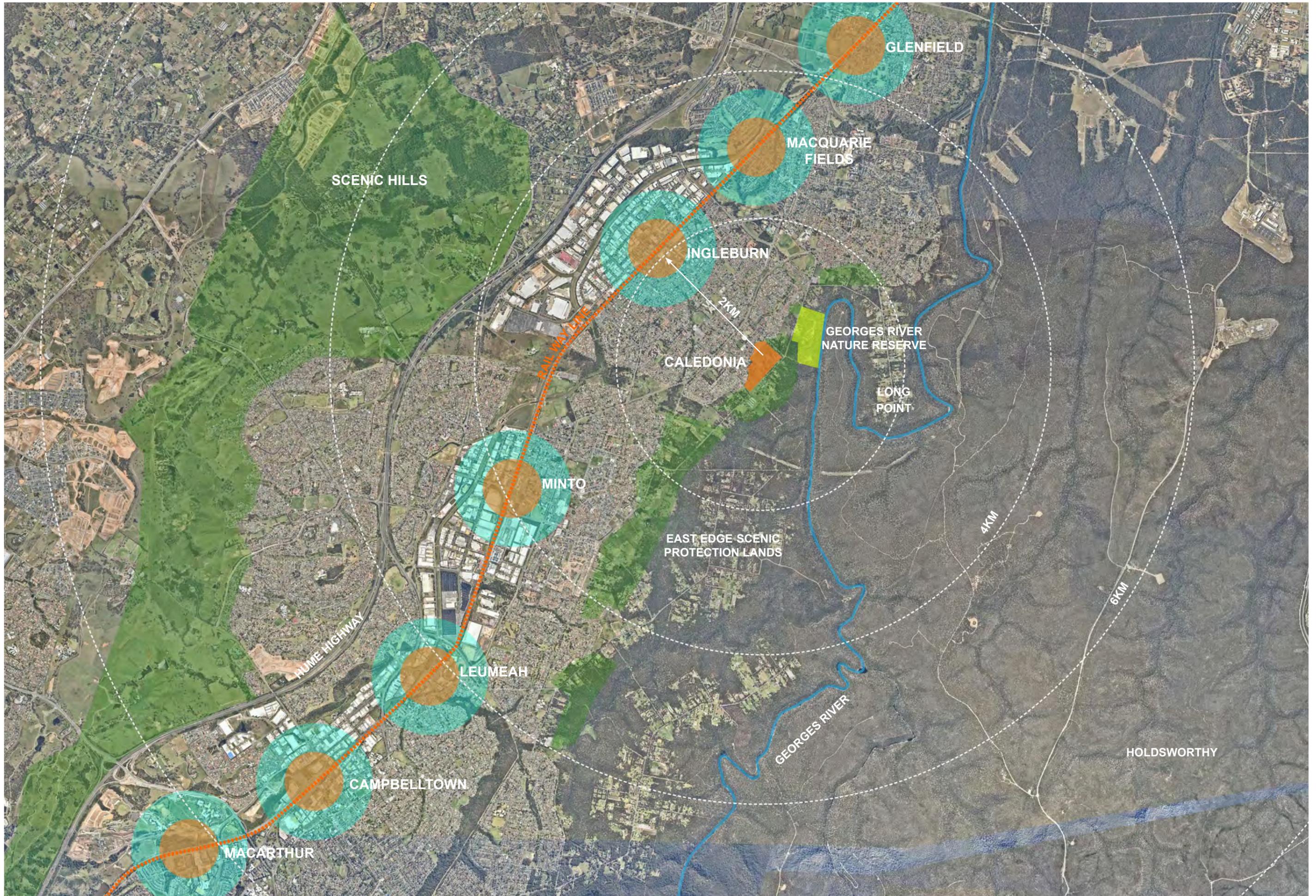
The plans contained in this section provide the context of the Caledonia project from metropolitan, regional and local perspectives.

