Planning Proposal

Evelyn Street, Macquarie Fields

Proposed amendment of Campbelltown Local Environmental Plan 2015

(Refer to the Addendum at the end of this Planning Proposal for updates in response to the Gateway Determination dated 10 June 2021)

Definitions and abbreviations

CLEP 2015 means Campbelltown Local Environmental Plan 2015

DCP means Development Control Plan

DPIE means Department of Planning, Industry and Environment

EP&A Act 1979 means *Environmental Planning and Assessment Act 1979*

GSC means Greater Sydney Commission

LGA means local government area

M means metres

PP means Planning Proposal

PPR means Planning Proposal Request

SEPP means State Environmental Planning Policy

SQM means square metres

Introduction/Background

The East Edge Scenic Protection Lands form a strategic transitionary landscape unit generally located between the eastern urban edge of Campbelltown City and the proposed "Georges River Parkway" (Road). The Landscape Unit has been the subject of numerous scenic landscape and urban capability investigations over recent years.

Council at its Ordinary meeting of 21 June 2016, reinforced the broad-ranging development principles for the future of the Landscape Unit, including the East Edge Scenic Protection Lands – Macquarie Fields – EEC1, which includes the Evelyn Street Fringe. Refer to Figure 1 for the extent of the Edgelands.

The policy position in the Council report of 21 June 2016, in relation to the Macquarie Fields Evelyn Street Fringe Precinct, reflects the transition from the existing residential density, generally 500 sqm to large lot sewered 4,000 sqm allotments. These later lots would generallyoccupy land with frontage to Oakley Street.

This foundation principle evolved during the review of a Planning Proposal Request (PPR) submitted for the part of the Macquarie Fields EEC1 precinct known as the Evelyn Street Fringe Precinct and during the advancement of a recently terminated Planning Proposal for the land.

More recently, the precinct has been identified in the Campbelltown Local Strategic Planning Statement Structure Plan as a ‘Potential Transition Area.’ Additionally, the Campbelltown Local Housing strategy identifies the need for housing diversity, including the target market underpinning this PP.

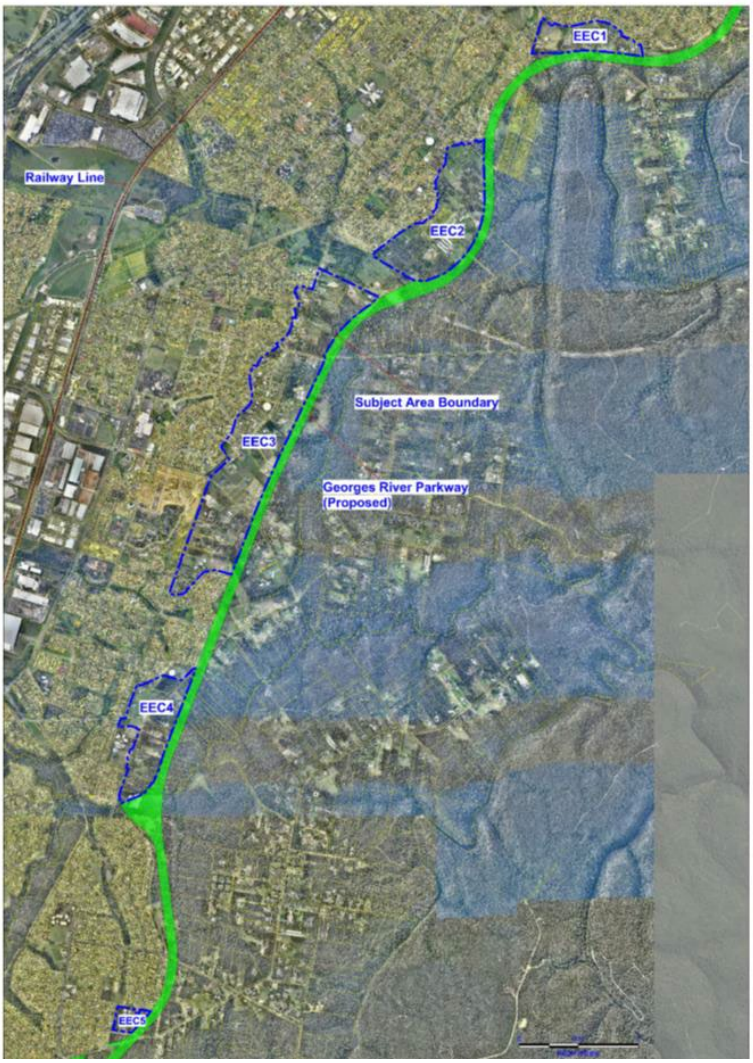


Figure 1 EEC Precincts

Existing Situation

The land holding comprises approximately 9.75 ha of rural residential land, containing seven properties generally with frontage to Evelyn Street and Oakley Road, Macquarie Fields. It forms part of the eastern edge of the suburb of Macquarie Fields and is part of a landscape unit, which is known as the East Edge Scenic Projection Lands or 'the Edgelands'. Generally, to the east is Oakley Road, which forms a clear divide to the densely vegetated George River environs.

The land is located approximately 1.25 km from the Glenquarie Centre, 2 km from Macquarie Fields Station and 2.5 km from Ingleburn Station.

An aerial photograph extract of the subject site in its immediate context is produced below.

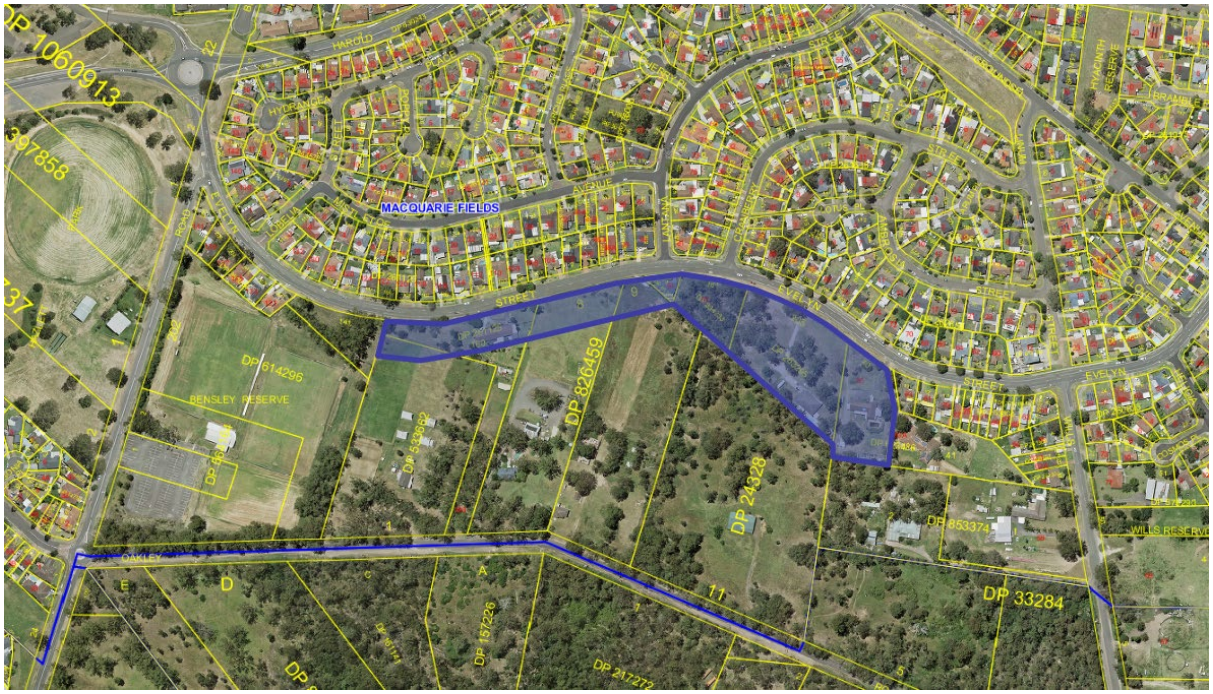


Figure 2 Subject Site and Immediate Locality

The real property description of the subject lands at Macquarie Fields is as follows:

- Part Lot 1 DP 533662 (No. 22 Oakley Road)
- Part Lots 8 and 9 DP 826459 (Nos. 18-16 Oakley Road)
- Part Lot 100 DP 261125 (No. 109 Evelyn Street)
- Lot 9 DP 852014 (No. 91 Evelyn Street)
- Lot 181 DP 834233 (No. 89 Evelyn Street)
- Lot 305 DP 263295 (No. 87 Evelyn Street)
- Lot 40 DP 623486 (No. 85 Evelyn Street)

The site occupies an urban edge location with a generally open wooded character. The site has access to reticulated service provision, some of which would need to be extended onto the site and augmented.

Part 1 – Objectives or Intended Outcomes

The objective of the Planning Proposal (PP) is to amend Campbelltown Local Environmental Plan 2015 (CLEP 2015) to facilitate the development of the subject lands for low density residential purposes as depicted conceptually in Annexure (3).

In seeking to realise this objective, the PP aims to deliver the following outcomes:

- a subdivision template with "transitional" 500 sqm minimum area allotments;
- strategic vegetation, bushfire hazard and landscape character management;
- sensitive integration with the existing residential interface;
- a strategic approach to community and physical infrastructure impact; and

- augmentation and reticulation of all essential services.

Part 2 - Explanation of provisions

It is proposed that CLEP 2015 be amended, for the land identified, as detailed below. (Refer to Annexure 1)

- Amend the zoning map from E4 Environmental Living to R2 – Low Density Residential.
- Amend the minimum lot size map from 2 ha to 500 m^2.
- Amend the minimum lot size for dual occupancy map from 2 ha to 700 m^2.
- Amend the maximum building height from 9 m to 8.5 m.
- Amend the lot averaging provision to not apply to the subject lands.

Part 3 - Justification

Section A – Need for the Planning Proposal

Is the planning proposal a result of an endorsed local strategic planning statement, strategic study or report?

The PP is consistent with a review of the planning provisions for the Eastern Edge Lands locality (Council meeting of 21 June 2016) and reinforced as a Transition Area in the Campbelltown Local Strategic Planning Statement Structure Plan.

It is noted that the PPR submitted in respectof the subject land is a professionally compiled report supported by a range of specialist studies. The subject reports were augmented/refined as the former Planning Proposal was advanced.

The supporting reports address the following specific areas:

- contamination;
- storm water management;
- traffic management and accessibility;
- service infrastructure provision;
- ecology;
- bushfire management
- concept subdivision layout plan; and
- planning framework compliance.

Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The PP is considered to be the best means of achieving the planning objective and intended outcomes detailed in Part 1. There are no other relevant means of accommodating the proposed development than to amend CLEP 2015 as proposed in this PP.

Section B – Relation to Strategic Planning Framework

Will the planning proposal give effect to the objectives and actions of the applicable regional, or district plan or strategy (including any exhibited draft plans or strategies)?

Greater Sydney Region Plan – A Metropolis of Three Cities

The Metropolis of Three Cities (GSRP) has been prepared by the NSW State Government to guide land use planning decisions for the next 20 years. The Plan sets a strategy for accommodating Sydney's future population growth and identifies the need to deliver 817,000 new jobs and 725,000 new homes by 20366. The Plan identifies that the most suitable areas for new housing are in locations close to jobs, public transport, community facilities and services. An assessment of the proposal against the relevant Directions and Objectives of the GSRP is provided in Table 1. (Refer to Annexure 2)

The proposal is generally consistent with the Plan particularly as the proposal seeks to ensure that development is aligned with the existing urban zoning of adjoining land, is within relatively close proximity to the Glenquarrie Centre and can access the metropolitan rail service at Macquarie Fields or Glenfield Stations. The proposal also provides housing diversity in the form of larger lots some of which occur in a natural woodland setting.

Western City District Plan - Connecting Communities

The Western City District Plan (WCDP) as updated in March 2018 when endorsed. It establises more detail in respect of the GSRP with regard to the anticipated sustainable growth in housing and employment in the Western District and amongst other things, is intended to inform the assessment of planning proposals.

The PP is considered to be consistent with the WCDP, in that it is consistent with the following relevant Directions and Planning Priorities summarised below and detailed in Table 1. (Refer to Annexure 2)

Planning Priority	Comments on consistency
W1 – Planning for a city supported byinfrastructure	Objective 4 - Infrastructure is Optimised.
W3 – Providing Services and social infrastructure to meet peoples changing needs	Objective 6 – Services and Infrastructure meet communities' changing needs.
W5: Providing housing supply, choice and affordability, with access to jobs and services	Objective 10 – Housing is more diverse and affordable
W6 – Creating and renewing great places and local centres and respecting the Districts Heritage	Objective 12 – Environmental Heritage is identified, conserved and enhanced
W12 – Protecting and improving the health and enjoyment of the Districts waterways	Objective 25 – The coast and waterways are protected and healthier
W15 - Increasing urban tree canopy cover and delivering Green Grid connections	Objective 30 – Urban Tree Canopy is increased

W19 – Reducing carbon emissions and managing energy, water and waste efficiently	Objective 33 – A low carbon city contributes zero emissions by 2050 and mitigates climate change.
W20 – Adopting to the impacts of urban and natural hazards and climate change	Objective 37 – Exposure to natural and urban hazards is reduced.

Campbelltown Local Environmental Plan 2015 (CLEP 2015)

The Campbelltown Local Environmental Plan 2015 (CLEP 2015) is the principal environmental planning instrument for the City of Campbelltown. The proposed changes to the CLEP 2015 are detailed in Parts 2 Explanation of Provisions and Part 4 Mapping of this PP.

The objectives and permitted uses of the R2 Low Density Residential zone are reproduced below:

Zone R2 Low Density Residential

1 Objectives of zone

- To provide for the housing needs of the community within a low density residential environment.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To enable development for purposes other than residential only if that development is compatible with the character of the living area and is of a domestic scale.
- To minimise overshadowing and ensure a desired level of solar access to all properties.
- To facilitate diverse and sustainable means of access and movement.

2 Permitted without consent

Home occupations

3 Permitted with consent

Attached dwellings; Boarding houses; Building identification signs; Business identification signs; Centre-based child care facilities; Community facilities; Dual occupancies; Dwelling houses; Emergency services facilities; Environmental facilities; Environmental protection works; Exhibition homes; Exhibition villages; Flood mitigation works; Group homes; Home-based child care; Home businesses; Home industries; Oyster aquaculture; Places of public worship; Pond-based aquaculture; Recreation areas; Recreation facilities (outdoor); Respite day care centres; Roads; Schools; Semi-detached dwellings; Tank-based aquaculture

4 Prohibited

Any development not specified in item 2 or 3

Campbelltown Local Environmental Plan 2015 (Amendment No.24)

Amendment No. 24 to CLEP 2015 as published on the NSW Legislation website on 23 April 2021 is noted to have included an update to the Terrestrial Biodiversity Map to accompany Clause 7.20 that now identifies part of the site to comprise biodiversity significance. The land contains 2.38 hectares of the Cumberland Plain Woodland, a critically endangered community. This vegetation is also mapped on the NSW Government's Biodiversity Values Map and would trigger entry into the Biodiversity Offset Scheme if clearing is proposed. Compliance with Clause 7.20, in association with the existing *Biodiversity Conservation Act 2016* would likely require further revision of the concept subdivision plan to minimise tree removal.

The update of the Terrestrial Biodiversity Map is consistent with Planning Priority W14 of the Wester District Plan.

Campbelltown (Sustainable City) Development Control Plan, 2015

This DCP provide a compendium of general controls for subdivisions and subsequent residential development.

The sensitivities of the site are such that a site specific part should be added to Volume 2 of the DCP. Such supplementary DCP material should accompany any public exhibition/consultation in respect of the PP.

It is recommended that the DCP be compiled by the applicant and be exhibited concurrently with the Planning Proposal should Gateway Authorisation be issued.

1. Is the Planning Proposal consistent with Council's local strategy or other local strategic plan?

Local Strategic Planning Statement 2019

The Local Strategic Planning Statement details Campbelltown City Council's plan for the community's social, environmental and economic land use need over the next 20 years. The LSPS provides context and direction for land use decision making within the Campbelltown Local Government Area (LGA). It seeks to:

- provide a 20 year land use vision for the Campbelltown LGA
- outline the characteristics that make our city special
- identify shared values to be enhanced or maintained
- direct how future growth and change will be managed

The LSPS responds to the District and Regional Plans and to the community's documented aspirations. The document establishes planning priorities to ensure that the LGA thrives now and remains prosperous in the future, having regard to the local context. The PP is consistent with the draft LSPS with the specific actions relevant to the PP discussed below, with a broader overview in Table 2 of Annexure 2.

LSPS Action	Comment
2.5 Contain urban development to existing urban areas and within identified	The proposal is on the fringe of the existing residential extent of Macquarie Fields. Although the land forms part of the Metropolitan Rural Area, it is designated in the LSPS Structure Plan as a 'Potential Transition Area' in a manner

growth and investigation areas, in order to protect the functions and values of scenic lands and the Metropolitan Rural Area (MRA).	consistent with Council's established policy position of 21 June 2016. Additionally, the proposal has been previously assessed as being sufficiently consistent with an evolving East Edge Scenic Protection Lands vision.
3.6: Identify and promote the conservation of environmental heritage and sensitive environmental areas including the Georges River Corridor Landscape, Scenic Hills and Wedderburn.	Areas of environmental significance would be protected in future final subdivision deign through compliance with the *Biodiversity Conservation Act 2016* and Council's Comprehensive Koala Plan of Management made in accordance with SEPP (Koala Habitat Protection) 2019. New residents would be encouraged to maintain street plantings and undertake relevant 'domestic' plantings.
5.6: Work in collaboration with relevant stakeholders to review and implement the recommendations of the Visual Analysis of Campbelltown's Scenic Hills and East Edge Scenic Protection Lands study	The Draft Visual and Landscape Analysis of the Scenic Hills and the East Edge Scenic Protection Lands study was considered by Council at its meeting on 18 October 2011, where the Study was adopted as an important contributory element to the preparation of Draft CLEP 2014 (then known as Draft CLEP 2013). The CLEP is noted to have been finally adopted as CLEP 2015 The subject landscape unit has evolved and a variant of the Woodland housing model is proposed in the vegetated part of the site.

In summary, the PP is generally consistent with the actions of the LSPS as a potential transition area.

Draft Campbelltown Local Housing Strategy 2020

The Draft Campbelltown Local Housing Strategy (CLHS) was endorsed at Council's Extraordinary Meeting of 29 September 2020 and would come into effect when endorsed by the Department of Planning, Industry and Environment (DPIE). Its primary aim is to examine the housing needs of Campbelltown's current and potential future residents and puts forward an evidence based approach to managing sustainable housing growth to 2036.

Council has prepared the CLHS to align with the updated CLEP 2015 and WCDP, which is relevant to the future zoning of the subject land.

The housing vision for Campbelltown LGA is to provide sustainable, high quality housing options to meet the diverse accommodation needs of the local community and future population growth.

The objectives of the CLHS are as follows:

- Meet the housing needs of the future population.
- To support urban containment.
- To provide for housing that meets the needs of all households.
- To encourage the provision of new housing in locations that support the 30 minute city principle.
- To encourage the planning of housing within neighbourhoods.
- Manage the development of Greenfield release areas.
- Facilitate the urban renewal of walkable catchments
- Support housing growth in the Campbelltown CBD
- Plan for incremental growth through infill development which is compatible with the desired neighbourhood character.
- Promote high quality and environmentally sustainable residential environments.

The PP is generally consistent with the relevant objectives detailed above and is envisaged for urban development as a transition area.

Campbelltown Community Strategic Plan – Campbelltown 2027

The Campbelltown City Community Strategic Plan (CSP) is a 10 year vision that identifies the main priorities and aspirations for the future of the Campbelltown City Local Government Area (LGA) and is Council's long term plan to deliver the community inspired vision.

The CSP acknowledges the need to provide for housing diversity and affordability in a structured way, whilst preserving the important natural attributes of the LGA and facilitating its promotion.

The PP is consistent with the CSP and would specifically facilitate delivery of the key outcomes as detailed below.

Table 2	
CSP Outcome	**Statement of Consistency**
Outcome 1	
A vibrant, liveable city	• The Proposal provides for greater housing choice and diversity.
Outcome 2	
A respected and protected natural environment	• The Proposal includes some ecologically sensitive and bushfire prone lands which can be managed through an appropriate final layout plan and compliance with prevailing legislation and planning guidelines
Outcome 3	
A thriving, attractive city	• The Proposal would add an extra dimension to local housing opportunities in a unique setting
Outcome 4	
A successful city	• The Proposal seeks to increase urban development in a location/setting that leverages off existing facilities and services.

2. Is the Planning Proposal consistent with applicable State Environmental Planning Polices?

The following State Environmental Planning Policies (SEPPs) are relevant to the PP.

Table 7 Assessment Against State Environmental Planning Policies		
SEPP	**Consistency**	**Evaluation**
SEPP No 1 Development Standards	Yes	Not applicable as CLEP 2015 is a Standard Instrument LEP & incorporates Clause 4.6 - Exceptions to Development Standards, which negates the need for consistency with SEPP 1.
SEPP No. 19 - Bushland in Urban Areas	Yes	Justifiably inconsistent given the qualities of vegetation generally established in the Flora and Fauna Assessment and the need to comply with Clause 7.20 of CLEP 2015.
SEPP No. 21 - Caravan Parks	N/A	Not Applicable to this PP.
SEPP No. 33 - Hazardous & Offensive Development	N/A	Not Applicable to this PP.
SEPP No. 36 - Manufactured Home Estates	Yes	The provisions of the SEPP are not compromised by the Proposal.
SEPP No. 44 - Koala Habitat Protection	N/A	Repealed
SEPP No. 50 - Canal Estate Development	N/A	Not Applicable to this PP.
SEPP No. 55 - Remediation of Land	N/A	A Phase One (P1) contamination investigation was undertaken and identified, limited areas of environmental sensitivity. The P1 was subsequently supplemented with a Phase 2 (P2) Environmental Assessment. Elevated chemical levels were identified in limited locations and subject to implementation of a relevant Remedial Action Plan, the land was considered to be capable of suitable remediation.
SEPP No. 64 - Advertising & Signage	Yes	Any future advertising/signage would need to comply with the provisions of the SEPP.
SEPP No. 65 - Design Quality of Residential Flat Development	N/A	Not applicable to this PP as residential flat buildings are not proposed on the site.
SEPP No. 70 - Affordable Housing (Revised Schemes)	N/A	Not applicable to this PP.
SEPP (Aboriginal Land) 2019	N/A	Not applicable to this PP.
SEPP (Activation Precincts) 2020	N/A	Not applicable to this PP.
SEPP (Affordable Rental Housing) 2009	Yes	The Proposal does not prejudice the application of the SEPP and development of the various forms of affordable housing.
SEPP (Building Sustainability Index: BASIX) 2004	Yes	The PP is not inconsistent with the application of the SEPP to residential development.

SEPP (Educational Establishments & Child Care Facilities) 2017	Yes	Any educational establishments would be subject to development approval in accordance with the provisions of the SEPP.
SEPP (Exempt & Complying Development Codes) 2008	Yes	The PP is not inconsistent with the SEPP and the provisions of which would apply to future developments.
SEPP (Housing for Seniors or People with a Disability)	Yes	The PP does not preclude future merit based provision of housing for seniors and people with a disability.
SEPP (Infrastructure) 2007	Yes	Yes, certain infrastructure required to service residential development would be permissible in accordance with this SEPP.
SEPP (Koala Habitat Protection) 2020	Yes	The subject Policy does not apply to the Campbelltown Local Government Area. It is noted, however, that the adoption of the Campbelltown Comprehensive Koala Plan of Management in accordance with (SEPP Koala Habitat Protection 2019 is captured by the savings and transitional provision of SEPP 2020.
SEPP (Koala Habitat Protection) 2021	Yes	A preliminary Koala assessment was undertaken and subsequently augmented. It is noted however, that the subject site is identified as core Koala habitat, and mapped in Council's Comprehensive Koala Plan of Management (Biolink, 2018). As per the provisions of SEPP 2021 - Koala Habitat Protection, Council's Comprehensive Koala Plan of Management must be complied with.
SEPP (Mining, Petroleum Production & Extractive Industries) 2007	N/A	Not applicable to this PP.
SEPP (Miscellaneous Consent Provisions) 2007	Yes	The Proposal does not conflict or hinder the achievement of the SEPP aims.
SEPP (Primary Production and Rural Development) 2019	N/A	Not applicable to this PP.
SEPP (State & Regional Development) 2011	N/A	Not Applicable to this PP.
SEPP (State Significant Precincts) 2005	N/A	Not Applicable to this PP.
SEPP (Sydney Drinking Water Catchment) 2011	N/A	Not Applicable to this PP.
SEPP (Sydney Region Growth Centres) 2006	N/A	Not Applicable to this PP.
SEPP (Vegetation in Non - Rural Areas) 2017	Yes	Consistent as the PP does not propose any provisions contrary to the SEPP.
SEPP (Western Sydney Employment Area) 2009	N/A	Not applicable to this PP.
SEPP (Western Sydney Parklands) 2009	N/A	Not applicable to this PP.

SREP No.2 Georges River Catchment	N/A	Consistent as the accompanying Stormwater Concept Plan establishes acceptable water management targets can be realised.
SREP No 20 Hawkesbury Nepean River	N/A	Not applicable to this PP.

3. Is the Planning Proposal consistent with applicable Ministerial Directions (S9.1 directions)?

The PP is generally consistent with the Section 9.1 directions issued by the Minister for Planning. A detailed commentary in respect of the relevant Section 9.1 directions is shown below.

Table 8
Assessment Against Relevant S9.1 Ministerial Directions

Ministerial Direction	Consistency	Evaluation
1.1 Business and Industrial Zones		
This Direction seeks to encourage employment in suitable locations, protect appropriately zoned business and industrial land and support the viability of identified centres.	N/A	Not applicable to this PP.
1.2 Rural Zones		
This Direction seeks to protect the agricultural production value of rural lands.	N/A	Not applicable to this PP.
1.3 Mining, Petroleum Production		
This Direction seeks to ensure petroleum production and extractive industries are not compromised by inappropriate development.	N/A	Not applicable to this PP.
1.5 Rural Lands		
This Direction seeks to facilitate the protection of rural land and its intrinsic values and contributions to the social, economic and environmental outcomes.	N/A	Not applicable to this PP.
2.1 Environmental Protection Zones		
This direction seeks to ensure that environmentally sensitive areas are not compromised.	Justifiably Inconsistent	Justifiably inconsistent as, the PP does not adversely impact on an environmentally sensitive area. The current Environmental Living zone is the product of a translation for the former Environmental Protection zoning, a zoning established due to the general scenic qualities of the precinct. Such qualities have been impacted significantly by nearby residential development and do not represent a major current constraint. Despite detailed Flora and Fauna Assessments Clause 7.20 of CLEP 2015 in respect of

		Terrestrial Biodiversity would together need to be complied with Council's Comprehensive Koala Plan of Management prepared.
2.3 Heritage Conservation		
This Direction seeks to conserve items, areas, objects and places of environmental heritage significance and indigenous heritage significance.	Consistent	No areas/issues of environmental heritage mitigate against the proposal proceeding.
2.6 Remediation of Contaminated Land		
This Direction seeks to reduce the risk of harm to human health and the environment through ensuring that contamination and remediation are considered at Planning Proposal stage.	Consistent	A Phase One (P1) contamination investigation was undertaken and identified, limited areas of environmental sensitivity. The P1 was subsequently supplemented with a Phase 2 Environmental Assessment. Elevated chemical levels were identified in limited locations and subject to implementation of a relevant Remedial Action Plan, the land was considered to be capable of suitable remediation.
3.1 Residential Zones		
This Direction seeks to encourage housing diversity, optimise use of infrastructure and minimise the impacts on resource lands.	Consistent	The PP seeks to provide an opportunity for housing on transitional sized allotments in accordance with a relevant zoning and minimum lot size. It can be readily and economically serviced and social infrastructure impacts appropriately addressed.
3.2 Home Occupations		
This Direction seeks to facilitate low impact small businesses in dwelling houses	Consistent	The Proposal includes standard provisions to facilitate home occupations.
3.4 Integrating Land Use and Transport		
This Direction seeks to ensure urban structures, building farms, land use locations, development design, subdivision and street layouts achieve movement efficiencies, optimise amenity and safety and contribute to more sustainable community outcomes.	Consistent	Consistent as the PP seeks to rezone land adjoining an existing urban area for residential development. The site is also proximate to public transport.
4.1 Acid Sulphate Soils		
This Direction seeks to avoid significant adverse environmental impacts from the use of land that has a probability of containing acid sulphate soils.	N/A	Consistent as the land is not known to exhibit acid sulphate qualities.
4.2 Mine Subsidence and Unstable Land		
This Direction seeks to prevent damage to life, property and the environment on land identified as unstable or potentially subject to mine subsidence.	N/A	The site is not identified to be within a Mine Subsidence area.

4.3 Flood Prone Land		
This Direction seeks to ensure flood hazards are appropriately managed in a development context both on and off the subject land.	N/A	The site is not identified to be flood prone.
4.4 Planning for Bushfire		
This Direction seeks to protect life, property and the environment from bushfire hazards, whilst, encouraging sound management of bushfire prone areas and discouraging incompatible land uses.	N/A	The proposal is accompanied by a Bushfire Report which generally supports the Proposal. The proposal needs to further demonstrate compliance with Planninf for Bushfire Protection (2019) as it is progressed.
5.2 Sydney Drinking Water Catchments		
This Directions seeks to protect the water quality in the Sydney drinking water catchment.	N/A	Not applicable in the Campbelltown LGA.
6.1 Approvals and Referral Requirements		
This Direction seeks to ensure that the LEP provisions encourage the efficient and appropriate assessment of development.	Consistent	Consistent as the PP does not alter the provisions relating to approval and referral requirements.
6.2 Reserving land for Public Purposes		
This Direction seeks to facilitate the provisions of public services and facilities by reserving the land for public purpose and remove any reservations of land for public purpose where land is no longer required for acquisition.	Consistent	Not applicable to this PP as no land is identified for acquisition by a public authority.
6.3 Site Specific Provisions		
This Direction seeks to discourage unnecessarily restrictive site specific planning controls.	Consistent	The Proposal pertains to amendments to the 'standard instrument' Campbelltown LEP 2015. No site specific provisions are proposed to be introduced to Campbelltown LEP 2015, via the Proposal.
7.1 Implementation of a "Plan for Growing Sydney"		
This Direction seeks to give legal effect to the planning principles; directions and priorities for sub regions, strategic centres and transport gateways.	Consistent	The Proposal is consistent with the 'Greater Sydney Region Plan' which has replaced the 'Plan for Growing Sydney.'
7.2 Implementation of a "Greater Macarthur Land Release Investigation Area		
This Direction seeks to ensure development within the Greater Macarthur Land Release Investigation Area is consistent with the Greater Macarthur Land Release Preliminary Strategy and Action Plan.	N/A	Not applicable to this PP, as the land is not within the Investigation Area.

Section C – Environmental Social or Economic impact

4. 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?

An initial and supplementary Flora and Fauna Assessment were undertaken in respect of the land with the conclusions produced below. The subject conclusions should importantly be read in the context of Notes 1 and 2 following.

- The proposed includes the removal of approximately 1.91 ha of vegetation, including 0.81ha of low/moderate quality Cumberland Plain Woodland (CPW), with such, not being considered to be significant;
- The long term viability of CPW within the site has been significantly compromised by past actions;
- No significant impacts are predicted to occur to CPW as a result of the small area to be removed.
- A number of threatened fauna species have the potential to occur within the site (in a foraging sense), however, are not considered likely to be significantly impacted;
- Migratory birds similarly are unlikely to utilise the site for roosting or feeding, and as such there is unlikely to be a significant impact on any migratory bird species;
- No evidence of the presence of Cumberland Plain Land Snails.
- The site does not meet the core Koala Habitat definition and accordingly a Koala Plan of Management is not required;
- Total impacts (direct and indirect) are not expected to significantly impact Koalas;
- No significant impact is predicted to occur to threatened species, populations or communities. Accordingly, preparation of a Species Impact Statement (SIS) is not warranted;
- Referral to the Commonwealth Department of Environment, under the EPBC Act is also not required; and
- A range of mitigation measures are, however, nominated. Additionally, the provisions of Clause 7.20 of CLEP 2015 must be complied with. (see Note 2)

Note 1: Notwithstanding the submitted Flora and Fauna Assessment the subject site is identified as core Koala habitat and is mapped accordingly in Council's Comprehensive Koala Plan of Management (Biolink, 2018). As per the provisions of the former State Environmental Planning Policy (Koala Habitat Protection) 2020 and State Environmental Planning Policy (Koala Habitat Protection) 2021, the provisions of Council's Comprehensive Koala Plan of Management (KPOM) must be complied with when future DA's are submitted for subdivision and/or dwelling erection.

Note 2: Notwithstanding the submitted Flora and Fauna Assessment the biodiversity values associated with the subject site have been mapped in Council's Terrestrial Biodiversity Values LEP Map (Refer to Clause 7.20 of CLEP 2015 and relevant mapping). Proposed impacts to biodiversity are likely to be required to be addressed/assessed via a formalised biodiversity offset strategy.

5. Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

There are no other significant environmental impacts, which require resolution in the context of the PP.

It is noted that there are solutions to satisfactorily manage stormwater (quantity and quality) and flooding and can be readily integrated with existing systems.

The traffic likely to be generated by the ultimate development can be readily integrated with the existing street network.

A Stage 1 Preliminary Environmental Site Assessment was undertaken, which concluded:

- Some existing buildings, the site of former buildings and some treated pine timber stockpiles present as areas of potential concern;
- A Phase 2 Detailed Environmental Site Assessment was subsequently undertaken. Elevated chemical levels were identified in limited locations. Subject to implementation of a relevant Remedial Action Plan, the land was considered to be capable of suitable remediation.

Amplification and reticulation of all service infrastructure, particularly water and sewer, is required to be addressed in a DCP addendum and any application for subdivision would need to address this criteria.

6. How has the planning proposal adequately addressed any social and economic effects?

The rezoning for residential purposes would result in positive economic effects. The PP would potentially result in short and medium term employment opportunities related to development and construction activities associated with the sub-divisional works and the subsequent erection of dwellings.

The increased supply of diverse housing stock would also have positive social impacts, particularly in terms of enhanced housing opportunities. Additionally, an increase in the resident population would potentially have positive social and economic impacts on the Glenquarie commercial centre.

Finally, Social Infrastructure impacts would importantly be addressed via a contribution pursuant to the Campbelltown Local Infrastructure Contributions Plan 2018.

Section D – State and Commonwealth interests

7. Is there adequate public infrastructure for the planning proposal?

Preliminary infrastructure investigations accompanied the PPR. These investigations concluded that the existing service infrastructure network (water, sewer, electricity, telecommunications and gas servicing) were available in the locality and could be economically augmented and reticulated.

The proposal, upon development, would readily integrate with the existing street network.

8. What are the views of State and Commonwealth public authorities consulted in accordance with the Gateway determination?

Relevant public authorities and service agencies would be consulted during the formal consultation phase. (Refer to Part 5 following), in the event of a Gateway Determination.

Part 4: Mapping

In seeking to achieve the PP objectives & outcomes the following map amendments are proposed and reflected in Annexure 1:

Table 9		
Item	**Sheet Number**	**Location**
Zoning Map	1500_COM_LZN_012A_010_20201015	Annexure 1 (a)
Height of Buildings Map	1500_COM_HOB_012_020_20150428	Annexure 1 (b)
Minimum Lot Size Map	1500_COM_LSZ_012_020_20150428	Annexure 1 (c)
Dual Occupancy Map	1500_COM_LSP_012_020_20201015	Annexure 1 (d)
Lot Averaging Map	1500_COM_LAV_012_020_20150428	Annexure 1 (e)

Part 5 - Community Consultation

It is proposed that community consultation and engagement with relevant public authorities and service agencies (Public Exhibition) take place in accordance with the provisions of Schedule 1 - Community participation requirements, of the EP&A Act 1979.

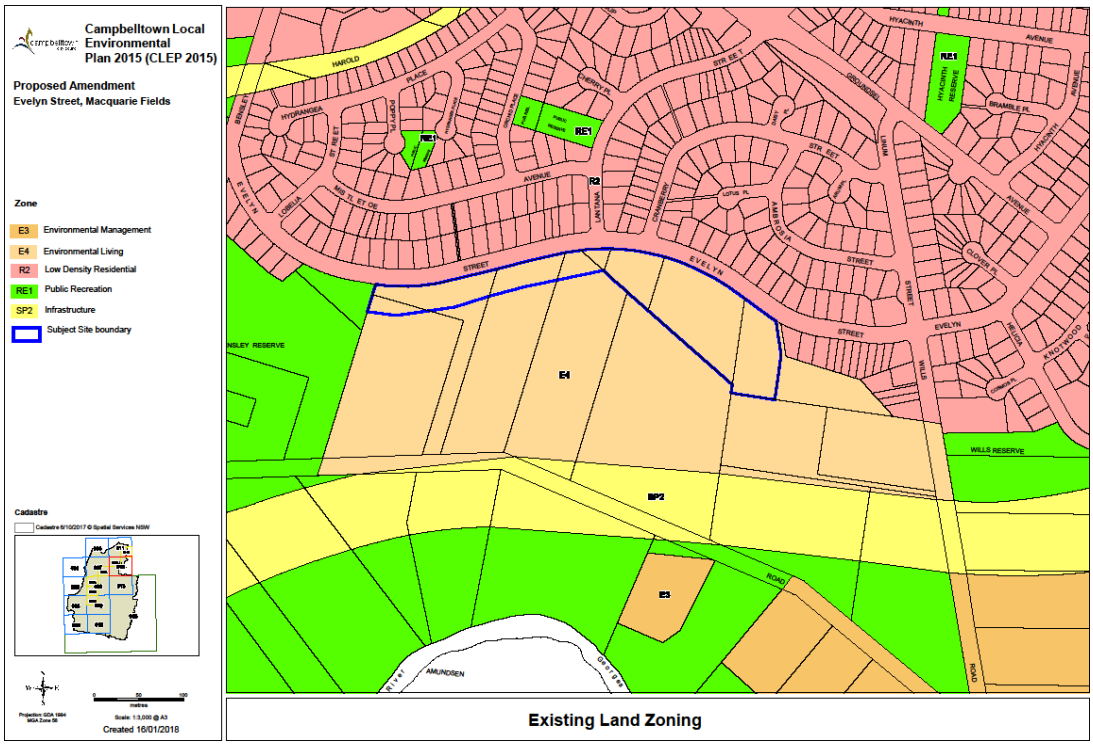
Specifically, it is proposed that the exhibition period extend for a period of 14 days, with documentation available on the Planning Portal, and Council's website during this period.