1.1 Metropolitan context

1.2 Regional context

1.3 Local context and structure







1.3 LOCAL CONTEXT AND STRUCTURE

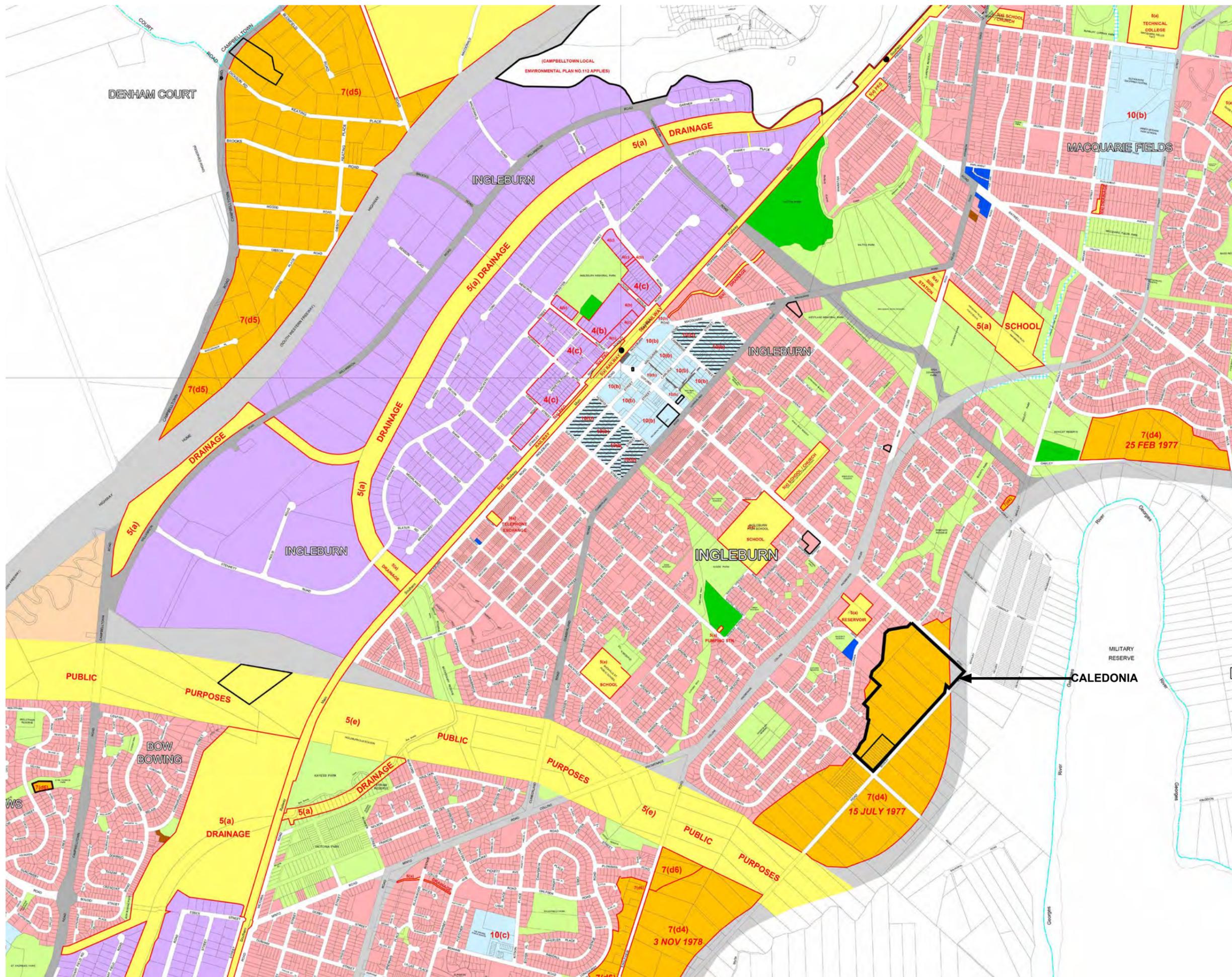




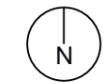
## 2.0 EXISTING PLANNING FRAMEWORK

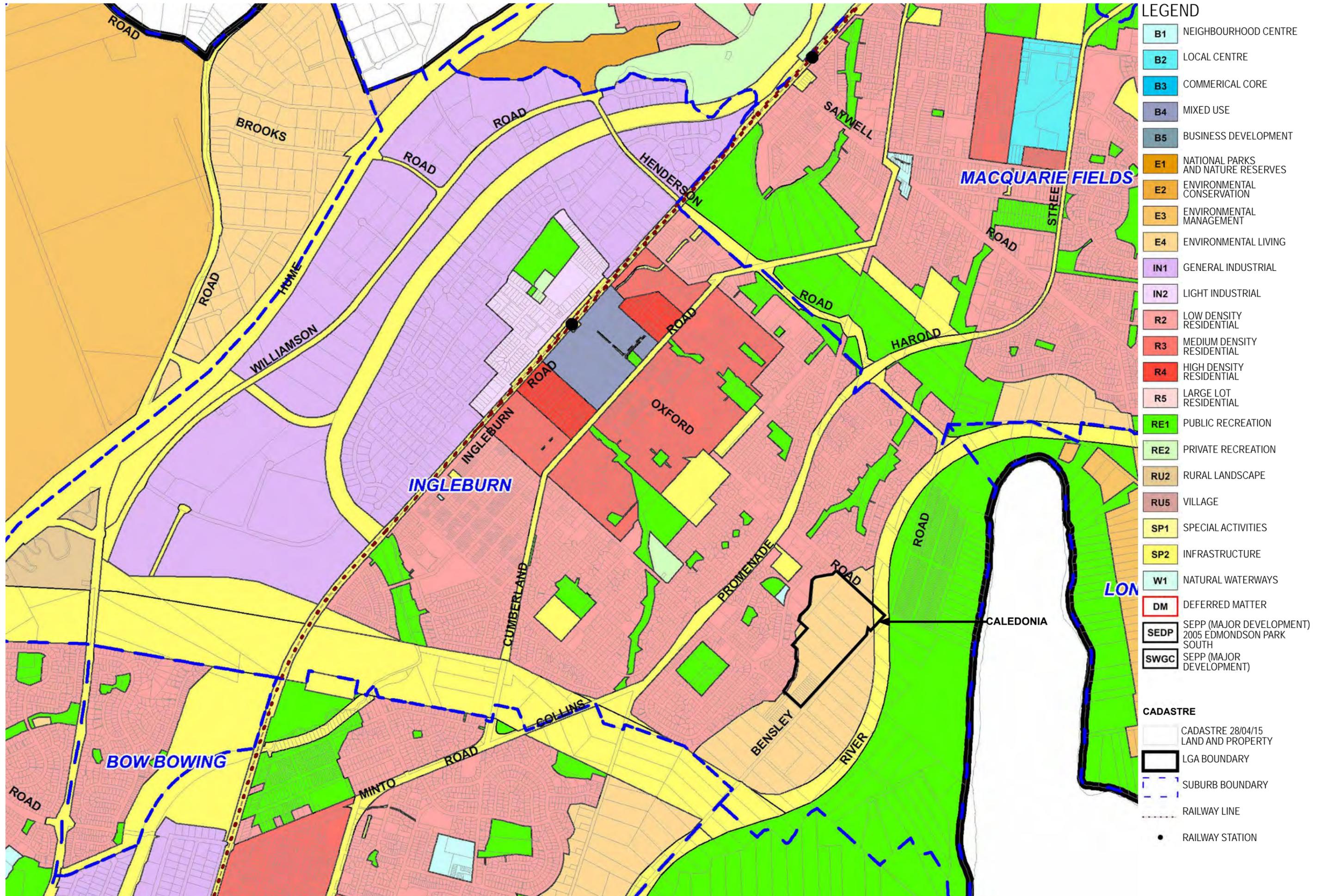
The plans contained in this section illustrate the planning framework and existing land use zones under Campbelltown LEP 2002 and the draft land use zones proposed under the provision Draft Campbelltown LEP 2014.

- 2.1 Current zone - Environmental Protection (7d4)  
Campbelltown LEP 2002
- 2.2 Proposed zone - Environmental Living (E4)  
Draft Campbelltown LEP 2014



- LEGEND**
- 1(a) RURAL
  - 1(d) RURAL FUTURE URBAN
  - 2(b) RESIDENTIAL B
  - 2(c) HIGHER DENSITY RESIDENTIAL
  - 3(a) GENERAL BUSINESS
  - 3(c) NEIGHBOURHOOD BUSINESS
  - 4(a) GENERAL INDUSTRY
  - 4(b) INDUSTRY B
  - 4(c) INDUSTRY C
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  - 5(c) SPECIAL USES SUB-ARTERIAL ROADS
  - 5(d) SPECIAL USES LOCAL ROADS
  - 5(e) SPECIAL USES PUBLIC PURPOSES CORRIDOR
  - 6(a) LOCAL OPEN SPACE
  - 6(b) REGIONAL OPEN SPACE
  - 6(c) PRIVATE OPEN SPACE
  - 7(d1) ENVIRONMENTAL PROTECTION 100HA MINIMUM
  - 7(d4) ENVIRONMENTAL PROTECTION 2HA MINIMUM
  - 7(d5) ENVIRONMENTAL PROTECTION 1HA MINIMUM
  - 7(d6) ENVIRONMENTAL PROTECTION 0.4HA MINIMUM
  - 7(b) NATIONAL PARK AND NATURE RESERVES
  - 9 COMMUNITY USES
  - 10(a) REGIONAL COMPREHENSIVE CENTRE
  - 10(b) REGIONAL COMPREHENSIVE CENTRE
  - 10(c) REGIONAL COMPREHENSIVE CENTRE
  - DEFERRED MATTER
  - HERITAGE ITEM
  - URBAN RELEASE AREA
  - CLAUSE 65
  - HERITAGE CONSERVATION AREA
  - LOCAL GOVERNMENT BOUNDARY