Part 6 Project Timeline

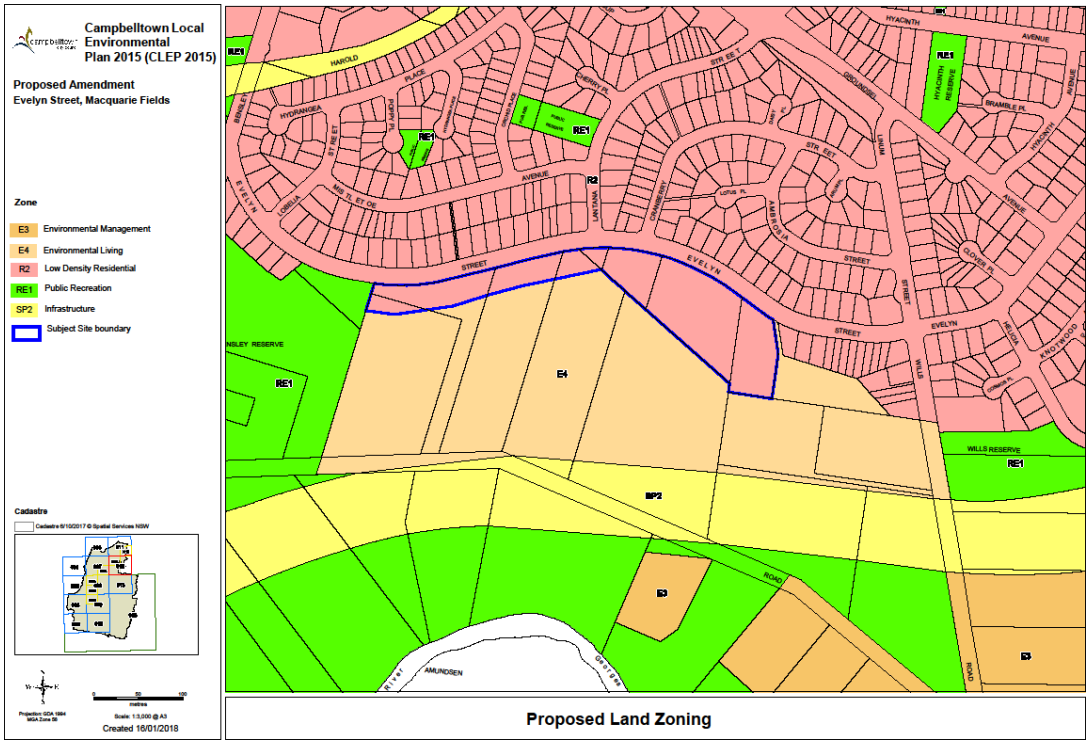
A draft project timeline has been included in the table below.

Table 10	
Milestone	**Timeline**
Referral to Local Planning Panel	March 2021
Referral for Gateway Determination	May 2021
Gateway Determination	July 2021
Completion of additional supporting documentation	September 2021
Public Exhibition	October 2021
Consideration of Submissions	November/December 2021
Report to Council	February 2022
Finalisation of LEP amendment	March 2022

Annexure 1 Changes to Zoning Map

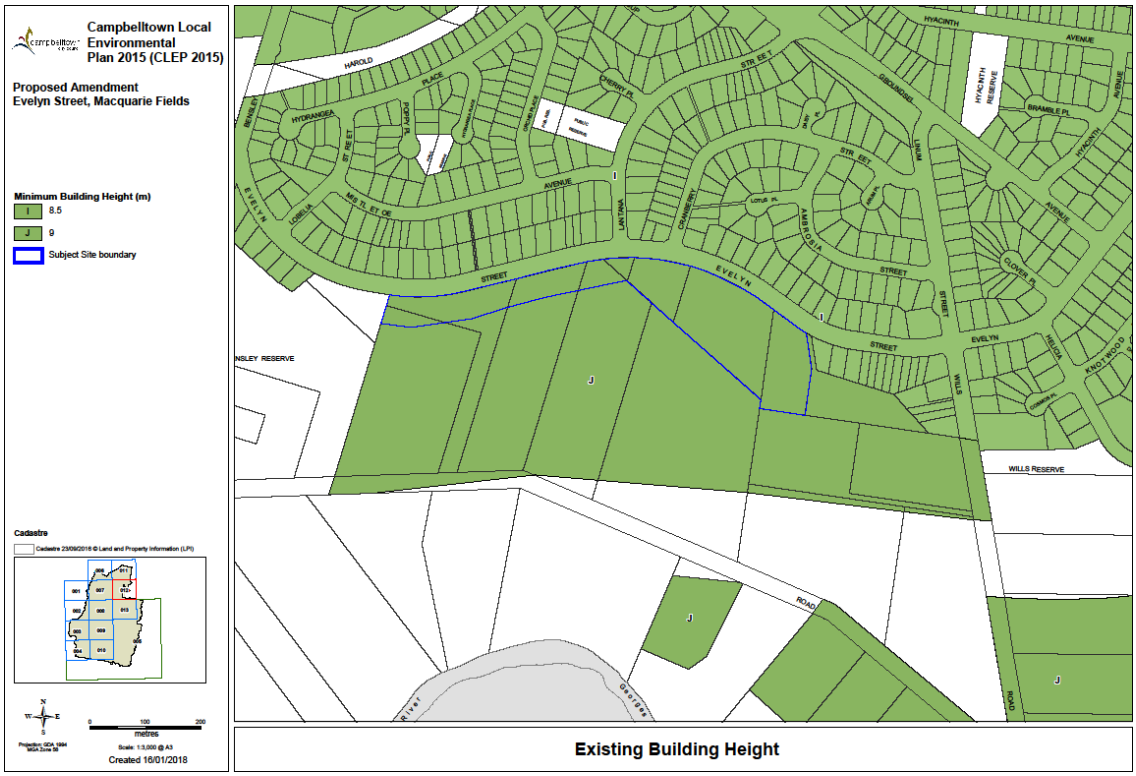


Existing Land Zoning

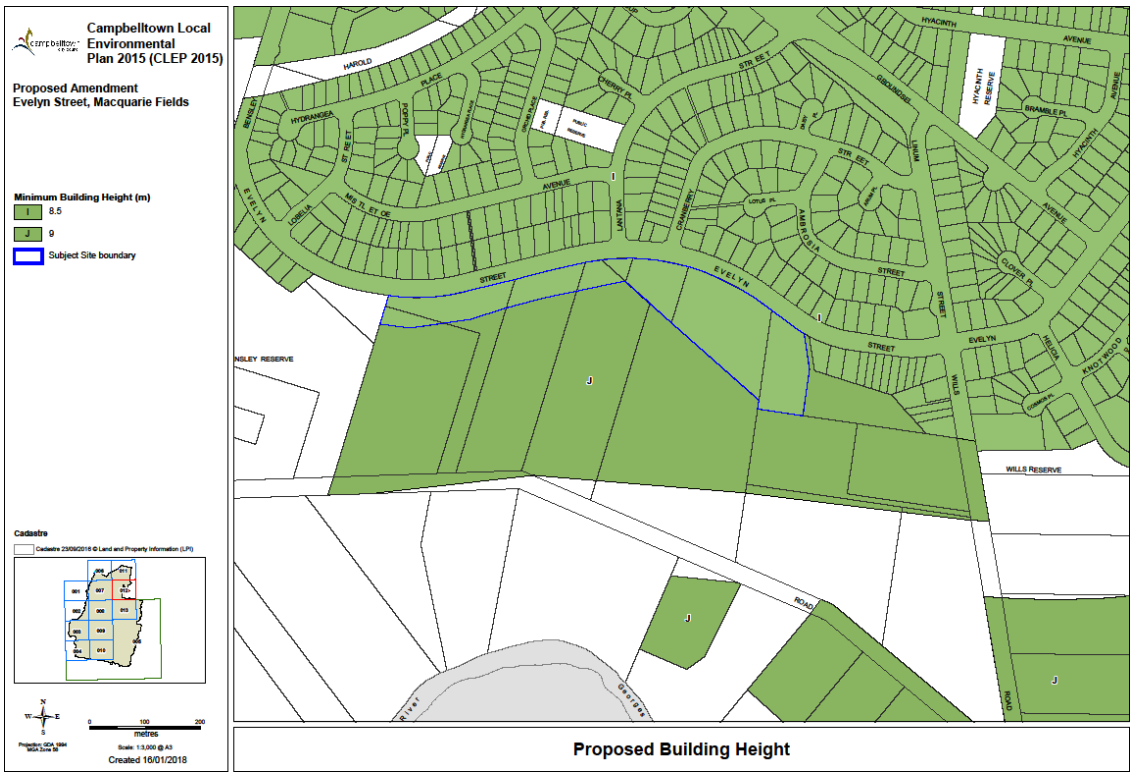


Proposed Land Zoning

Annexure 1 (b) – Changes to Height of Buildings Map

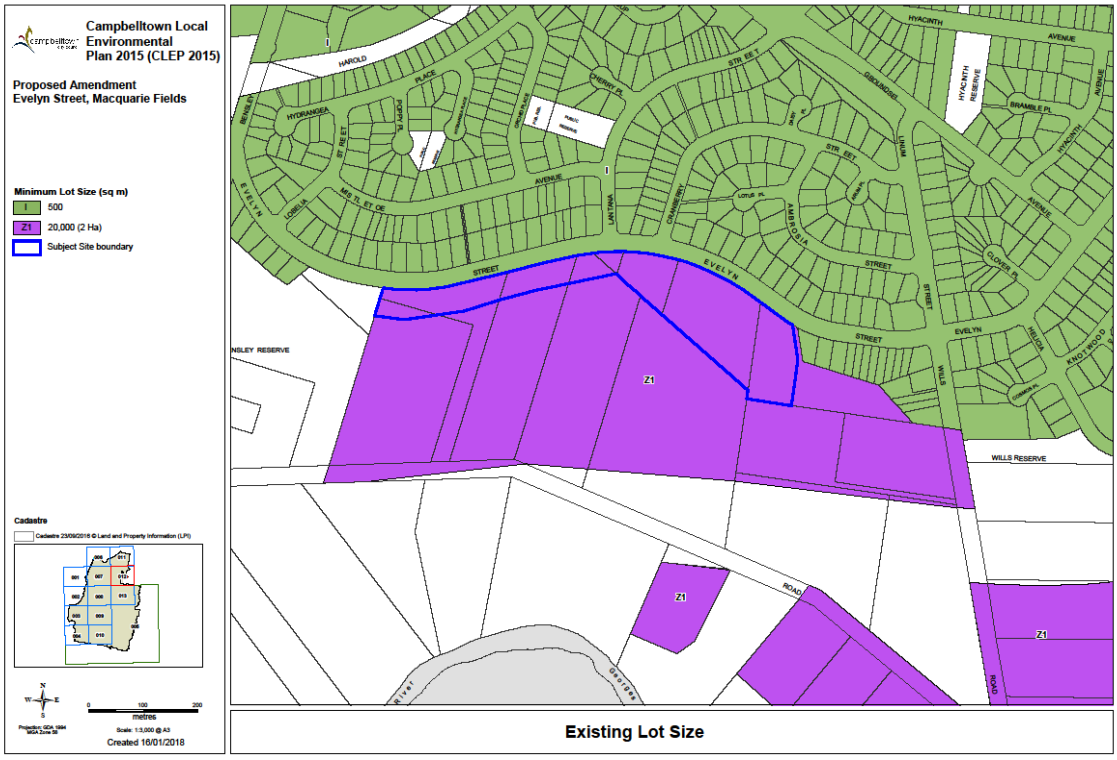


Existing Building Height

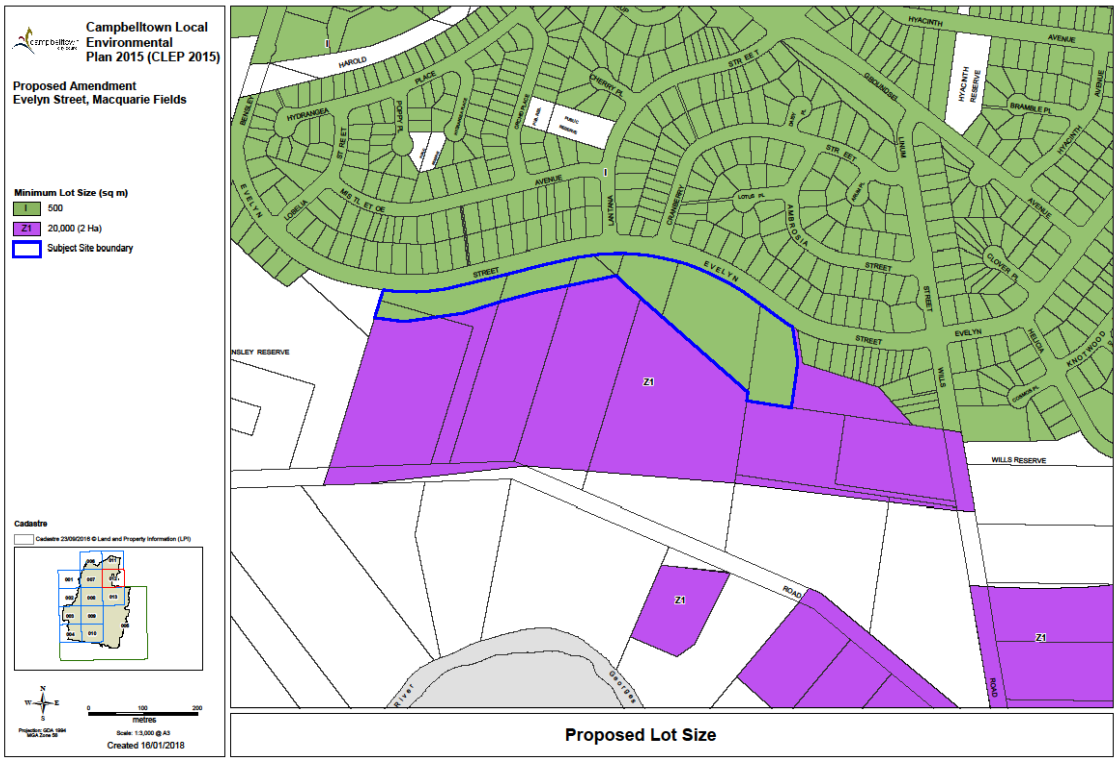


Proposed Building Height

Annexure 1 (c) – Changes to Minimum Lot Size Map

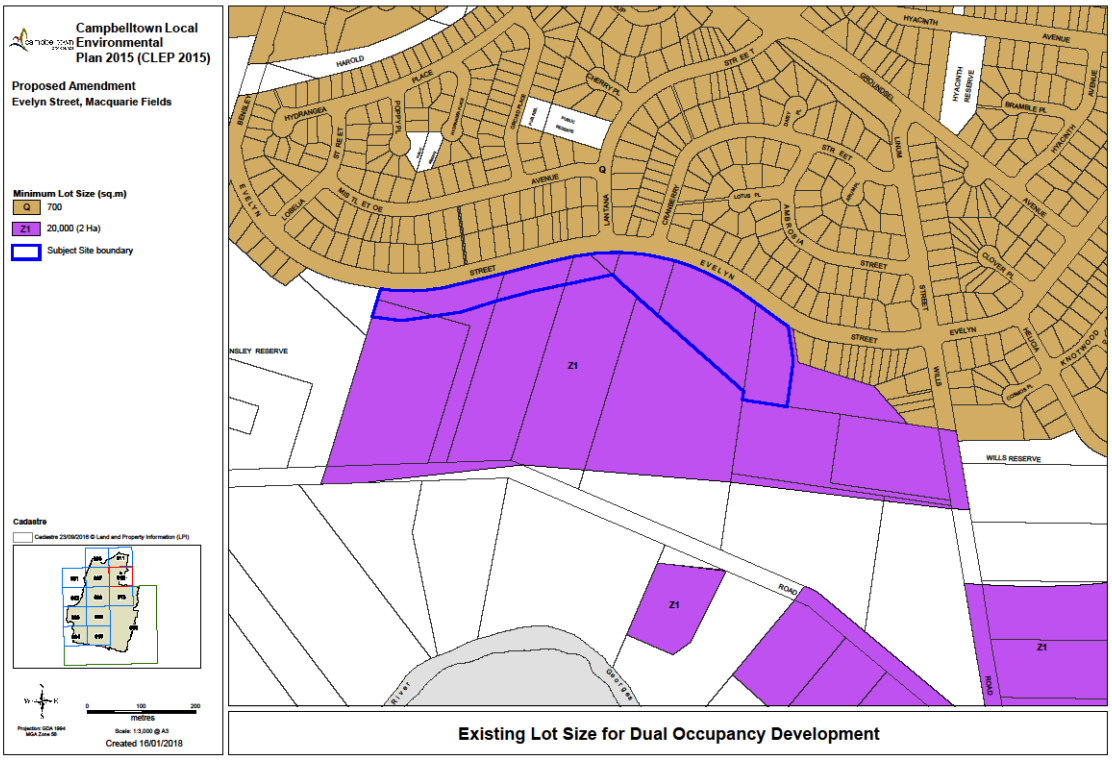


Existing Lot Size

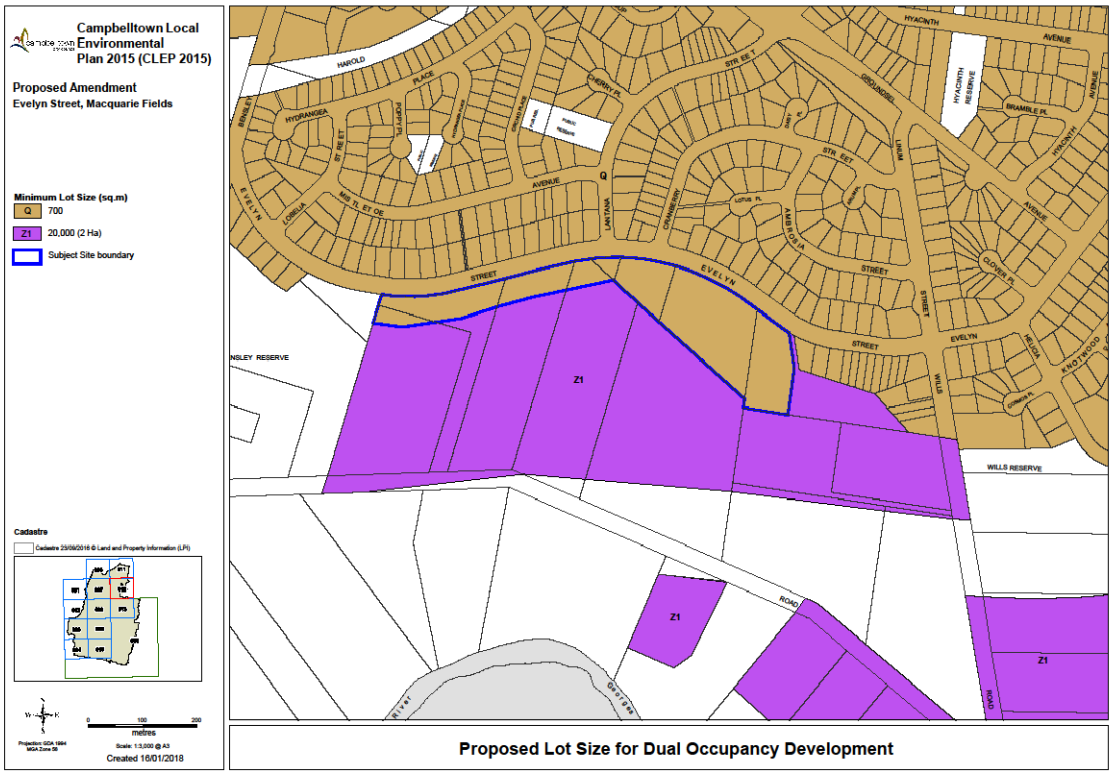


Proposed Lot Size

Annexure 1 (d) – Changes to Dual Occupancy Minimum Lot

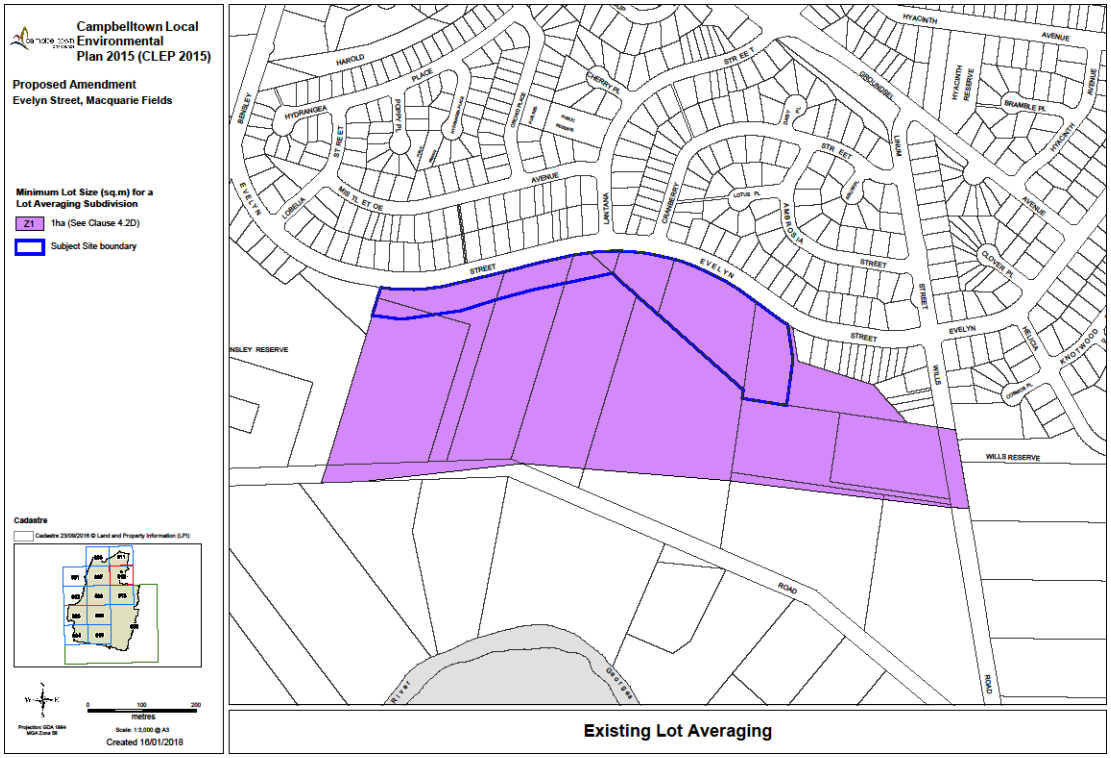


Existing Lot Size for Dual Occupancy Development

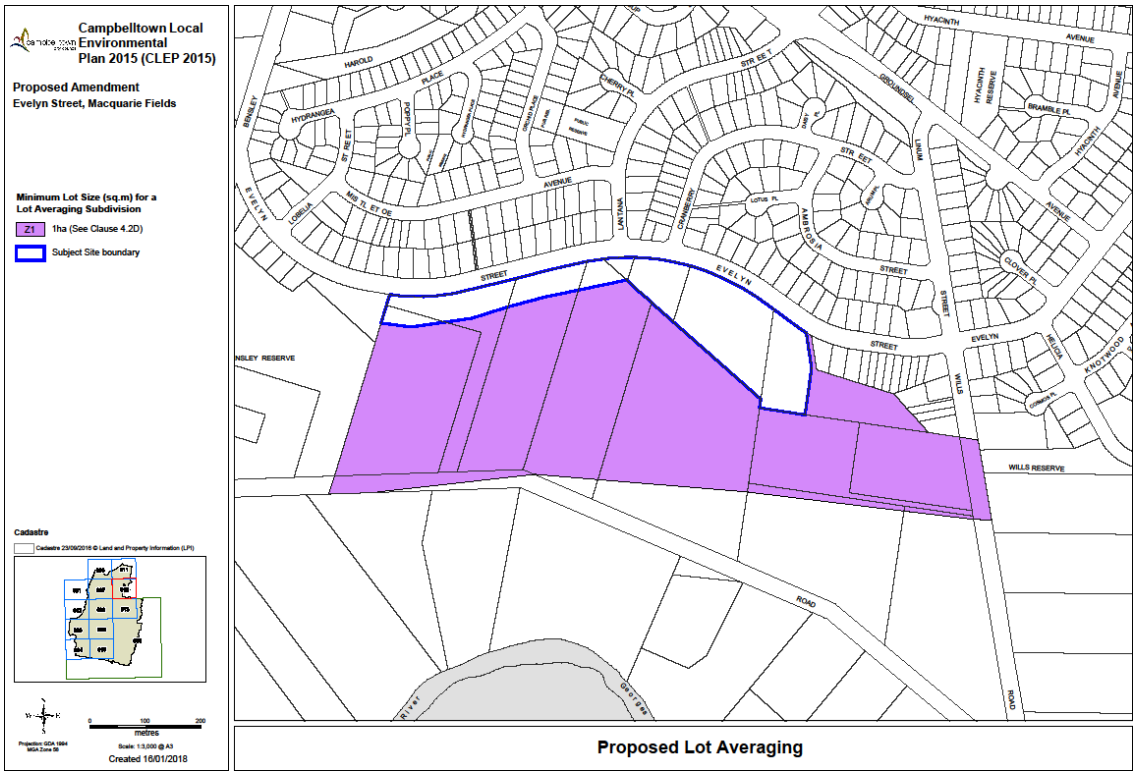


Proposed Lot Size for Dual Occupancy Development

Annexure 1 (e) – Changes to Minimum Lot Size for Lot Averaging



Existing Lot Averaging



Proposed Lot Averaging

Annexure 2 – Strategic Context

Table 1: Greater Sydney and Western City District Plan

Key Directions and Planning Priorities			
Greater Sydney Region Plan	**Western City District Plan**	**Consistency**	**Response**
Infrastructure and Collaboration			
A City Supported by Infrastructure			
» *Infrastructure supports the three cities* » *Infrastructure aligns with forecast growth - growth infrastructure compact* » *Infrastructure adapts to meet future needs* » *Infrastructure use is optimised*	» *Planning for a city supported by infrastructure (W1)*	Generally Consistent	The proposal represents a small urban extension on the fringe of a serviced urban area (notionally 24 lots). Initial reports including Sydney Water communication attest to the ability to service the proposal, subject to minor augmentation works. Therefore, it is considered that the PP is generally consistent with the objectives within the direction 'A City Supported by Infrastructure.'
A Collaborative City			
» *Benefits of growth realised by collaboration of governments, community and business*	» *Working through collaboration (W2)*	Generally Consistent	Whilst, the Proposal is not identified in the plan as a specific Collaboration Area, the PP would will entail compulsory community engagement and consultation with authorities/agencies in accordance with a new Gateway Determination. Therefore, the Proposal can be considered consistent with the objectives of 'A Collaborative City'
Liveability			
A City for People			
» *Services and infrastructure meet communities' changing needs* » *Communities are healthy, resilient and socially connected* » *Greater Sydney's communities are culturally rich with diverse neighbourhoods*	» *Providing services and social infrastructure to meet peoples changing needs (W3)* » *Fostering healthy, creative, culturally rich and socially connected communities (W4)*	Generally Consistent	The proposal does not propose any additional education or health facilities as the proposed yield will not impact significantly on the existing social infrastructure. It also provides a platform for a small socially connected extension to the existing community. Contributions would be paid by the additional allotments, pursuant to Campbelltown Local

» *Greater Sydney celebrates the arts and supports creative industries and innovation*			Infrastructure Contributions Plan 2018. Therefore, the proposal can be considered consistent with the objectives of 'A City for People'.
Housing the City			
» *Greater housing supply* » *Housing is more diverse and affordable*	» *Providing housing supply, choice and affordability, with access to jobs, services and public transport (W5)*	Generally Consistent	The proposal proposes a small cell of approximately 24 allotments that will cater for conventional and a housing/lifestyle opportunity rarely catered for in Campbelltown's current housing provision. Housing affordability is more than adequately catered for in the urban release and urban renewal housing programs. Housing supply, however, does not adequately cater for diversity at the 'lifestyle/environmental living' / larger lot end of the housing spectrum. The proposal would importantly contribute to the subject emerging housing void in a location with adequate access to Campbelltown LGA employment opportunities and city facilities and services, including the nearby Glenquarie and Ingleburn local centres. Therefore, whilst not addressing affordability (which is more than adequately catered for in the urban release and urban renewal housing programs) the proposal importantly addresses an emerging void in housing diversity and can be considered generally consistent with the objectives of 'Housing the City.'
A City of Great Places			
» *Great places that bring people together* » *Environmental heritage is identified, conserved and enhanced*	» *Creating and renewing great places and local centres, and respecting the District's heritage (W6)*	Generally Consistent	The proposal's intent is to create a place that sensitively integrates with the existing community and conserves important elements of the natural environment.

			The proposal has the potential to meet the objectives of 'A City of Great Places' and therefore can be considered consistent.
Productivity			
A Well Connected City			
» *A metropolis of three cities -integrated land use and transport creates walkable and 30 minute cities* » *The Eastern, GPOP and Western Economic corridors are better connected and more competitive and efficient* » *Freight and logistics network is competitive and efficient* » *Regional connectivity is enhanced*	» *Establishing the land use and transport structure to deliver a liveable, productive and sustainable Western Parkland City (W7)*	Generally Consistent	The proposal does not directly impact this Direction. It seeks to leverage off the established road network and relative proximity to existing centres and facilities and services. It also will integrate with local pedestrian/cycle networks. Therefore, the proposal can be considered consistent with the direction 'A Well Connected City.'
Jobs and Skills for the City			
» *Harbour CBD is stronger and more competitive* » *Greater Parramatta is stronger and better connected* » *Western Sydney Airport and Badgerys Creek Aerotropolis are economic catalysts for Western Parkland City* » *Internationally competitive health, education, research and innovation. precincts* » *Investment and business activity in centres* » *Industrial and urban services land is planned, protected and manager* » *Economic sectors are targeted for success*	» *Leveraging industry opportunities from the Western Sydney Airport and Badgerys Creek Aerotropolis (W8)* » *Growing and strengthening the metropolitan city cluster (W9)* » *Maximising freight and logistics opportunities and planning and managing industrial and urban services land (W10)* » *Growing investment, business opportunities and jobs in strategic centres (W11)*	Generally Consistent	The Proposal does not directly impact this Direction. It provides a potential housing environment for a skilled workforce and/or local business people sparingly catered for to date. Therefore, the proposal can be considered consistent with the direction 'Jobs and Skills for the City.'
Sustainability			

A City in its Landscape			
» *The coast and waterways are protected and healthier* » *A cool and green parkland city in the South Creek corridor* » *Biodiversity is protected, urban bushland and remnant vegetation is enhanced* » *Scenic and cultural landscapes are protected* » *Environmental, social and economic values in rural areas are protected and enhanced* » *Urban tree canopy cover is increased* » *Public open space is accessible, protected and enhanced* » *The Green Grid links, parks, open spaces, bushland and walking and cycling paths*	» *Protecting and improving the health and enjoyment of the District's waterways (W12)* » *Creating a Parkland City urban structure and identity with South Creek as a defining spatial element (W13)* » *Protecting and enhancing bush land and biodiversity (W14)* » *Increasing urban tree canopy cover and delivering Green Grid connections (W15)* » *Protecting and enhancing scenic and cultural landscapes (W16)* » *Better managing rural areas (W17)* » *Delivering high quality open space (W18)*	Generally Consistent	The proposal provides an opportunity as part of the limited urbanisation of the site to achieve environmental outcomes that would alternatively not be achieved. The principles of an appropriate stormwater management strategy have been developed and coupled with standard sediment and erosion control measures would need to deliver neutral or beneficial water quality outcomes. The remnant vegetation, would largely be retained in a managed landscape unit which is currently unmanaged. Street plantings and domestic plantings will compensate in part for any vegetation loss. All DA's for subdivision would need to comply with the provisions of the Biodiversity Conservation Act, terrestrial biodiversity conservation provisions of CLEP 2015 and Koala SEPP 2021. Other mechanisms including building envelope plans and restrictions on title in the proposed managed vegetated landscape can be enforced through a relevant DCP amendment at subdivision stage to minimise the impact on vegetation.
An Efficient City			
» *A low carbon city contributes to net-zero emissions by 2050 and mitigates climate change* » *Energy and water flows are captured, used and re-used* » *More waste is re-used and recycled to support*	» *Reducing carbon emissions and managing energy, water and waste efficiently (W19)*	Generally Consistent	The proposal, through the managed vegetated landscape together with street tree, domestic planting, initiatives and the potential purchase of biodiversity credits would potentially compensate for any limited carbon emissions. Additionally, passive solar design principles beyond the BASIX can

the development of a circular economy			be detailed in the relevant DCP amendment. Also on-site capacity exists for managing green waste. Therefore, the proposal can be considered consistent with the direction 'An Efficient City.'
A Resilient City			
» *People and places adapt to climate change and future shocks and stresses* » *Exposure to natural and urban hazards is reduced* » *Heatwaves and extreme heat are managed*	» *Adapting to the impacts of urban and natural hazards and climate change (W20)*	Generally Consistent	The proposal will likely produce an outcome which is at least neutral in terms of hazard management. The conserved natural areas and street and domestic plantings would likely contribute to combating any urban heat generation. Whilst, the remnant vegetation would be managed in accordance with the principles of Planning for Bushfire Protection 2019. The land is "high" in the drainage catchment and not subject to flooding. Further a controlled stormwater management system would prevent the prospects of flooding. Therefore, the proposal can be considered consistent with the direction 'A Resilient City.'

Table 2: Campbelltown Local Strategic Planning Statement (CLSPS)

Local Strategic Planning Statement	
Action	Comment
Liveability - A Vibrant, Liveable City	
Planning Priority 1 - Creating a great place to live, work, play and visit	
Strategic Policy Positions: • Our people are our most valued asset • Our city is an inclusive place for all people	
1.11 Support the creation of walkable neighbourhoods to enhance community health and wellbeing and create liveable, sustainable urban areas.	The proposal would provide opportunities for pedestrian integration with the surrounding neighbourhood including access to local sport and recreation facilities and bus stops.
1.16 Maximise urban shade by protecting existing trees, ensuring new developments incorporate	The proposal would protect many of the exiting trees, together with new property owners managing the conservation of an onsite vegetation outside of building

appropriate landscaping and by increasing planting in the open space areas and streetscapes.	envelopes, coupled with enhanced street tree planting and 'domestic' plantings.
1.17 Ensure open space is well connected via pedestrian and cycle links.	The proposal would provide for integration with local pedestrian and cycle links.
1.22 Investigate opportunities to deliver an integrated active transport plan and network (for cyclists and pedestrians) that links important destinations with transport infrastructure between urban development, the open space network and with adjoining areas.	The proposal provides limited opportunities to integrate with the existing accessibility network.
1.25 Support the health and well-being of the community through master planning (including that of key public spaces) and encouraging healthy urban design outcomes, particularly for children, seniors and people with a disability.	The precinct links with the existing accessibility network as referenced above. Additionally, the larger scale residential settings would provide enhanced opportunities for healthy living including on-site leisure and recreation and domestic food production/gardening.
Planning Priority 2 – Creating high quality, diverse housing	
Strategic Policy Positions: • Contain urban growth within the existing urban area or within the identified priority growth and urban investigation areas • Housing supply, diversity, choice and quality respond to community needs and contribute to housing requirements at the District level	
2.1 Develop a comprehensive Local Housing Strategy for Campbelltown LGA that identifies and prioritises the areas for growth having regard to housing demand, growth trends and the existing and likely future housing stock.	The CLHS has identified the potential for Large Lot housing to cater for professionals, this being one of the central markets/audiences of the proposal.
2.5 Contain Urban Development to existing urban areas and within identified growth and investigation areas, in order to protect the functions and values of scenic lands, environmentally sensitive lands and the Metropolitan Rural Area (MRA)	The land is identified in the CLSPS as a "potential transition area", acknowledging opportunities for limited transitionary residential development.
2.12 Promote housing diversity through local planning controls and initiatives.	The proposal provides a unique opportunity to add more diversity to the local housing offer via providing larger lots in an attractive environmental setting, whilst retaining ready access to urban services.
2.15 Ensure that sufficient, quality and accessible open space is provided for new urban areas.	Sufficient accessible open space is provided nearby.
Planning Priority 3 - Embracing our heritage and cultural identity	
Strategic Policy Positions: • Our heritage is respected as a fundamental part of our identity • Our city embraces its Indigenous heritage and culture • Our diverse cultural mix is an asset for our city	
3.6 Identify and promote the conservation of environmental heritage and sensitive environmental areas including the Georges River Corridor Landscape, Scenic Hills and Wedderburn.	The more sensitive ecological areas would be subject to the Terrestrial Biodiversity Provisions detailed in clause 7.20 of the CLEP 2015 and relevant mapping in the recently adopted CLEP 2015 (Amendment No 24), together with the provisions of the Biodiversity Conservation Act 2016 and SEPP (Koala Habitat Protection) 2021. Additionally, the stormwater management principles developed by Council and standard sediment and

	erosion control measures will assist in protecting the Georges River Corridor.
3.7 Manage development outcomes having appropriate regard to environmental and heritage considerations.	The concept subdivision layout (as amended) demonstrates minimum vegetation loss and facilitates planting initiatives on private land.
Sustainability - A respected and Protected Natural Environment	
Planning Priority 5 – Embracing our unique landscape setting.	
Strategic Policy Positions: • Campbelltown is a City of choice and opportunity in a natural environment • Our scenic and natural city edges are protected into the future • We celebrate the First Nations People as the traditional custodians of our land, and embrace their knowledge in the stewardship of our natural environment. • Our multicultural community is celebrated and embraced.	
5.6 Work in collaboration with relevant stakeholders to review and implement the recommendations of the Visual Analysis of Campbelltown's Scenic Hills and East Edge Scenic Protection Lands study.	The proposal is consistent with the evolving character expectations in respect of the East Edge Scenic Protection Lands.
5.7 Develop an asset management plan for scenic and cultural landscapes.	The proposal potentially assists in managing the somewhat degraded naturally occurring woodland.
5.10 Ensure development in undertaken in accordance with relevant legislation to preserve and/or enhance scenic and cultural landscapes	The proposal aims to minimise development impacts on the existing natural environment and facilitate increased ownership/stewardship of the retained vegetation. The proposal would ensure statutory requirements are met in pursuit of the conservation objectives attached to the Scenic Landscapes.
5.11 Promote community management of scenic hills and cultural landscapes in LGA	Increased private ownership would enhance stewardship of the remnant woodland.
5.16 Continue to require sediment and erosion control measures in all development, to assist in maintaining water quality and catchment health.	Additionally, the stormwater management principles developed by Council and standard sediment and erosion control measures would assist in protecting the Georges River Corridor.
5.17 Expand the terrestrial biodiversity layer in the LEP to cover the whole LGA.	The recently finalised draft CLEP 2015 review expands the terrestrial biodiversity layer to include the subject site and accordingly the enactment of clause 7.20 of CLEP 2015.
5.18 Work in partnership with Government and key stakeholders, including the development industry, to ensure that future development is undertaken in a manner that protects areas of biodiversity value.	To ensure the best outcome occurs for this precinct, appropriate consultation needs to occur with Authorities and the community as the proposal is advanced.
Planning Priority 6 – Respecting and Protecting our natural assets	
Strategic Policy Positions: • We conserve and protect our rich and diverse biodiversity • We contribute measurable improvements to local air and water quality • We will ensure that natural bushland and open spaces are accessible, attractive and safe places for recreation and wellbeing	
6.3 Expand the terrestrial biodiversity layer in the LEP to cover the whole LGA.	The recently finalised draft CLEP 2015 review expands the terrestrial biodiversity layer to include the subject site and accordingly the enactment of Clause 7.20 of CLEP 2015.
6.25 Work towards residents being a maximum 400 from quality open space.	The proposal generally fulfils this objective.
Productivity – A thriving, attractive city	
Planning Priority 8 – Adapting to climate change and building resilience	

Strategic Policy Positions: • We will increase out city's resilience to ensure our future prosperity. • We strive to embed the delivery of low resource, low carbon solutions • We will adopt best practice in mitigating and adapting to climate change. • We will address the urban heat island effect and implement innovative ways to cool our LGA to maintain liveable standards for a healthy community.	
8.29 Work with key stakeholders to protect waterways, riparian vegetation and environmental values.	Key stakeholders would be consulted through the planning phase to ensure that biodiversity is protected and conserved in an appropriate manner.

Planning Proposal

Evelyn Street, Macquarie Fields

Proposed amendment of Campbelltown Local Environmental Plan 2015

(Addendum – 28 October 2021)

Introduction

The Addendum has been compiled in response to additional investigations / documentation commissioned in respect of Conditions 1 (a) and (b) of the Gateway Determination dated 10 June 2021 and reproduced as Attachment "A1".

Documentation/Additional Investigations

The additional investigations / documentation included in the following and form Attachments "B1-B5" included to this Addendum

- Biodiversity Assessment Report (Cumberland Ecology) – 6 October 2021 – Attachment "B1
- Vegetation Assessment Report (Cumberland Ecology) – 7 October 2021 – Attachment "B2"
- Bushfire Assessment Report (Bushfire Consulting Services Pty Ltd) – 8 October 2020 Attachment "B3"
- Stormwater Management Report V.2 (as amended) – 2 July 2021 (Statiker) – Attachment "B4"
- Amended Concept Plan, Zoning Map and Minimum Lot Size Map (Plan zone Drawings Revision No.12) Attachment "B5"

Response to Pre-Exhibition Gateway Requirements

1(a)(i) Koala Habitat

(Is the site host to koala habitat or core koala habitat)

All of the woodland (on the northeastern portion of the site) is established in the Vegetation Assessment Report (Attachment B2) to comprise core koala habitat under Koala SEPP 2021 and align with areas of mapped core koala habitat under the Campbelltown Comprehensive Koala Plan of Management (CKPoM).

Development Application(s) for future subdivision would require further assessment in accordance with Section 6.4 and 7.1 of the CKPoM. Any proposed vegetation clearance would need to be supported by a Koala Assessment Report (KAAR) prepared in accordance with the CKPoM.

Consistency with Section 9.1 Direction 2.1 – Environmental Protection Zones

The Direction seeks to ensure that environmentally sensitive areas are not compromised.

The Planning Proposal is considered to be justifiably inconsistent with the Direction (6(b) and of minor significance 6(d), as documented in the Biodiversity Assessment Report (Attachment B1).

Notwithstanding, future development would likely trigger the Biodiversity Offset Scheme (BOS) provisions and require the preparation of a Biodiversity Development Assessment Report (BDAR) in accordance with the Biodiversity Assessment Method (BAM). Additionally, should significant threatened species be impacted, the EPBC Act may be triggered and require referral to the Commonwealth.

Draft Cumberland Plain Conservation Plan – Important Koala Habitat

When determining the rezoning area and extent, the existing mapping for the site under the Campbelltown LEP was considered. The subject site partly contains areas mapped as 'Terrestrial Biodiversity' under the Campbelltown LEP (Part 7 Clause 7.20) likely in association with the existing broad scale mapping of native vegetation within the subject site.

The objectives of this clause includes:

- protecting native fauna and flora, and
- protecting the ecological processes necessary for their continued existence, and
- encouraging the conservation and recovery of native fauna and flora and their habitats, and
- maximising connectivity and minimising habitat fragmentation.

It is assumed that the potential impacts associated with native vegetation in the Planning Proposal are an accurate surrogate for potential impacts to areas mapped as Terrestrial Biodiversity. As such, potential impacts to these areas are confined to the rezoning area, with other areas of vegetation mapped as Terrestrial Biodiversity retained within the subject site. The potential impacts to this area also continue to allow for movement in an east-west direction through the subject site and does not result in the isolation or fragmentation of any of the mapped areas.

SEPP (Koala Habitat Protection) 2021 and Campbelltown City Council – Comprehensive Koala Plan

Clause 10 of the SEPP contains the following provisions relating to "Preparation of local environmental plans:"

When preparing draft local environmental plans for any land to which this Policy applies, other than rural land, the council shall:

(a) have regard to the general and specific aims of the Policy, and

(b) give priority to retaining bushland, unless it is satisfied that significant environmental, economic or social benefits will arise which outweigh the value of the bushland.

The land to the west of the site is zoned for public open space. The overall proposed rezoning would have no impact on the general and specific aims of the policy given that the rezoning has an extremely minor interface with that land (a potentially 30 metre lot depth interface).

In relation to Clause 10(b), the proposal would not result in the reduction or loss of any bushland adjoining the site subject to the planning proposal and rezoning.

Further consideration would also be occur at the Development Application stage to ensure all future plans are also consistent with the SEPP.

(ii) Proposed Impacts on Biodiversity Values

(Demonstrate the impacts and present options to address development impacts that will either minimise vegetation and threatened species (loss) or detail a formalised biodiversity offset strategy.)

A formalised BOS would be required due to an inability to avoid higher quality vegetation at the development application stage for future subdivision/s.

The potential impact on biodiversity values can be drawn from reference to the Biodiversity Assessment Report at Attachment B1.

Consistency with SEPP No. 19 Bushland in Urban Areas

The SEPP aims to protect and preserve bushland in urban areas.

Under the SEPP (Koala Habitat Protection) 2021 (Koala SEPP 2021), a Development Application (DA) must assess the impacts of the development on koalas where there is no KPoM in place. These impacts need to be considered through the preparation of a Koala Assessment Report if the property the development takes place on is greater than one hectare, or adjacent land holdings by the same land holder combined exceed one hectare, and Core Koala Habitat is present. If a KPoM is in place for a specified LGA or parts thereof, a Planning Proposal is required to demonstrate consistency with the relevant approved KPoM.

Demonstrating consistency with a KPoM also demonstrates consistency with the Koala SEPP 2021. In order to show consistency with the Campbelltown's approved [Comprehensive] Koala Plan of Management (CKPoM) and therefore the Koala SEPP 2021, Cumberland Ecology has prepared a Vegetation Assessment Report (VAR) to support the planning proposal (REF 16066RP4 – Attachment B2). Further information on how the Planning Proposal is consistent with the Koala SEPP 2021 and the CKPoM is discussed in the VAR (16066RP4- Attachment B2) and the Biodiversity Assessment Report (16066RP3 – Attachment B1).

Consistency with CLE P2015 Clause 7.20 Terrestrial Biodiversity

The Draft Cumberland Plain Conservation Plan (DCPCP) includes a koala conservation program that is designed to avoid, minimise and offset potential impacts on koalas and aims to have a long term strategy to protect koalas and koala habitat in South Western Sydney. Several areas of the subject site and rezoning area are mapped as Important Koala Habitat under the DCPCP likely in association with native vegetation mapped as Cumberland Plain Woodland. While the Planning Proposal intends to rezone areas containing Important Koala Habitat, extensive mapped areas within and surrounding the subject site will be retained – including large areas to the south bordering the Nepean River. Further consideration of the rezoning area at the Development Application stage would ensure all future plans are consistent with the DCPCP.

1(b) Bushfire Protection Report Update

(Update the Bushfire Report to reflect the site boundaries and proposed concept plan)

A new Bushfire Assessment Report was compiled by Bushfire Consulting Services Pty Ltd (dated 8 October 2021). The Report forms Attachment (B3) to this Addendum.

Consistency with Bushfire Protection, 2019

The Report concluded that development of the nature portrayed in the Concept Plan can achieve Asset Protection Zones (APZs) equivalent to a minimum BAL 29 and further satisfies the objectives and performance requirements of Planning for Bushfire Protection. 2019 subject to implementation of the recommendations contained in the Report.

Consistency with Section 9.1 Direction 4.4 – Planning for Bushfire Protection

Direction 4.4

The Direction seeks to protect life, property and the environment from bushfire hazards, whilst encouraging sound management of bushfire prone areas and discouraging incompatible landuse.

In accordance with the Direction, consultation was undertaken with the NSW Rural Fire Service who raised no objection at a strategic level to the Planning Proposal.

Future development applications would, however, be required to demonstrate compliance with Planning for Bushfire Protection 2019.

Amended Mapping

It is noted that the part of area previously proposed to be rezoned R2 Low Density Residential with a 500 m^2 minimum lot size is now proposed to remain zoned E4 Environmental Living with a 1,000 m^2 minimum lot size provision. (Refer to Planzone Drawing No. RZ02 and No. LSZ02 respectively in attachment “B5”).

The subject amendments seek to reflect the sensitivities identified in the updated ecological and bushfire reports.

Attachment "A1"

Gateway Determination (10 June 2021)

(PP-2021-3506) IRF21/2391

Ms Lindy Deitz
General Manager
Campbelltown City Council
PO Box 57
CAMPBELLTOWN NSW 2560

Attention: Mr Graham Pascoe

Dear Ms Deitz

Planning proposal PP-2021-3506 to amend Campbelltown Local Environmental Plan 2015

I am writing in response to Council's request for a Gateway determination under section 3.34(1) of the *Environmental Planning and Assessment Act 1979* (the Act) and additional information received on date 17 May 2021, in respect of the planning proposal to rezone land fronting Evelyn Street, Macquarie Fields from E4 Environmental Living to R2 Low Density Residential.

As delegate of the Minister for Planning and Public Spaces, I have now determined that the planning proposal should proceed subject to the conditions in the enclosed Gateway determination. I have conditioned the Gateway for Council to be authorised as the local plan-making authority.

The amendment to the local environmental plan (LEP) is to be finalised within 12 months of the date of the Gateway determination. While a condition of the Gateway determination requires the proposal to be exhibited and reported to Council for determination by 29 April 2022, given the history of this planning proposal, Council is encouraged to finalise the plan-making process as soon as possible. Council's request to draft and finalise the LEP should be made directly to Parliamentary Counsel's Office six weeks prior to the projected publication date. A copy of the request should be forwarded to the Department of Planning, Industry and Environment.

The state government is committed to reducing the time taken to complete LEPs by tailoring the steps in the process to the complexity of the proposal, and by providing clear and publicly available justification for each plan at an early stage. In order to meet these commitments, the Minister may take action under section 3.32(2)(d) of the Act if the time frames outlined in this determination are not met.

Should you have any enquiries about this matter, I have arranged for Mr Stuart McIntosh to assist you. Mr McIntosh can be contacted on 9995 5821.

Yours sincerely

10 June 2021

Adrian Hohenzollern
Director, Western
Central River City and Western Parkland City
Greater Sydney, Place and Infrastructure
Department of Planning, Industry and Environment

Delegate of the Minister for Planning and Public Spaces

Encl: Gateway determination
Authorised plan-making reporting template

Gateway Determination

***Planning proposal (Department Ref: PP-2021-3506)**: to rezone land fronting Evelyn Street, Macquarie Fields from E4 Environmental Living to R2 Low Density Residential.*

I, the Director Western, Central River City and Western Parkland City, at the Department of Planning, Industry and Environment, as delegate of the Minister for Planning and Public Spaces, have determined under section 3.34(2) of the *Environmental Planning and Assessment Act 1979* (the Act) that an amendment to the Campbelltown Local Environmental Plan (LEP) 2015 to rezone land fronting Evelyn Street, Macquarie Fields from E4 Environmental Living to R2 Low Density Residential should proceed subject to the following conditions:

1. Prior to public exhibition, Council is to:
   (a) update the Flora and Fauna Report to reflect the site boundary and proposed concept plan and:
      i. determine if the site is host to koala habitat or core koala habitat and demonstrate consistency with: Section 9.1 Direction 2.1 Environmental Protection Zones; draft Cumberland Plain Conservation Plan - Important Koala Habitat; SEPP (Koala Habitat Protection) 2021; and Campbelltown City Council's Comprehensive Koala Plan of Management.
      ii. show the proposed impacts to biodiversity values, and present options to address development impacts that will either minimise vegetation and threatened species or detail what is required in a formalised biodiversity offset strategy, and demonstrate consistency with SEPP No.19 Bush Land in Urban Areas and Clause 7.20 Terrestrial Biodiversity of LEP 2015.
   (b) Update the Bush Fire Report to reflect the site boundary and proposed concept plan and demonstrate consistency with Planning for Bush Fire Protection 2019, and Section 9.1 Direction 4.4 Planning for Bush Fire.

2. Public exhibition is required to start prior to 1 November 2021, under section 3.34(2)(c) and schedule 1 clause 4 of the Act as follows:
   (a) the planning proposal must be made publicly available for a minimum of 28 days; and
   (b) the planning proposal authority must comply with the notice requirements for public exhibition of planning proposals and the specifications for material that must be made publicly available along with planning proposals as identified in section 6.5.2 of *A guide to preparing local environmental plans* (Department of Planning and Environment, 2018).

3. Consultation is required with the following public authorities/organisations under section 3.34(2)(d) of the Act and/or to comply with the requirements of relevant section 9.1 Directions:

   - NSW Rural Fire Service
   - Environment, Energy and Science Group
   - Transport for NSW
   - Sydney Water
   - Telstra
   - Endeavour Energy
   - Jemena

   Each public authority/organisation is to be provided with a copy of the updated planning proposal and any relevant supporting material prior to public exhibition and given at least 21 days to comment on the proposal.

4. A public hearing is not required to be held into the matter by any person or body under section 3.34(2)(e) of the Act. This does not discharge Council from any obligation it may otherwise have to conduct a public hearing (for example, in response to a submission or if reclassifying land).

5. The planning proposal authority is authorised as the local plan-making authority to exercise the functions under section 3.36(2) of the Act subject to the following:

   (a) the planning proposal authority has satisfied all the conditions of the Gateway determination;
   (b) the planning proposal is consistent with section 9.1 Directions or the Secretary has agreed that any inconsistencies are justified; and
   (c) there are no outstanding written objections from public authorities.

6. The time frame for completing the LEP is to be 12 months following the date of the Gateway determination. To ensure this timeframe is met, Council is required to publicly exhibit the planning proposal and report the proposal to Councillors for determination by 29 April 2022.

Dated 10 June 2021.

Adrian Hohenzollern
Director Western,
Central River City and Western Parkland City
Greater Sydney, Place and Infrastructure
Department of Planning, Industry and Environment

Delegate of the Minister for Planning and Public Spaces

Attachment "B1"

Biodiversity Assessment Report

(Cumberland Ecology – 6 October 2021)

Biodiversity Assessment Report

Evelyn Street, Macquarie Fields Planning Proposal

Evelyn Street Landowners Group

7 October 2021

Final

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Report No. 16066RP3

The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or commendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology.

Version	Date Issued	Amended by	Details
v1	7/10/2021	JL, GK	Final

Approved by:	Dr David Robertson
Position:	Director
Signed:	David Robertson
Date:	6 October, 2021

Table of Contents

Table of Tables

Table of Photographs

Table of Appendices

Table of Figures

Glossary

Term/Abbreviation	Definition
BAM	Biodiversity Assessment Method
BC Act	NSW *Biodiversity Conservation Act 2016*
BC Regulation	NSW *Biodiversity Conservation Regulation 2017*
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offsets Scheme
Campbelltown LEP	Campbelltown *Local Environmental Plan 2015*
CKPoM	Campbelltown Comprehensive Koala Plan of Management
DA	Development Application
DBH	Diameter at Breast Height
DPIE	NSW Department of Planning, Industry and the Environment
EP&A Act	NSW Environmental Planning and Assessment Act
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FFA	Flora and Fauna Assessment
GIS	Geographic Information System
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
Koala SEPP 2021	*State Environment Planning Policy (Koala Habitat Protection) 2021*
KPoM	Koala Plan of Management
LGA	Local Government Area
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
Rezoning area	Area associated with the planning proposal for rezoning from E4 – Environmental living to R2 – Low Density Residential
Subject site	Properties associated with the planning proposal listed in Section 1.1
TEC	Threatened Ecological Community
The project	A planning proposal to amend the zoning for the rezoning area from E4 - Environmental Living to R2 – Low Density Residential under the Campbelltown LEP 2015
TSC Act	NSW *Threatened Species Conservation Act 1995*
VAR	Vegetation Assessment Report
WoNS	Weed of National Significance

1. Introduction

1.1. Purpose

Cumberland Ecology Pty Ltd (Cumberland Ecology) has been commissioned by Planzone, on behalf of the Evelyn Street Landowners Group ('the client'), to conduct a Biodiversity Assessment to support a planning proposal to amend the zoning for an area within the following properties:

- 85 Evelyn Street, Macquarie Fields (Lot 40 DP623486);
- 87 Evelyn Street, Macquarie Fields (Lot 305 DP263295);
- 89 Evelyn Street, Macquarie Fields (Lot 181 DP834233);
- 16 Oakley Road, Macquarie Fields (Lot 9 DP826459);
- 18 Oakley Road, Macquarie Fields (Lot 8 DP826459);
- 109 Evelyn Street, Macquarie Fields (Lot 100 DP261125); and
- The northern portion of 22 Oakley Road, Macquarie Fields (Lot 1 DP533662).

Note that the above listed properties are hereafter referred to collectively as the 'subject site' whilst the area to be rezoned is referred to as the 'rezoning area' (**Figure 1**). The planning proposal proposes to rezone the rezoning area from E4 – Environmental Living to R2 – Low Density Residential under the *Campbelltown Local Environmental Plan 2015* (Campbelltown LEP).

The purpose of this report is to address the ecological considerations described in the Department of Planning and Environment's Guide to Preparing Planning Proposals by describing current biodiversity values of the rezoning area and providing a high level assessment of the potential impacts of the planning proposal on flora and fauna (DPE 2018). For completeness, this assessment also considers the biodiversity values of the whole subject site to obtain and describe the potential impacts in the context of the larger area represented by the subject site. Particular attention is focussed on threatened species, populations and communities that are listed under the New South Wales (NSW) *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The specific objectives of this report are to:

- Describe the vegetation communities on the subject site;
- Describe fauna habitats and fauna usage of the subject site;
- Identify any threatened species, populations or ecological communities (as listed under the BC Act and/or EPBC Act) existing on the subject site;
- Assess the likelihood of occurrence of threatened species, populations or communities (as listed under the BC Act and/or EPBC Act) within the subject site;
- Describe potential future ecological assessment requirements that may apply at the development application (DA) stage;

- Provide a high level assessment of the potential impact of the likely future development on threatened communities, flora and fauna, including the completion of Tests of Significance under Section 7.3 of the BC Act; and
- Where relevant, recommend mitigation measures to reduce the impacts of the planning proposal and subsequent development on biodiversity values.

1.2. Background

1.2.1. Project Background

Cumberland Ecology has been involved in previous applications submitted by the client for the Planning Proposal. This involvement included the preparation of a Flora and Fauna Assessment (FFA) to support the project in October 2018 and a subsequent Response to Submissions in November 2019. Since this FFA was originally prepared in May 2017, both of these previously prepared documents were consistent with the planning provisions at the time, including the NSW *Threatened Species Conservation Act 1995* (TSC Act) and the *State Environment Planning Policy No. 44 – Koala Habitat Protection*. It is understood that the previous application submitted to Campbelltown Council was to be submitted to the NSW Department of Planning, Industry and Environment (DPIE) for Gateway Determination. As the timeframe for submission of the prior applications has since lapsed, the project requires reassessment using current state planning provisions resulting in the preparation of this report. These current state planning provisions include:

- NSW *Environmental Planning and Assessment Act (1979)* (EP&A Act);
- NSW *Biodiversity Conservation Act 2016* (BC Act);
- *State Environment Planning Policy* (Koala Habitat Protection) 2021 (Koala SEPP 2021); and
- Campbelltown's approved Koala Plan of Management (CKPoM).

Cumberland Ecology is also associated with the preparation of a Vegetation Assessment Report (VAR) to support the planning proposal. It is understood that the VAR is required to ensure the planning proposal is consistent with the *State Environmental Planning Policy (Koala Habitat Protection) 2021* and Campbelltown's approved Comprehensive Koala Plan of Management (CKPoM) and has been prepared as a separate document to this BAR (REF: 16066RP4).

1.2.2. Description of the Subject Site and Rezoning Area

The subject site is defined as the land within the lots listed in ***Section 1.1*** above. The subject site is 6.28 ha in area and is located wholly within the Campbelltown Council Local Government Area (LGA). The subject site is situated within the residential suburb of Macquarie Fields, located approximately 32 km south-west of the Sydney CBD. The subject site is surrounded by residential properties to the north and east and vegetation within the riparian corridor of the Georges River to the south. The subject site is situated on the southern frontage of Evelyn Street and extends in some areas to Oakley Road on the southern boundary. The subject site is within 1 km of a large tract of bushland that has a moderate degree of connectivity to vegetation associated with Holsworthy Military Base.

The rezoning area runs along the northern boundary of the subject site and covers areas within all the properties associated with the subject site. The rezoning area wholly contains the areas that are being proposed for rezoning from E4 – Environmental living to R2 – Low Density Residential under the Campbelltown LEP.

The subject site and rezoning area are shown on **Figure 1**.

1.2.3. Description of the Project

Planzone Consulting are acting on behalf of the Evelyn Street Landowners Group for submission of a rezoning planning proposal to Campbelltown City Council for the subject site. The planning proposal is for the rezoning of the 'rezoning area' in the northern portion of the subject site from E4 - Environmental Living to R2 - Low Density Residential. It is anticipated that the rezoning and subsequent subdivision will yield approximately 34 residential lots (including existing dwellings at numbers 85, 87 and 109 Evelyn Street) along the north of the subject site with an Evelyn Street frontage (**Figure 2**). The remainder of the subject site will be unaffected by the current planning proposal and will remain as E4 – Environmental Living.

1.3. Relevant Legislation

1.3.1. Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), any action (which includes a development, Project or activity) that is considered likely to have a significant impact on Matters of National Environmental Significance (MNES) (including nationally threatened ecological communities and species and listed migratory species) must be referred to the Commonwealth Minister for the Environment. The purpose of the referral is to allow a decision to be made about whether an action requires approval on a Commonwealth level. If an action is considered likely to have a significant impact on MNES, it is declared a "controlled action" and Commonwealth approval is required.

As the rezoning area contains threatened entities listed under the EBPC Act, it is likely that a referral to the commonwealth will be required to accompany future Development Applications (DA).

1.3.2. NSW *Environmental Planning and Assessment Act 1979*

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) is the overarching planning legislation in NSW that provides for the creation of planning instruments that guide land use. The EP&A Act also provides for the protection of the environment, including the protection and conservation of native fauna and flora species. This includes threatened species, populations and ecological communities, and their habitats, as listed under the BC Act and NSW *Fisheries Management Act 1994*.

1.3.3. NSW *Biodiversity Conservation Act 2016*

The BC Act is the key piece of legislation in NSW relating to the protection and management of biodiversity and threatened species. The purpose of the BC Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development. The BC Act is supported by regulations, including the *Biodiversity Conservation Regulation 2017* (BC Regulation).

1.3.4. State Environmental Planning Policy (Koala Habitat Protection) 2021

State Environmental Planning Policy (Koala Habitat Protection) 2021 (Koala SEPP 2021) applies to the Campbelltown LGA as of 17 March 2021. It replaces the *State Environmental Planning Policy (Koala Habitat Protection) 2020* reverting to, for the most part, the changes legislated by *State Environmental Planning Policy (Koala Habitat Protection) 2019*, which in turn replaced the original State Environmental Planning Policy No. 44 – Koala Habitat Protection (SEPP 44) and proposed a number of changes to the older legislation. Under Koala SEPP 2021, any Koala Plan of Management (KPoM) approved under Koala SEPP 2019 or Koala SEPP 2020 remains an approved KPoM under Koala SEPP 2021.

Under the Koala SEPP 2021 a Development Application (DA) must assess the impacts of the development on koalas where there is no KPoM in place. These impacts need to be considered through the preparation of a Koala Assessment Report if the property the development takes place on is greater than one hectare, or adjacent land holdings by the same land holder combined exceed one hectare, and Core Koala Habitat is present. If a KPoM is in place for a specified LGA or parts thereof, a DA is required to demonstrate consistency with the relevant approved KPoM.

Demonstrating consistency with KPoM also demonstrates consistency with the *State Environmental Planning Policy (Koala Habitat Protection) 2021*. In order to show consistency with the Campbelltown's approved Comprehensive Koala Plan of Management (CKPoM), Cumberland Ecology has prepared a separate VAR to support the planning proposal (REF 16066RP4).

2. Methodology

2.1. Desktop Assessment

Mapping layers from The Native Vegetation of the Sydney Metropolitan Area (OEH 2016) and the Map of Threatened Ecological Communities in Greater Sydney (DPIE 2021) were reviewed to determine the potential vegetation communities present, including those that align to Threatened Ecological Communities (TECs) listed under the BC Act and/or EPBC Act.

Database analysis was conducted for the locality on 28 September 2021 using the NSW BioNet Atlas and the Commonwealth EPBC Act Protected Matters Search Tool. The locality is defined as the area within a 5 km radius of the subject site. The NSW BioNet Atlas and the Commonwealth Protected Matters Search Tool were examined for records of any threatened flora and fauna species listed under the BC Act and/or EPBC Act within the locality.

2.2. Field Surveys

2.2.1. Flora Survey

A flora survey was conducted on 26 August 2021 by a botanist and two ecologists from Cumberland Ecology. The flora survey consisted of the following:

- A random meander survey across the subject site to compile a species list and to map vegetation communities;
- A plot-based vegetation integrity assessment performed in accordance with the Biodiversity Assessment Method (BAM);
- Targeted searches for threatened flora species identified as being present within the locality and having the potential to be present by way of random meander; and
- Taking photographs of vegetation to provide a visual documentation of Plant Community Types (PCTs) present and their condition.

Identification of the PCTs occurring within the subject site was guided by the findings of the floristic survey. The data collected during surveys of the subject site was analysed in conjunction with a review of the PCTs held within the VIS Classification Database. Consideration was given to the occurrence within the Sydney Basin Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion and Cumberland IBRA Sub-regions. The locations of flora surveys within the subject site are shown in **Figure 3**.

2.2.1.1. Vegetation Mapping

Previous vegetation mapping of the subject site prepared by the former Office of Environment and Heritage (OEH) and DPIE were reviewed prior to the survey in order to determine vegetation communities that could occur within the subject site (OEH 2016, DPIE 2021). The vegetation within the subject site was ground-truthed by Cumberland Ecology. Vegetation community boundaries were made using a hand-held Global Positioning System (GPS) and mark-up of aerial photographs. The data collected was analysed and the resultant information was synthesised using a Geographic Information System (GIS) to produce a vegetation map of the subject site.

2.2.1.2. Random Meander

A flora survey was undertaken within the subject site via random meander. Flora species encountered during the random meander were noted to compile a species list for the subject site. The random meander also targeted threatened flora species known from the locality.

2.2.1.3. Vegetation Integrity Assessment

A vegetation integrity assessment was undertaken in the subject site in accordance with the BAM. Surveys included establishment of a single 20 m x 50 m plot within which the following data was collected:

- Composition for each growth form group by counting the number of native plant species recorded for each growth form group within a 20 m x 20 m floristic plot;
- Structure of each growth form group as the sum of all the individual projected foliage cover estimates of all native plant species recorded within each growth form group within a 20 m x 20 m floristic plot;
- Cover of 'High Threat Exotic' weed species within a 20 m x 20 m floristic plot;
    - Assessment of function attributes within a 20 m x 50 m plot, including:
    - Count of number of large trees;
    - Tree stem size classes, measured as 'diameter at breast height over bark' (DBH);
    - Regeneration based on the presence of living trees with stems <5 cm DBH;
    - The total length in metres of fallen logs over 10 cm in diameter;
- Assessment of litter cover within five 1 m x 1 m plots evenly spread within the 20 m x 50 m plot; and
- Number of trees with hollows that are visible from the ground within the 20 m x 50 m plot.

Four BAM plots were undertaken within the subject site, and the locations are shown in **Figure 3**.

2.2.2. Fauna Survey

2.2.2.1. Habitat Assessment

A fauna habitat assessment was conducted by an ecologist on 26 August 2021. The subject site was assessed for groundcover, shrub/understory cover, canopy cover, tree hollows as well as other habitat features such as bush rock, fallen trees and signs of fauna use such as scats, scratches and scrapings.

The nature and extent of fauna habitats in the subject site were assessed and areas where fauna species could reside or forage were identified. This included consideration of important indicators of habitat condition and complexity including the occurrence of microhabitats such as tree hollows, fallen logs, bush rock and wetland areas such as creeks and soaks.

An assessment of the structural complexity of vegetation, the age structure of the vegetation and the nature and extent of human disturbance throughout the subject site was also undertaken and considered. Tree hollows were used as a general indication of habitat quality for arboreal fauna and hollow-dwelling birds and

bats. Any hollows observed during surveys were recorded and the general vegetation condition and tree maturity was used to predict whether trees on site were likely to contain hollows.

During the habitat assessment, any fauna species seen or heard calling were recorded.

2.2.2.2. Koala Surveys

Surveys were undertaken for the Koala in September 2018, utilising the Spot Assessment Technique (SAT) methodology as outlined in Phillips and Callaghan (2011). A 50 m sampling grid was established over the subject site with a total of eight (8) SAT survey sites established across the subject site. Field assessments carried out at the SAT survey site included:

- Selection and sampling of a central mature Koala feed tree (or another species if no feed trees are present);
- Subsequent sampling of up to 29 of the trees closest to this central tree, i.e. a total of 30 trees sampled at each SAT site;
- At each SAT survey site, a maximum of two-person minutes was spent searching for faecal pellets (scats) within a one metre radius of the base of each selected tree. Searching ceased if a Koala faecal pellet was located before the two minutes expired;
- Searching for faecal pellets involved an initial inspection of the ground surface followed by a robust disturbance, i.e. raking of the leaf litter if necessary to search for faecal pellets; and
- The species of each tree searched was recorded along with presence/absence of Koala faecal pellets. Notes were made on whether the scats were fresh or old and a photograph and/or sample was taken.

Area searches for the Koala were also undertaken at each of the SAT survey site, irrespective of result of the faecal pellet searches. At each of the SAT survey sites, a five-minute visual inspection of trees was conducted within a 25 m radius of the central tree.

The locations of all koala surveys conducted are shown in **Figure 3**.

2.2.2.3. Cumberland Plain Land Snail Searches

Targeted surveys for the Cumberland Plain Land Snail were undertaken on 24 March 2017 in areas of suitable habitat. Snails were searched for around the base of trees with a diameter at breast height of greater than 10 cm, with preference to trees with the presence of leaf litter within one metre of the base of the tree. The base of each tree was searched for up to two minutes.

The locations of all Cumberland Plain Land Snail surveys conducted are shown in **Figure 3**.

2.2.3. Survey Limitations

The subject site was easily accessible, and a random meander transect was conducted within the extent of vegetation. Despite this, it is unlikely that all flora species present within the subject site have been recorded. However, it is probable that the vast majority of species, and all of the endemic, native species present at the time of the survey were recorded, and that issues including conservation significance of the flora, and ecological constraints of native vegetation on development have been satisfactorily assessed. An assessment

of the likelihood of occurrence of all threatened flora species recorded or likely to occur within a 5 km radius of the subject site was undertaken to supplement the threatened flora survey.

Limited fauna surveys were undertaken for this assessment, which mainly relied on database analysis of species recorded within a 5 km radius, and fauna habitat assessment. The data produced by the database analysis and fauna habitat assessment is intended to be indicative of the types of species that could occur within the subject site.

3. Results

3.1. Introduction

As mentioned previously, this assessment considers the biodiversity in the context of the whole subject site. The following sections present the results of the surveys for the whole subject site concurrently with the rezoning area as it is important to note the potential impacts of the project within the rezoning area as well as the proposed retention within the subject site.

3.2. Vegetation Communities

Previous broad-scale mapping conducted by OEH indicates that Cumberland Shale Plains Woodland, Cumberland Shale-Sandstone Ironbark Forest, Undifferentiated Regenerating Shrubs, Urban Native and Exotic Cover and Weeds and Exotics are present within the subject site. A number of these communities are described as conforming to various threatened communities listed under the TSC Act and/or EPBC Act. Surveys by Cumberland Ecology for this assessment refined the existing vegetation mapping of the subject site and identified the following vegetation communities:

- Cumberland Plain Woodland – Moderate condition;
- Cumberland Plain Woodland – Poor condition;
- Planted Garden Vegetation; and,
- Exotic Grassland.

The areas of these communities are provided in **Table 1** and the distribution of these communities is shown in **Figure 4.** Descriptions of each of the vegetation communities are provided below.

Table 1 Extent of vegetation communities within the subject site

Vegetation Communities	Subject Site	Rezoning Area
Cumberland Plain Woodland - Moderate condition	0.72	0.32
Cumberland Plain Woodland - Poor condition	1.56	0.63
Planted Garden Vegetation	0.18	0.14
Exotic Grassland	3.26	1.22
Cleared Land	0.57	0.30
Total	**6.28**	**2.60**

3.2.1. PCT 849 - Cumberland Shale Plains Woodland

Vegetation Formation: Grassy Woodlands

Vegetation Class: Coastal Valley Grassy Woodlands

Percent Cleared Value: 93

TEC Status of Onsite Occurrence: Critically Endangered Ecology Community (CEEC) – Cumberland Plain Woodland

3.2.1.1. General Description

Cumberland Shale Plains Woodland (PCT 849) is present throughout the subject site as scattered patches of shrubs/trees over exotic grassland and as two separate patches of woodland with a predominantly native understory. Within the subject site, this community varies between poor to moderate condition and has been mapped as occurring in two conditions states – moderate and poor. The canopy species within the subject site are *Eucalyptus moluccana* (Grey Box), *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus crebra* (Narrow-leaved Ironbark). To a lesser extent *Eucalyptus fibrosa* (Red Ironbark), *Eucalyptus amplifolia* (Cabbage Gum) and *Eucalyptus eugenioides* (Thin-leaved Stringybark) are also present in some areas.