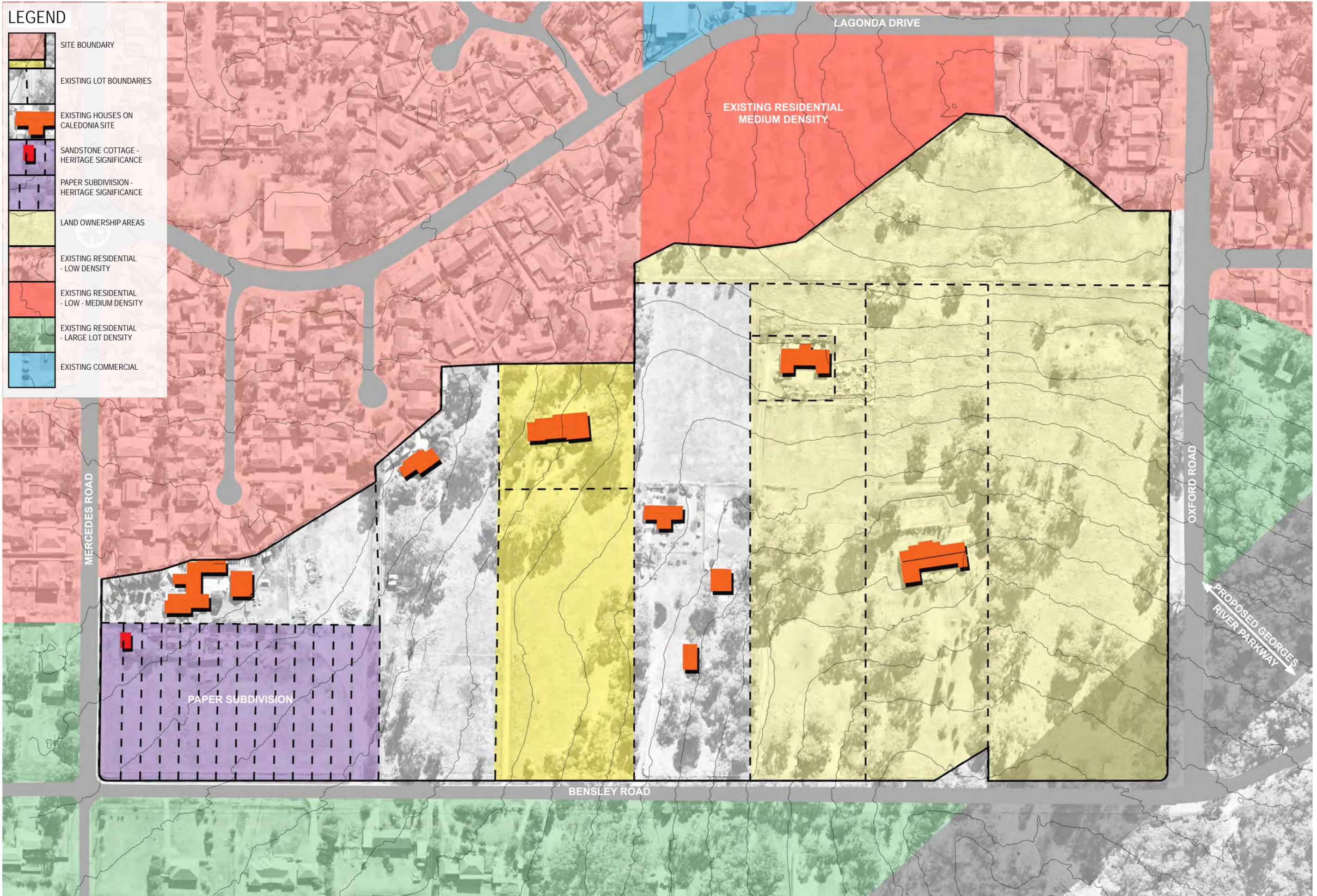




## 3.0 AREA & SITE ANALYSIS

This section analyses the area and the Caledonia site from three different perspectives – Cultural, Natural and Landscape.

- 3.1 Cultural character
- 3.2 Natural character
- 3.3 Landscape character



3.1 CULTURAL CHARACTER



Historic Sandstone Cottage



Variety of site boundary fencing



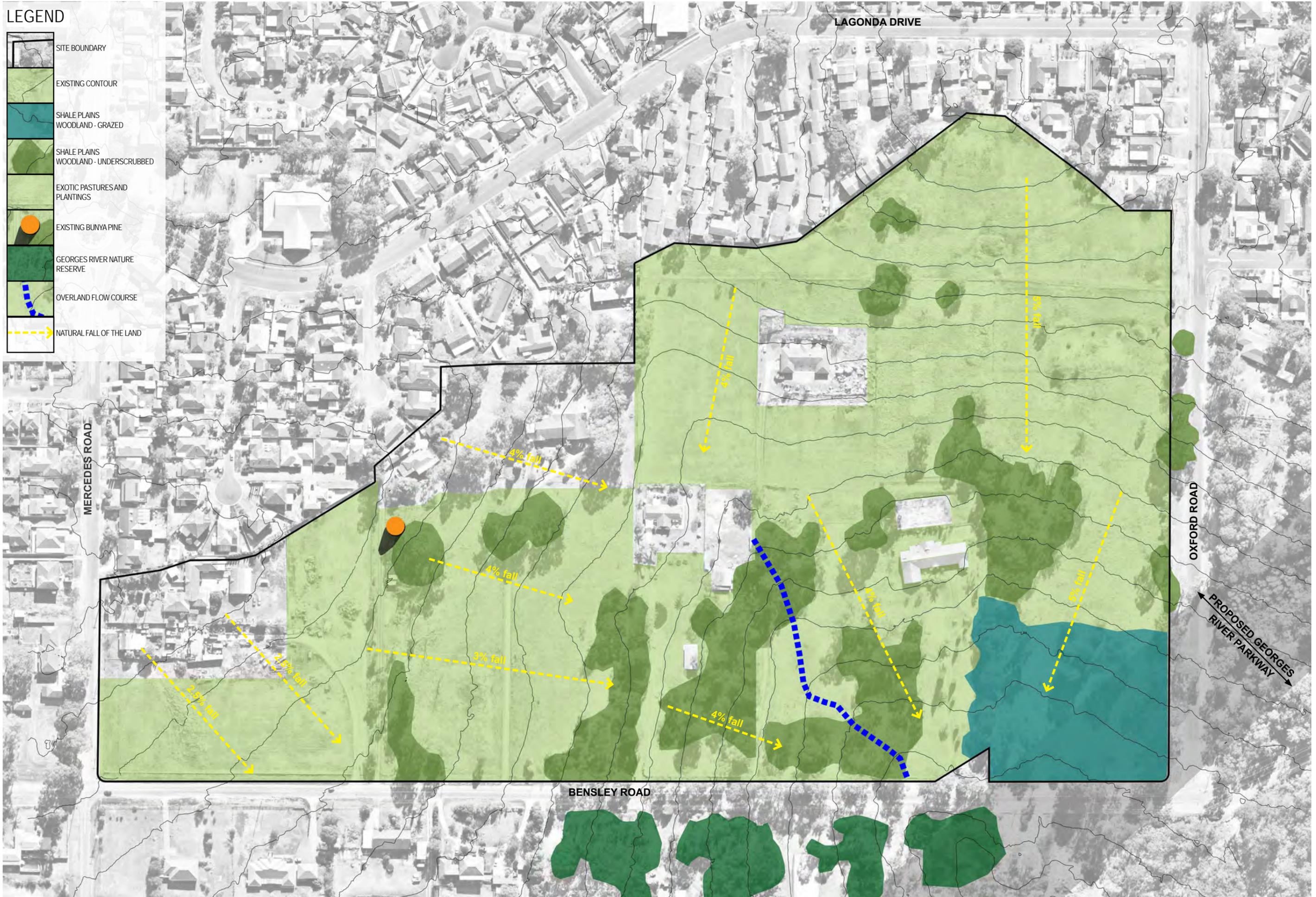
Exotic plantings to driveways



Two storey residential to the northern edge of the site

LEGEND

- SITE BOUNDARY
- EXISTING CONTOUR
- SHALE PLAINS WOODLAND - GRAZED
- SHALE PLAINS WOODLAND - UNDERSCRUBBED
- EXOTIC PASTURES AND PLANTINGS
- EXISTING BUNYA PINE
- GEORGES RIVER NATURE RESERVE
- OVERLAND FLOW COURSE
- NATURAL FALL OF THE LAND





Existing drainage swale through remnant trees



Informal groups of trees create a distinct natural edge to Bensley and Oxford Roads