Within the moderate condition state, the shrub layer is dominated by *Bursaria spinosa* (Blackthorn), and scattered individuals of *Acacia decurrens* (Black Wattle) and *Acacia implexa* (Hickory Wattle). Scattered *Eucalyptus moluccana* (Grey Box) in the shrub layer suggests that there is some potential for natural regeneration of canopy/sub-canopy species. A number of woody exotic weeds are associated with this condition class including *Brassica fruticulosa* (Twiggy Turnip) and *Osteospermum fruticosum*.

A low abundance of native herbaceous species were recorded within the subject site. Native forbs and grass species typical of the community are present within the subject site: Poranthera microphylla (Small Poranthera), *Einadia nutans subsp.* linifolia (Climbing Saltbush), Einadia nutans *subsp. nutans* (Climbing Saltbush), *Einadia hastata* (Berry Saltbush), *Einadia* polygonoides, *Dichondra repens* (Kidney Weed), *Oxalis perennans*, *Plectranthus parviflorus* (Cockspur Flower), *Solanum prinophyllum* (Forest Nightshade), *Grona varians* (Slender Tick-trefoil), *Glycine tabacina*, *Hardenbergia violacea* (Purple Coral Pea), *Commelina cyanea*, *Cyperus gracilis* (Slender Flat-sedge), *Lomandra filiformis subsp. filiformis* (Wattle Mat-rush), *Dianella longifolia* (Blueberry Lily), *Aristida ramosa* (Purple Wiregrass), *Chloris ventricosa* (Plump Windmill Grass) and *Microlaena stipoides* (Weeping Grass), These occur in varying compositions throughout this community, where native species are more common in some areas and absent/low abundance in other areas.

Exotic groundcover is generally dominant within this community on the subject site and includes species such as *Sida rhombifolia*, *Bidens pilosa* (Cobblers Pegs), *Senecio madagascariensis* (Fireweed), *Sonchus oleraceus* (Common Sowthistle), *Plantago lanceolata* (Lamb's Tongues), *Araujia sericifera* (Moth Vine), *Asparagus asparagoides* (Bridal Creeper), *Ehrharta erecta* (Panic Veldtgrass) and *Cenchrus clandestinus* (Kikuyu Grass).

3.2.1.2. Condition States

Within the subject site, PCT 849 exists in two condition states including areas in 'moderate condition' and areas in 'poor condition'. Both condition states are present throughout the subject site and occur within the rezoning area as described below.

i. Moderate Condition

The moderate condition state occurs as two separate stands in the central north and south west, and covers approximately 0.72 ha within the subject site of which 0.32 ha occurs within the rezoning area. This zone contains areas of canopy regrowth and an intact shrub layer dominated by *Bursaria spinosa* (Blackthorn). It was

determined in the field to be a separate condition class to the PCT 849 canopy trees that occurred over an exotic understory throughout the remainder of the subject site.

An example of this condition state is shown in **Photograph 1**.

Photograph 1 PCT 849 (moderate condition) within the subject site

ii. Poor Condition

The poor condition state occurs in scattered patches across the subject site covering 1.56 ha of which 0.63 ha occurs within the rezoning area. This condition state was determined in the field to be distinguishable from the moderate condition areas as it did not display an intact native shrub layer. This condition state for the most part occurred as canopy trees over exotic grassland.

An example of this condition state is shown in **Photograph 2** and **Photograph 3**.

Photograph 2 PCT 849 (poor condition) within the subject site

Photograph 3 PCT 849 (poor condition) within the subject site

3.2.1.3. Alignment with Threatened Ecological Communities

Within the BioNet Vegetation Classification, this PCT is associated with Cumberland Plain Woodland in the Sydney Basin Bioregion, which is listed as a CEEC under the BC Act and the EPBC Act. The vegetation conforming to the moderate condition within the subject site has been assessed as conforming to the Cumberland Plain Woodland TEC listing under both the BC Act and EPBC Act. The poor condition state mapped within the subject site has been determined to not conform to the EPBC Act listing of the community as it generally occurs as scattered stands of native canopy with exotic undergrowth and does not form a patch larger than 0.5 ha.

Specifically, Cumberland Plain Woodland naturally occurs within the locality and the vegetation on the subject site closely conforms to the features identified in the final determination for the community, especially in the areas of the subject site. Floristic characters used to distinguish these areas were the prevalence of *Eucalyptus moluccana* (Grey Box) and *Eucalyptus tereticornis*, the generally sparse understorey of locally indigenous shrubs, and occurrence of diagnostic native grasses and forbs. Furthermore, the edaphic features of the subject site are characteristic of those identified in the final determination, specifically the occurrence of clays derived from shales.

At this stage, the moderate condition state of PCT 849 within the subject site has been determined to conform to the EPBC Act listing for Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest. This condition state:

- Contains native tree species with more than 10% canopy cover;
- Is part of a patch size larger than 0.5 ha; and
- Contains more than 50% native perennial understory species.

3.3. Planted Garden Vegetation

Planted Garden Vegetation is present surrounding existing residential dwellings and comprises 0.18 ha within the subject site of which 0.14 ha occurs within the rezoning area. Canopy and sub-canopy species within this vegetation community are non-endemic native species such as *Eucalyptus microcorys* (Tallowwood), *Macadamia integrifolia* (Macadamia), *Melaleuca armillaris* (Bracelet Honey-myrtle) and *Cupaniopsis anacardioides* (Tuckeroo). Shrub species are non-endemic native species such as *Callistemon viminalis* (Weeping Bottlebrush), *Callistemon citrus* and a number of *Grevillea* cultivars. Woody exotic species surround the existing residential dwellings and include *Pinus radiata* (Radiata Pine), *Prunus* spp., *Jacaranda mimosifolia* (Jacaranda), *Liquidambar styraciflua*, *Quercus palustris* (Pin Oak), *Ulmus parvifolia* (Chinese Elm) and *Acer japonicum* (Japanese Maple).

Four scattered *Acacia decurrens* (Black Wattle) individuals over exotic grassland are included in this condition state as well as three threatened flora species listed including *Macadamia integrifolia* (Rough-shelled Bush Nut), *Eucalyptus nicholii* (Narrow-leaved Black Peppermint) and *Syzygium paniculatum* (Magenta Lilly Pilly). *Macadamia integrifolia* (Rough-shelled Bush Nut) and *Eucalyptus nicholii* (Narrow-leaved Black Peppermint) are not endemic the Greater Sydney Region and *Syzygium paniculatum* (Magenta Lilly Pilly) typically occurs in

rainforest vegetation types of which does not naturally occur within the subject site. All these species have been planted within a garden context.

This community does not comprise a defined native vegetation unit and does not conform to a listing under the BC Act or EPBC Act.

An example of the community is shown in **Photograph 4** and **Photograph 5.**

Photograph 4 Planted natives within the subject site

Photograph 5 Planted exotic vegetation surrounding existing residential dwellings

3.4. Exotic Grassland

Exotic Grassland occupies 3.26 ha of the subject site of which 1.22 ha occurs in the rezoning area. Groundcover within this community is predominantly exotic grass and consists of species including *Cenchrus clandestinus* (Kikuyu), *Paspalum dilatatum* (Paspalum) and *Setaria parviflora*. Native grasses are also present in some areas such as *Microlaena stipoides* (Weeping Grass). Herbaceous exotic species include *Gamochaeta americana* (Cudweed), *Hypochaeris radicata* (Catsear), *Senecio madagascariensis* (Fireweed) and *Sida rhombifolia*. A large patch of *Rubus fruticosus aggregate* (Blackberry) is present within the exotic grassland in the north. See **Appendix A** for full species list.

Examples of this community are shown in **Photograph 6.**

Photograph 6 Exotic grassland within the subject site

3.5. Flora

3.5.1. General Species

A total of 154 species were recorded within the subject site during field surveys, including 56 native species (36%) and 98 exotic species (64%). Of the native species recorded in subject site, the most frequently recorded plant family was Myrtaceae (13 species), followed by Fabaceae (six species) families. Of the exotic species recorded in the subject site, the most frequently recorded plant family was Asteraceae (14 species). A total species list for the subject site is provided in **Appendix A**.

3.5.1.1. Significant Weeds

The subject site contains numerous significant weeds with 14 exotic species listed as weeds of other regional concern, four listed as state priority weeds and one listed as a regional priority weed under the Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022 under the NSW *Biosecurity Act 2015 (Local Land Services 2019)*. The subject site also contains five exotic species listed as weeds of national significance (WoNS) and 22 listed as high threat weeds in accordance with the BAM. Significant weeds that are present within the subject site are shown in **Table 2**.

Table 2 Significant weeds within the subject site

Family	Scientific Name	Common Name	High Threat Weed	Biodiversity Act Status	WoNS
Aizoaceae	*Galenia pubescens*	Galenia	Yes	OWRC	
Apocynaceae	*Vinca major*	Periwinkle	Yes	OWRC	
Araceae	*Zantedeschia aethiopica*	Arum Lily		OWRC	
Arecaceae	*Phoenix canariensis*	Canary Island Date Palm	Yes	OWRC	
Arecaceae	*Washingtonia filifera*			OWRC	
Asparagaceae	*Asparagus aethiopicus*	Asparagus Fern	Yes	SP	Yes
Asparagaceae	*Asparagus asparagoides*	Bridal Creeper	Yes		Yes
Asteraceae	*Bidens pilosa*	Cobbler's Pegs	Yes		
Asteraceae	*Senecio madagascariensis*	Fireweed	Yes	SP	Yes
Cactaceae	*Opuntia stricta*	Common Prickly Pear	Yes	SP	Yes
Crassulaceae	*Bryophyllum delagoense*	Mother of millions	Yes		
Cyperaceae	*Cyperus eragrostis*	Umbrella Sedge	Yes		
Malaceae	*Rhaphiolepis indica*	Indian Hawthorn		OWRC	
Oleaceae	*Jasminum polyanthum*	White Jasmine		OWRC	
Oleaceae	*Ligustrum lucidum*	Large-leaved Privet	Yes	OWRC	
Oleaceae	*Olea europaea*	Common Olive	Yes	RP	
Pinaceae	*Pinus radiata*	Radiata Pine	Yes	OWRC	
Poaceae	*Cenchrus clandestinus*	Kikuyu Grass	Yes		
Poaceae	*Ehrharta erecta*	Panic Veldtgrass	Yes		
Poaceae	*Eragrostis curvula*	African Lovegrass	Yes	OWRC	
Poaceae	*Paspalum dilatatum*	Paspalum	Yes		
Poaceae	*Stenotaphrum secundatum*	Buffalo Grass	Yes		
Polygalaceae	*Polygala myrtifolia*		Yes		
Polygonaceae	*Acetosa sagittata*	Rambling Dock	Yes	OWRC	
Rutaceae	*Murraya paniculata*			OWRC	
Sapindaceae	*Cardiospermum grandiflorum*	Balloon Vine	Yes	OWRC	
Solanaceae	*Lycium ferocissimum*	African Boxthorn	Yes	SP	Yes
Ulmaceae	*Ulmus parvifolia*	Chinese Elm		OWRC	

3.5.2. Threatened Flora Species

The subject site contains three planted threatened flora species including *Macadamia integrifolia* (Rough-shelled Bush Nut), *Eucalyptus nicholii* (Narrow-leaved Black Peppermint) and *Syzygium paniculatum* (Magenta Lilly Pilly) (**Figure 5**). *Macadamia integrifolia* (Rough-shelled Bush Nut) and *Eucalyptus nicholii* (Narrow-leaved Black Peppermint) are not endemic the Greater Sydney Region and *Syzygium paniculatum* (Magenta Lilly Pilly) typically occurs in rainforest vegetation types of which does not naturally occur within the subject site. All these species have been planted within a garden context. Therefore, these species have not been considered further within this assessment. All species were recorded within the rezoning area and the listing status is provided in **Table 3** below.

Table 3 Threatened flora species recorded within the subject site

Species Name	Common Name	BC Act Status	EPBC Act Status
Macadamia integrifolia	Rough-shelled Bush Nut	Vulnerable	Vulnerable
Eucalyptus nicholii	Narrow-leaved Black Peppermint	Vulnerable	Vulnerable
Syzygium paniculatum	Magenta Lilly Pilly	Endangered	Vulnerable

A total of 27 threatened flora species are known to occur within 5 km of the subject site according to the BioNet Atlas of Australia (EES 2021). No other threatened flora species were identified on the subject site during surveys further to the list provided in **Table 3**. No threatened flora species are considered likely to occur within the subject site further to the planted *Macadamia integrifolia* (Rough-shelled Bush Nut) and *Eucalyptus nicholii* (Narrow-leaved Black Peppermint) and *Syzygium paniculatum* individuals recorded during the survey period.

3.6. Fauna

3.6.1. Fauna Habitat

The primary habitat for native fauna within the subject site consists of the existing native and exotic vegetation. This vegetation within the subject site is likely to comprise foraging habitat to be utilised on an occasional and opportunistic basis by highly mobile or aerial fauna species as part of a larger foraging range.

Habitat features recorded within the subject site are summarised below and shown in **Figure 5**. Specific habitat features are described in **Table 4** and whether they are located within the rezoning area.

Table 4 Habitat features within the subject site

Habitat Feature	Habitat Category	Within Rezoning Area	Tree Species (if applicable)	Notes
H1	Dam	No	-	Artificial farm dam in a garden setting surrounded by native canopy trees. May provide foraging habitat for threatened bird and mammal species.

Habitat Feature	Habitat Category	Within Rezoning Area	Tree Species (if applicable)	Notes
H2	Hollow-bearing Tree (15 cm)	No	*Eucalyptus tereticornis*	Bears two ~15 cm diameter hollows. May offer suitable nesting/roosting habitat for birds and arboreal mammals.
H3	Fallen timber	No	-	Fallen deceased tree. May provide suitable shelter for ground dwelling mammals.
H4	Fallen timber	Yes	-	Fallen deceased tree. May provide suitable shelter for ground dwelling mammals.
H5	Fallen timber	Yes	-	Fallen deceased tree. May provide suitable shelter for ground dwelling mammals.
H6	Fallen timber	Yes	-	Fallen deceased tree. May provide suitable shelter for ground dwelling mammals.
H7	Hollow-bearing Tree (5-15 cm)	Yes	Deceased *Eucalyptus crebra*	Bears two ~5 cm and one ~15 cm diameter hollow. May offer lower quality nesting/roosting habitat for birds and arboreal mammals due to its low height.
H8	Shed	No	-	Derelict farm shed. May provide marginal habitat for microchiropteran bats.
H9	Shed	No	-	Derelict farm shed. May provide marginal habitat for microchiropteran bats.
H10	Shed	No	-	Derelict farm shed. May provide marginal habitat for microchiropteran bats.
H11	Shed	No	-	Derelict farm shed. May provide marginal habitat for microchiropteran bats.
H12	Shed	No	-	Derelict farm shed. May provide marginal habitat for microchiropteran bats.

3.6.2. General Species

Five vertebrate fauna species have been recorded from the subject site during surveys. A fauna species list for the subject site is provided in **Table 5**.

Table 5 Fauna species list

Family	Common Name	Scientific Name	Detection Method
Cacatuidae	Sulphur-crested Cockatoo	*Cacatua galerita*	O/W
Alcedinidae	Kookaburra	*Dacelo novaeguineae*	O/W
Psittaculidae	Rainbow Lorikeet	*Trichoglossus moluccanus*	O/W
Meliphagidae	Noisy Miner	*Marinora melanocephala*	O/W
Corvidae	Australian Raven	*Corvus coronoides*	O/W

Detection Method: O = Observed, W = Heard

3.6.3. Threatened Fauna Species

One threatened species; the Koala has been recorded from scats within the subject site (**Figure 5**). In addition, a total of 34 threatened fauna species (excluding marine species) have been recorded within the locality of the subject site according to the BioNet Atlas of Australia (EES 2021). The BioNet Atlas holds three records Koala within the subject site including those that were recorded as part of this assessment. No other threatened fauna species have been recorded within the subject site according to the BioNet Atlas.

Several highly mobile or aerial threatened fauna species are known to occur within a 5 km radius of the subject site and may occasionally and opportunistically forage within the available habitat as part of a larger foraging range. Sessile or immobile threatened fauna species would be unlikely to utilise the habitat within the subject site due to a lack of habitat connectivity. The threatened fauna species with the greatest likelihood of occurrence are listed below:

- Koala (*Phascolarctos cinereus*);
- Cumberland Plain Land Snail (*Meridolum corneovirens*);
- Large Forest Owls including;
    - Barking Owl (*Ninox connivens*),
    - Powerful Owl (*Ninox strenua*),
- Microchiropteran bats including;
    - Large Bent-winged Bat (Miniopterus orianae oceanensis),
    - Large-eared Pied Bat (*Chalinolobus dwyeri*),
    - Little Bent-winged Bat (*Miniopterus australis*), and
- Grey-headed Flying-fox (*Pteropus poliocephalus*).

3.6.4. Significance of Available Habitat

The subject site is only considered to contain significant habitat for Koala and is not considered to constitute significant breeding habitat for other threatened fauna. The groups of fauna most likely to utilise the habitat within the subject site include Koala, Large Forest Owls, microchiropteran bats and Grey-headed Flying Fox. These species are all highly mobile and would be anticipated to utilise the foraging resources within the subject site on a seasonal, occasional or opportunistic basis as part of a larger foraging range. No threatened fauna species would be solely reliant on the habitat within the subject site.

3.6.4.1. Koala

During the September 2018 survey period, evidence of Koalas in the form of scats were recorded within the rezoning area. Additionally, under the Koala SEPP 2021, the subject site as being highly suitable koala habitat and where koalas are recorded as being present. As such, the subject site is considered to comprise core koala habitat under the Koala SEPP 2021.

Furthermore, numerous Koala feed trees are present throughout the subject site listed under the Koala SEPP 2021. Five species listed are present; *Eucalyptus crebra, Eucalyptus eugenoides, Eucalyptus fibrosa, Eucalyptus moluccana and Eucalyptus tereticornis*. *Eucalyptus punctata* is also present in the local area but is located outside the subject site. The dominant feed tree species throughout the subject site is *E. tereticornis* which occurs extensively throughout the subject site. These trees provide potential foraging habitat for the Koala.

3.6.4.2. Cumberland Plain Land Snail

No Cumberland Plain Land Snails (live or empty shells) were found during targeted surveys on the subject site. Although the majority of trees had a DBH of at least 10 cm, leaf litter was generally absent or scarce. The bases of trees were either dominated by exotics or exposed. The moderate condition patches of PCT 849 could provide suitable habitat for this species due to the apparent low frequency of use resulting in a build up of leaf litter.. However, all other areas of the subject site are considered to not provide optimal conditions for this species to occur due to extensive previous disturbance, such as introduction of exotic groundcover and mowing.

Numerous exotic Garden Snails (*Cornu aspersa*) were located throughout the moderate condition area of PCT 849 in the north of the subject site along Evelyn Street.

3.6.4.3. Large Forest Owls

The large forest owls species known to occur within the locality would utilise the subject site as breeding habitat due to its highly urbanised setting and a lack of suitably sized hollows. According to the Recovery Plan for Large Forest Owls, hollows with an entry diameter of 40 cm wide and greater than 100 cm deep are required for breeding for the Powerful Owl, Barking Owl and Masked Owl (DEC (NSW) 2006). Subsequently, the subject site is considered to constitute foraging habitat for Large Forest Owls.

3.6.4.4. Microchiropteran Bats

The majority of locally occurring microchiropteran bats breed in maternity caves and would not utilise the subject site as breeding habitat. Cave breeding species known to the locality include the Large Bent-winged

Bat and the Large-eared Pied Bat. All of the aforementioned microchiropteran bats would be expected to forage for insects in the native canopy of the subject site.

3.6.4.5. Grey-headed Flying Fox

The subject site does not contain a Grey-headed Flying Fox camp and would therefore only constitute foraging habitat. The Grey-headed Flying Fox would be expected to forage within the subject site on a seasonal or opportunistic basis most likely when the native canopy is in bloom.

4. Discussion

4.1. Potential Ecological Impacts

This chapter considers the potential ecological impacts of potential future development practises on the biodiversity values within the subject site. The ecological impacts of future development will involve the direct disturbance of vegetation and associated habitat loss. The likely future development is located within the rezoning area which is occupied by areas mapped as PCT 849, planted garden vegetation, exotic grassland, and existing dwellings and associated cleared land. This future development is also anticipated to result in the partial removal of the PCT 849 and associated Koala habitat within the rezoning area. Areas within the rezoning area that are proposed to be impacted as a result of this future development are provided in **Table 6**. Future development within the subject site may additionally result in indirect impacts are also relevant and are discussed below.

Table 6 Potential impacts of the likely future development

Vegetation Communities	Subject Site (ha)	Rezoning Area (ha)	Indicative Retention within the Subject Site (ha)	Indicative Retention (%)
Cumberland Plain Woodland - Moderate condition	0.72	0.32	0.40	55.77%
Cumberland Plain Woodland - Poor condition	1.56	0.63	0.93	59.82%
Planted Garden Vegetation	0.18	0.14	0.04	23.19%
Exotic Grassland	3.26	1.22	2.03	62.42%
Cleared Land	0.57	0.30	0.27	47.53%
Total	**6.28**	**2.60**	**3.68**	**58.54%**

4.1.1. Direct Impacts

The direct impacts of the likely future development includes clearing within the rezoning area, and removal of associated habitat. The extent of impacts from the proposed rezoning on vegetation communities and habitat within the subject site will not extend beyond the indicative rezoning area. These impacts are proposed to be ameliorated through the retention of native vegetation outside of the rezoning area and will include amelioration measures in accordance with the avoid, minimise, offset hierarchy of the BAM.

4.1.1.1. Vegetation Removal within the Rezoning Area

It is expected that earthworks and construction of new dwellings will be required following the approval of the planning proposal. This will result in localised soil disturbance and the removal of vegetation and associated habitat within the rezoning area as shown in **Figure 6.** The rezoning area has been partially historically cleared and the majority of the native trees within the rezoning area do not have an intact understorey. Subsequently, the project will involve direct impacts to a 0.95 ha area of PCT 849.

4.1.1.2. General Fauna Habitat Feature Removal

The likely future development will require the removal of nectar-producing trees and shrubs which may constitute foraging habitat for insects, blossom-dependant birds, arboreal mammals and megachiropteran bats (flying-foxes). The likely future development may result in the removal of up to four habitat features. These habitat features may represent potential habitat for tree hollow roosting microchiropteran bats and small birds. This impact can be ameliorated through the installation of nest-boxes throughout retained vegetation as described in ***Section 4.2.8.***

4.1.1.3. Koala Habitat Removal

As mentioned previously, the subject site and rezoning area are considered to comprise core koala habitat under the Koala SEPP 2021. Of this core koala habitat, approximately 0.95 ha occurs within the rezoning area in the form of the areas mapped as PCT 849 and may require removal as part of future development practises.

The project will also result in habitat fragmentation, which is the process whereby habitat loss results in the division of large, continuous habitats into smaller isolated fragments. The area between fragments is typically man-made and largely inhabitable by the species that previously existed in the area. Although the proposed development will remove some potential habitat for the Koala, it has been previously extensively cleared from mowing, grazing and other land uses being in a rural residential area. The proposed removal of this small area of vegetation and marginal habitat would very minimally add to fragmentation further than current conditions.

As an increased number of residential dwellings are proposed, light pollution will be increased. However, this should not significantly impact any Koalas foraging in the remainder of the subject site. Light pollution is already present along the Evelyn Street frontage where the proposed development will occur.

4.1.2. Indirect Impacts

The indirect impacts of the future development practises are anticipated to occur in areas throughout the subject site and surrounding area situated directly adjacent the rezoning area.

4.1.2.1. Edge Effects

Edge effects are impacts that occur at the interface between natural habitats, especially forests and disturbed or developed land (Yahner 1988). When an edge is created between woodland and a cleared area, changes to ecological processes within the vegetation can extend between 10 m and 100 m from the edge (Yahner 1988). These include microclimatic changes in light, temperature, humidity and wind, which can favour a suite of different species and therefore cause significant changes to the ecology of the patch (Lindenmayer and Fischer 2006). Edge effects can also result from the increase in noise and artificial light from a project.

Future development practises are not considered likely to result in significant edge effects to vegetation due to the currently degraded condition of the available habitat within and surrounding the subject site.

4.1.2.2. Construction Impacts

A number of indirect impacts relevant to the construction phase of the future development practises have the potential to impact the remaining ecological values of the subject site, such as those relating to dust, noise, light and erosion.

4.1.2.3. Noise

Noise can affect animal physiology and behaviour, and if it becomes an ongoing stress, it can be injurious to an animal's energy budget, reproductive success and long-term survival. There are other potential impacts that include habitat loss through avoidance, reduced reproductive success and a retreat away from favourable habitats (AMEC 2005).

It is likely that most animal species will habituate to the periodic noise disturbance (AMEC 2005), and the construction phases of future development are likely to cause only temporary disturbance only to occurring fauna. It is unlikely that noise levels will have a significant, long-term, impact on any wildlife populations.

4.1.2.4. Light

Future development has the potential to increase the level of artificial light in the natural environment. Increased light levels may adversely impact wildlife by direct glare, chronic or periodic increased illumination and temporary unexpected fluctuations in light levels (Saleh 2007, Longcore and Rich 2010).

While future development practises will have some effect on the surrounding environment, the impacts from light pollution are likely to be minimal. The subject site is located in an urban environment that is currently subject to high levels of artificial light. Any minimal increase in light levels is expected to be localised to the subject site. Light pollution from the future development is unlikely to have a significant or long-term impact on any fauna species.

4.1.2.5. Sedimentation and Erosion

During the construction phase of the future development practises, the retained vegetation can be impacted by sedimentation and erosion. Cutting and filling of the subject site for foundations is likely to increase potential erosion. Eroded sediment can smother retained vegetation if appropriate control measures are not implemented. Smothering can reduce regeneration of groundcover species and enter drainage lines. Sediment and eroded material can also contain weed matter and nutrients, and movement of this material into the retained vegetation can facilitate the spread of weeds. Increased weed invasion can result in changes to community composition. With the implementation of appropriate sediment control methods, the risk of sedimentation is considered to be minor and manageable.

4.1.3. Indirect Impacts Upon Threatened Fauna Species

Future development practises have the potential to result in a number of direct and indirect impacts to the habitat of potentially occurring threatened fauna species within the subject site. In addition to the direct removal of habitat within the subject site, potential indirect impacts to fauna habitat include:

- Habitat disturbance during the construction phase of the future development practises (e.g. changes in noise);
- Erosion and sedimentation; and
- Modification of microhabitat features resulting from long and short-term edge effects (e.g. changes in light filtration).

A number of these impacts are already present within the subject site due to previous clearing and residential land use. The potential changes to the adjoining habitat resulting from indirect impacts are expected to be localised and overall are not considered to cause a substantial change in the habitat of the potentially occurring threatened fauna species. A number of indicative mitigation measures are provided below in ***Section 4.2*** to minimise impacts upon threatened fauna for the likely future development.

4.2. Avoidance and Mitigation Measures

The purpose of this section is to outline a suite of indicative avoidance and mitigation measures that are proposed to minimise the impacts of future development practises upon the biodiversity values of the subject site and rezoning area. As demonstrated in previous chapters, despite the rezoning area being highly modified as a result of previous development, it provides foraging habitat for threatened species. As a result, it is anticipated that there will be a need to implement measures to minimise impacts to these entities. These measures will be described in further detail within the relevant biodiversity assessment at the DA stage.

4.2.1. Vegetation Retention

A minimum of 1.33 ha of PCT 849 is proposed to be retained within the subject site outside the rezoning area, subject to further arborist assessment and approval at the DA stage of the project. It is noted that the PCT 849 to be retained is located along the southern boundary of the subject site, bearing connectivity to the native vegetation within the adjacent lot. Out of the native vegetation occurrence throughout the subject site, the area of PCT 849 to be retained will serve to maintain a degree of linkage throughout the urban landscape.

The area of vegetation to be retained could also be further enhanced with the establishment of understorey replanting as described in **Section 4.2.6**.

4.2.2. Inductions

Site inductions are to be given by the civil contractor to ensure all site workers and visitors are aware of ecological issues associated with the subject site and the location of any restricted access areas.

4.2.3. Access Restrictions

To avoid unnecessary removal or damage to vegetation to be retained adjacent to the rezoning area, the clearing area should be clearly demarcated and signed to ensure no vegetation beyond these boundaries is removed. Clearing works and equipment should be excluded from areas outside the clearing area.

4.2.4. Erosion, Sedimentation and Pollution Control

To reduce sedimentation on the construction site, erosion control measures should be implemented. This includes minimising the amount of exposed soils on the site at any given time. All soil stockpiles should be adequately covered when not in use to prevent erosion through heavy rainfall.

Sediment fences should be established around the perimeter of the development area to prevent the impacts of sedimentation on adjoining vegetation and the adjacent drainage line. During development, precautions should be taken to ensure that no pollution, such as petrochemical substances or water containing suspended

solids, escapes the construction site. Pollution traps and efficient removal of pollution to an off-site location would help to minimise pollution impacts.

4.2.5. Pre-clearing and Clearing Surveys

Pre-clearing surveys are to be undertaken by a suitably qualified ecologist if trees are to be removed as a result of future development practises. Pre-clearing surveys will include the provision of a report following the completion of a pre-clearing survey, detailing the location and type of each habitat feature.

To minimise impacts to native fauna species, clearing is to be undertaken in the following two-stage process under the supervision of a suitably qualified ecologist:

- The initial phase of clearing will involve clearing around identified habitat features and leaving the features overnight; and
- The second stage will involve clearing of the habitat features left overnight followed by an inspection.

Provisions will be made to protect any immobile native fauna during clearing activities by the following means:

- All persons working on the vegetation clearing will be briefed about the possible fauna present and should avoid injuring any present;
- Animals disturbed or dislodged during the clearance but not injured should be assisted to move to the adjacent bushland; and
- If animals are injured during the vegetation clearance, appropriate steps will be taken to humanely treat the animal.

4.2.6. Landscaping and Understorey Replanting

Landscaping presents an opportunity for revegetation of the subject site with characteristic species of the Cumberland Plain Woodland TEC. For any landscaping works to be undertaken, it is recommended that characteristic species of Cumberland Plain Woodland listed in the final determination be utilised where possible (NSW Scientific Committee 2009).

All plants to be planted should be of local provenance (if possible, from within a 10 km radius of the subject site) and sourced from nurseries that specialise in growing seedlings of native plants with seed sourced from bushland within the locality. This is to avoid planting of cultivars that are human created, and not genetically representative of species as they naturally occur in the locality. All plants will be disease and pest-free, hardened off and well-watered at the time of planting. All plants are to be provided in a healthy condition. They must have good root development and a sturdy shoot system.

This type of landscaping could restore the floristic diversity and associated habitat that has been absent since the subject site was predominantly cleared. This will result in enhanced habitat values in the longer term for locally native fauna groups including small birds, microchiropteran bats, arboreal mammals and reptiles.

4.2.7. Weed Control Measures

Significant weed species occurring within the subject site should be managed in order to prevent further spread. As such, it is recommended that all exotic vegetation removed from the subject site should be disposed of appropriately as identified in the Regional Strategic Weed Management Plan. Specific weed management practices must be applied to the significant weeds listed in **Table 2**.

4.2.8. Nest-box Installation

The total number of tree hollows removed by the proposed development will be recorded during pre-clearance surveys. In order to compensate for the loss of tree hollows, an equal or greater number of nest boxes will be installed to the number of tree hollows removed within areas of nearby habitat proposed to be retained. All nest boxes should be installed under the supervision of an ecologist in appropriate locations prior to undertaking clearing works. This will allow for any rescued fauna to be placed into installed nest boxes if the individual(s) are deemed to be uninjured during the clearing works. Provision of a report following the installation of nest boxes will be provided detailing the total number installed, their locations and number/type of species relocated. This report may form part of the clearing report detailed above.

4.3. Future Assessment Requirements

4.3.1. EPBC Act Requirements

Threatened species, populations and communities listed under the EPBC Act that are considered to be directly or indirectly impacted by the proposed development should be assessed in accordance with the *Matters of National Environmental Significance Significant Impact Guidelines 1.1* (DoE, 2013). If a development is considered to significantly impact any MNES, then a referral would be required to be submitted.

Based on the known ecological values of the subject site, it is possible that a proposed development would result in a significant impact to MNES in the form of areas of vegetation that conform to the EPBC Act listed CEEC - Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest. As such, a referral may be required for proposed development that impact this entity.

4.3.2. BC Act Requirements

4.3.2.1. Biodiversity Offsets Scheme Entry Thresholds

To determine the type of assessment required for a future development under Part 4 (Local Development) of the EP&A Act, it is necessary to determine whether the proposed development triggers the BOS. For the proposed development to trigger the BOS, it would need to be considered as likely to significantly affect threatened species, which could occur as follows:

- It is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test of significance in Section 7.3 of the BC Act;
- It exceeds the biodiversity offsets scheme threshold according to Clause 7.1 of the BC Regulation, with the thresholds being:

- The clearing of native vegetation of an area above a prescribed threshold based on the minimum lot size; or
- The clearing of native vegetation, or other prescribed action, on land included on the Biodiversity Values Map.

- It is carried out in a declared area of outstanding biodiversity value (AOBV).

As no development plans are proposed at this stage of the planning proposal, no test of significance, for Cumberland Plain Woodland, Koala and potentially occurring threatened fauna species, in accordance with Section 7.3 of the BC Act has been undertaken for this assessment. As such, any future development application lodged for the future development of the rezoning area would need to prepare a test of significance in accordance with Section 7.3 of the BC Act in the event that the BOS was not triggered by another mechanism.

The rezoning area comprises lots which all have a minimum lot size of 2 ha. Based on the areas of clearing thresholds outlined within the BC Regulation, and reproduced in **Table 7**, the BOS would be triggered if the proposed development cleared ≥0.5 ha of native vegetation. If the clearing of native vegetation for a proposed development was <0.5 ha, then the BOS would not be triggered by this mechanism. As the rezoning area contains a total of 0.95 ha of native vegetation, the BOS could potentially be triggered by this mechanism, taking into consideration the 1.33 ha area of native vegetation to be retained.

Table 7 Area of clearing thresholds

Minimum Lot Size of Land	Area of Clearing
Less than 1 hectare	0.25 hectares or more
Less than 40 hectares but not less than 1 hectare	**0.5 hectares or more**
Less than 1,000 hectares but not less than 40 hectares	1 hectare or more
1,000 hectares or more	2 hectares or more

The rezoning area currently has areas mapped on the Biodiversity Values Map as of 1 October 2021. Therefore, the BOS would likely be triggered by this mechanism. As the Biodiversity Values Map is subject to regular updates, it would need to be consulted during the development application process.

The subject site is not currently mapped as an AOBV. Therefore, the BOS is not currently triggered by this mechanism. Although unlikely to be included in the near future, the list of AOBVs would need to be consulted during the development application process.

i. Conclusion

The impacts of project are proposed to be assessed in greater detail at the DA stage and as the BOS is likely to be triggered as outlined in the sections above, a Biodiversity Development Assessment Report will need to be prepared by a suitably experienced and qualified ecological consultant to accompany a DA.

5. Conclusion

This report supports a planning proposal seeking to amend the Campbelltown LEP to change the zoning for areas within the subject site referred to in this report as the rezoning area from E4 – Environmental Living to R2 – Low Density Residential to facilitate a subdivision. The biodiversity values of the subject site and potential ecological impacts of future development practisers have been assessed at a high level.

The subject site currently contains 2.28 ha of PCT 849 Cumberland Shale Plains Woodland, consistent with Cumberland Plain Woodland in the Sydney Basin Bioregion, listed as a CEEC under the NSW BC Act, some of which also conforms to the EBPC Act listing of the TEC. The remainder of the subject site is comprised of Planted Garden Vegetation (0.18 ha), Exotic Grassland (3.26 ha) and Cleared Land (0.57 ha). Future development practises resulting from the rezoning area have potential to result in impacts to 0.95 ha of PCT 849, 0.14 ha of Planted Garden Vegetation, 1.22 ha of Exotic Grassland and 0.30 ha of Cleared Land.

The areas of PCT 849 vegetation throughout the subject site comprise potential foraging habitat for several aerial and highly mobile threatened fauna species as part of a broader habitat range. These species are unlikely to be dependent on the resources present in the subject site. Further to this, evidence for Koalas were recorded within the rezoning area during the September 2018 survey period which has resulted in the determination that the areas of PCT 849 constitute core koala habitat under the Koala SEPP 2021. A VAR consistent with the CKPoM has therefore been prepared as a separate document and submitted in conjunction with this report to assess the koala habitat onsite and potential impacts. It is suggested that any works occurring within the above-described areas of habitat be accompanied by the suite of mitigation measures proposed to minimise the impacts on biodiversity values as described in ***Section 4.2***. The impacts of the future development practises and any applicable mitigation measures will need to be re-evaluated at the DA stage of the project.

A minimum area of 1.33 ha of PCT 849 is proposed to be retained outside the rezoning area within the subject site. This area of vegetation is located along the southern and eastern boundaries of the subject site, bearing connectivity to the native vegetation within adjacent lots. Out of the native vegetation occurrence throughout the subject site, the area of PCT 849 to be retained will serve to maintain a degree of linkage throughout the urban landscape. The area of vegetation to be retained could potentially be further enhanced with the establishment of understorey replanting with characteristic species of the Cumberland Plain Woodland TEC.

It is likely that future development of the rezoning area will trigger the BOS and require the preparation of a BDAR in accordance with the BAM to accompany a DA. Additionally, should significant areas of PCT 849 that conform to the EPBC Act listing of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest be impacted as part of future development practises, a referral to the commonwealth would be required.

6. References

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APPENDIX A :
Flora Species List

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		Plot 4		RMS 1
				C	A	C	A	C	A	C	A	
Fabaceae (Mimosoideae)	*Acacia decurrens*	Black Wattle				1	10					x
Fabaceae (Mimosoideae)	*Acacia implexa*	Hickory Wattle				0.8	15					x
Polygonaceae	*Acetosa sagittata*	Rambling Dock	*									x
Agavaceae	*Agave americana*	Century Plant	*									x
Asphodelaceae	*Aloe vera*		*									x
Apocynaceae	*Araujia sericiflora*	Moth Vine	*									x
Asteraceae	*Arctotheca calendula*	Capeweed	*	0.8	100							x
Poaceae	*Aristida ramosa*	Purple Wiregrass				2	200					
Asparagaceae	*Asparagus aethiopicus*	Asparagus Fern	*			0.1	10					
Asparagaceae	*Asparagus asparagoides*	Bridal Creeper	*	0.1	10	0.2	50			0.4	40	x
Chenopodiaceae	*Atriplex semibaccata*	Creeping Saltbush										x
Asteraceae	*Bidens pilosa*	Cobbler's Pegs	*			1	80			0.2	40	
Nyctaginaceae	*Bougainvillea glabra*		*									x
Brassicaceae	*Brassica fruticulosa*	Twiggy Turnip	*			4	150			0.4	30	x
Poaceae	*Bromus catharticus*	Praire Grass	*			1	100	4	200	1	100	x
Crassulaceae	*Bryophyllum delagoense*	Mother of millions	*			0.2	40					x
Pittosporaceae	*Bursaria spinosa*	Native Blackthorn		0.1	5	10	50					

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		Plot 4		RMS 1
				C	A	C	A	C	A	C	A	
Myrtaceae	*Callistemon citrinus*	Crimson Bottlebrush										x
Myrtaceae	*Callistemon rigidus*	Stiff Bottlebrush										x
Callitrichaceae	*Callitriche stagnalis*	Common Starwort	*									x
Brassicaceae	*Capsella bursa-pastoris*	Shepherd's Purse	*					0.1	10			x
Sapindaceae	*Cardiospermum grandiflorum*	Balloon Vine	*			0.2	20					
Aizoaceae	*Carpobrotus glaucescens*	Pigface										x
Vitaceae	*Cayratia clematidea*	Native Grape		0.1	10							x
Poaceae	*Cenchrus clandestinus*	Kikuyu Grass	*	5	250			70	3500			x
Caryophyllaceae	*Cerastium glomeratum*	Mouse-ear Chickweed	*	0.2	40							x
Poaceae	*Chloris ventricosa*	Tall Chloris				5	500					
Rutaceae	*Citrus reticulata*	Tangarine, Mandarin	*									x
Amaryllidaceae	*Clivia miniata*		*									x
Commelinaceae	*Commelina cyanea*	Native Wandering Jew										x
Convolvulaceae	*Convolvulus erubescens*	Pink Bindweed				0.3	30					x
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	*	0.1	10							
Asteraceae	*Conyza sumatrensis*	Tall fleabane	*					0.1	10			x
Asteraceae	*Cotula australis*	Common Cotula		0.1	20					0.1	10	
Crassulaceae	*Crassula ovata*	Jade Plant	*			0.2	10					x
Crassulaceae	*Crassula sarmentosa var. sarmentosa*		*									x

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		Plot 4		RMS 1
				C	A	C	A	C	A	C	A	
Crassulaceae	*Crassula sieberiana*	Australian Stonecrop								0.1	20	
Sapindaceae	*Cupaniopsis anacardioides*	Tuckeroo										x
Cupressaceae	*Cupressus macrocarpa*	Monterey Cypress	*									x
Poaceae	*Cynodon dactylon*	Common Couch		10	1000			10	1000			x
Cyperaceae	*Cyperus eragrostis*	Umbrella Sedge	*									x
Cyperaceae	*Cyperus gracilis*	Slender Flat-sedge		0.1	20							x
Orchidaceae	*Dendrobium spp.*											x
Fabaceae (Faboideae)	*Desmodium varians*	Slender Tick-trefoil		0.1	5	0.1	20					
Phormiaceae	*Dianella longifolia var. longifolia*					0.2	20					
Convolvulaceae	*Dichondra repens*	Kidney Weed		0.2	50	1	200	2	80	0.6	180	
Doryanthaceae	*Doryanthes excelsa*	Gymea Lily										x
Poaceae	*Ehrharta erecta*	Panic Veldtgrass	*	10	1000					20	1000	x
Chenopodiaceae	*Einadia hastata*	Berry Saltbush										x
Chenopodiaceae	*Einadia nutans subsp. linifolia*	Climbing Saltbush										x
Chenopodiaceae	*Einadia nutans subsp. nutans*	Climbing Saltbush								0.1	15	
Chenopodiaceae	*Einadia polygonoides*	Knotweed Goosefoot										x
Poaceae	*Entolasia stricta*	Wiry Panic				1	100					
Poaceae	*Eragrostis curvula*	African Lovegrass	*									x
Malaceae	*Eriobotrya japonica*	Loquat	*									x

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		Plot 4		RMS 1
				C	A	C	A	C	A	C	A	
Geraniaceae	*Erodium cicutarium*	Common Crowfoot	*									x
Myrtaceae	*Eucalyptus amplifolia*	Cabbage Gum										x
Myrtaceae	*Eucalyptus crebra*	Narrow-leaved Ironbark								10	1	
Myrtaceae	*Eucalyptus eugenioides*	Thin-leaved Stringybark										x
Myrtaceae	*Eucalyptus fibrosa*	Red Ironbark										x
Myrtaceae	*Eucalyptus moluccana*	Grey Box		20	2	50	24			60	12	
Myrtaceae	*Eucalyptus nicholii*	Rough-leaved Black Peppermint										x
Myrtaceae	*Eucalyptus tereticornis*	Forest Red Gum		30	5							
Asteraceae	*Facelis retusa*		*	0.2	100							
Fumariaceae	*Fumaria muralis*	Wall Fumitory	*							0.2	40	
Cyperaceae	*Gahnia aspera*	Rough Saw-sedge				0.2	2					
Aizoaceae	*Galenia pubescens*	Galenia	*									x
Asteraceae	*Gamochaeta pensylvanica*	Cudweed	*	0.2	40			0.1	20			
Fabaceae (Faboideae)	*Glycine tabacina*	Variable Glycine		0.2	60	0.2	40			0.1	10	
Proteaceae	*Grevillea spp.*											x
Fabaceae (Faboideae)	*Hardenbergia violacea*	False Sarsaparilla		0.1	5							
Clusiaceae	*Hypericum gramineum*	Small St John's Wort		0.1	5							
Asteraceae	*Hypochaeris albiflora*	White Flatweed	*							0.1	10	

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		Plot 4		RMS 1
				C	A	C	A	C	A	C	A	
Asteraceae	*Hypochoeris radicata*	Catsear	*	0.4	80	0.2	40	0.2	40	0.4	45	
Fabaceae (Faboideae)	*Indigofera australis*	Australian Indigo				0.4	5					x
Bignoniaceae	*Jacaranda mimosifolia*	Jacaranda	*									x
Oleaceae	*Jasminum officinale*		*							0.2	10	
Oleaceae	*Jasminum polyanthum*	White Jasmine	*									x
Lythraceae	*Lagerstroemia indica*		*									x
Lamiaceae	*Lavandula angustifolia*		*									x
Brassicaceae	*Lepidium bonariense*	Argentine Peppercress	*							0.1	10	
Brassicaceae	*Lepidium didymum*	Lesser Swinecress	*									x
Myrtaceae	*Leptospermum petersonii*	Lemon-scented Teatree										x
Oleaceae	*Ligustrum lucidum*	Large-leaved Privet	*									x
Linaceae	*Linum trigynum*	French Flax	*									x
Poaceae	*Lolium perenne*	Perennial Ryegrass	*	20	1000	1	100			30	1500	x
Lomandraceae	*Lomandra filiformis subsp. filiformis*					0.1	5					
Fabaceae (Faboideae)	*Lotus uliginosus*	Birds-foot Trefoil	*					5	500			x
Solanaceae	*Lycium ferocissimum*	African Boxthorn	*									x
Primulaceae	*Lysimachia arvensis*	Scarlet Pimpernel	*	0.2	40	0.1	50					
Proteaceae	*Macadamia integrifolia*	Rough -shelled Bush Nut										x

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		Plot 4		RMS 1
				C	A	C	A	C	A	C	A	
Malvaceae	*Malva parviflora*	Small-flowered Mallow	*									x
Fabaceae (Faboideae)	*Medicago arabica*	Spotted Burr Medic	*									x
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	*			0.2	20					x
Myrtaceae	*Melaleuca bracteata*	Black Tea-tree										x
Myrtaceae	*Melaleuca linariifolia*	Flax-leaved Paperbark										x
Myrtaceae	*Melaleuca quinquenervia*	Broad-leaved Paperbark										x
Myrtaceae	*Melaleuca styphelioides*	Prickly-leaved Tea Tree										x
Poaceae	*Microlaena stipoides var. stipoides*	Weeping Grass		5	500	10	1000			30	3000	x
Malvaceae	*Modiola caroliniana*	Red-flowered Mallow	*					0.4	40	0.2	40	x
Araceae	*Monstera deliciosa*	Fruit Salad Plant	*									x
Moraceae	*Morus alba*	White Mulberry	*									x
Rutaceae	*Murraya paniculata*		*									x
Nandinaceae	*Nandina domestica*	Japanese Sacred Bamboo	*									x
Davalliaceae	*Nephrolepis cordifolia*	Fishbone Fern										x
Oleaceae	*Olea europaea*	Common Olive	*									x
Cactaceae	*Opuntia stricta*	Common Prickly Pear	*									x
Asteraceae	*Osteospermum fruticosum*		*			0.4	10					
Oxalidaceae	*Oxalis corniculata*	Creeping Oxalis	*	0.1	20			0.2	150			x

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		Plot 4		RMS 1
				C	A	C	A	C	A	C	A	
Oxalidaceae	*Oxalis perennans*			0.1	15	0.1	10			0.1	10	x
Caryophyllaceae	*Paronychia brasiliana*	Chilean Whitlow Wort, Brazilian Whitlow	*	0.1	10					0.2	80	
Poaceae	*Paspalum dilatatum*	Paspalum	*					1	160			x
Passifloraceae	*Passiflora edulis*	Common Passionfruit	*									x
Geraniaceae	*Pelargonium spp.*											x
Arecaceae	*Phoenix canariensis*	Canary Island Date Palm	*									x
Malaceae	*Photinia serratifolia*	Chinese Photinia	*									x
Pinaceae	*Pinus radiata*	Radiata Pine	*									x
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	*	0.8	100	0.6	50	0.2	20	0.6	100	x
Lamiaceae	*Plectranthus parviflorus*					0.1	10			0.2	20	
Plumbaginaceae	*Plumbago auriculata*	Cape leadwot	*									x
Poaceae	*Poa annua*	Winter Grass	*	2	200			1	100			x
Polygalaceae	*Polygala myrtifolia*		*									x
Phyllanthaceae	*Poranthera microphylla*	Small Poranthera		0.1	10							
Phyllanthaceae	*Poranthera microphylla*	Small Poranthera				0.2	150					
Portulacaceae	*Portulacaria afra*		*									x
Rosaceae	*Prunus spp.*		*									x
Acanthaceae	*Pseuderanthemum variabile*	Pastel Flower		0.1	10							

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		Plot 4		RMS 1
				C	A	C	A	C	A	C	A	
Acanthaceae	*Pseuderanthemum variabile*	Pastel Flower										x
Fagaceae	*Quercus palustris*	Pin Oak	*									x
Malaceae	*Rhaphiolepis indica*	Indian Hawthorn	*									x
Rosaceae	*Rosa spp.*		*									x
Polygonaceae	*Rumex brownii*	Swamp Dock						0.1	10			
Polygonaceae	*Rumex crispus*	Curled Dock	*									x
Poaceae	*Rytidosperma caespitosum*	Ringed Wallaby Grass		1	100	2	200					x
Asteraceae	*Senecio madagascariensis*	Fireweed	*	0.1	10	0.1	5			0.2	40	x
Poaceae	*Setaria parviflora*		*			0.8	80					
Malvaceae	*Sida rhombifolia*	Paddy's Lucerne	*	0.1	10	0.2	40			0.4	35	x
Malvaceae	*Sida spinosa*		*							0.1	5	
Solanaceae	*Solanum prinophyllum*	Forest Nightshade				0.1	10					
Asteraceae	*Soliva sessilis*	Bindyi	*	2	500			1	200	0.6	300	x
Asteraceae	*Sonchus asper*	Prickly Sowthistle	*							0.1	10	
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	*	0.2	30	0.2	20			0.2	20	x
Poaceae	*Sorghum bicolor*	Sorghum	*									x
Lamiaceae	*Stachys arvensis*	Stagger Weed	*					0.1	20			x
Caryophyllaceae	*Stellaria media*	Common Chickweed	*							0.1	10	x
Poaceae	*Stenotaphrum secundatum*	Buffalo Grass	*									x
Myrtaceae	*Syzygium paniculatum*	Magenta Lilly Pilly										x

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		Plot 4		RMS 1
				C	A	C	A	C	A	C	A	
Portulacaceae	*Talinum paniculatum*		*									x
Asteraceae	*Taraxacum officinale*	Dandelion	*	0.2	20			0.2	40			x
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	*					5	1500			x
Ulmaceae	*Ulmus parvifolia*	Chinese Elm	*									x
Verbenaceae	*Verbena bonariensis*	Purpletop	*			0.2	60					
Fabaceae (Faboideae)	*Vicia sativa*	Common vetch	*					0.1	5			
Apocynaceae	*Vinca major*	Periwinkle	*									x
Asteraceae	*Vittadinia cuneata var. cuneata f. minor*					0.2	20					
Poaceae	*Vulpia myuros*	Rat's Tail Fescue	*	15	1000							x
Arecaceae	*Washingtonia filifera*		*									x
Agavaceae	*Yucca aloifolia*	Spanish Bayonet	*									x
Araceae	*Zantedeschia aethiopica*	Arum Lily	*									x

APPENDIX B :
Threatened Species in the Locality

Table 8 Threatened flora species records from the 5 km locality

Scientific Name	Common Name	BC Act Status	EBPC Act Status	Number of Records
Acacia bynoeana	Bynoe's Wattle	E	V	1
Acacia pubescens	Downy Wattle	V	V	1
Allocasuarina glareicola		E	E	1
Caladenia tessellata	Thick-lipped Spider-orchid	E	V	1
Cryptostylis hunteriana	Leafless Tongue-orchid	V	V	1
Cynanchum elegans	White-flowered Wax Plant	E	E	1
Genoplesium baueri	Yellow Gnat-orchid	E	E	1
Grevillea parviflora subsp. parviflora	Small-flower Grevillea	V	V	16
Hibbertia puberula		E		17
Hibbertia sp. Bankstown		E	CE	1
Leucopogon exolasius	Woronora Beard-heath	V	V	1
Melaleuca biconvexa	Biconvex Paperbark	V	V	1
Melaleuca deanei	Deane's Melaleuca	V	V	1
Persicaria elatior	Knotweed	V	V	1
Persoonia hirsuta	Hairy Geebung	E	E	1
Persoonia nutans	Nodding Geebung	E	E	42
Pimelea curviflora var. curviflora		V	V	1
Pimelea spicata		E	E	1
Pomaderris brunnea	Brown Pomaderris	E	V	104
Pterostylis gibbosa	Illawarra Greenhood	E	E	1
Pterostylis saxicola	Sydney Plains Greenhood	E	E	12
Rhizanthella slateri	Eastern Underground Orchid	V	E	1
Rhodamnia rubescens	Scrub Turpentine	CE	CE	1
Rhodomyrtus psidioides	Native Guava	CE	CE	1
Syzygium paniculatum	Magenta Lilly Pilly	E	V	1
Thelymitra kangaloonica	Kangaloon Sun Orchid	CE	CE	1
Thesium australe	Austral Toadflax	V	V	1

Table 9 Threatened fauna species records from the 5 km locality

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Number of Records
Botaurus poiciloptilus	Australasian Bittern	E	E	1
Rostratula australis	Australian Painted Snipe	E	E	1
Monarcha melanopsis	Black-faced Monarch		M	1
Hoplocephalus bungaroides	Broad-headed Snake		V	1
Petrogale penicillata	Brush-tailed Rock-wallaby	E	V	1
Meridolum corneovirens	Cumberland Plain Land Snail	E		4
Calidris ferruginea	Curlew Sandpiper	E	CE	1
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V		3
Numenius madagascariensis	Eastern Curlew		CE	1
Thinornis cucullatus cucullatus	Eastern Hooded Plover	CE	V	1
Heleioporus australiacus	Giant Burrowing Frog	V	V	1
Petauroides volans	Greater Glider		V	1
Litoria aurea	Green and Golden Bell Frog	E	V	1
Falco hypoleucos	Grey Falcon	E	V	1
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	21
Litoria raniformis	Growling Grass Frog	E	V	1
Phascolarctos cinereus	Koala	V	V	60
Miniopterus orianae oceanensis	Large Bent-winged Bat	V		2
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	1
Glossopsitta pusilla	Little Lorikeet	V		7
Tyto novaehollandiae	Masked Owl	V		1
Pseudomys novaehollandiae	New Holland Mouse		V	1
Cuculus optatus	Oriental Cuckoo		M	1
Grantiella picta	Painted Honeyeater	V	V	1
Ninox strenua	Powerful Owl	V		2
Anthochaera phrygia	Regent Honeyeater	CE	CE	1
Rhipidura rufifrons	Rufous Fantail		M	1
Myiagra cyanoleuca	Satin Flycatcher		M	1
Dasyurus maculatus maculatus	Spot-tailed Quoll	V	E	1
Mixophyes balbus	Stuttering Frog	E	V	1
Lathamus discolor	Swift Parrot	E	CE	1

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Number of Records
Haliaeetus leucogaster	White-bellied Sea-Eagle	V		1
Hirundapus caudacutus	White-throated Needletail		V	1
Motacilla flava	Yellow Wagtail		M	1

FIGURES

Legend

- Subject Site
- Rezoning Area
- Lot Boundaries Associated with the Planning Proposal

Image Source:
Image © NearMap 2021
Dated: 11/8/2021

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Campbelltown LGA

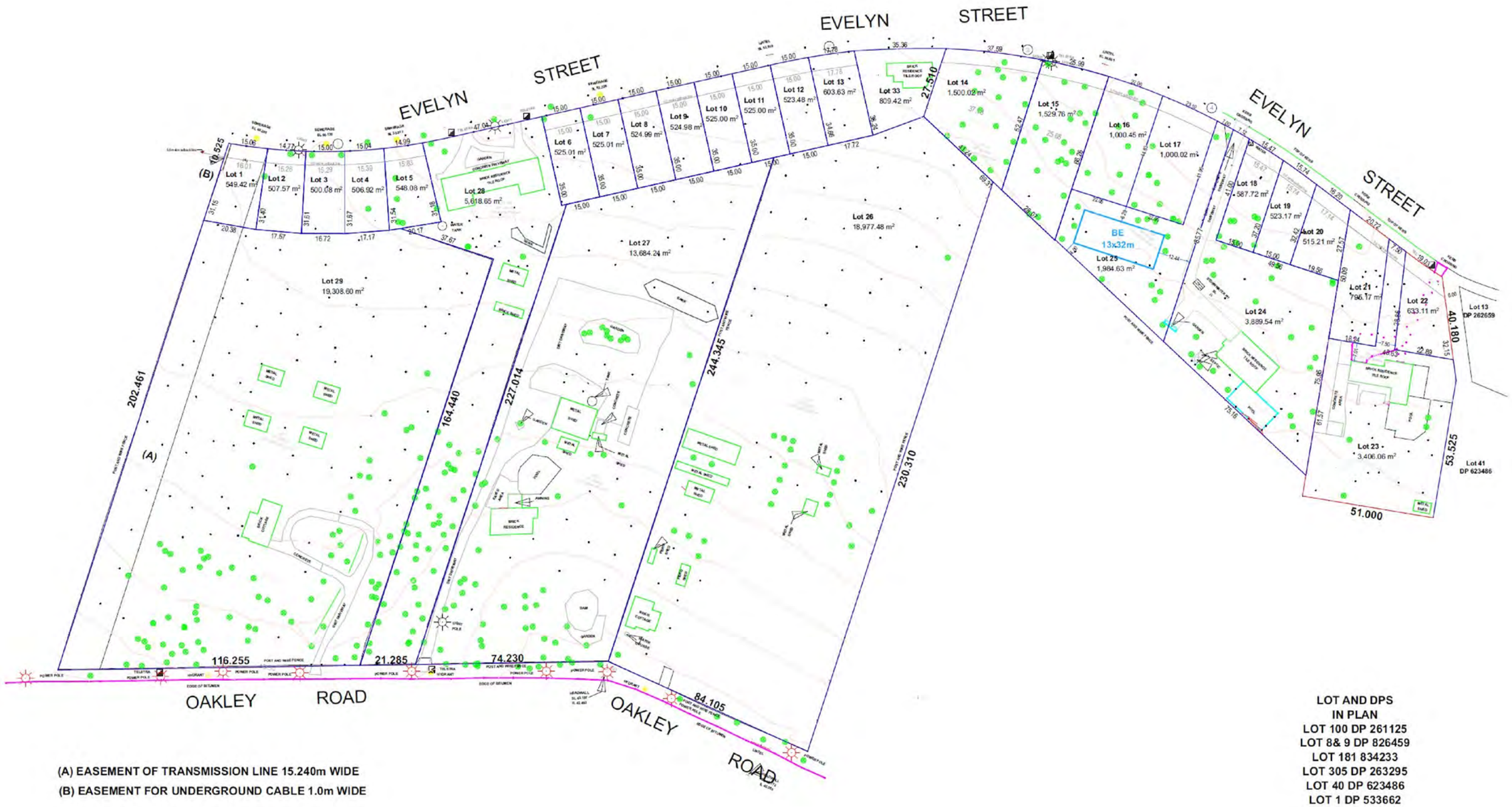
Coordinate System: MGA Zone 56 (GDA 94)

cumberland ecology

0 50 m

I:\...\16066\Figures\RP3\20211006\Figure 1. Location

Figure 1. Location of the subject site and rezoning area



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enquiry@planzone.com.au
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Notes

Do not scale off drawings, use scaled measurements. All measurements to be confirmed on site prior to commencement of any works.

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bdaa BUILDING DESIGNERS ASSOCIATION OF AUSTRALIA

N

Details

Proposal	Subdivision
Address	Evelyn Street, Macquarie Fields
Project No.	20150604
Revision No.	12
Drawing No.	PP01
Client Name	Evelyn Street Group of Owners
LGA	Campbelltown City Council
Drawing Title	Proposed Subdivision Plan
Scale	1:1000
Drawn By	A H

Revisions

Rev #	Revision Name	Issue Date	Rev #	Revision Name	Issue Date
02	Draft 2 for Client Review	23/03/2016	08	Lot 14-24 Amendment	13/05/2020
03	Draft 3 for Client Review	31/03/2016	09	Amended Planning Proposal	20/08/2020
04	Draft 4 for Client Review	22/04/2016	10	Amended Planning Proposal	1/10/2020
05	Revised Lot Layout for NKG	1/07/2016	11	Amended Lot 23 Access Handle	20/10/2020
06	Final Revisions	19/11/2019	12	Updated for Gateway 2/Ecology	5/10/2021

I:\...\16066\Figures\RP3\20211006\Figure 2. Proposed subdivision layout

Figure 2. Proposed subdivision layout of the rezoning area

Image Source: Planzone 2021

Legend

- Subject Site

Flora Survey Locations

- BAM Plot Locations
- Random Meander

Fauna Survey Locations

- Cumberland Plain Land Snail Survey Tracks
- SAT Survey Tracks
- SAT Survey Locations

Image Source:
Image © NearMap 2021
Dated: 11/8/2021

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Campbelltown LGA

Coordinate System: MGA Zone 56 (GDA 94)

cumberland ecology

0 50 m

I:\...\16066\Figures\RP3\20210929\Figure 3. Survey locations

Figure 3. Survey locations

Legend

- Subject Site
- Rezoning Area

Vegetation Community

- Cumberland Plain Woodland - Moderate condition
- Cumberland Plain Woodland - Poor condition
- Planted Garden Vegetation
- Exotic Grassland
- Cleared Land

Image Source:
Image © NearMap 2021
Dated: 11/8/2021

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Campbelltown LGA

Coordinate System: MGA Zone 56 (GDA 94)

cumberland ecology

0 50 m

I:\...\16066\Figures\RP3\20210929\Figure 4. Vegetation communities

Figure 4. Vegetation communities within the subject site and rezoning area

Legend

- Subject Site
- Rezoning Area

Habitat Feature

- Hollow-bearing Tree
- Fallen Timber
- Shed
- Dam

Threatened Flora Records

- Eucalyptus nicholii
- Macadamia integrifolia
- Syzygium paniculatum

Threatened Fauna Records

- Koala

Image Source:
Image © NearMap 2021
Dated: 11/8/2021

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Campbelltown LGA

Coordinate System: MGA Zone 56 (GDA 94)

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I:\...\16066\Figures\RP3\20210929\Figure 5. habitat features and threatened species

Figure 5. habitat features and threatened species records within the subject site and rezoning area

Legend

- Subject Site
- Rezoning Area

Vegetation Community

- Cumberland Plain Woodland - Moderate condition
- Cumberland Plain Woodland - Poor condition
- Planted Garden Vegetation
- Exotic Grassland
- Cleared Land

Habitat Feature

- Hollow-bearing Tree
- Fallen Timber
- Shed
- Dam

Threatened Flora Records

- Eucalyptus nicholii
- Macadamia integrifolia
- Syzygium paniculatum

Threatened Fauna Records

- Koala

Image Source:
Image © NearMap 2021
Dated: 11/8/2021

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Campbelltown LGA

Coordinate System: MGA Zone 56 (GDA 94)

cumberland ecology

0 50 m

I:\...\16066\Figures\RP3\20210929\Figure 6. Indicative future impacts

Figure 6. Indicative future impacts within the rezoning area

Attachment "B2"

Vegetation Assessment Report

(Cumberland Ecology – 7 October 2021)

Vegetation Assessment Report

Evelyn Street, Macquarie Fields Planning Proposal

Evelyn Street Landowners Group

7 October 2021

Final

(02) 9868 1933 | PO Box 2474 Carlingford Court NSW 2118 | cumberlandecology.com.au

Report No. 16066RP4

The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or commendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology.

Version	Date Issued	Amended by	Details
v1	7/10/2021	JL, TP	Final

Approved by:	Dr David Robertson
Position:	Director
Signed:	David Robertson
Date:	7 October, 2021

Table of Contents

Table of Tables

Table of Photographs

Table of Appendices

Table of Figures

Glossary

Term/Abbreviation	Definition
BAR	Biodiversity Assessment Report (16066RP3)
BC Act	NSW Biodiversity Conservation Act 2016
CEEC	Critically Endangered Ecological Community
CKPoM	Campbelltown Comprehensive Koala Plan of Management (approved)
Council	Campbelltown City Council
DA	Development Application
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DBH	Diameter at Breast Height
GIS	Geographic Information Systems
GPS	Global Positioning System
KAR	Koala Assessment Report
KMA	Koala Management Area
Koala SEPP 2021	State Environmental Planning Policy (Koala Habitat Protection) 2021
KPoM	Koala Plan of Management
KUTS	Koala Use Tree Species
LGA	Local Government Area
PCT	Plant Community Type
PKFT	Preferred Koala Feed Trees
Rezoning area	Area associated with the planning proposal from E4 – Environmental living to R2 – Low Density Residential
SAT	Spot Assessment Technique
SEPP 44	State Environmental Planning Policy No. 44 – Koala Habitat Protection
Subject site	Properties associated with the planning proposal listed in Section 1.1
TEC	Threatened Ecological Community
the client	Evelyn Street Landowners Group
VAR	Vegetation Assessment Report
VAR study area	All areas within 20 m of the rezoning area and not outside the lots associated with the subject site

1. Introduction

1.1. Purpose

Cumberland Ecology has been requested by Planzone on behalf of the Evelyn Street Landowners Group (the 'client') to provide a Vegetation Assessment Report (VAR) to support the Evelyn Street Planning Proposal (the planning proposal). It is understood that the VAR is required to ensure the planning proposal is consistent with the *State Environmental Planning Policy (Koala Habitat Protection) 2021* (Koala SEPP 2021) and Campbelltown's approved Comprehensive Koala Plan of Management (the CKPoM) (Phillips 2018). This VAR has been submitted in conjunction with the Biodiversity Assessment Report (BAR) prepared by Cumberland Ecology in October 2021 that is to be submitted in support of the planning proposal. The area subject to the planning proposal is the Evelyn Street frontage of the following properties:

- 85 Evelyn Street, Macquarie Fields (Lot 40 DP623486);
- 87 Evelyn Street, Macquarie Fields (Lot 305 DP263295);
- 89 Evelyn Street, Macquarie Fields (Lot 181 DP834233);
- 16 Oakley Road, Macquarie Fields (Lot 9 DP826459);
- 18 Oakley Road, Macquarie Fields (Lot 8 DP826459);
- 109 Evelyn Street, Macquarie Fields (Lot 100 DP261125); and
- The northern portion of 22 Oakley Road, Macquarie Fields (Lot 1 DP533662).

The above listed properties have been referred to as the 'subject site' in the BAR and for consistency, is referred to as the subject site in this VAR. The area to be rezoned is referred to as the 'rezoning area' (**Figure 1**) and for this VAR to be consistent with the CKPoM, a 20 m study area buffer has been placed around the rezoning area within the lot boundaries listed above and is hereafter referred to as the VAR study area. The VAR study area is located in the Campbelltown Local Government Area (LGA) and the planning proposal proposes to rezone the rezoning area from E4 – Environmental Living to R2 – Low Density Residential under the *Campbelltown Local Environmental Plan 2015* (Campbelltown LEP).

The purpose of this document is to present a VAR that has been prepared in accordance with the requirements of the CKPoM, to identify the likely impact on koala habitat and populations that may occur in the VAR study area due to the development to be facilitated by the rezoning.

1.2. Legislative Requirements

1.2.1. State Environmental Planning Policy (Koala Habitat Protection) 2021

State Environmental Planning Policy (Koala Habitat Protection) 2021 (Koala SEPP 2021) applies to the Campbelltown Local Government Area (LGA) as of 17 March 2021. It replaces the *State Environmental Planning Policy (Koala Habitat Protection) 2020*, reverting to for the most part, the changes legislated by *State Environmental Planning Policy (Koala Habitat Protection) 2019*, which replaced the older *State Environmental Planning Policy No. 44 – Koala Habitat Protection* (SEPP 44).

The Koala SEPP 2021 includes a number of changes to the older legislation including a new definition of 'core koala habitat'. The list of tree species used by koalas listed under the Koala SEPP 2021 has also been expanded from 10 under SEPP 44, to 123 under the Koala SEPP 2021, across nine distinct regions of NSW, known as Koala Management Areas (KMAs). Tree species detailed in Schedule 2 of the Koala SEPP 2021 utilised by koalas as habitat are referred to as Koala Use Tree Species (KUTS).

Under the Koala SEPP 2021 a Development Application (DA) must assess the impacts of the development on koalas where there is no Koala Plan of Management (KPoM) in place with the preparation of a Koala Assessment Report (KAR). A KAR is only required if the property the development is proposed to take place on is greater than one hectare, or adjacent land holdings by the same land holder combined exceed one hectare, and Core Koala Habitat is present. If a KPoM is in place a DA is required to demonstrate consistency with the KPoM.

The VAR study area is located in the Campbelltown LGA, for which a CKPoM has been prepared. The CKPoM has been adopted and is now in force, and therefore demonstrating consistency of a planning proposal with the CKPoM also demonstrates consistency with the Koala SEPP 2021. The requirements of the CKPoM are considered in **Section 1.2.2** below.

1.2.2. Campbelltown Comprehensive Koala Plan of Management (CKPoM)

This section considers the requirements of the CKPoM and the relevant sections as they relate to the planning proposal. Relevant sections are reproduced verbatim in italics below.

Section 6.2.4(i) of the CKPoM states:

'*A planning proposal pursuant to Section 55 of the EPA Act should demonstrate consistency with this Plan* (being the CKPoM) *so as to identify the likely impact on koala habitat and populations of the type of development to be facilitated by the rezoning*'.

Section 6.3.1 of the CKPOM states:

(i) A rezoning or DA must establish if the land being the subject of the application contains any potential koala habitat by way of a Vegetation Assessment Report (VAR); and

(ii) As a minimum, the VAR shall include:

• a description of the tallest stratum cover as well as details of the species composition of each vegetation community

• a checklist of native vegetation species occurring in each vegetation patch, including any isolated paddock trees on partially cleared lands

• a stadia-metric survey that identifies the precise location, identity and dbh of all native vegetation proposed to be removed and/or within 20m of the proposed development footprint, including any proposed infrastructure, easements and APZs

• a map of where (P)KFTs and shelter trees were recorded.

Section 6.4.8 states:

(ii) for the purposes of Section 6.4.2 of the Plan, Council may exercise discretion subject to the application demonstrating to the satisfaction of Council that that retention of (P)KFTs > 200mm DBH has been maximised and that the proposed tree removal will not prejudice the overall vision, aims and objectives of the Plan

Note that the CKPoM utilises the definitions of koala habitat from the repealed SEPP 44. These definitions are:

"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.

"Potential koala habitat" means areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.

Trees listed in Appendix E of the CKPoM with a DBH >200mm are referred to as PKFTs.

In accordance with the CKPoM, for the purposes of mapping and determining Preferred Koala Feed Trees (PKFTs), this report defines PKFTs as those listed in Appendix E of the CKPoM and have a diameter-at-breast-height (DBH) of >200mm that occur within 20 m of the rezoning area and as mentioned previously, is referred to as the VAR study area. Note the VAR study area includes areas within 20 m of the rezoning area and that are also accessible as part of this assessment i.e. are within lots associated with the subject site.

Table 1 provides a compliance table that shows where each of the above VAR requirements identified in the CKPoM are addressed within this report.

Table 1 Compliance Table – VAR Requirements under the CKPoM

Requirement	Report Location
Description of the tallest stratum cover as well as details of the species composition of each vegetation community	**Chapter 3** describes the vegetation communities found within the VAR study area and **Table 4** displays stratum height in relation to their associate patch.
A checklist of native vegetation species occurring in each vegetation patch, including any isolated paddock trees on partially cleared lands	**Appendix A** provides a checklist of native vegetation species recorded in each of the flora plots undertaken in accordance with the Biodiversity Assessment Method (BAM) within vegetation patches in the VAR study area. BAM plot locations are shown in **Figure 4**. The species composition of scattered native paddock trees is detailed in **Table 4** in **Chapter 3** and these areas are shown in **Figure 5**.
A stadia-metric survey that identifies the precise location, identity and dbh of all native vegetation proposed to be removed and/or within 20m of the proposed development footprint, including any proposed infrastructure, easements and APZs	A stadia-metric survey of all native vegetation was conducted according to the methods detailed in **Section 2.2.3**. The results of the stadia-metric survey are detailed in **Chapter 3**, with the locations shown in **Figure 7.**
A map of where (P)KFTs and shelter trees were recorded.	All PKFTs (including shelter trees) recorded within the VAR study area are shown in **Figures 7**.

Note that this VAR has been submitted in support of the planning proposal in conjunction with a Biodiversity Assessment Report (BAR) for the subject site and rezoning area (16066RP3). As such, descriptions of the biodiversity values within the subject site and rezoning area provided in this VAR are consistent with the BAR.

2. Methodology

2.1. Desktop Assessment

Database analysis was conducted for the locality on 28 September 2021 using the NSW BioNet Atlas and the Commonwealth EPBC Act Protected Matters Search Tool for Koala records from the last 18 years. The locality is defined as the area within a 5 km radius of the subject site (EES 2021).

Additionally, mapping layers from Figure 5.1 of the CKPoM were reviewed to determine the locations of mapped Core Koala Habitat or Potential Koala Habitat in close proximity to the VAR study area.

2.2. Surveys

Surveys undertaken as part of the BAR which are relevant to the results presented in this VAR are provided below and detailed under the below headings:

- Flora Survey conducted on 26 August 2021 for the BAR;
- Koala survey conducted in September 2018 for the BAR; and
- Stadia Metric Surveys conducted on 26 August 2021 for this VAR.