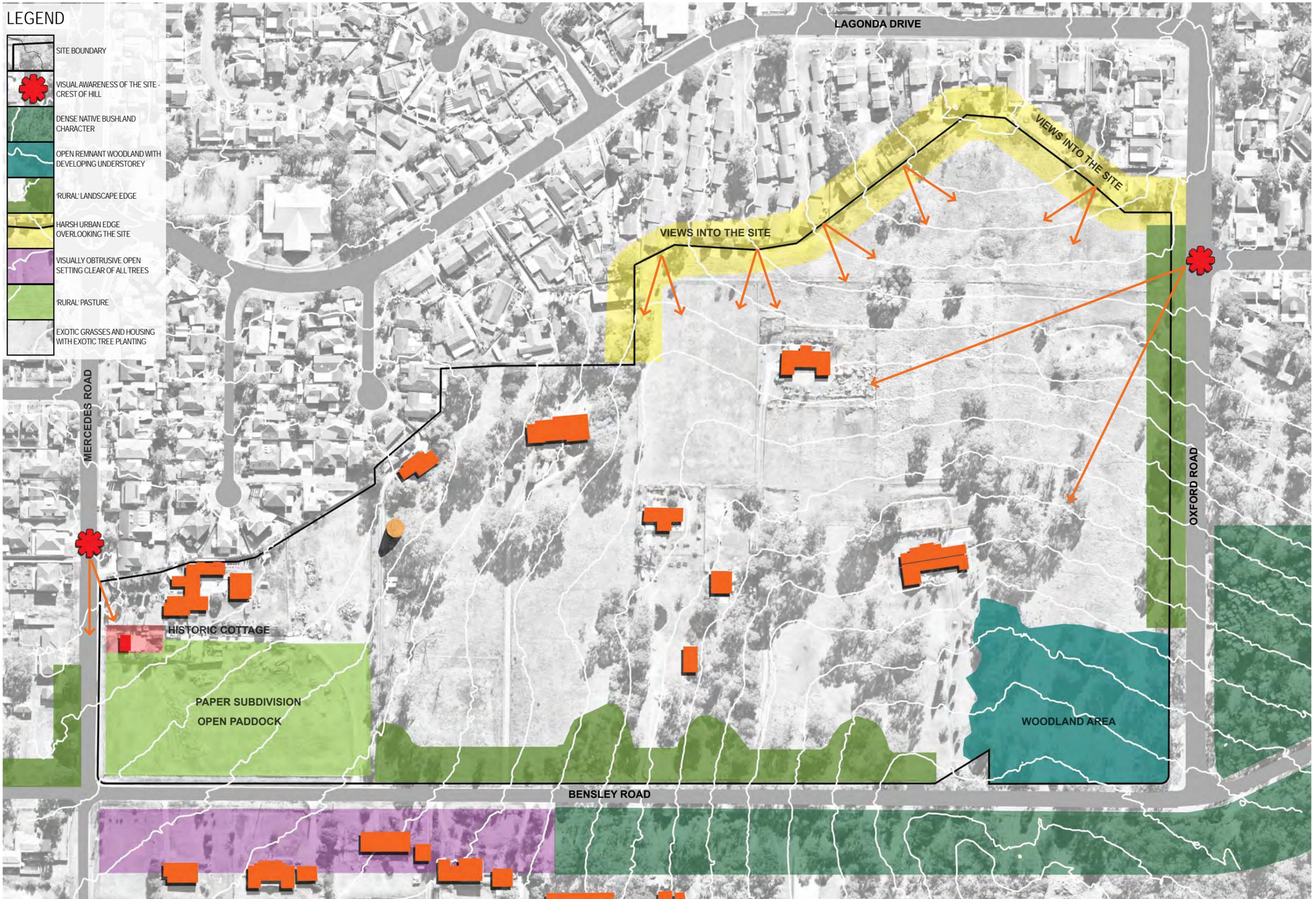
Native woodland character to the Oxford and Bensley Road corner



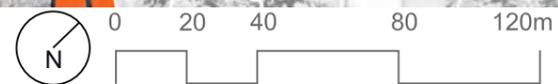
Open pasture to the Mercedes and Bensley Road corner

LEGEND

- SITE BOUNDARY
- VISUAL AWARENESS OF THE SITE - CREST OF HILL
- DENSE NATIVE BUSHLAND CHARACTER
- OPEN REMNANT WOODLAND WITH DEVELOPING UNDERSTOREY
- RURAL LANDSCAPE EDGE
- HARSH URBAN EDGE OVERLOOKING THE SITE
- VISUALLY OBTRUSIVE OPEN SETTING CLEAR OF ALL TREES
- RURAL PASTURE
- EXOTIC GRASSES AND HOUSING WITH EXOTIC TREE PLANTING



3.3 LANDSCAPE CHARACTER





Bensley Road scenic landscape edge to be reinforced



Native woodland to be retained



Oxford Road scenic landscape edge to be reinforced



Bensley Road edge to be reinforced



Residential character to the north



Bensley Road landscape to be renewed



Bensley Road landscape to be renewed



Exotic trees conflict with the remnant native woodland across the lower part of the site

### 3.3 LANDSCAPE CHARACTER



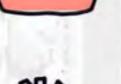
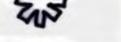


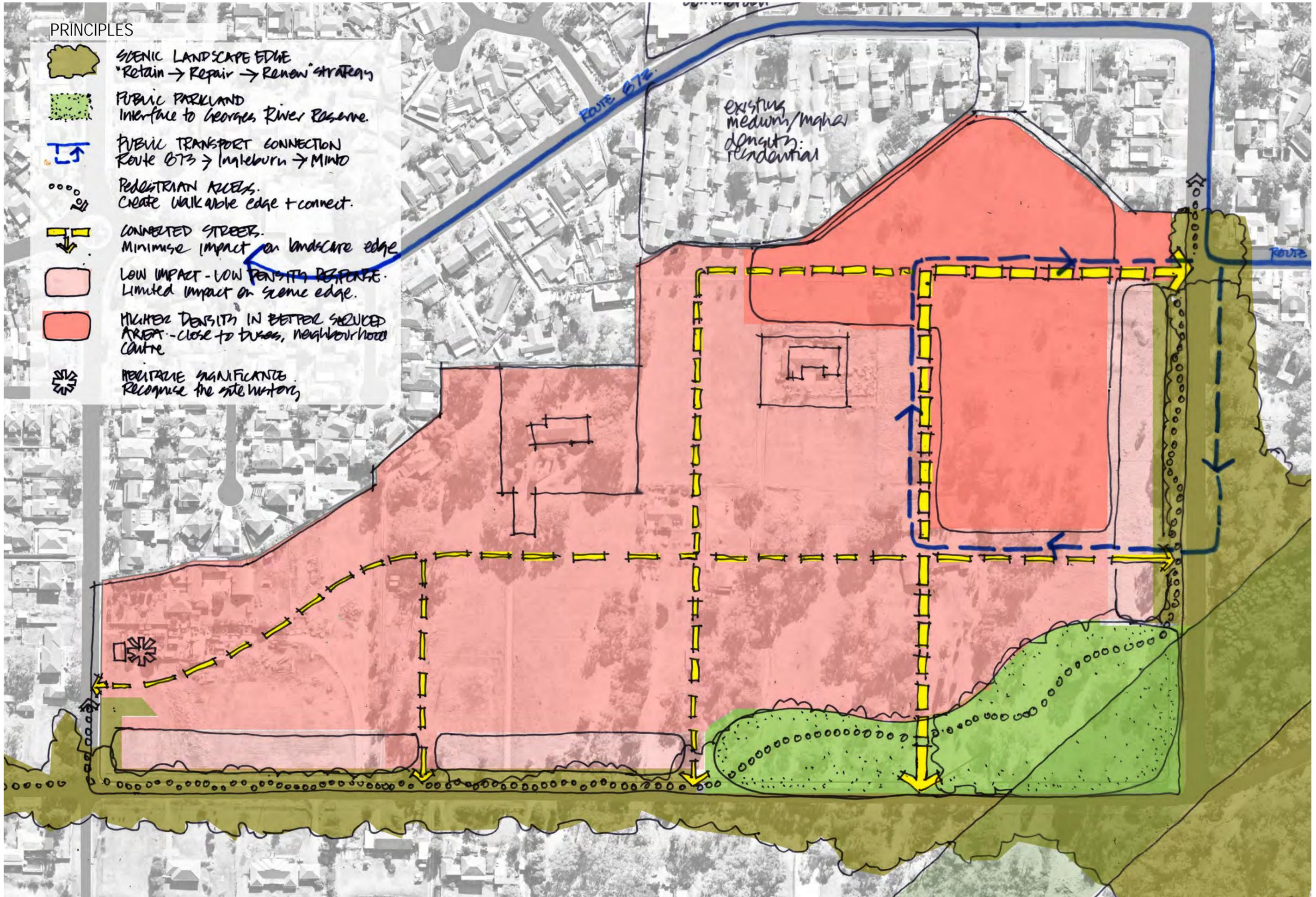
## 4.0 DESIGN STRATEGY

The Caledonia concept master plan embodies best practice urban and landscape design principles that seek to:

- Retain and embellish of the existing scenic landscape character of the Edge Lands and conserve of key vegetation communities.
- Retain a low density rural edge character to the Georges River Regional Open Space Parklands that is low impact, sensitive and defensible.
- Establish a connected street network that integrates with and complements the existing street pattern and is designed to function in pre and post Georges River Parkway modes.
- Enable existing public bus services to easily service the main part of the the site.
- Focus higher density housing in areas that are well serviced for public transport and close to the improve the nearby neighbourhood centre.
- Deliver complementary repair and renewal strategies for trees and vegetation that enhance the Edge Lands scenic landscape character.
- At the interface Georges River Regional Open Space parklands, create new public open spaces that reinforce the Edge Lands parkland character
- Establish structured street tree planting that is complementary to the scenic landscape character.
- Optimise the use of existing physical infrastructure and services
- Establish a robust and adaptable development structure that can be developed comprehensively or in an integrated series of stages that respects lot existing lot boundaries.

PRINCIPLES

-  SCENIC LANDSCAPE EDGE  
"Retain → Repair → Renew" strategy
-  PUBLIC PARKLAND  
Interface to Georges River Reserve.
-  PUBLIC TRANSPORT CONNECTION  
Route 873 → Ingleburn → MIND
-  PEDESTRIAN ACCESS.  
Create walkable edge + connect.
-  CONNECTED STREETS.  
Minimise impact on landscape edge
-  LOW IMPACT - LOW DENSITY RESPONSE.  
Limited impact on scenic edge.
-  HIGHER DENSITY IN BETTER SERVED AREA - close to buses, neighbourhood centre
-  HERITAGE SIGNIFICANCE.  
Recognise the site history.





## 4. DESIGN CONCEPT

The vision for Caledonia is to create a new village community that responds sensitively to the scenic landscape character, whilst connecting seamlessly with the existing community of Ingleburn and providing a broad mix of new housing that can meet the changing needs of a growing community.

The name 'Caledonia' has been chosen as a reference to the name of the historic village subdivision planned for the area, but never built. The historic paper subdivision on the corner of Bensley Road and Mercedes Road is an unbuilt remnant of the original Caledonia village. Caledonia originates from the Roman name for part of northern Britain, later applied to all of Scotland.

4.1 Structure plan

4.2 Vegetation RETAINED

Caledonia Woodland: Existing and proposed

4.3 Vegetation REPAIRED

Oxford Road: Existing and proposed

4.4 Vegetation RENEWED

Bensley Road: Existing and proposed

4.5 Caledonia – Preliminary Concept Master Plan

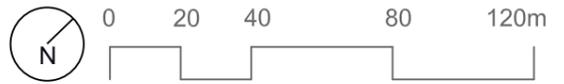
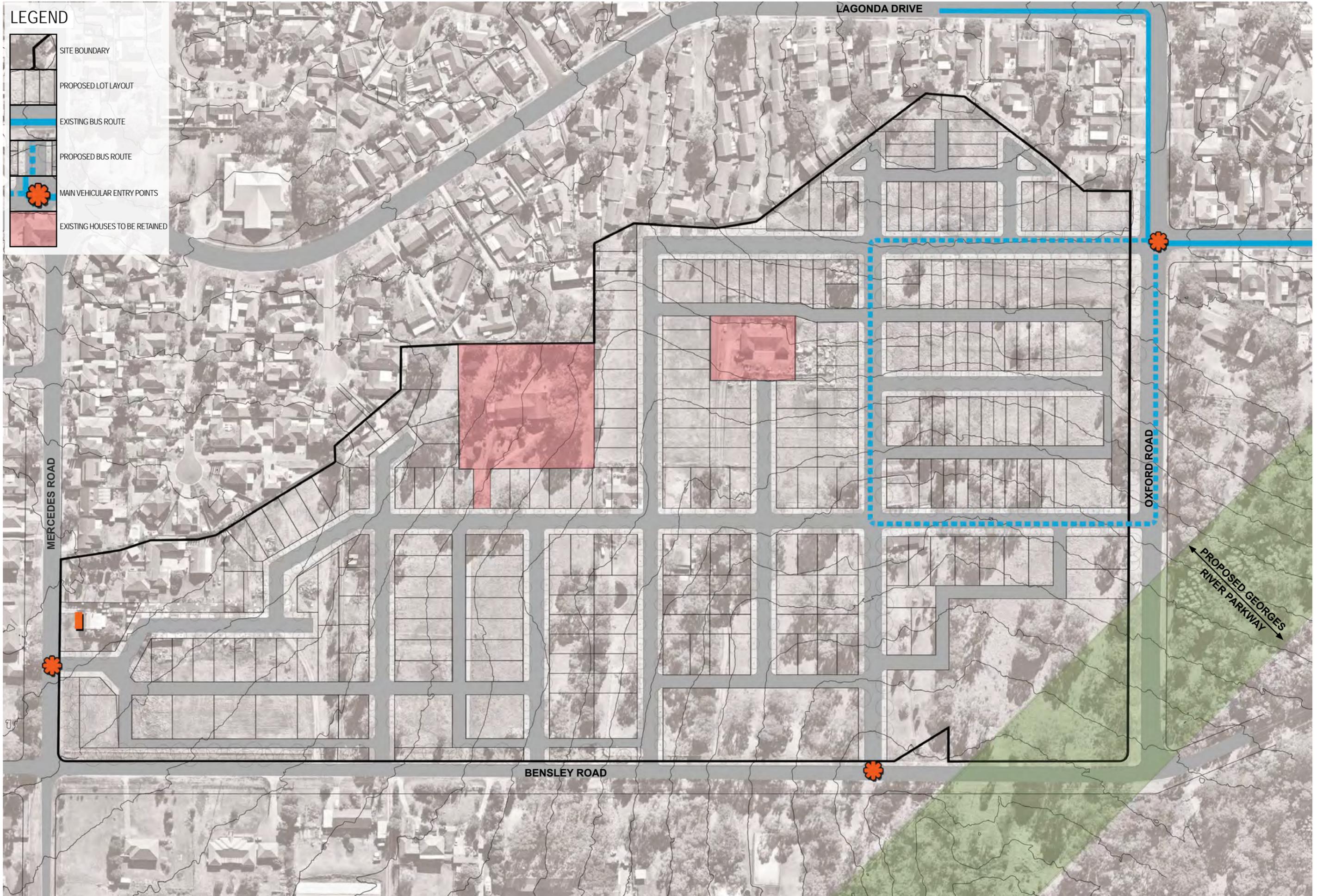
4.6 Caledonia – Proposed Residential typologies

4.7 Caledonia – Proposed land use zoning plan



LEGEND

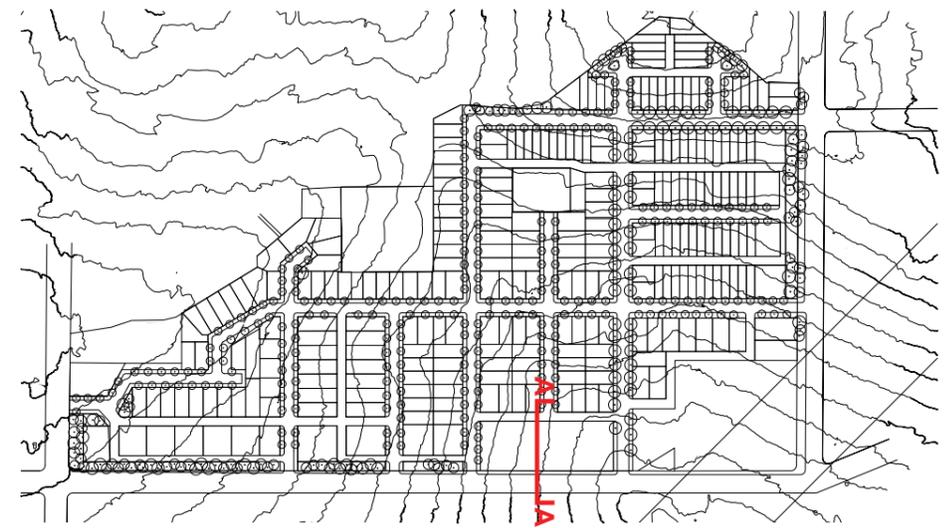
- SITE BOUNDARY
- PROPOSED LOT LAYOUT
- EXISTING BUS ROUTE
- PROPOSED BUS ROUTE
- MAIN VEHICULAR ENTRY POINTS
- EXISTING HOUSES TO BE RETAINED