2.2.1. Flora Survey

A flora survey was conducted on 26 August 2021 by a botanist and two ecologists from Cumberland Ecology. The flora survey consisted of the following:

- A random meander survey across the subject site to compile a species list and to map vegetation communities;
- A plot-based vegetation integrity assessment performed in accordance with the BAM;
- Targeted searches for threatened flora species identified as being present within the locality and having the potential to be present by way of random meander; and
- Taking photographs of vegetation to provide a visual documentation of Plant Community Types (PCTs) present and their condition.

Identification of the PCTs occurring within the subject site was guided by the findings of the floristic survey. The data collected during surveys of the subject site was analysed in conjunction with a review of the PCTs held within the VIS Classification Database. Consideration was given to the occurrence within the Sydney Basin Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion and Cumberland IBRA Sub-regions. The locations of flora surveys within the subject site are shown in **Figure 2**.

2.2.1.1. Vegetation Mapping

Previous vegetation mapping of the subject site prepared by the former Office of Environment and Heritage (OEH) were reviewed prior to the survey in order to determine vegetation communities that could occur within the subject site (OEH 2016). The vegetation within the subject site was ground-truthed by Cumberland Ecology. Vegetation community boundaries were made using a hand-held Global Positioning System (GPS) and mark-

up of aerial photographs. The data collected was analysed and the resultant information was synthesised using a Geographic Information System (GIS) to produce a vegetation map of the subject site.

2.2.1.2. Vegetation Integrity Assessment

A vegetation integrity assessment was undertaken in the subject site in accordance with the BAM. Surveys included establishment of a single 20 m x 50 m plot within which the following data was collected:

- Composition for each growth form group by counting the number of native plant species recorded for each growth form group within a 20 m x 20 m floristic plot;
- Structure of each growth form group as the sum of all the individual projected foliage cover estimates of all native plant species recorded within each growth form group within a 20 m x 20 m floristic plot;
- Cover of 'High Threat Exotic' weed species within a 20 m x 20 m floristic plot;
    - Assessment of function attributes within a 20 m x 50 m plot, including:
    - Count of number of large trees;
    - Tree stem size classes, measured as 'diameter at breast height over bark' (DBH);
    - Regeneration based on the presence of living trees with stems <5 cm DBH;
    - The total length in metres of fallen logs over 10 cm in diameter;
- Assessment of litter cover within five 1 m x 1 m plots evenly spread within the 20 m x 50 m plot; and
- Number of trees with hollows that are visible from the ground within the 20 m x 50 m plot.

Four BAM plots were undertaken within the subject site, three of which were within the VAR study area (**Figure 2**)

2.2.2. Koala Survey

2.2.3. Koala Surveys

Surveys were undertaken for the koala in September 2018 for the BAR and are consistent with the methodology required for this VAR. These surveys utilised the Spot Assessment Technique (SAT) survey methodology as outlined in Phillips and Callaghan (2011). A 50 m sampling grid was established over the subject site with a total of eight (8) SAT survey sites established across the subject site, three of which were within the VAR study area. Field assessments carried out at each SAT survey site included:

- Selection and sampling of a central mature koala feed tree (or another species if no feed trees are present);
- Subsequent sampling of up to 29 of the trees closest to this central tree, i.e. a total of 30 trees sampled at each SAT survey site;

- At each SAT survey site, a maximum of two-person minutes was spent searching for faecal pellets (scats) within a one metre radius of the base of each selected tree. Searching ceased if a koala faecal pellet was located before the two minutes expired;
- Searching for faecal pellets involved an initial inspection of the ground surface followed by a robust disturbance, i.e. raking of the leaf litter if necessary to search for faecal pellets; and
- The species of each tree searched was recorded along with presence/absence of koala faecal pellets. Notes were made on whether the scats were fresh or old and a photograph and/or sample was taken.

Area searches for the koala were also undertaken at each of the SAT survey site, irrespective of result of the faecal pellet searches. At each of the SAT survey sites, a five-minute visual inspection of trees was conducted within a 25 m radius of the central tree.

SAT survey sites and survey tracks are shown on **Figure 2**.

2.2.4. Stadia Metric Surveys

Stadia Metric Surveys were undertaken within the VAR study area of trees by Cumberland Ecology on 26 August 2021. A tree was defined as a perennial plant with at least one self-supporting stem which:

- Has a height of more than three (3) metres, or
- Has an outside circumference of at least 500mm at ground level; or
- Has a branch and foliage crown spread of at least 4 metres.

Cumberland Ecology undertook a detailed survey of trees using a handheld GPS with a maximum error of 5 m. All trees were surveyed based on GDA94 Zone 56 MGA coordinates and Australian Height Datum (AHD).

The data was then analysed by Cumberland Ecology staff in Microsoft Excel format containing tree data in the following format: Tree Number/Easting/Northing/Height/Canopy spread/Trunk diameter (ground)/Trunk diameter (chest)/Multi stem status.

For the purposes of this assessment the term "native" was defined as per the NSW *Local Land Services Act 2013* (LLS Act), i.e. *"A plant is native to New South Wales if it was established in New South Wales before European settlement. The regulations may authorise conclusive presumptions to be made of the species of plants native to New South Wales by adopting any relevant classification in an official database of plants that is publicly accessible*". As such, some individuals of planted species native to Australia, but not indigenous to NSW, were excluded from the dataset presented in this report.

Stadia Metric Survey tracks are shown on **Figure 2**.

2.3. Limitations

The Stadia Metric Survey of the VAR study area was conducted by Cumberland Ecology ecologists using handheld GPS units. Nevertheless, it is considered the surveys presented in this report provides enough detail of the core koala habitat present and individual tree locations within the VAR study area to allow Council to

assess the consistency of the planning proposal with the CKPoM. The handheld GPS units used to mark the locations of trees within the VAR study area have a maximum error of 5 m. Therefore, the tree locations recorded are considered to be accurate enough to allow for a comprehensive and detailed list of PKFTs within the VAR study area.

Additionally, while consistency with the CKPoM requires surveys to occur within 20 m of the rezoning area, the VAR study area could not extend further than the lot boundaries associated with the subject site due to access constraints. As such, all areas within 20 m of the rezoning area that fall outside the subject site were not surveyed for this VAR or the BAR.

3. Results

3.1. Desktop Assessment

A review of these records (**Figure 3**) shows no further koalas to have been recorded within the VAR study area within the last 18 years further to those recorded as part of the BAR surveys (***Section 3.2.4***). Koalas have therefore been recorded within the VAR study area and as such, all native vegetation mapped within the VAR study area constitutes Core Koala Habitat under the Koala SEPP 2021. This is consistent with the mapping within the CKPoM, which appears to map Core Koala Habitat within the general area of the subject site and VAR study area.

The Potential and Core Koala Habitat identified by the CKPoM within the LGA in relation to the VAR study area is shown in **Figure 4**.

3.2. Vegetation Communities

This assessment considers the vegetation communities present in the VAR study area provide context of the areas subject to the planning proposal. A detailed layout of the vegetation communities within the whole subject site can be found in Figure 4 of the BAR.

Previous broad-scale mapping conducted by OEH indicates that Cumberland Shale Plains Woodland, Cumberland Shale-Sandstone Ironbark Forest, Undifferentiated Regenerating Shrubs, Urban Native and Exotic Cover and Weeds and Exotics are present within the VAR study area. Surveys by Cumberland Ecology for this assessment refined the existing vegetation mapping of the VAR study area and identified the following vegetation communities:

- Cumberland Shale Plains Woodland – Moderate condition;
- Cumberland Shale Plains Woodland – Poor condition;
- Planted Garden Vegetation; and,
- Exotic Grassland.

Cumberland Shale Plains Woodland corresponds to PCT 849 'Cumberland Plain Woodland in the Sydney Basin Bioregion', which is listed as a Critically Endangered Ecological Community (CEEC) under the BC Act. It also corresponds to 'Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest', which is a CEEC listed under the EPBC Act.

The areas of these communities are provided in **Table 2** and the distribution of these communities is shown in **Figure 4.** Descriptions of each of the vegetation communities are provided in subsections below.

Table 2 Extent of vegetation communities within the VAR study area and rezoning area

Vegetation Communities	BC Act Status	VAR Study Area	Rezoning Area
Cumberland Plain Woodland - Moderate condition	CEEC	0.37	0.32
Cumberland Plain Woodland - Poor condition	CEEC	0.63	0.63
Planted Garden Vegetation	Not listed	0.17	0.14
Exotic Grassland	Not listed	1.78	1.22
Cleared Land	N/A	0.30	0.30
Total		**3.24**	**2.60**

3.2.1. Cumberland Shale Plains Woodland

Vegetation Formation: Grassy Woodlands

Vegetation Class: Coastal Valley Grassy Woodlands

Percent Cleared Value: 93

TEC Status: Critically Endangered Ecology Community (CEEC) – Cumberland Plain Woodland

3.2.1.1. General Description

Cumberland Shale Plains Woodland (PCT 849) is present throughout the VAR study area as scattered patches of shrubs/trees over exotic grassland and as one patch of intact woodland. Within the VAR study area, this community is considered to be in relatively poor to moderate condition. The canopy species within the VAR study area are *Eucalyptus moluccana* (Grey Box), *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus crebra* (Narrow-leaved Ironbark). To a lesser extent *Eucalyptus fibrosa* (Red Ironbark), *Eucalyptus amplifolia* (Cabbage Gum) and *Eucalyptus eugenioides* (Thin-leaved Stringybark) are also present in some areas.

In better quality areas, the shrub layer is dominated by *Bursaria spinosa* (Blackthorn), and scattered individuals of *Acacia decurrens* (Black Wattle) and *Acacia implexa* (Hickory Wattle). Scattered *Eucalyptus moluccana* (Grey Box) in the shrub layer suggests that there is some potential for natural regeneration of canopy/sub-canopy species. A number of woody exotic weeds are associated with this condition class including *Brassica fruticulosa* (Twiggy Turnip) and *Osteospermum fruticosum*.

A low abundance of native herbaceous species were recorded within the VAR study area. Native forbs and grass species typical of the community are present within the VAR study area: Poranthera microphylla (Small Poranthera), *Einadia nutans subsp.* linifolia (Climbing Saltbush), Einadia nutans *subsp. nutans* (Climbing Saltbush), *Einadia hastata* (Berry Saltbush), *Einadia* polygonoides, *Dichondra repens* (Kidney Weed), *Oxalis perennans*, *Plectranthus parviflorus* (Cockspur Flower), *Solanum prinophyllum* (Forest Nightshade), *Grona varians* (Slender Tick-trefoil), *Glycine tabacina*, *Hardenbergia violacea* (Purple Coral Pea), *Commelina cyanea*, *Cyperus gracilis* (Slender Flat-sedge), *Lomandra filiformis subsp. filiformis* (Wattle Mat-rush), *Dianella longifolia* (Blueberry Lily), *Aristida ramosa* (Purple Wiregrass), *Chloris ventricosa* (Plump Windmill Grass) and *Microlaena stipoides* (Weeping Grass), These occur in varying compositions throughout this community, where native species are more common in some areas and absent/low abundance in other areas.

Exotic groundcover is generally dominant within this community in the VAR study area and includes species such as *Sida rhombifolia*, *Bidens pilosa* (Cobblers Pegs), *Senecio madagascariensis* (Fireweed), *Sonchus oleraceus* (Common Sowthistle), *Plantago lanceolata* (Lamb's Tongues), *Araujia sericifera* (Moth Vine), *Asparagus asparagoides* (Bridal Creeper), *Ehrharta erecta* (Panic Veldtgrass) and *Cenchrus clandestinus* (Kikuyu Grass).

3.2.1.2. Condition States

Within the VAR study area, Cumberland Shale Plains Woodland exists in two condition states including areas in 'moderate condition' and areas in 'poor condition'. Both condition states are described below.

i. Moderate Condition

The moderate condition state of Cumberland Shale Plains Woodland occurs as one large stand in the central north and covers approximately 0.37 ha within the VAR study area and 0.32 ha within the rezoning area (see **Figure 4**). This zone contains areas of canopy regrowth and an intact shrub layer dominated by *Bursaria spinosa* (Blackthorn).

An example of this condition state is shown in **Photograph 1**.

Photograph 1 Cumberland Shale Plains Woodland (moderate condition) within the VAR study area

ii. Poor Condition

The poor condition state occurs in scattered patches across the VAR study area covering 0.63 ha all of which occurs within the rezoning area (see **Figure 4**). This condition state was distinguishable from the moderate condition areas as it did not display an intact native shrub layer. This condition state for the most part occurred as canopy trees over exotic grassland.

An example of this condition state is shown in **Photograph 2**.

Photograph 2 Cumberland Shale Plains Woodland (poor condition) within the VAR study area

3.2.1.3. Alignment with Threatened Ecological Communities

Within the BioNet Vegetation Classification, PCT 849 is associated with Cumberland Plain Woodland in the Sydney Basin Bioregion, which is listed as a CEEC under the BC Act and the EPBC Act.

Cumberland Plain Woodland naturally occurs within the locality and the vegetation in the VAR study area closely conforms to the features identified in the final determination for the community. Floristic characters used to distinguish this community were the prevalence of *Eucalyptus moluccana* (Grey Box) and *Eucalyptus tereticornis*, the generally sparse understorey of locally indigenous shrubs, and occurrence of diagnostic native grasses and forbs. Furthermore, the edaphic features of the VAR study area are characteristic of those identified in the final determination, specifically the occurrence of clays derived from shales.

All of the areas of PCT 849 within the VAR study area have been assessed as conforming to the Cumberland Plain Woodland CEEC listing under the BC Act. However, only the moderate condition state of PCT 849 within the VAR study area has been determined to conform to the EPBC Act listing for Cumberland Plain Shale Woodlands and Shale Gravel Transition Forest. This condition state conforms to the EPBC Act listing because it:

- Contains native tree species with more than 10% canopy cover;
- Is part of a patch size larger than 0.5 ha; and

- Contains more than 50% native perennial understory species.

The poor condition state mapped within the VAR study area has been determined to not conform to the EPBC Act listing of the community as it generally occurs as scattered stands of native canopy with exotic undergrowth and does not form a patch larger than 0.5 ha.

3.2.2. Planted Garden Vegetation

Planted Garden Vegetation is present surrounding existing residential dwellings and comprises 0.17 ha within the VAR study area, most of which occurs within the rezoning area (0.14 ha) (see **Figure 4**). Canopy and sub-canopy species within this vegetation community are non-endemic native species such as *Eucalyptus microcorys* (Tallowwood), *Macadamia integrifolia* (Macadamia), *Melaleuca armillaris* (Bracelet Honey-myrtle) and *Cupaniopsis anacardioides* (Tuckeroo). Shrub species are non-endemic native species such as *Callistemon viminalis* (Weeping Bottlebrush), *Callistemon citrus* and a number of *Grevillea* spp. cultivars. Woody exotic species surround the existing residential dwellings and include *Pinus radiata* (Radiata Pine), *Prunus* spp., *Jacaranda mimosifolia* (Jacaranda), *Liquidambar styraciflua*, *Quercus palustris* (Pin Oak), *Ulmus parvifolia* (Chinese Elm) and *Acer japonicum* (Japanese Maple).

Four scattered *Acacia decurrens* (Black Wattle) individuals over exotic grassland are included in this condition state as well as three threatened flora species listed including *Macadamia integrifolia* (Rough-shelled Bush Nut), *Eucalyptus nicholii* (Narrow-leaved Black Peppermint) and Syzygium paniculatum (Magenta Lilly Pilly). *Macadamia integrifolia* (Rough-shelled Bush Nut) and *Eucalyptus nicholii* (Narrow-leaved Black Peppermint) are not endemic the Greater Sydney Region and all have been planted within a garden context.

This community does not comprise a defined native vegetation unit and does not conform to a listing under the BC Act or EPBC Act.

An example of the community is shown in **Photograph 3**, **Photograph 4** and **Photograph 5.**

Photograph 3 Planted garden vegetation within the VAR study area

Photograph 4 Planted garden vegetation surrounding existing residential dwellings

Photograph 5 Acacia individuals mapped as Planted Garden Vegetation within the VAR study area

3.2.3. Exotic Grassland

Exotic vegetation occurs as exotic dominated grassland that occupies 1.78 ha of the VAR study area and 1.22 ha of the rezoning area (see **Figure 4**). Groundcover within this community is predominantly exotic grass and consists of species including *Cenchrus clandestinus* (Kikuyu), *Paspalum dilatatum* (Paspalum) and *Setaria parviflora*. Native grasses are also present in some areas such as *Microlaena stipoides* (Weeping Grass). Herbaceous exotic species include *Gamochaeta americana* (Cudweed), *Hypochaeris radicata* (Catsear), *Senecio madagascariensis* (Fireweed) and *Sida rhombifolia*. A large patch of *Rubus fruticosus aggregate* (Blackberry) is present within the exotic grassland in the north. See **Appendix A** for a full species list.

An example of this community is shown in **Photograph 6.**

Photograph 6 Exotic grassland within the VAR study area

3.2.4. Koala Surveys

The SAT surveys conducted as part of the BAR recorded evidence for Koalas in the form of scats at the base of four separate KUTS, three of which occur within the VAR study area (**Figure 5**). As such, the vegetation conforming to PCT 849 within the VAR study area is also considered to conform to Core Koala Habitat under the Koala SEPP 2021 as there is evidence of Koala presence in the previous 18 years.

Additionally, Core Koala Habitat as defined in the CKPoM was mapped by Cumberland Ecology across the VAR study area based on the presence in vegetation patches of occurrences of greater than 15% PKFTs (**Figure 5**).

3.3. Native Vegetation Species

For the purposes of describing the species composition of vegetation patches within the VAR study area, the vegetation present has been divided into numbered patches, which are shown on **Figure 6**. In the absence of a detailed methodology for determining patches in the CKPoM, patches were determined by Cumberland Ecology based on their connectivity to each other and whether there are significant barriers separating areas of bushland. This resulted in one patch being identified within the VAR study area as well as two isolated paddock trees that are surrounded by cleared lands and exotic grassland within the study area. The vegetation mapping presented utilised the vegetation mapping presented with the BAR prepared by Cumberland Ecology to support the planning proposal. The patches identified in the VAR study area and the corresponding BAM plots are shown in **Table 3** below. Species composition data for these BAM plots is provided in **Appendix A**.

Table 3 Location of BAM plots within vegetation patches

Patch Number	BAM Plot ID	Vegetation Community
1	P1 and P2	PCT 849 – Cumberland Shale Plains Woodland – Moderate and Poor Condition
Isolated paddock tree	N/A	Single *Eucalyptus moluccana*
Isolated paddock tree	N/A	Single *Eucalyptus tereticornis*

Note that the isolated paddock trees are not associated with BAM plot data due to the small size of the area within the VAR study area. As stated in **Table 3** however, they are associated with a single tree including a single *Eucalyptus moluccana* and *Eucalyptus tereticornis*, respectively.

3.4. Stadia Metric Survey Results

The results of the Stadia Metric Survey of the Study Area for PKFTs are presented in **Table 4** below (on the next page). Locations of PKFTs identified during the surveys are shown in **Figure 7**.

Table 4 Tree locations within the VAR study area

WP	Date	Zone	Easting	Northing	Elevation (m)	Community	Patch Number	Species Name	Canopy Spread (m)	DBH (m)	Height (m)	Multistem?	Dead?	Habitat
1	26/08/2021	56	305469	6235680	69	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus crebra*	18.2	91	26.9			
1A	26/08/2021	56	305549	6235658	69	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	11.7	45	16.5			
1B	26/08/2021	56	305743	6235657	69	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus crebra*	3.1	16	9.2			
2	26/08/2021	56	305510	6235704	68	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus crebra*	3.1	69	24.7			
3	26/08/2021	56	305514	6235697	68	Exotic Grassland	N/A	*Ulmus parvifolia*	17.3	33	13.9			
4	26/08/2021	56	305508	6235717	68	Planted Garden Vegetation	N/A	*Jacaranda mimosifolia*	11	19	8.5			
5	26/08/2021	56	305505	6235724	67	Planted Garden Vegetation	N/A	*Syzygium paniculatum*	7.2	11	7.3	Y		
6	26/08/2021	56	305506	6235716	67	Planted Garden Vegetation	N/A	*Prunus persica*	4.1	5	2.5			
7	26/08/2021	56	305503	6235717	68	Planted Garden Vegetation	N/A	*Eriobotrya japonica*	1.9	3	2.1			
8	26/08/2021	56	305478	6235736	66	Planted Garden Vegetation	N/A	*Melaleuca quinquenervia*	1.3	12	6.3	Y		
9	26/08/2021	56	305476	6235735	64	Planted Garden Vegetation	N/A	*Melaleuca quinquenervia*	3.5	13	5.8	Y		
10	26/08/2021	56	305477	6235738	65	Planted Garden Vegetation	N/A	*Melaleuca quinquenervia*	1.2	11	5.9			
11	26/08/2021	56	305475	6235739	65	Planted Garden Vegetation	N/A	*Melaleuca quinquenervia*	0.9	8	4.2	Y	Y	
12	26/08/2021	56	305476	6235738	65	Planted Garden Vegetation	N/A	*Melaleuca quinquenervia*	1.1	9	5.8	Y	Y	
13	26/08/2021	56	305479	6235739	65	Planted Garden Vegetation	N/A	*Melaleuca linariifolia*	3.6	9	6.3			
14	26/08/2021	56	305482	6235744	65	Planted Garden Vegetation	N/A	*Melaleuca quinquenervia*	4.1	17	6.1	Y		
15	26/08/2021	56	305489	6235740	65	Planted Garden Vegetation	N/A	*Melaleuca quinquenervia*	4.5	19	6.5	Y		
16	26/08/2021	56	305489	6235745	64	Planted Garden Vegetation	N/A	*Ligustrum lucidum*	5.2	13	7.2	Y		
17	26/08/2021	56	305486	6235742	64	Planted Garden Vegetation	N/A	*Melaleuca quinquenervia*	1.1	9	6.5		Y	
18	26/08/2021	56	305492	6235742	64	Planted Garden Vegetation	N/A	*Melaleuca linariifolia*	2.8	8	6.1	Y		
19	26/08/2021	56	305490	6235740	64	Planted Garden Vegetation	N/A	*Melaleuca linariifolia*	2.9	6	5.9	Y		
20	26/08/2021	56	305497	6235746	63	Planted Garden Vegetation	N/A	*Jacaranda mimosifolia*	8.2	19	6.1	Y		
21	26/08/2021	56	305455	6235700	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	10.2	51	22.8			
22	26/08/2021	56	305455	6235690	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	11.1	47	21.5			
23	26/08/2021	56	305450	6235686	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	7.8	31	19.8			
24	26/08/2021	56	305452	6235683	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	12.4	47	20.5			

WP	Date	Zone	Easting	Northing	Elevation (m)	Community	Patch Number	Species Name	Canopy Spread (m)	DBH (m)	Height (m)	Multistem?	Dead?	Habitat
25	26/08/2021	56	305449	6235679	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	7.5	27	15.6			
26	26/08/2021	56	305421	6235695	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	6.8	43	20.3			
27	26/08/2021	56	305422	6235700	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	5.9	41	19.6			
28	26/08/2021	56	305416	6235709	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.8	39	18.8			
29	26/08/2021	56	305414	6235713	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.9	43	17.5			
30	26/08/2021	56	305415	6235723	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.5	43	16.2			
31	26/08/2021	56	305457	6235713	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	9.1	45	19.6			
32	26/08/2021	56	305458	6235724	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	5.2	36	16.7			
33	26/08/2021	56	305448	6235716	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	15.3	51	17.2	Y		
34	26/08/2021	56	305462	6235739	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	8.9	50	20.2			
35	26/08/2021	56	305463	6235740	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus crebra*	6.2	37	18.1			
36	26/08/2021	56	305439	6235735	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	13.1	52	21.3			
37	26/08/2021	56	305440	6235742	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	12.8	55	21.7			
38	26/08/2021	56	305443	6235746	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	13.4	30	20.4	Y		
39	26/08/2021	56	305431	6235757	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	8.8	41	16.8	Y		
40	26/08/2021	56	305434	6235765	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	7.1	40	17.1			
41	26/08/2021	56	305434	6235765	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	15.2	51	18.2			
42	26/08/2021	56	305426	6235745	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	5.2	24	13			
43	26/08/2021	56	305428	6235753	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	5.7	32	17.5			

WP	Date	Zone	Easting	Northing	Elevation (m)	Community	Patch Number	Species Name	Canopy Spread (m)	DBH (m)	Height (m)	Multistem?	Dead?	Habitat
44	26/08/2021	56	305427	6235766	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	6.5	42	16.2			
45	26/08/2021	56	305424	6235765	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	4.8	28	14.9			
46	26/08/2021	56	305417	6235762	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	6.7	33	15.8			
47	26/08/2021	56	305416	6235753	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	11.5	42	17.1			
48	26/08/2021	56	305419	6235758	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	7.2	34	16.2			
49	26/08/2021	56	305413	6235752	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	4.1	22	15.1			
50	26/08/2021	56	305415	6235746	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	7.9	39	16.8			
51	26/08/2021	56	305396	6235721	57	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	6.8	42	15.9			
52	26/08/2021	56	305415	6235741	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	15.1	63	21.2	Y	Y	
53	26/08/2021	56	305396	6235732	57	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	3.1	32	16.8			
54	26/08/2021	56	305397	6235729	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	7.3	38	16.4			
55	26/08/2021	56	305393	6235734	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	8.7	38	14.1			
56	26/08/2021	56	305379	6235739	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	7.1	57	15.8			
57	26/08/2021	56	305371	6235749	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	13.5	60	16.3	Y		
58	26/08/2021	56	305362	6235756	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus eugenioides*	9.2	26	14.1			
59	26/08/2021	56	305366	6235762	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	10.1	52	17.2			
60	26/08/2021	56	305366	6235768	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	7.9	37	18.1			
61	26/08/2021	56	305367	6235777	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus crebra*	7.2	24	14.8			
62	26/08/2021	56	305376	6235771	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	13.5	49	18.9			

WP	Date	Zone	Easting	Northing	Elevation (m)	Community	Patch Number	Species Name	Canopy Spread (m)	DBH (m)	Height (m)	Multistem?	Dead?	Habitat
63	26/08/2021	56	305380	6235771	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	12.8	42	17.3			
64	26/08/2021	56	305383	6235767	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	9.7	44	16.7	Y		
65	26/08/2021	56	305388	6235763	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	8.9	35	16.5	Y		
66	26/08/2021	56	305395	6235761	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	4.7	36	16.8		Y	
67	26/08/2021	56	305400	6235755	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	5.1	26	15.2			
68	26/08/2021	56	305397	6235752	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	11.2	52	17.8			
69	26/08/2021	56	305404	6235763	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	4.1	33	14.1			
70	26/08/2021	56	305405	6235763	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	7.8	34	15.3			
71	26/08/2021	56	305399	6235770	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	9.2	38	18.3			
72	26/08/2021	56	305399	6235777	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	11.3	38	15.1			
73	26/08/2021	56	305396	6235779	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.9	39	16.5			
74	26/08/2021	56	305386	6235780	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	15.6	52	19.5			
75	26/08/2021	56	305387	6235790	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	7.8	34	17.9			
76	26/08/2021	56	305384	6235795	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	7.5	34	18.1			
77	26/08/2021	56	305388	6235809	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	11.5	29	17.6	Y		
78	26/08/2021	56	305388	6235809	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	6.8	19	11.8	Y		
79	26/08/2021	56	305386	6235810	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.2	37	16.9			
80	26/08/2021	56	305384	6235805	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	12.1	39	17.2	Y		
81	26/08/2021	56	305392	6235791	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	7.5	22	14.8	Y		

WP	Date	Zone	Easting	Northing	Elevation (m)	Community	Patch Number	Species Name	Canopy Spread (m)	DBH (m)	Height (m)	Multistem?	Dead?	Habitat
82	26/08/2021	56	305423	6235794	64	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	31.3	80	25.1			
83	26/08/2021	56	305418	6235795	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	12.8	35	13.8			
84	26/08/2021	56	305418	6235794	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	11.3	20	12.1	Y		
85	26/08/2021	56	305356	6235762	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	2.5	5	5.8			
86	26/08/2021	56	305356	6235765	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus crebra*	18.6	56	21.8			
87	26/08/2021	56	305359	6235771	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	9.1	39	18.9	Y		
88	26/08/2021	56	305360	6235773	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	7.8	41	16.2	Y		
89	26/08/2021	56	305350	6235774	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	2.5	7	6.2	Y		
90	26/08/2021	56	305348	6235769	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	1.1	9	8.7		Y	
91	26/08/2021	56	305349	6235766	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	9.2	33	14.8		Y	
92	26/08/2021	56	305354	6235765	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	1.2	8	9.6		Y	
93	26/08/2021	56	305354	6235765	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	2.2	7	6		Y	
94	26/08/2021	56	305354	6235771	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	2.2	7	6			
95	26/08/2021	56	305343	6235773	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus crebra*	5.2	14	9			
96	26/08/2021	56	305348	6235771	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	4.1	24	12.8			
97	26/08/2021	56	305342	6235776	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	1.1	9	8.7		Y	
98	26/08/2021	56	305348	6235775	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	10.8	37	18	Y		
99	26/08/2021	56	305359	6235781	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	2.1	7	6			
100	26/08/2021	56	305361	6235782	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.2	29	18.2			

WP	Date	Zone	Easting	Northing	Elevation (m)	Community	Patch Number	Species Name	Canopy Spread (m)	DBH (m)	Height (m)	Multistem?	Dead?	Habitat
101	26/08/2021	56	305361	6235785	64	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.7	36	18	Y		
102	26/08/2021	56	305363	6235783	64	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	11.2	45	19.3			
103	26/08/2021	56	305365	6235791	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	5.2	24	15.3			
104	26/08/2021	56	305369	6235796	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	9.8	72	19.1	Y	Y	
105	26/08/2021	56	305363	6235792	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	3.1	10	10.8	Y		
106	26/08/2021	56	305371	6235800	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	13.2	37	17.9			
107	26/08/2021	56	305376	6235807	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	12.6	48	18.3			
108	26/08/2021	56	305368	6235805	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	9.1	38	19.1			
109	26/08/2021	56	305364	6235806	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.5	36	17.7			
110	26/08/2021	56	305370	6235812	65	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	12.1	49	19.2	Y		
111	26/08/2021	56	305356	6235817	64	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	10.2	42	18	Y		
112	26/08/2021	56	305354	6235824	64	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	7.8	33	17.3		Y	
113	26/08/2021	56	305352	6235814	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	6.8	22	13.1	Y	Y	
114	26/08/2021	56	305352	6235793	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	12.3	40	17.4	Y		
115	26/08/2021	56	305348	6235786	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.5	36	17.9	Y		
116	26/08/2021	56	305339	6235786	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	6.3	20	12.8			
117	26/08/2021	56	305339	6235786	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	7.6	32	17	Y		
118	26/08/2021	56	305341	6235786	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	26.1	70	22.3	Y		
119	26/08/2021	56	305340	6235789	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.9	51	18.8			

WP	Date	Zone	Easting	Northing	Elevation (m)	Community	Patch Number	Species Name	Canopy Spread (m)	DBH (m)	Height (m)	Multistem?	Dead?	Habitat
120	26/08/2021	56	305345	6235792	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	7.8	39	17.1			
121	26/08/2021	56	305351	6235796	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	4.6	11	7.4			
122	26/08/2021	56	305351	6235799	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	6	30	12.6		Y	
123	26/08/2021	56	305346	6235805	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	5.7	26	14.1			
124	26/08/2021	56	305347	6235809	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	6.3	39	16.8		Y	
125	26/08/2021	56	305344	6235816	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	6.7	21	15.1		Y	
126	26/08/2021	56	305345	6235821	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.8	39	17			
127	26/08/2021	56	305342	6235822	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Acacia decurrens*	3	6	4.2			
128	26/08/2021	56	305342	6235822	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	1.5	3	4.1			
129	26/08/2021	56	305338	6235820	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Acacia decurrens*	2.5	5	3.5			
130	26/08/2021	56	305339	6235824	63	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	7.8	30	13		Y	
131	26/08/2021	56	305334	6235822	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	5.8	26	13.7		Y	
132	26/08/2021	56	305333	6235820	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Acacia decurrens*	3.8	7	6.7			
133	26/08/2021	56	305335	6235817	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	7.7	33	14.1			
134	26/08/2021	56	305332	6235816	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	4.2	28	14.7			
135	26/08/2021	56	305331	6235813	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	4.5	28	15.3			
136	26/08/2021	56	305338	6235813	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	2.7	20	9.7		Y	
137	26/08/2021	56	305342	6235808	61	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	12.3	39	18.1		Y	
138	26/08/2021	56	305339	6235802	62	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	3.1	9	9.8		Y	

WP	Date	Zone	Easting	Northing	Elevation (m)	Community	Patch Number	Species Name	Canopy Spread (m)	DBH (m)	Height (m)	Multistem?	Dead?	Habitat
139	26/08/2021	56	305335	6235806	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	6.6	22	15.2			
140	26/08/2021	56	305330	6235789	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	3.8	24	14.8			
141	26/08/2021	56	305328	6235793	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	1.9	9	8.1			
142	26/08/2021	56	305324	6235789	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	5.7	20	9.9			
143	26/08/2021	56	305324	6235793	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	9.5	36	18.8			
144	26/08/2021	56	305322	6235794	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	10.2	37	19.2			
145	26/08/2021	56	305317	6235796	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	15.8	82	20.7	Y		
146	26/08/2021	56	305324	6235798	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus crebra*	28.3	67	23.5			
147	26/08/2021	56	305318	6235804	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Acacia decurrens*	4.8	13	5.7			
148	26/08/2021	56	305318	6235808	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	6.8	25	13.1			
149	26/08/2021	56	305318	6235809	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.4	33	18.2			
150	26/08/2021	56	305318	6235807	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Acacia decurrens*	3.1	5	5.9			
151	26/08/2021	56	305318	6235807	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	2.5	4	5.2			
152	26/08/2021	56	305324	6235812	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	5.3	15	9.1	Y		
153	26/08/2021	56	305324	6235817	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	14	44	19.4	Y		
154	26/08/2021	56	305329	6235815	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Acacia decurrens*	3.2	5	5.2			
155	26/08/2021	56	305329	6235816	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Acacia decurrens*	2.1	4	4.1			
156	26/08/2021	56	305331	6235816	60	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	1.5	3	5.8	Y		
157	26/08/2021	56	305326	6235812	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	3.8	14	5.5		Y	

WP	Date	Zone	Easting	Northing	Elevation (m)	Community	Patch Number	Species Name	Canopy Spread (m)	DBH (m)	Height (m)	Multistem?	Dead?	Habitat
158	26/08/2021	56	305324	6235813	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	11.2	38	19.1			
159	26/08/2021	56	305326	6235807	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	15.3	47	20.3			
160	26/08/2021	56	305330	6235803	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.8	30	17.8			
161	26/08/2021	56	305336	6235800	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	6.3	22	14.9			
162	26/08/2021	56	305345	6235799	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*ERROR Waypoint*	0	0	0			
163	26/08/2021	56	305329	6235781	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	26.6	66	21.9	Y		
164	26/08/2021	56	305324	6235772	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	2.1	4	4.2			
165	26/08/2021	56	305327	6235759	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	6.1	21	18.7			
166	26/08/2021	56	305324	6235757	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	8.3	22	16.9			
167	26/08/2021	56	305326	6235755	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Acacia decurrens*	6.2	14	5.8			
168	26/08/2021	56	305320	6235763	57	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	2.3	5	5.3			
169	26/08/2021	56	305323	6235774	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	1.8	4	5.1			
170	26/08/2021	56	305321	6235778	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	2.2	5	5.4			
171	26/08/2021	56	305320	6235775	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	1.8	2	3.7			
172	26/08/2021	56	305319	6235775	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	5.6	18	8.1			
173	26/08/2021	56	305319	6235785	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus tereticornis*	0.5	18	7.9		Y	
174	26/08/2021	56	305302	6235789	59	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	6.2	18	10.3		Y	
175	26/08/2021	56	305293	6235780	58	PCT 849 - Cumberland Shale Plains Woodland - Moderate and Poor Condition	1	*Eucalyptus moluccana*	5.9	20	11.2		Y	
176	26/08/2021	56	305217	6235799	58	Planted Garden Vegetation	N/A	*Acacia decurrens*	5.6	13	5.7			Fallen tree/log at base
177	26/08/2021	56	305260	6235817	58	Planted Garden Vegetation	N/A	*Acacia decurrens*	5.8	15	6.1			

WP	Date	Zone	Easting	Northing	Elevation (m)	Community	Patch Number	Species Name	Canopy Spread (m)	DBH (m)	Height (m)	Multistem?	Dead?	Habitat
178	26/08/2021	56	305242	6235806	59	Planted Garden Vegetation	N/A	*Acacia decurrens*	5.7	14	5.5			Fallen tree/log at base
179	26/08/2021	56	305230	6235808	58	Planted Garden Vegetation	N/A	*Acacia decurrens*	5.7	13	4.8			Fallen tree/log at base
180	26/08/2021	56	305178	6235797	58	PCT 849 - Cumberland Shale Plains Woodland - Poor Condition	Isolated Paddock Tree	*Eucalyptus tereticornis*	13.8	82	19.8	Y		
181	26/08/2021	56	305163	6235797	58	Planted Garden Vegetation	N/A	*Leptospermum petersonii*	6.3	12	6.3	Y		
182	26/08/2021	56	305156	6235787	58	Planted Garden Vegetation	N/A	*Callistemon citrinus*	4.9	22	3.8	Y		
183	26/08/2021	56	305046	6235774	56	PCT 849 - Cumberland Shale Plains Woodland - Poor Condition	Isolated Paddock Tree	*Eucalyptus moluccana*	14.9	35	17.5			
184	26/08/2021	56	305051	6235771	57	Planted Garden Vegetation	N/A	*Allocasuarina littoralis*	8.3	26	11.7			
185	26/08/2021	56	305060	6235782	58	Planted Garden Vegetation	N/A	*Pinus radiata*	13.1	46	15.6	Y		
186	26/08/2021	56	305075	6235780	58	Planted Garden Vegetation	N/A	*Pinus radiata*	12.8	43	16.1			
187	26/08/2021	56	305079	6235781	57	Planted Garden Vegetation	N/A	*Callistemon citrinus*	9.8	18	12.3	Y	Y	
188	26/08/2021	56	305082	6235781	59	Planted Garden Vegetation	N/A	*Prunus persica*	12.6	28	14.2	Y		
189	26/08/2021	56	305091	6235761	58	Planted Garden Vegetation	N/A	*Exotic deciduous sp.*	15.2	33	13.1			
190	26/08/2021	56	305103	6235770	59	Planted Garden Vegetation	N/A	*Eucalyptus microcorys*	8.5	81	19.8			
191	26/08/2021	56	305103	6235765	59	Planted Garden Vegetation	N/A	*Exotic deciduous sp.*	9.3	22	11.3	Y		
192	26/08/2021	56	305104	6235755	57	Planted Garden Vegetation	N/A	*Eucalyptus nicholii*	8.1	41	5.6			
193	26/08/2021	56	305116	6235755	58	Planted Garden Vegetation	N/A	*Eucalyptus sideroxylon*	10.6	45	14.8			
194	26/08/2021	56	305106	6235756	58	Planted Garden Vegetation	N/A	*Macadamia integrifolia*	8.7	18	8.1			
195	26/08/2021	56	305120	6235762	58	Planted Garden Vegetation	N/A	*Quercus palustris*	7.2	51	13.3			
196	26/08/2021	56	305120	6235768	59	Planted Garden Vegetation	N/A	*Callistemon citrinus*	2.3	7	4.8	Y		
197	26/08/2021	56	305120	6235768	59	Planted Garden Vegetation	N/A	*Grevillea Robyn Gordon*	3.6	13	5.1			
198	26/08/2021	56	305119	6235769	59	Planted Garden Vegetation	N/A	*Callistemon viminalis*	2.1	11	4.2	Y		
199	26/08/2021	56	305130	6235748	57	Planted Garden Vegetation	N/A	*Eucalyptus crebra*	28.6	105	19.7		Y	1 Medium and 2 Small Hollows
200	26/08/2021	56	305161	6235738	56	Exotic Grassland	N/A	*Grevillea honeydew*	3.2	5	3.9			
201	26/08/2021	56	305163	6235751	56	Planted Garden Vegetation	N/A	*Callistemon citrinus*	2.1	2	2.8	Y		
202	26/08/2021	56	305166	6235763	57	Planted Garden Vegetation	N/A	*Callistemon viminalis*	2.2	2	2.1	Y		
203	26/08/2021	56	305168	6235771	57	Planted Garden Vegetation	N/A	*Callistemon citrinus*	2.1	2	2.6	Y		
204	26/08/2021	56	305169	6235774	58	Planted Garden Vegetation	N/A	*Callistemon citrinus*	1.9	2	2.8	Y		
205	26/08/2021	56	305170	6235776	58	Planted Garden Vegetation	N/A	*Callistemon citrinus*	1.5	2	2.3	Y		
206	26/08/2021	56	305172	6235778	58	Planted Garden Vegetation	N/A	*Callistemon citrinus*	1.6	2	2.1	Y		
207	26/08/2021	56	305113	6235787	56	Planted Garden Vegetation	N/A	*Grevillea honeydew*	3.1	2	2.8	Y		

WP	Date	Zone	Easting	Northing	Elevation (m)	Community	Patch Number	Species Name	Canopy Spread (m)	DBH (m)	Height (m)	Multistem?	Dead?	Habitat
208	26/08/2021	56	305115	6235787	55	Planted Garden Vegetation	N/A	*Leptospermum petersonii*	12.2	15	7.1	Y		
209	26/08/2021	56	305119	6235785	56	Planted Garden Vegetation	N/A	*Leptospermum petersonii*	11.7	13	6.8			

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4. Conclusion

This report supports a planning proposal seeking to amend the Campbelltown LEP to change the zoning for areas within the subject site referred to in this report as the rezoning area from E4 – Environmental Living to R2 – Low Density Residential to facilitate a subdivision.