4.2 VEGETATION RETAINED



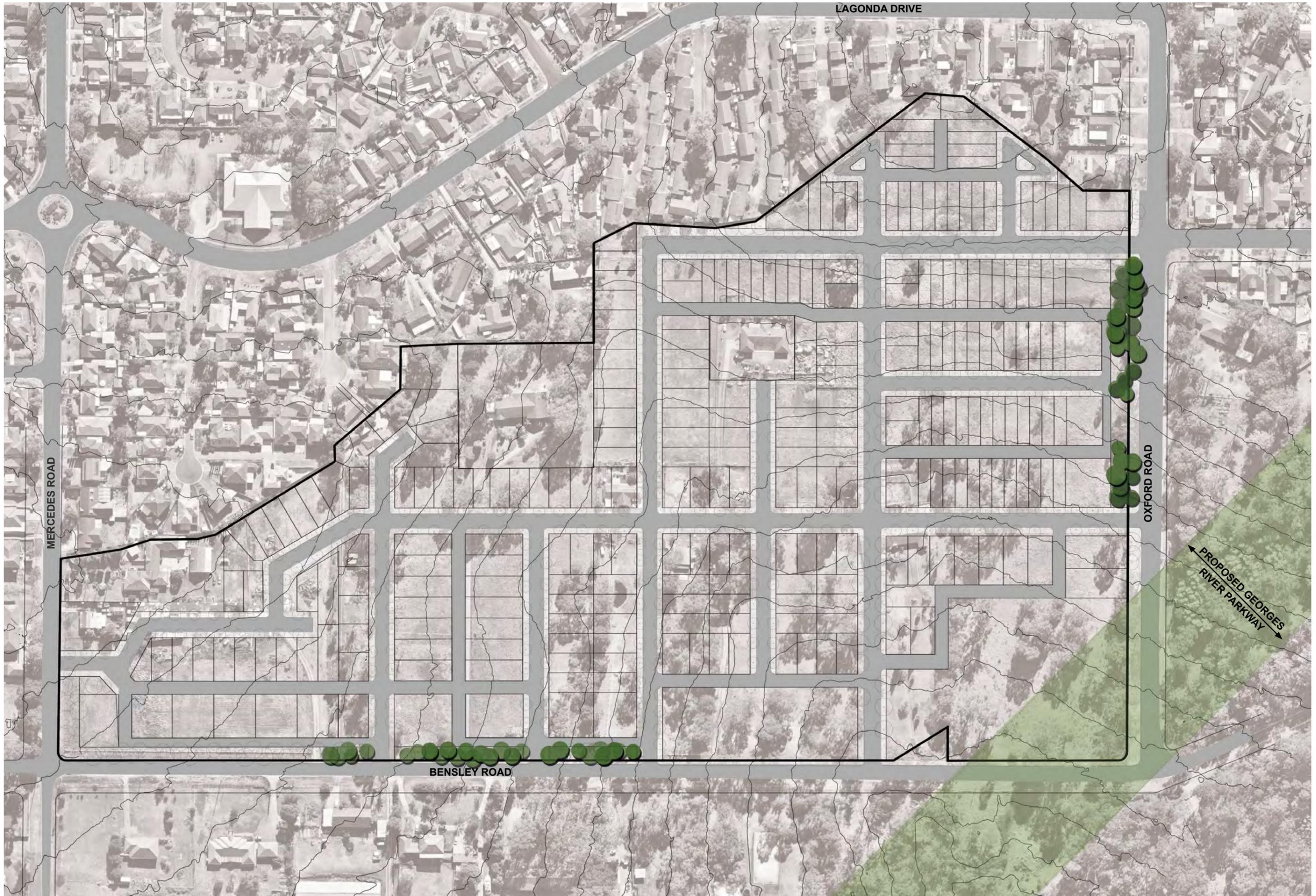


KEY PLAN





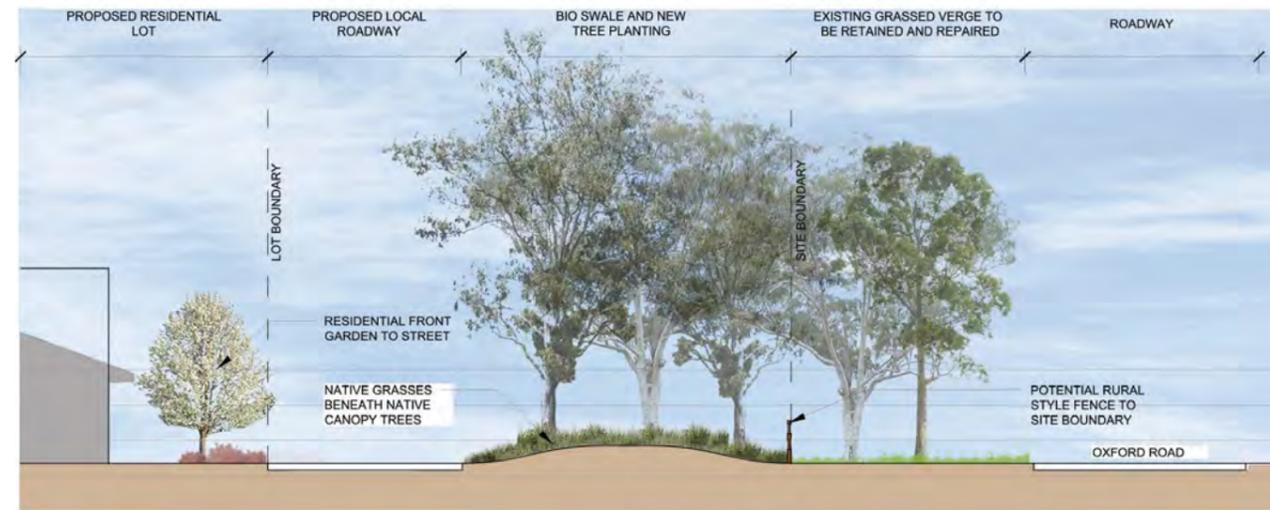




4.3 VEGETATION REPAIRED

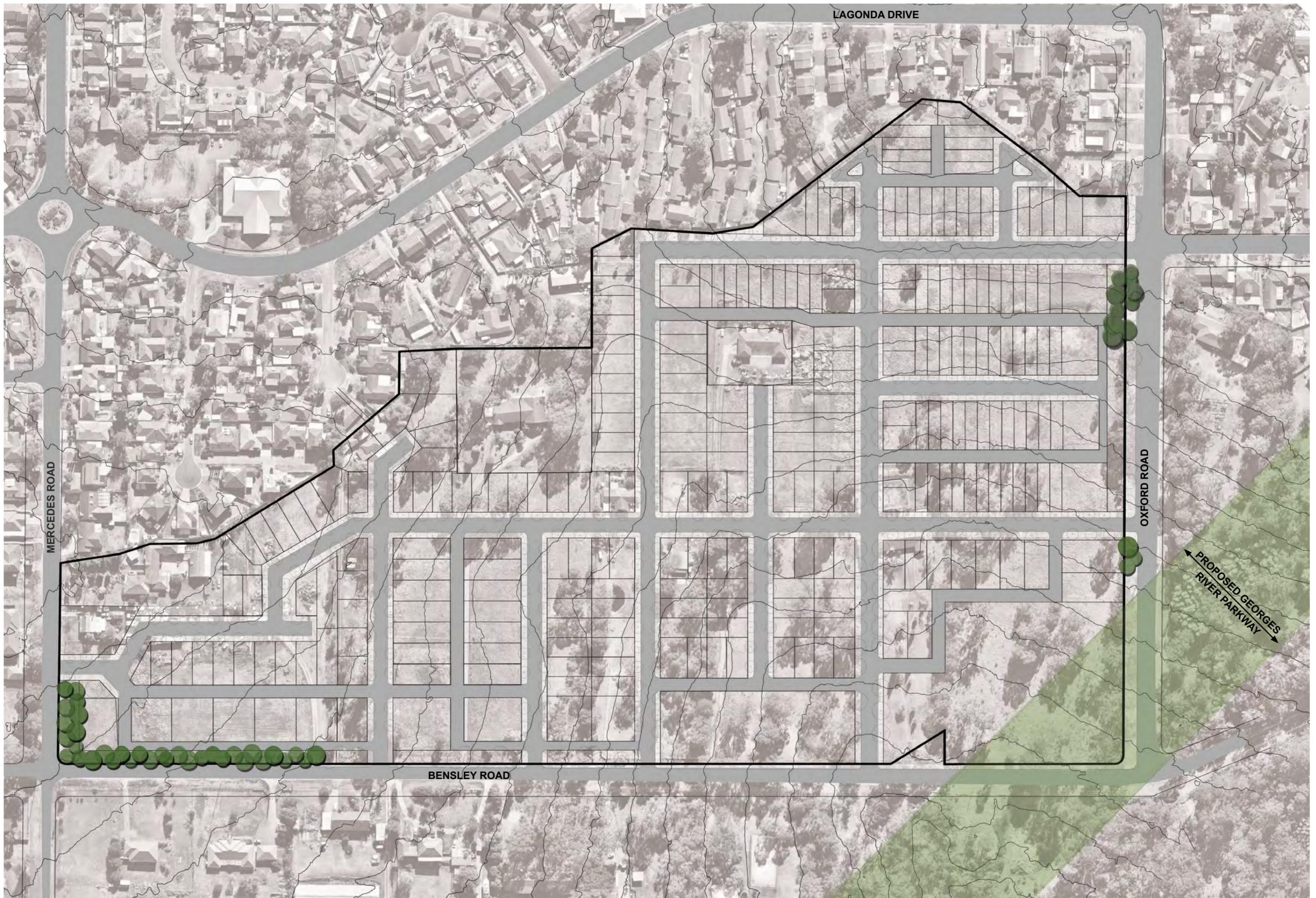


KEY PLAN

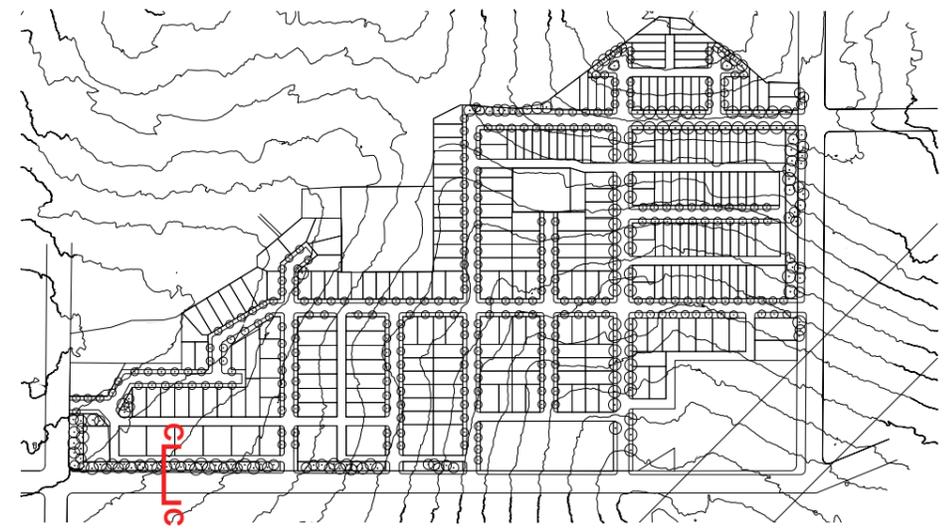




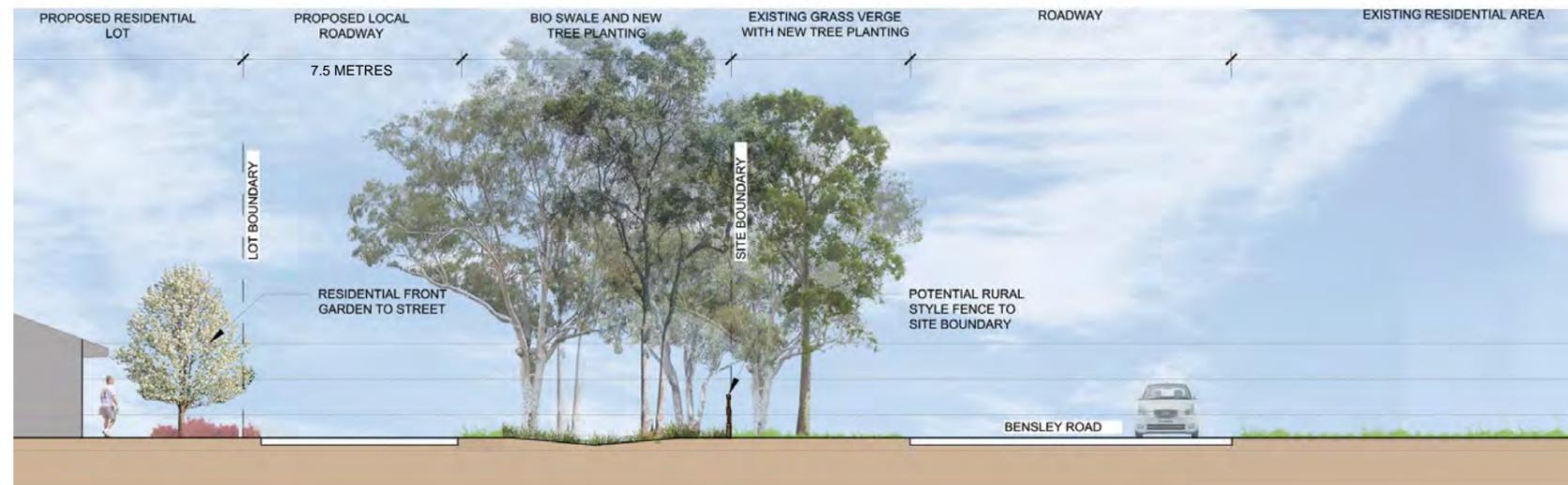




4.3 VEGETATION RENEWED



KEY PLAN





4.3 BENSLEY ROAD EXISTING



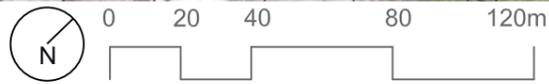
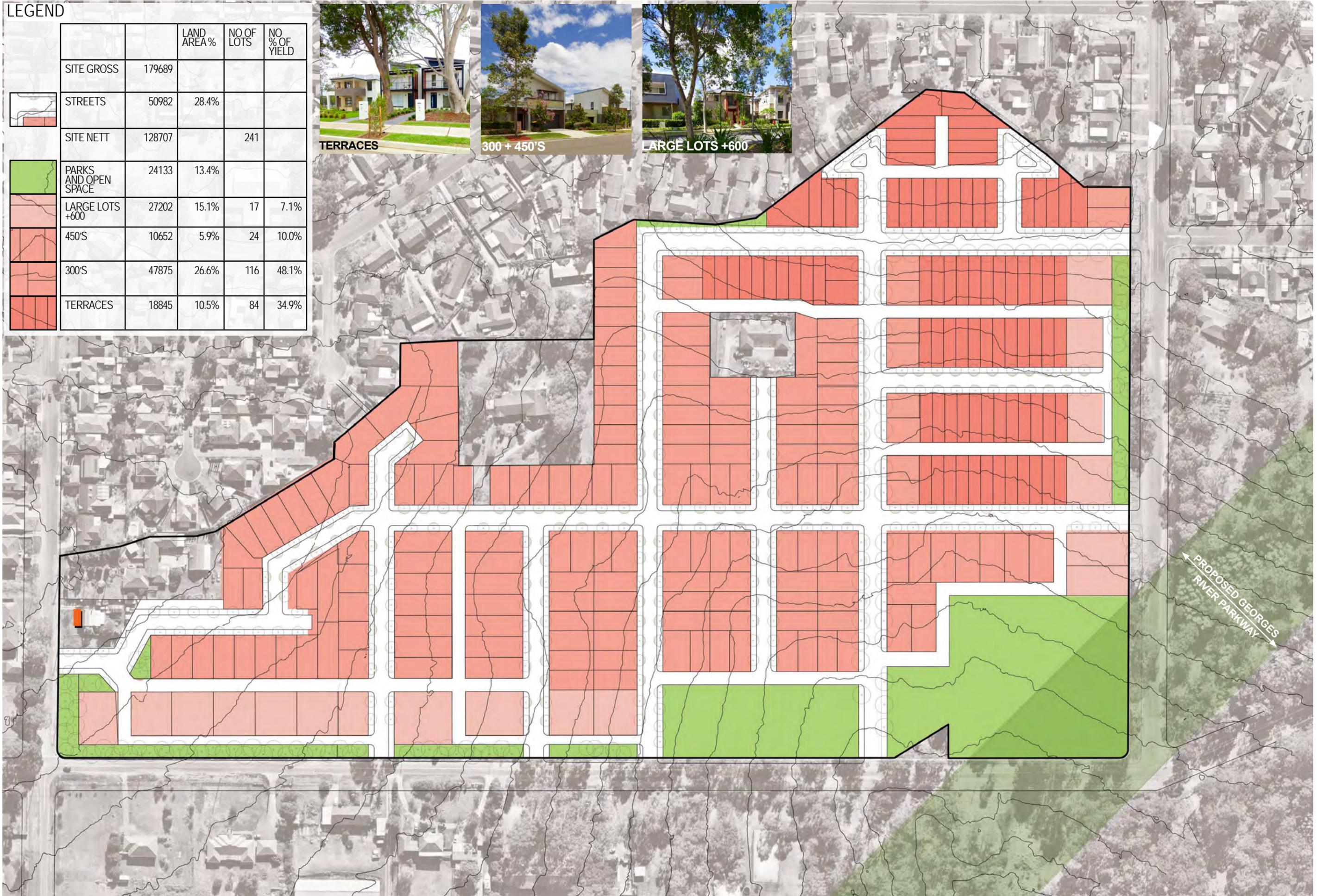
# DESIGN NOTES