The surveys covered the VAR study area and mapped 211 trees, of which 197 were native to the Greater Sydney Region and 176 were classified as KUTS under the Koala SEPP 2021. These include an estimated 38 PKFTs according to the definitions provided by the CKPOM, which solely comprised *Eucalyptus tereticornis* (Forest Red Gum), and 105 Secondary Koala Feed Trees, which solely comprised *Eucalypus moluccana* (Grey Box).

A total of one vegetation patch and two isolated paddock trees occurs in the VAR study area. The largest most continuous areas of KUTS and PKFTs occur in the areas mapped as the moderate condition of PCT 849 and all areas mapped as PCT 849 conform to the definition of 'core koala habitat' under the CKPoM. No koala shelter tree species listed by the CKPoM occur on site.

As all areas of woodland within the VAR study area have been considered to be core koala habitat under the Koala SEPP 2021 and are within areas of mapped core koala habitat under the CKPoM, following the rezoning and subdivision of the land, future impacts will require further assessment at the Development Application (DA) stage consistent with Section 6.4 and Section 7.1 of the CKPoM. DAs requiring such vegetation clearance will also need to be supported by a Koala Activity Assessment Report (KAAR), consistent with the methodology outlined in the CKPoM.

5. References

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APPENDIX A :
BAM Plot Data

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Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		RMS 1
				C	A	C	A	C	A	
Fabaceae (Mimosoideae)	*Acacia decurrens*	Black Wattle				1	10			x
Fabaceae (Mimosoideae)	*Acacia implexa*	Hickory Wattle				0.8	15			x
Polygonaceae	*Acetosa sagittata*	Rambling Dock	*							x
Agavaceae	*Agave americana*	Century Plant	*							x
Asphodelaceae	*Aloe vera*		*							x
Apocynaceae	*Araujia sericiflora*	Moth Vine	*							x
Asteraceae	*Arctotheca calendula*	Capeweed	*	0.8	100					x
Poaceae	*Aristida ramosa*	Purple Wiregrass				2	200			
Asparagaceae	*Asparagus aethiopicus*	Asparagus Fern	*			0.1	10			
Asparagaceae	*Asparagus asparagoides*	Bridal Creeper	*	0.1	10	0.2	50			x
Chenopodiaceae	*Atriplex semibaccata*	Creeping Saltbush								x
Asteraceae	*Bidens pilosa*	Cobbler's Pegs	*			1	80			
Nyctaginaceae	*Bougainvillea glabra*		*							x
Brassicaceae	*Brassica fruticulosa*	Twiggy Turnip	*			4	150			x
Poaceae	*Bromus catharticus*	Praire Grass	*			1	100	4	200	x
Crassulaceae	*Bryophyllum delagoense*	Mother of millions	*			0.2	40			x
Pittosporaceae	*Bursaria spinosa*	Native Blackthorn		0.1	5	10	50			
Myrtaceae	*Callistemon citrinus*	Crimson Bottlebrush								x

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		RMS 1
				C	A	C	A	C	A	
Myrtaceae	*Callistemon rigidus*	Stiff Bottlebrush								x
Callitrichaceae	*Callitriche stagnalis*	Common Starwort	*							x
Brassicaceae	*Capsella bursa-pastoris*	Shepherd's Purse	*					0.1	10	x
Sapindaceae	*Cardiospermum grandiflorum*	Balloon Vine	*			0.2	20			
Aizoaceae	*Carpobrotus glaucescens*	Pigface								x
Vitaceae	*Cayratia clematidea*	Native Grape		0.1	10					x
Poaceae	*Cenchrus clandestinus*	Kikuyu Grass	*	5	250			70	3500	x
Caryophyllaceae	*Cerastium glomeratum*	Mouse-ear Chickweed	*	0.2	40					x
Poaceae	*Chloris ventricosa*	Tall Chloris				5	500			
Rutaceae	*Citrus reticulata*	Tangarine, Mandarin	*							x
Amaryllidaceae	*Clivia miniata*		*							x
Commelinaceae	*Commelina cyanea*	Native Wandering Jew								x
Convolvulaceae	*Convolvulus erubescens*	Pink Bindweed				0.3	30			x
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	*	0.1	10					
Asteraceae	*Conyza sumatrensis*	Tall fleabane	*					0.1	10	x
Asteraceae	*Cotula australis*	Common Cotula		0.1	20					
Crassulaceae	*Crassula ovata*	Jade Plant	*			0.2	10			x
Crassulaceae	*Crassula sarmentosa var. sarmentosa*		*							x
Crassulaceae	*Crassula sieberiana*	Australian Stonecrop								

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		RMS 1
				C	A	C	A	C	A	
Sapindaceae	*Cupaniopsis anacardioides*	Tuckeroo								x
Cupressaceae	*Cupressus macrocarpa*	Monterey Cypress	*							x
Poaceae	*Cynodon dactylon*	Common Couch		10	1000			10	1000	x
Cyperaceae	*Cyperus eragrostis*	Umbrella Sedge	*							x
Cyperaceae	*Cyperus gracilis*	Slender Flat-sedge		0.1	20					x
Orchidaceae	*Dendrobium spp.*									x
Fabaceae (Faboideae)	*Desmodium varians*	Slender Tick-trefoil		0.1	5	0.1	20			
Phormiaceae	*Dianella longifolia var. longifolia*					0.2	20			
Convolvulaceae	*Dichondra repens*	Kidney Weed		0.2	50	1	200	2	80	
Doryanthaceae	*Doryanthes excelsa*	Gymea Lily								x
Poaceae	*Ehrharta erecta*	Panic Veldtgrass	*	10	1000					x
Chenopodiaceae	*Einadia hastata*	Berry Saltbush								x
Chenopodiaceae	*Einadia nutans subsp. linifolia*	Climbing Saltbush								x
Chenopodiaceae	*Einadia nutans subsp. nutans*	Climbing Saltbush								
Chenopodiaceae	*Einadia polygonoides*	Knotweed Goosefoot								x
Poaceae	*Entolasia stricta*	Wiry Panic				1	100			
Poaceae	*Eragrostis curvula*	African Lovegrass	*							x
Malaceae	*Eriobotrya japonica*	Loquat	*							x
Geraniaceae	*Erodium cicutarium*	Common Crowfoot	*							x

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		RMS 1
				C	A	C	A	C	A	
Myrtaceae	*Eucalyptus amplifolia*	Cabbage Gum								x
Myrtaceae	*Eucalyptus crebra*	Narrow-leaved Ironbark								
Myrtaceae	*Eucalyptus eugenioides*	Thin-leaved Stringybark								x
Myrtaceae	*Eucalyptus fibrosa*	Red Ironbark								x
Myrtaceae	*Eucalyptus moluccana*	Grey Box		20	2	50	24			
Myrtaceae	*Eucalyptus nicholii*	Rough-leaved Black Peppermint								x
Myrtaceae	*Eucalyptus tereticornis*	Forest Red Gum		30	5					
Asteraceae	*Facelis retusa*		*	0.2	100					
Fumariaceae	*Fumaria muralis*	Wall Fumitory	*							
Cyperaceae	*Gahnia aspera*	Rough Saw-sedge				0.2	2			
Aizoaceae	*Galenia pubescens*	Galenia	*							x
Asteraceae	*Gamochaeta pensylvanica*	Cudweed	*	0.2	40			0.1	20	
Fabaceae (Faboideae)	*Glycine tabacina*	Variable Glycine		0.2	60	0.2	40			
Proteaceae	*Grevillea spp.*									x
Fabaceae (Faboideae)	*Hardenbergia violacea*	False Sarsaparilla		0.1	5					
Clusiaceae	*Hypericum gramineum*	Small St John's Wort		0.1	5					
Asteraceae	*Hypochaeris albiflora*	White Flatweed	*							
Asteraceae	*Hypochoeris radicata*	Catsear	*	0.4	80	0.2	40	0.2	40	

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		RMS 1
				C	A	C	A	C	A	
Fabaceae (Faboideae)	*Indigofera australis*	Australian Indigo				0.4	5			x
Bignoniaceae	*Jacaranda mimosifolia*	Jacaranda	*							x
Oleaceae	*Jasminum officinale*		*							
Oleaceae	*Jasminum polyanthum*	White Jasmine	*							x
Lythraceae	*Lagerstroemia indica*		*							x
Lamiaceae	*Lavandula angustifolia*		*							x
Brassicaceae	*Lepidium bonariense*	Argentine Peppercress	*							
Brassicaceae	*Lepidium didymum*	Lesser Swinecress	*							x
Myrtaceae	*Leptospermum petersonii*	Lemon-scented Teatree								x
Oleaceae	*Ligustrum lucidum*	Large-leaved Privet	*							x
Linaceae	*Linum trigynum*	French Flax	*							x
Poaceae	*Lolium perenne*	Perennial Ryegrass	*	20	1000	1	100			x
Lomandraceae	*Lomandra filiformis subsp. filiformis*					0.1	5			
Fabaceae (Faboideae)	*Lotus uliginosus*	Birds-foot Trefoil	*					5	500	x
Solanaceae	*Lycium ferocissimum*	African Boxthorn	*							x
Primulaceae	*Lysimachia arvensis*	Scarlet Pimpernel	*	0.2	40	0.1	50			
Proteaceae	*Macadamia integrifolia*	Rough -shelled Bush Nut								x
Malvaceae	*Malva parviflora*	Small-flowered Mallow	*							x

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		RMS 1
				C	A	C	A	C	A	
Fabaceae (Faboideae)	*Medicago arabica*	Spotted Burr Medic	*							x
Fabaceae (Faboideae)	*Medicago polymorpha*	Burr Medic	*			0.2	20			x
Myrtaceae	*Melaleuca bracteata*	Black Tea-tree								x
Myrtaceae	*Melaleuca linariifolia*	Flax-leaved Paperbark								x
Myrtaceae	*Melaleuca quinquenervia*	Broad-leaved Paperbark								x
Myrtaceae	*Melaleuca styphelioides*	Prickly-leaved Tea Tree								x
Poaceae	*Microlaena stipoides var. stipoides*	Weeping Grass		5	500	10	1000			x
Malvaceae	*Modiola caroliniana*	Red-flowered Mallow	*					0.4	40	x
Araceae	*Monstera deliciosa*	Fruit Salad Plant	*							x
Moraceae	*Morus alba*	White Mulberry	*							x
Rutaceae	*Murraya paniculata*		*							x
Nandinaceae	*Nandina domestica*	Japanese Sacred Bamboo	*							x
Davalliaceae	*Nephrolepis cordifolia*	Fishbone Fern								x
Oleaceae	*Olea europaea*	Common Olive	*							x
Cactaceae	*Opuntia stricta*	Common Prickly Pear	*							x
Asteraceae	*Osteospermum fruticosum*		*			0.4	10			
Oxalidaceae	*Oxalis corniculata*	Creeping Oxalis	*	0.1	20			0.2	150	x
Oxalidaceae	*Oxalis perennans*			0.1	15	0.1	10			x

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		RMS 1
				C	A	C	A	C	A	
Caryophyllaceae	*Paronychia brasiliana*	Chilean Whitlow Wort, Brazilian Whitlow	*	0.1	10					
Poaceae	*Paspalum dilatatum*	Paspalum	*					1	160	x
Passifloraceae	*Passiflora edulis*	Common Passionfruit	*							x
Geraniaceae	*Pelargonium spp.*									x
Arecaceae	*Phoenix canariensis*	Canary Island Date Palm	*							x
Malaceae	*Photinia serratifolia*	Chinese Photinia	*							x
Pinaceae	*Pinus radiata*	Radiata Pine	*							x
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	*	0.8	100	0.6	50	0.2	20	x
Lamiaceae	*Plectranthus parviflorus*					0.1	10			
Plumbaginaceae	*Plumbago auriculata*	Cape leadwot	*							x
Poaceae	*Poa annua*	Winter Grass	*	2	200			1	100	x
Polygalaceae	*Polygala myrtifolia*		*							x
Phyllanthaceae	*Poranthera microphylla*	Small Poranthera		0.1	10					
Phyllanthaceae	*Poranthera microphylla*	Small Poranthera				0.2	150			
Portulacaceae	*Portulacaria afra*		*							x
Rosaceae	*Prunus spp.*		*							x
Acanthaceae	*Pseuderanthemum variabile*	Pastel Flower		0.1	10					
Acanthaceae	*Pseuderanthemum variabile*	Pastel Flower								x

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		RMS 1
				C	A	C	A	C	A	
Fagaceae	*Quercus palustris*	Pin Oak	*							x
Malaceae	*Rhaphiolepis indica*	Indian Hawthorn	*							x
Rosaceae	*Rosa spp.*		*							x
Polygonaceae	*Rumex brownii*	Swamp Dock						0.1	10	
Polygonaceae	*Rumex crispus*	Curled Dock	*							x
Poaceae	*Rytidosperma caespitosum*	Ringed Wallaby Grass		1	100	2	200			x
Asteraceae	*Senecio madagascariensis*	Fireweed	*	0.1	10	0.1	5			x
Poaceae	*Setaria parviflora*		*			0.8	80			
Malvaceae	*Sida rhombifolia*	Paddy's Lucerne	*	0.1	10	0.2	40			x
Malvaceae	*Sida spinosa*		*							
Solanaceae	*Solanum prinophyllum*	Forest Nightshade				0.1	10			
Asteraceae	*Soliva sessilis*	Bindyi	*	2	500			1	200	x
Asteraceae	*Sonchus asper*	Prickly Sowthistle	*							
Asteraceae	*Sonchus oleraceus*	Common Sowthistle	*	0.2	30	0.2	20			x
Poaceae	*Sorghum bicolor*	Sorghum	*							x
Lamiaceae	*Stachys arvensis*	Stagger Weed	*					0.1	20	x
Caryophyllaceae	*Stellaria media*	Common Chickweed	*							x
Poaceae	*Stenotaphrum secundatum*	Buffalo Grass	*							x
Myrtaceae	*Syzygium paniculatum*	Magenta Lilly Pilly								x
Portulacaceae	*Talinum paniculatum*		*							x

Family	Scientific Name	Common Name	Exotic	Plot 1		Plot 2		Plot 3		RMS 1
				C	A	C	A	C	A	
Asteraceae	*Taraxacum officinale*	Dandelion	*	0.2	20			0.2	40	x
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	*					5	1500	x
Ulmaceae	*Ulmus parvifolia*	Chinese Elm	*							x
Verbenaceae	*Verbena bonariensis*	Purpletop	*			0.2	60			
Fabaceae (Faboideae)	*Vicia sativa*	Common vetch	*					0.1	5	
Apocynaceae	*Vinca major*	Periwinkle	*							x
Asteraceae	*Vittadinia cuneata var. cuneata f. minor*					0.2	20			
Poaceae	*Vulpia myuros*	Rat's Tail Fescue	*	15	1000					x
Arecaceae	*Washingtonia filifera*		*							x
Agavaceae	*Yucca aloifolia*	Spanish Bayonet	*							x
Araceae	*Zantedeschia aethiopica*	Arum Lily	*							x

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FIGURES

Legend

- VAR Study Area
- Rezoning Area
- Subject Site
- Lot Boundaries Associated with the Planning Proposal

Image Source:
Image © NearMap 2021
Dated: 11/8/2021

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Campbelltown LGA

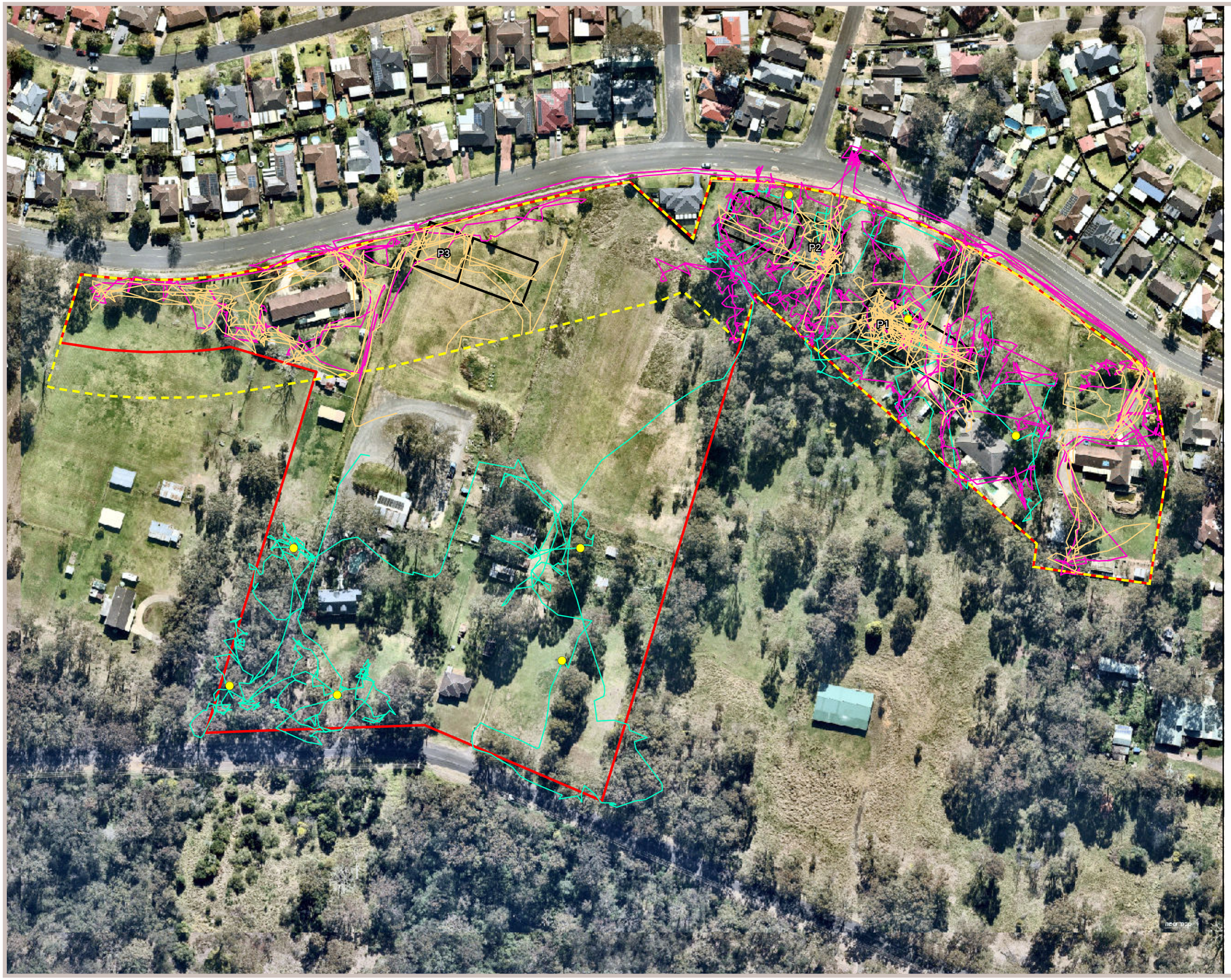
Coordinate System: MGA Zone 56 (GDA 94)

cumberland ecology

0 50 m

I:\...\16066\Figures\RP4\20211006\Figure 1. Location

Figure 1. Location of the subject site, rezoning area and the VAR study area



Legend

- VAR Study Area
- Subject Site

Flora Survey Locations

- BAM Plot Locations
- Random Meander

Koala Survey Locations

- Stadia Metric Survey Tracks
- SAT Survey Tracks
- SAT Survey Locations

Image Source:
Image © NearMap 2021
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Data Source:
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SIX Maps 'Clip and Ship'
Campbelltown LGA

Coordinate System: MGA Zone 56 (GDA 94)

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I:\...\16066\Figures\RP4\20211006\Figure 2. Survey locations

Figure 2. Survey locations

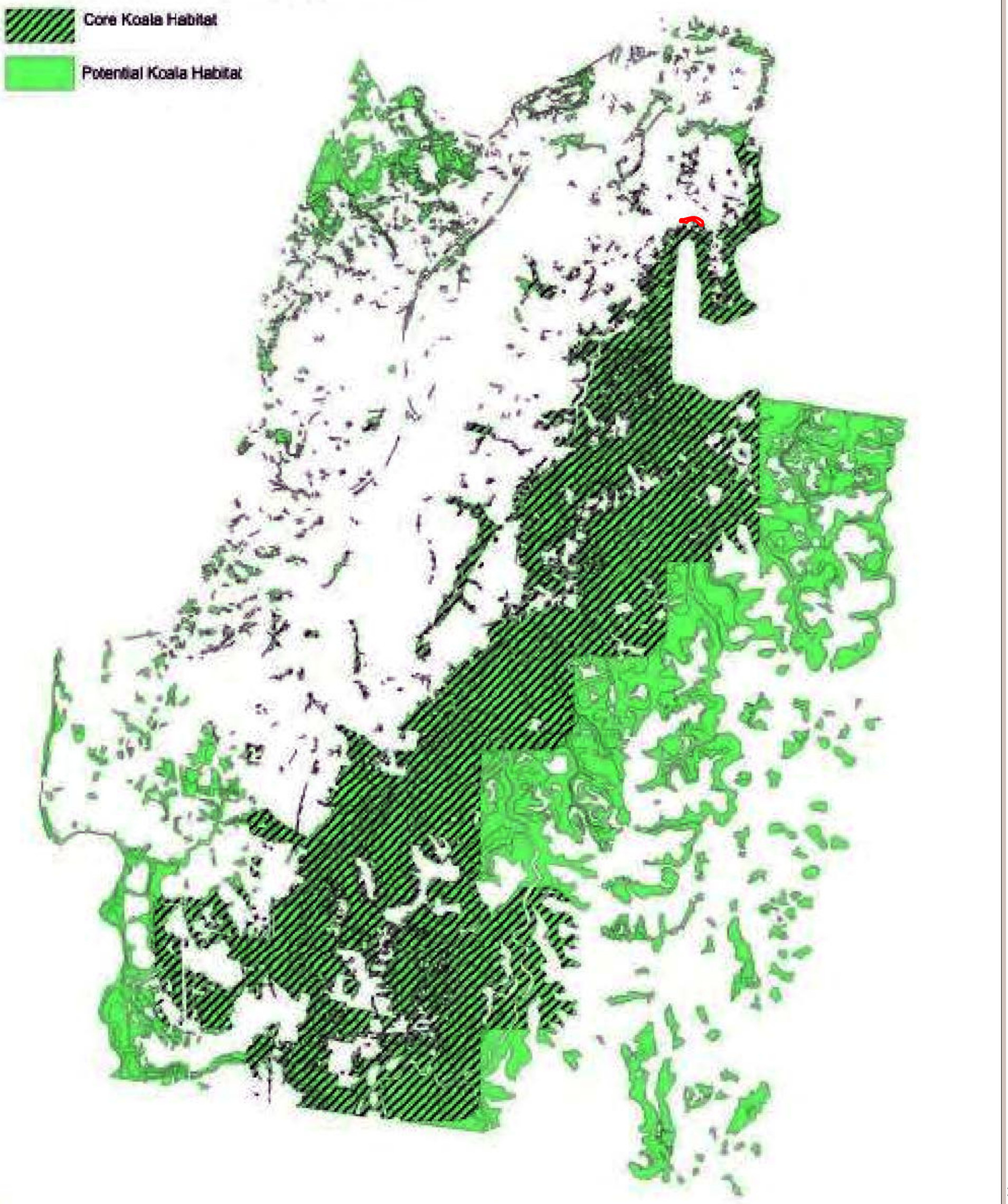

Figure 3. Extent of potential and core koala habitat across the Campbelltown LGA

Legend

- VAR Study Area
- Subject Site
- Rezoning Area

Vegetation Community

- Cumberland Plain Woodland - Moderate condition
- Cumberland Plain Woodland - Poor condition
- Planted Garden Vegetation
- Exotic Grassland
- Cleared Land

Image Source:
Image © NearMap 2021
Dated: 11/8/2021

Data Source:
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Campbelltown LGA

Coordinate System: MGA Zone 56 (GDA 94)

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I:\...\16066\Figures\RP4\20211006\Figure 4. Vegetation communities

Figure 4. Vegetation communities within the VAR study area

Legend

- VAR Study Area
- Subject Site
- Core Koala Habitat
- Koala Scat Records

Vegetation Community

- Cumberland Plain Woodland - Moderate condition
- Cumberland Plain Woodland - Poor condition
- Planted Garden Vegetation
- Exotic Grassland
- Cleared Land

Image Source:
Image © NearMap 2021
Dated: 11/8/2021

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Campbelltown LGA

Coordinate System: MGA Zone 56 (GDA 94)

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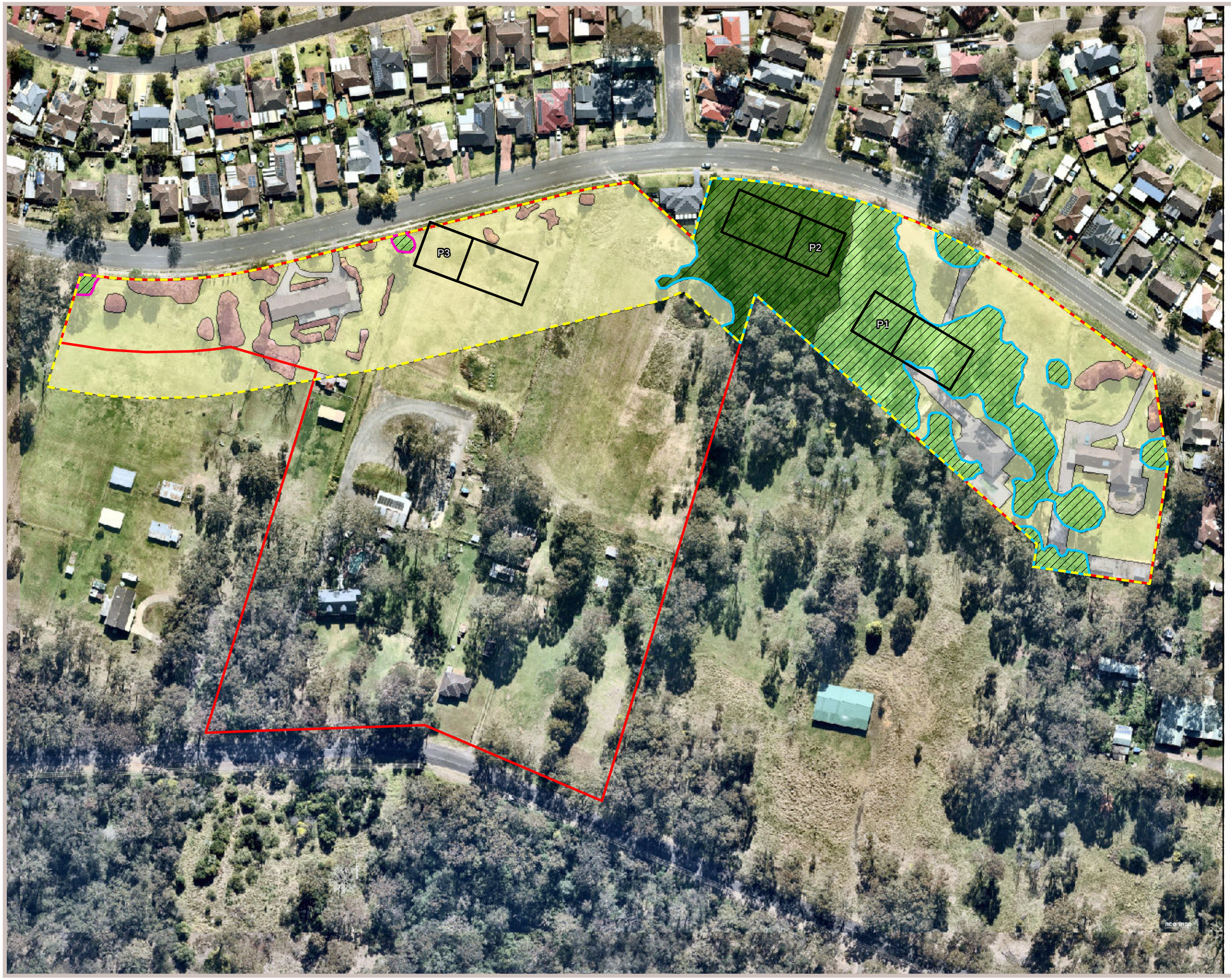
0 50 m

I:\...\16066\Figures\RP4\20211006\Figure 5. Koala records and habitat

Figure 5. Koala records and Koala habitat within the VAR study area under the Campbelltown Koala Plan of Management



Legend

- VAR Study Area
- Subject Site
- BAM Plot Locations

Vegetation Patch Number

- Patch 1
- Isolated Paddock Tree

Vegetation Community

- Cumberland Plain Woodland - Moderate condition
- Cumberland Plain Woodland - Poor condition
- Planted Garden Vegetation
- Exotic Grassland
- Cleared Land

Image Source:
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0 50 m

I:\...\16066\Figures\RP4\20211006\Figure 6. Vegetation patches

Figure 6. Vegetation patches and BAM plots within the VAR study area

Legend

VAR Study Area

Subject Site

Preferred Koala Feed Tree (CKPoM)

Eucalyptus tereticornis

Secondary Koala Feed Tree

Eucalyptus moluccana

Vegetation Patch Number

Patch 1

Isolated Paddock Tree

Vegetation Community

Cumberland Plain Woodland - Moderate condition

Cumberland Plain Woodland - Poor condition

Planted Garden Vegetation

Exotic Grassland

Cleared Land

Image Source:
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Dated: 11/8/2021

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Campbelltown LGA

Coordinate System: MGA Zone 56 (GDA 94)

cumberland ecology

0 50 m

I:\...\16066\Figures\RP4\20211006\Figure 7. Survey results

Figure 7. Stadia Metric Survey results

Attachment "B3"

Bushfire Assessment Report

(Bushfire Consulting Services Pty Ltd – 8 October 2021)

BUSHFIRE CONSULTING SERVICES PTY LTD
Designing Bushfire Protection Measures

Reference: J21/1022
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Penrith NSW 2751
Tel: 02 4744 5800
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www.bfcs.com.au
Date of Issue: 8 October 2021

Bush Fire Assessment Report

in relation to the proposed

Planning Proposal

at:

85 Evelyn Street (Lot 40 DP 623486), 87 Evelyn Street (Lot 305 DP 263295), 89 Evelyn Street (Lot 181 DP 834233), 16 Oakley Road (Lot 9 DP 826459), 18 Oakley (Lot 8 DP 826459), 109 Evelyn Street (Lot 100 DP 261125) and the northern portion of 22 Oakley Road (Lot 1 DP 533662), Macquarie Fields (subject site)

Contents

Document Tracking

Item	Detail
Project Name	Bush Fire Assessment Report, Planning Proposal
Project Address	85 Evelyn Street (Lot 40 DP 623486), 87 Evelyn Street (Lot 305 DP 263295), 89 Evelyn Street (Lot 181 DP 834233), 16 Oakley Road (Lot 9 DP 826459), 18 Oakley (Lot 8 DP 826459), 109 Evelyn Street (Lot 100 DP 261125) and the northern portion of 22 Oakley Road (Lot 1 DP 533662), Macquarie Fields
Client Name	Planzone, on behalf of the Evelyn Street Landowners Group
Project Number	J21/1022
Plan Reference	Subdivision plans by Planzone project no 20150604 revision 12 dated 05/10/21
Prepared by	Nicole van Dorst
Peer Reviewed by	Catherine Gorrie

Bushfire Consulting Services Pty Ltd Contact Details	
Catherine Gorrie	Managing Director
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Email	info@bfcs.com.au

Document Control

Version	Primary Author	Description	Date Completed
1	Nicole van Dorst	Draft	08/10/21
2	Catherine Gorrie	Final/Peer review	08/10/21

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Disclaimer

Any recommendation or advice expressed in this report is made in good faith and in accordance with the relevant legislation for bushfire prone development in New South Wales. Bushfire Consulting Services Pty Ltd has endeavoured to ensure that the information in this document is correct. However, many factors outside our current knowledge or control affect the recipient's needs and project plans. Bushfire Consulting Services Pty Ltd does not warrant or represent that the document is free from error or omissions and does not accept liability for any errors or omissions. Changes to available information, legislation and schedules are made on an ongoing basis and readers should obtain up to date information. To the fullest extent possible Bushfire Consulting Services Pty Ltd excludes any express or implied warranty as to condition, fitness, merchantability or suitability of this document and limits its liability for direct or consequential loss at Bushfire Consulting Services Pty Ltd option to re-supplying the document or the cost of correcting the document. In no event shall Bushfire Consulting Services Pty Ltd responses to questions or any other information in this document be deemed to be incorporated into any legally binding agreement without the express written consent of an officer of Bushfire Consulting Services Pty Ltd.

It should be borne in mind that the measures recommended in this report cannot guarantee that a building will survive a bushfire event on every occasion. This is due to the degree of vegetation management, the unpredictable behaviour of bushfires and extreme weather conditions. As such, the author is not liable to any person for any damage or loss whatsoever which has occurred or may occur in relation to the person taking action or not taking action based on the recommendations of this report.