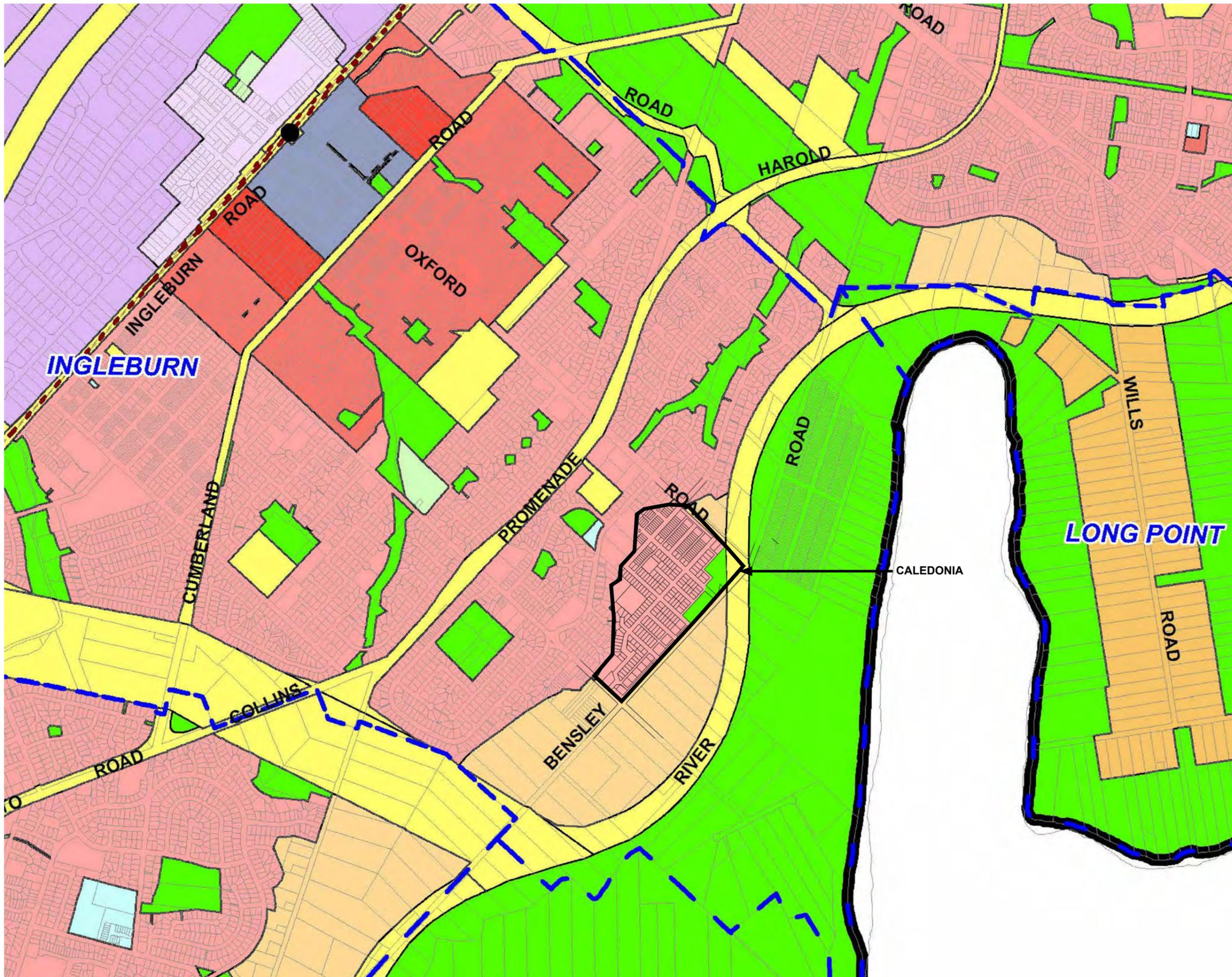
- 1 Sandstone cottage retained with appropriate curtilage.
- 2 Mercedes Road entry with pocket parks and marker tree.
- 3 Bensley Road frontage renewed with bioswale and native tree planting to reinforce local "rural verge" character.
- 4 Existing Bunya Pine potential as a historic marker.
- 5 Minor Streets identified with medium size native trees.
- 6 Bensley Park. Existing trees retained with open grassed areas for recreation.
- 7 Existing residence retained.
- 8 Caledonia Woodland. Existing Cumberland Plain Woodland retained as site feature.
- 9 Proposed Georges River Parkway with existing trees retained to reinforce of "rural verge" character.
- 10 "Rural verge" character to Oxford Road is retained and repaired with additional native tree planting.
- 11 Potential vehicular entry is an extension of the existing road network.
- 12 Main road access identified with wider verge and large native canopy trees.



**LEGEND**

	LAND AREA %	NO OF LOTS	NO % OF YIELD
SITE GROSS	179689		
STREETS	50982	28.4%	
SITE NETT	128707		241
PARKS AND OPEN SPACE	24133	13.4%	
LARGE LOTS +600	27202	15.1%	17 7.1%
450'S	10652	5.9%	24 10.0%
300'S	47875	26.6%	116 48.1%
TERRACES	18845	10.5%	84 34.9%





**LEGEND**

B1	NEIGHBOURHOOD CENTRE
B2	LOCAL CENTRE
B3	COMMERCIAL CORE
B4	MIXED USE
B5	BUSINESS DEVELOPMENT
E1	NATIONAL PARKS AND NATURE RESERVES
E2	ENVIRONMENTAL CONSERVATION
E3	ENVIRONMENTAL MANAGEMENT
E4	ENVIRONMENTAL LIVING
IN1	GENERAL INDUSTRIAL
IN2	LIGHT INDUSTRIAL
R2	LOW DENSITY RESIDENTIAL
R3	MEDIUM DENSITY RESIDENTIAL
R4	HIGH DENSITY RESIDENTIAL
R5	LARGE LOT RESIDENTIAL
RE1	PUBLIC RECREATION
RE2	PRIVATE RECREATION
RU2	RURAL LANDSCAPE
RU5	VILLAGE
SP1	SPECIAL ACTIVITIES
SP2	INFRASTRUCTURE
W1	NATURAL WATERWAYS
DM	DEFERRED MATTER
SEDP	SEPP (MAJOR DEVELOPMENT) 2005 EDMONDSON PARK SOUTH
SWG	SEPP (MAJOR DEVELOPMENT)

**CADASTRE**

(Thin grey line)	CADASTRE 28/04/15 LAND AND PROPERTY
(Thick black line)	LGA BOUNDARY
(Dashed blue line)	SUBURB BOUNDARY
(Dotted line)	RAILWAY LINE
(Black dot)	RAILWAY STATION