NOTE: This bush fire assessment shall remain valid for 12 months from the date of issue.

Executive Summary

Bushfire Consulting Services was commissioned by Planzone, on behalf of the Evelyn Street Landowners Group to provide a bush fire assessment to support a planning proposal to amend the zoning at;

- 85 Evelyn Street, Macquarie Fields (Lot 40 DP 623486)
- 87 Evelyn Street, Macquarie Fields (Lot 305 DP 263295)
- 89 Evelyn Street, Macquarie Fields (Lot 181 DP 834233)
- 16 Oakley Road, Macquarie Fields (Lot 9 DP 826459)
- 18 Oakley, Macquarie Fields (Lot 8 DP 826459)
- 109 Evelyn Street, Macquarie Fields (Lot 100 DP 261125), and
- 22 Oakley Road, Macquarie Fields (Lot 1 DP 533662)

The subject site is mapped as designated bush fire prone land by Campbelltown Council with the majority of the site mapped as Category 3 (Grassland) vegetation with Category 1 vegetation limited within the southern portion of 22 Oakley Road.

Section 9.1(2) Direction of the EP&A Act requires Council to consult with the Commissioner of the RFS and to consider any comments by the Commissioner and to have regard to the planning principles of 'Planning for Bush Fire Protection (PBP) (NSWRFS 2019).

This report identifies matters for consideration for the planning proposal and highlights the required bushfire protection measures for future development under Direction 4.4 of PBP.

The key principle for the proposal is to ensure that future development can comply with PBP. Planning principles for the proposal include the provision of adequate access, establishment of adequate APZs for future housing, specifying minimum lot depths to accommodate APZs and the introduction of controls which avoid placing inappropriate developments in hazardous areas and placement of combustible material in APZs.

As such, this report makes recommendations in accordance with the aim, objectives, and performance criteria of Chapter 4 of the NSW RFS document '*Planning for Bush Fire Protection*'.

The recommendations address the required bush fire protection measures, including:

- establishment and maintenance of asset protection zones (APZs)
- provision of minimum setbacks for existing buildings to guide any future replanting within the properties and to ensure bushfire risk is not increased.
- adequate access for emergency personnel
- adequate water supply, and utility requirements
- provision of electrical or gas supplies that don't add to the bush fire risk to buildings
- construction requirements under AS3959-2018 (Standards Australia 2018)
- landscaping to reduce the risk of ignition by embers, and to minimise flame contact and radiant heat on the proposed development
- upgrading of existing dwellings for ember protection

Where all recommendations are implemented, the report concludes that the proposal can comply with the aim, objectives and performance criteria of PBP.

Compliance Summary

This Assessment has been Certified by: Nicole van Dorst BPAD-Level 3 Accredited Practitioner FPAA Cert No: BPAD23610	
Has a maximum radiant heat level of 29kW/m^2 been demonstrated?	Yes
Does this development comply with the aim and objectives of PBP?	Yes
Is referral to the NSW Rural Fire Service (RFS) required?	Yes

List of Abbreviations

APZ	Asset Protection Zone
AS3959	Australian Standard 3959 – 2018 *Construction of Buildings in Bushfire Prone Areas*
BAL	Bushfire Attack Level
BAR	Biodiversity Assessment Report
BFSA	Bush Fire Safety Authority
BPAD	Bushfire Planning and Design (Accreditation Scheme)
BPMs	Bushfire Protection Measures
BPLM	Bushfire Prone Land Map
Council	Campbelltown City Council
DA	Development Application
DEM	Digital Elevation Model
EP&A Act	*Environmental Planning and Assessment Act – 1979*
FDI	Fire Danger Index
FPAA	Fire Protection Association of Australia
IPA	Inner Protection Area
kW/m^2	Kilowatts per metre squared
LiDAR	Light Detection and Ranging
LPMA	Land & Property Management Authority
NCC	*National Construction Code*
PBP	*Planning for Bush Fire Protection 2019*
RF Act	*Rural Fires Act – 1997*
RFS	NSW Rural Fire Service
SEPP	*State Environmental Planning Policy*
SIX	Spatial Information Exchange

1. Introduction

This report has been commissioned by Planzone, on behalf of the Evelyn Street Landowners Group to provide a bush fire assessment for a proposed rezoning at 85 Evelyn Street (Lot 40 DP 623486), 87 Evelyn Street (Lot 305 DP 263295), 89 Evelyn Street (Lot 181 DP 834233), 16 Oakley Road (Lot 9 DP 826459), 18 Oakley (Lot 8 DP 826459), 109 Evelyn Street (Lot 100 DP 261125) and the northern portion of 22 Oakley Road (Lot 1 DP 533662), Macquarie Fields.

The subject property is "bushfire prone land" as per the local Council bushfire prone land map (Figure 4) as defined by section 10.3 (s10.3) of the Environmental Planning & Assessment Act (EP&A) 1979 and therefore the requirements stipulated by legislation apply to any new development on the site.

Planning for Bush Fire Protection 2019 (Chapter 4) describes this type of development as a "planning proposal" and therefore the requirements of Section 9.1(2) Direction of the EP&A Act are applicable.

The bush fire assessment and recommendations are derived from the Rural Fire Service document Planning for Bush Fire Protection 2019.

2. Purpose of this Report

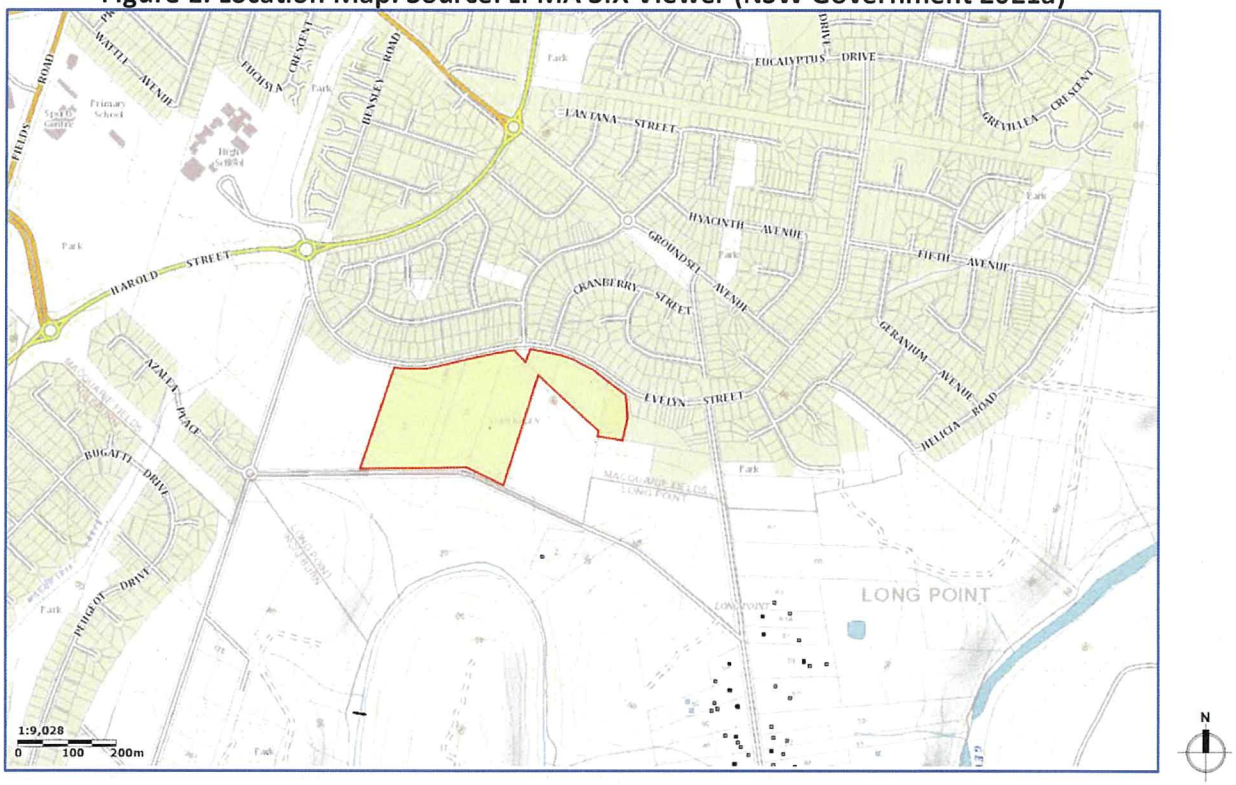
The purpose of this report is to provide the owners, the Consent Authority and the Rural Fire Service with a description of the proposed development as well as the vegetation type, slope and any other factors influencing the likely bushfire behaviour, sufficient to show that the development will be protected from the likely bushfire threat as outlined in current legislation.

This assessment includes an analysis of the hazard, threat and subsequent risk to the development and provides recommendations that satisfy the aim and objectives of Planning for Bush Fire Protection.

3. Location

The site is located and known as 85 Evelyn Street (Lot 40 DP 623486), 87 Evelyn Street (Lot 305 DP 263295), 89 Evelyn Street (Lot 181 DP 834233), 16 Oakley Road (Lot 9 DP 826459), 18 Oakley (Lot 8 DP 826459), 109 Evelyn Street (Lot 100 DP 261125) and the northern portion of 22 Oakley Road (Lot 1 DP 533662), Macquarie Fields. The property is part of the Campbelltown local government area.

Figure 1. Location Map. Source: LPMA SIX Viewer (NSW Government 2021a)

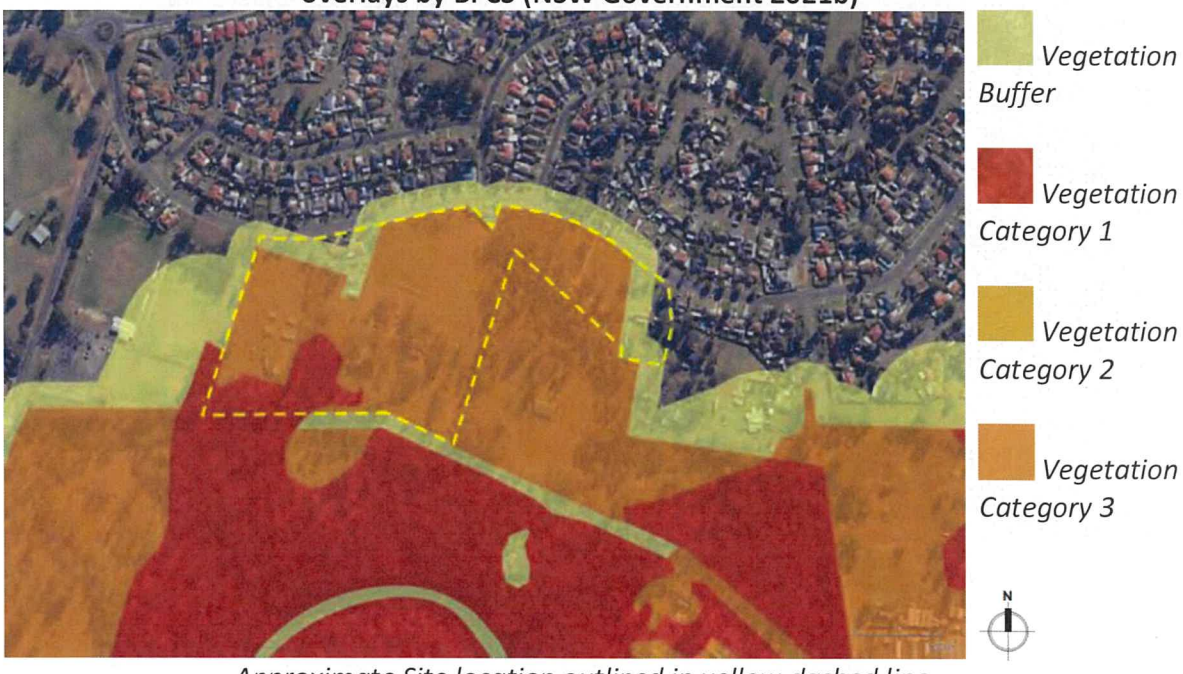


Approximate Subject Site location outlined in red

Figure 2. Aerial Map. Source: Nearmap with overlays by BFCS (NSW Government 2021a)

Site location outlined in red

Figure 3. Bushfire Prone Land Map. Source: NSW Government Planning Portal with overlays by BFCS (NSW Government 2021b)



Approximate Site location outlined in yellow dashed line

4. Property Description

The property is comprised of 85 Evelyn Street (Lot 40 DP 623486), 87 Evelyn Street (Lot 305 DP 263295), 89 Evelyn Street (Lot 181 DP 834233), 16 Oakley Road (Lot 9 DP 826459), 18 Oakley (Lot 8 DP 826459), 109 Evelyn Street (Lot 100 DP 261125) and the northern portion of 22 Oakley Road (Lot 1 DP 533662), Macquarie Fields covering approximately 9.97ha in area (Figure 2). It is bounded by Evelyn Street to the north, Oakey Road to the south, Bensley Reserve to the west and low density residential development to the east. The site currently contains seven dwellings and a number of sheds and outbuildings which are expected to be retained.

4.1 Zoning

The land is currently zoned E4 and SP2 under Campbelltown Local Environmental Plan 2015. Adjacent lands to the north and east are zoned R2 and to the west RE1 (Figure 4).

Figure 4. Zoning Map. Source: NSW Government Planning Viewer (NSW Government 2021b)

Approximate subject site location outlined in yellow dashed line

4.2 Biodiversity Values

A Biodiversity Assessment Report (BAR) has been prepared by Cumberland Ecology (October 2021). This report has identified the presence of three (3) threatened flora species, one (1) threatened fauna species (Koala) and the critically Endangered Ecological Community Cumberland Plain Woodland.

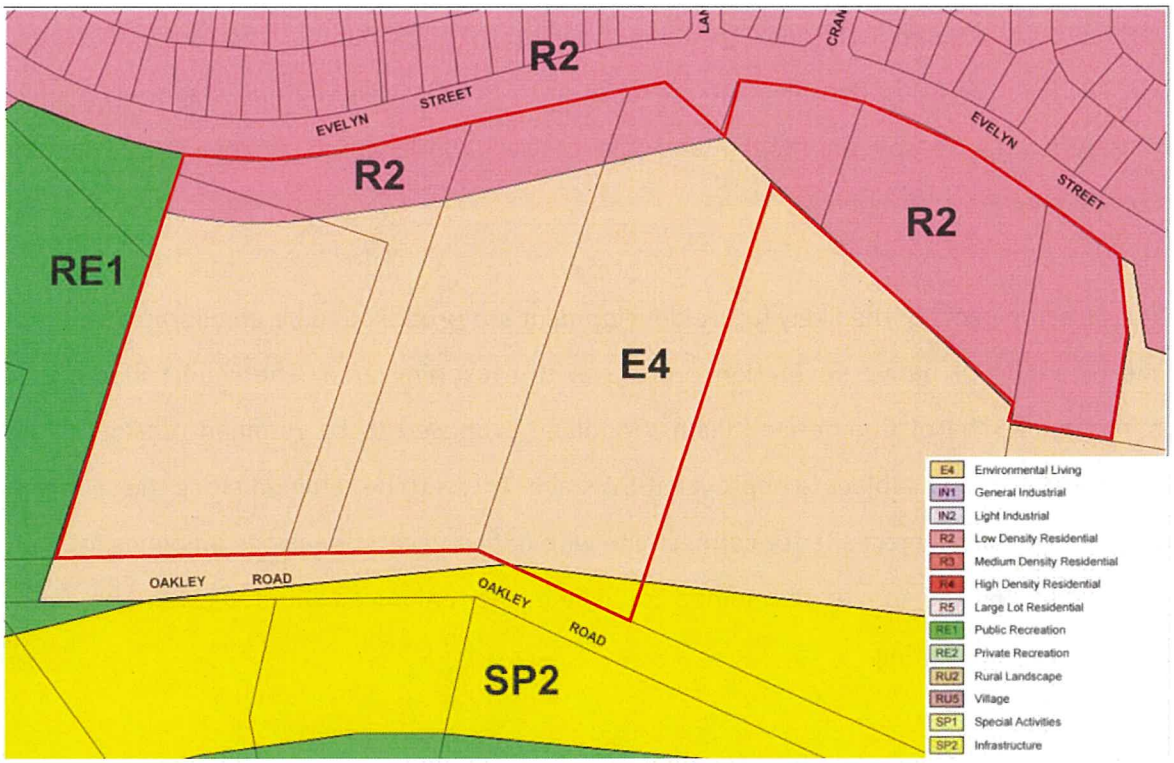
The direct impacts of the likely future development are proposed to be ameliorated through the retention of native vegetation outside of the rezoning area. The report identifies a minimum 1.33ha of Cumberland Plain Woodland proposed to be retained outside of the rezoning areas and subject to approval at DA stage. This is to be retained along the southern boundary of the subject site for connectivity with native vegetation in the adjoining lot. The BAR states that the area to be retained could be further enhanced with the establishment of understorey replanting.

The BAR report concludes that the impacts of the project are proposed to be assessed in greater detail at the DA stage and the BOS is likely to be triggered, a Biodiversity Development Assessment Report will need to be prepared.

4.3 The Proposal

The planning proposal seeks to facilitate the future subdivision and development of the land for low density residential purposes. This will result in the rezoning of a strip of land with direct frontage to Evelyn Street to R2 Low density Residential. The remainder of the land will retain its current E4 zoning. The R2 zoning is consistent with the existing residential development to the north of the site.

Figure 5. Proposed Zoning Map. Source: Planzone Consulting



Site location outlined in red

5. Bushfire Strategic Study

PBP provides planning principles for rezoning to residential land as well as guidance on effective bushfire protection measures.

For strategic development proposals in bush fire prone areas *PBP* requires, as a minimum, assessment of the components provided in the table below. These issues are addressed in further detail in Section 7 of this report.

Issue	Detail	Assessment Considerations	Comment
Bush fire landscape assessment	A bush fire landscape assessment considers the likelihood of a bush fire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape	The bush fire hazard in the surrounding area, including: • Vegetation • Topography • Weather The potential fire behaviour that might be generated based on the above; Any history of bush fire in the area; Potential fire runs into the site and the intensity of such fire runs; and The difficulty in accessing and suppressing a fire, the continuity of bush fire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.	An assessment of the bushfire hazard has been provided in Section 7 of this report. There is a bushfire risk associated with the remnant Woodland vegetation within the property to the south. This risk will be mitigated by APZs of up to 50m for the new dwellings and the presence of existing buildings / infrastructure and driveways which fragments the landscape Fire history obtained from SEED dataset records three (3) wildfires within the Holsworthy Military Reserve on the eastern side of the Georges River approximately 1km to the east of the site as well as two smaller wildfires over 500m to the south of the site

Issue	Detail	Assessment Considerations	Comment
Land use assessment	The land use assessment will identify the most appropriate locations within the masterplan area or site layout for the proposed land uses	The risk profile of different areas of the development layout based on the above landscape study; The proposed land use zones and permitted uses; The most appropriate siting of different land uses based on risk profiles within the site (i.e. not locating development on ridge tops, SFPP development to be located in lower risk areas of the site); and The impact of the siting of these uses on APZ provision	The proposed new dwellings have been sited fronting Evelyn Street with access provided to the north and away from the direct threat of bushfire. The proposed residential zoning is compatible with the bushfire risk and adequate bushfire protection measures can be provided in accordance with PBP

Issue	Detail	Assessment Considerations	Comment
Access and egress	A study of the existing and proposed road networks both within and external to the masterplan area or site layout	The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile; The location of key access routes and direction of travel; and The potential for development to be isolated in the event of a bush fire	Evelyn Street has an 11m wide carriageway and provides direct egress way from the direct threat of bushfire. The new lots (23 in total) have at least four (4) options for direction of travel via Lantana and Cranberry Street to the north and Evelyn Street to the east or west. It is unlikely that the development will be isolated in a bushfire and the existing networks has the capacity to support the proposed new rezoning

Issue	Detail	Assessment Considerations	Comment
Emergency services	An assessment of the future impact of new development on emergency services	Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/ brigades; and Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency	There are four (4) fire brigades located within 10km of the site. Casula Rural Fire brigade is located a 14min drive to the north Minto Heights Rural Fire Station and NSW Rural Fire Service on Alderney Street (9m drive) to the south Fire and Rescue NSW St Andrews Fire Station (10min drive) to the south-west No additional services are considered necessary
Infrastructure	An assessment of the issues associated with infrastructure and utilities	The ability of the reticulated water system to deal with a major bush fire event in terms of pressures, flows, and spacing of hydrants; and Life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines etc	The reticulated water supply will comply with the requirements of PBP and will be made a condition of consent at DA stage. There are no high voltage power lines or gas supply in close proximity to the site

Issue	Detail	Assessment Considerations	Comment
Adjoining land	The impact of new development on adjoining landowners and their ability to undertake bush fire management	Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bush Fire Management Plans	All APZ's will be confined within the development property. The proposed change of use will decrease the bushfire risk for surrounding residential properties to the north and east of the site

Figure 6. Fire History. Source: SEED data set

Site location denoted by latitude and longitude details

6. Site Assessment

Bushfire Consulting Services Pty Ltd attended the site on 6 October 2021. The assessment relates to the new development and concept subdivision shown in the site plans (reference Appendix 1 below). The NSW Spatial Services mapping website has also been used as a reference (NSW Government 2021a), and 'Ocean Shores to Desert Dunes' by David Keith (Keith 2004), in determining the vegetation type.

7. Identify APZs

7.1 Determine Vegetation Formations

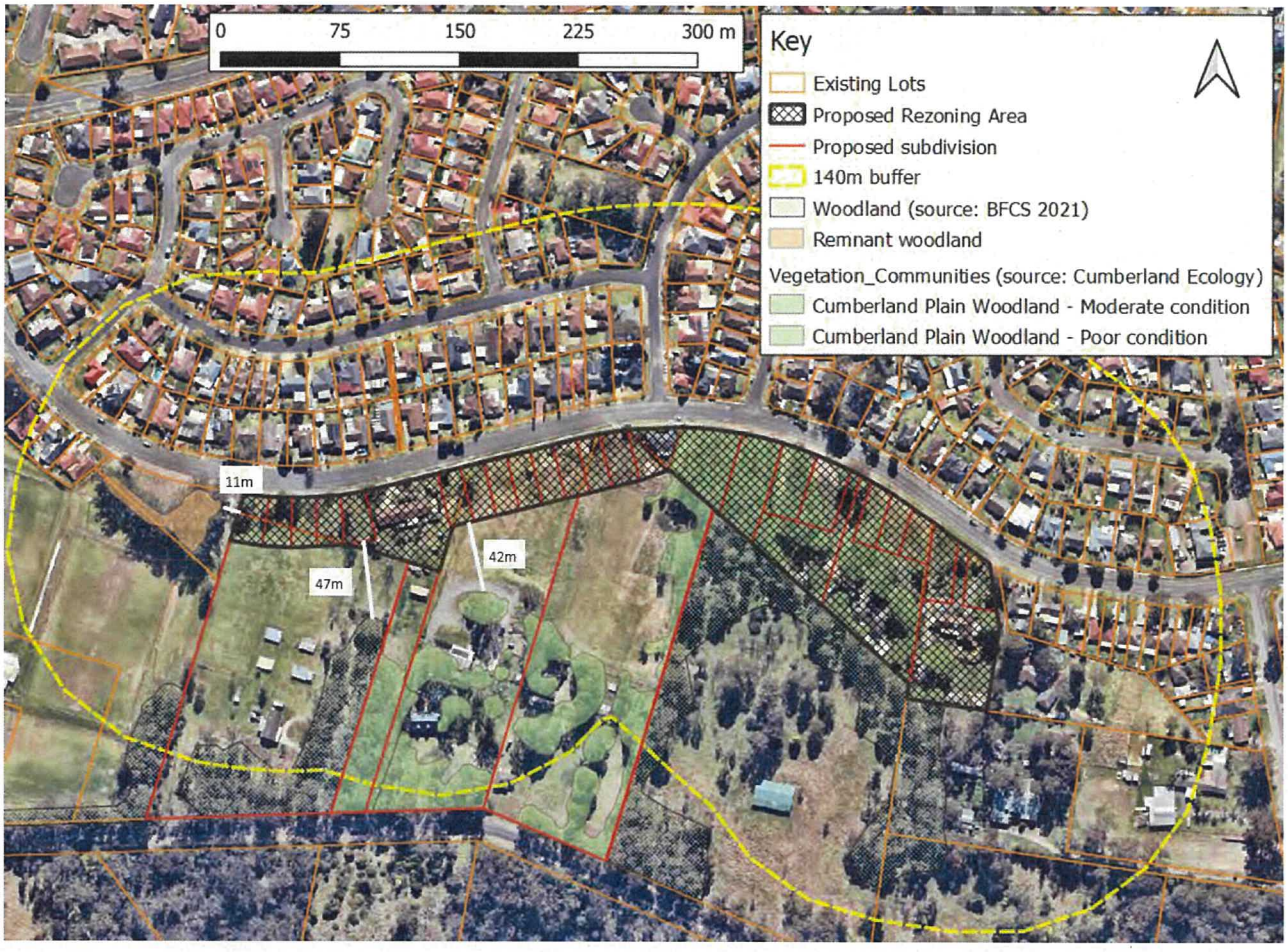
The hazardous vegetation formations for each aspect of the development within 140m of the asset have been identified according to Keith (2004). The bushfire threat emanates from Grassy Woodland located within and external to the site. The vegetation within the site has been confirmed by survey undertaken by Cumberland Ecology. This vegetation is consistent with the description outlined in Figure A1.2 of PBP and is dominated by an open to sparse layer of eucalypts with crowns rarely touching and shrubs are sparsely distributed.

The Grassy Woodland external to the site has been confirmed via a site inspection undertaken by BFCS on 6 October 2021. This inspection also identified a small remnant patch of Woodland (0.12ha in size) located to the west of proposed rezoning area. This small and narrow parcel of vegetation has less opportunity to support fully developed bush fires because of its limited size.

PBP identifies remnant vegetation is a parcel of vegetation with a size of less than 1 Ha or a shape that provides a potential fire run that could threaten buildings not exceeding 50m. These remnants are considered a low hazard and APZ setbacks and building construction standards for these may be the same as for rainforests.

The Grassland within the site is currently maintained by mowing and/or grazing. To ensure the ongoing maintenance of this grassland a 50m APZ has been applied and will be assured via an 88B easement restriction.

Figure 7. Hazardous vegetation affecting the proposal. Source: NearMap (2021) with overlays source: Cumberland Ecology. Overlays by BFCS P/L Aerial Photo date: 11/08/2021



Proposed rezoning outlined in black. Vegetation was assessed to a distance of 140m from the proposed rezoning boundary

7.2 The effective slope

The slope of the land under the classified vegetation has a direct influence on the rate of fire spread, the intensity of the fire and the level of radiant heat flux. The effective slope of the land from the proposed R2 zoned land for a distance of 100m is derived from a site assessment combined with the most detailed contour data available. The slope is then categorised into one of following classes, relative to the location of the hazard:

all upslope vegetation (considered 0 degrees)

>0 to 5 degrees downslope vegetation

>5 degrees to 10 degrees downslope vegetation

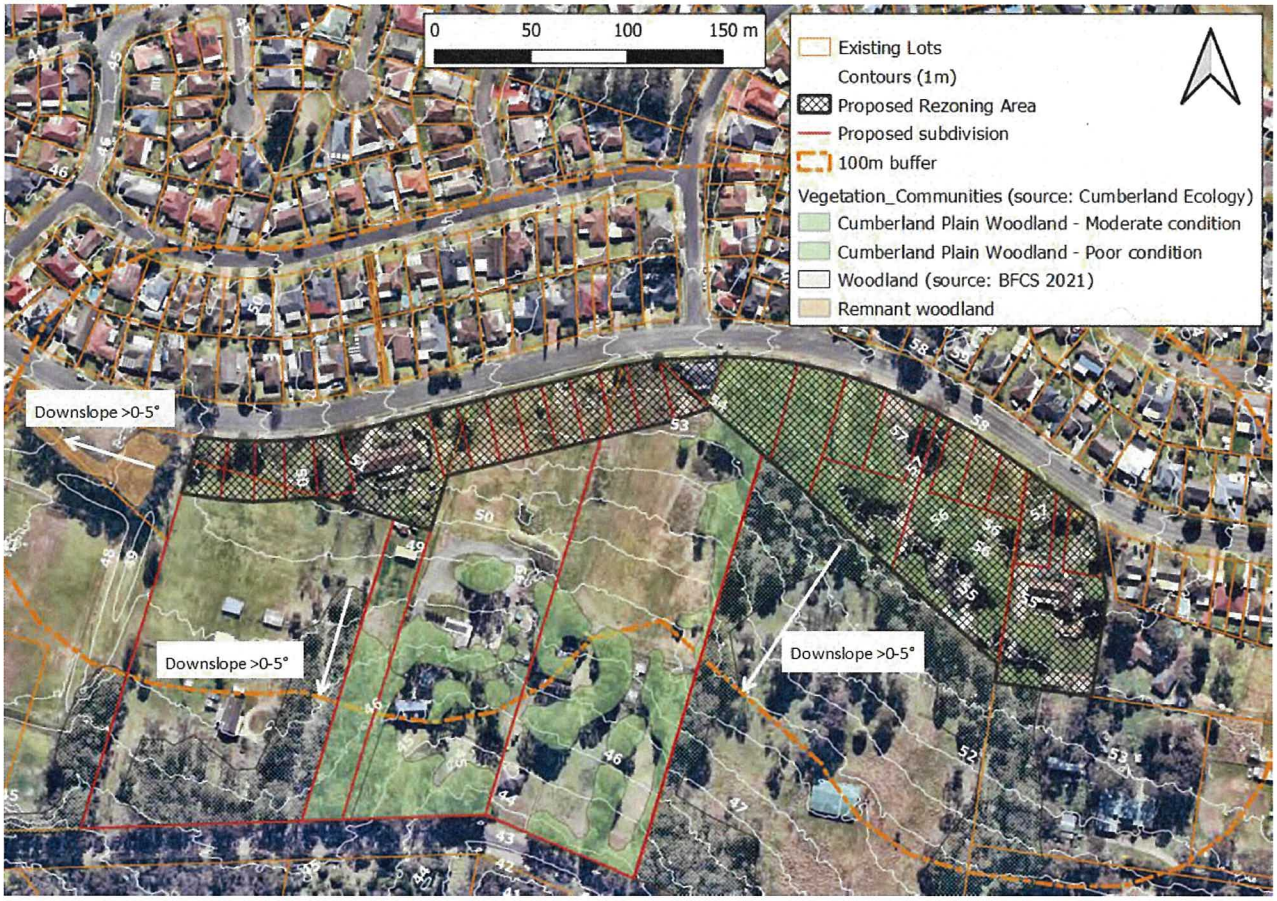
>10 degrees to 15 degrees downslope vegetation, and

>15 degrees to 20 degrees downslope vegetation.

1m DEM data is sourced from NSW Spatial Services which is captured using LiDAR and has a horizontal accuracy of 0.3m and vertical accuracy of 0.8m at 95%.

The effective slope has been measured manually on site over a distance of 100m from the proposed development where accessible, under the classified vegetation community constituting the hazard. The slope was found to be consistent with the topographical information from NSW Spatial Services LiDAR data.

Figure 8. Slope Diagram. Source: NearMap (2021) and LiDAR (NSW Government 2021a) with overlays by BFCS P/L & Cumberland Ecology: Aerial Photography Date: 11/08/2021



Proposed rezoning outlined in black, 1m contours, Slope is

East - ((49-47)/70) x 1/tan = 1.6° downslope

South- ((49-46)/84) x 1/tan = 2° downslope & ((54-50)/94) x 1/tan = 2.4° downslope

Direction from Building Footprint	Slope Description
North	N/A
East	N/A
South	Downslope >0- 5°
West	Downslope >0- 5°

7.3 Fire Weather

The development is located in the Campbelltown Council area, a part of the Greater Sydney Region, which has a Fire Danger Index of 100.

7.4 Determination of APZs

An Asset Protection Zone (APZ) is a fuel-reduced area surrounding a built asset or structure. An APZ provides a buffer zone between a bush fire hazard and an asset and an area of reduced bush fire fuel that allows suppression of fire. It also provides an area from which backburning or hazard reduction can be conducted, and allows emergency services access as well as providing a relatively safe area for firefighters and home owners to defend their property.

Potential building footprints must not be exposed to radiant heat levels exceeding 29kW/m^2 on each proposed lot. Bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy. PBP has minimum specifications for APZs to be established around a dwelling to be managed as an Inner Protection Area (IPA).

An IPA should provide a tree canopy cover of less than 15% and should be located greater than 2 metres from any part of the roofline of a dwelling. Garden beds or flammable shrubs are not to be located under trees and should be no closer than 10m from an exposed window or door. Trees should have lower limbs removed up to a height of 2m above the ground.

To identify the appropriate APZ, the relevant FFDI, vegetation formation and effective slope are matched using Table A1.12.2 of PBP.

Table A1.12.2 of PBP – Proposed Lots 1 – 13 - Distances for APZs – residential development, FFDI 100 areas (<29kW/m^2, 1090K)

Aspect	Distance from hazard	Vegetation Classification	Slope Under Classified Vegetation	APZ provided
North	>100m	N/A	N/A	>100m
East	>100m	N/A	N/A	>100m
South	>42m	Woodland	Downslope >0- 5°	*50m
West	11m	Remnant Woodland	Downslope >0- 5°	14m

**refer Note 1*

Note 1 – The 50m APZ has been applied to ensure the ongoing maintenance of the Grassland as an APZ. The APZ includes a 12m building setback within proposed Lots 1-13 and a 38m APZ within proposed Lots 29, 28,27, 26. The 38m APZ will be subject to an 88B easement agreement to ensure maintenance in perpetuity.

Figure 9. APZ – Proposed Lots 1 – 13 & existing dwellings. Source: NearMap with overlays by BFCS P/L: Aerial Photography Date: 11/08/2021

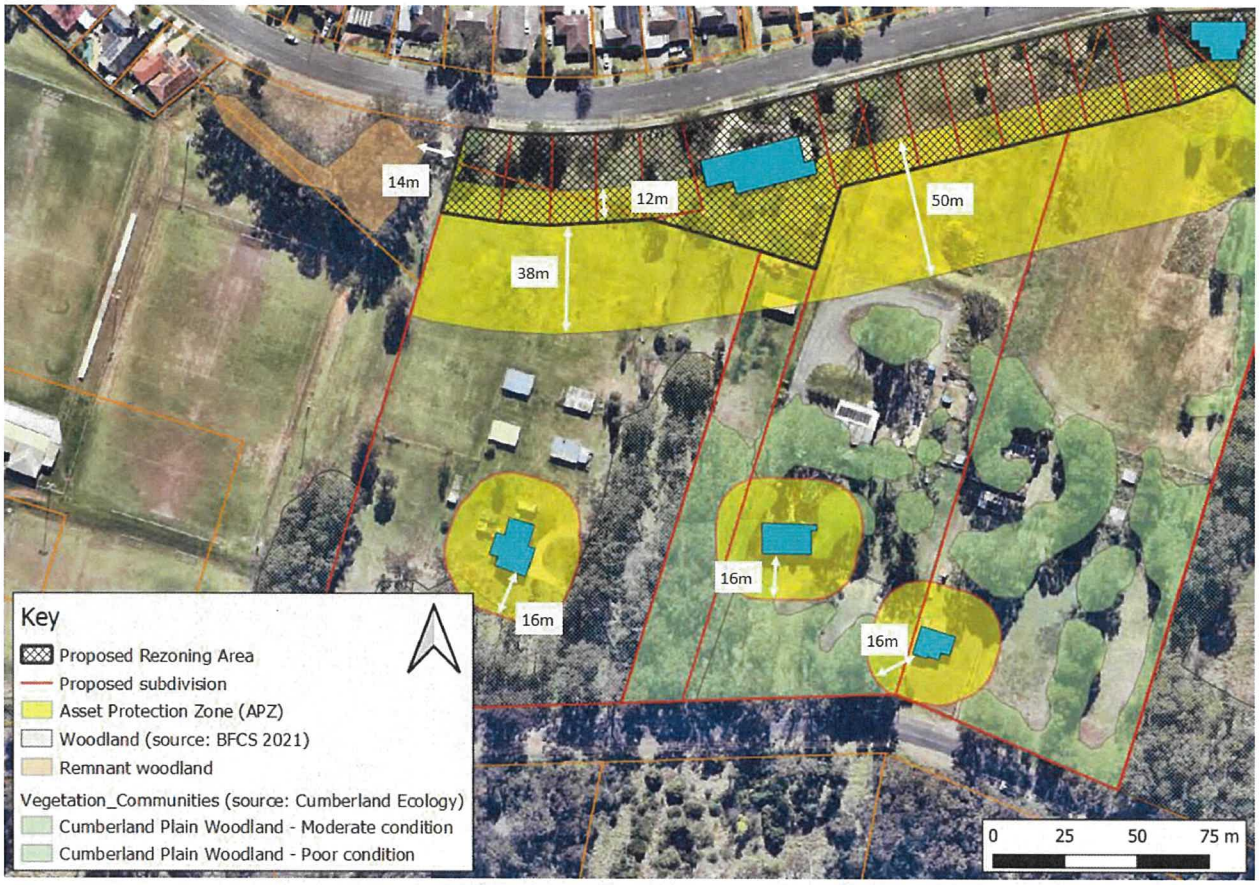
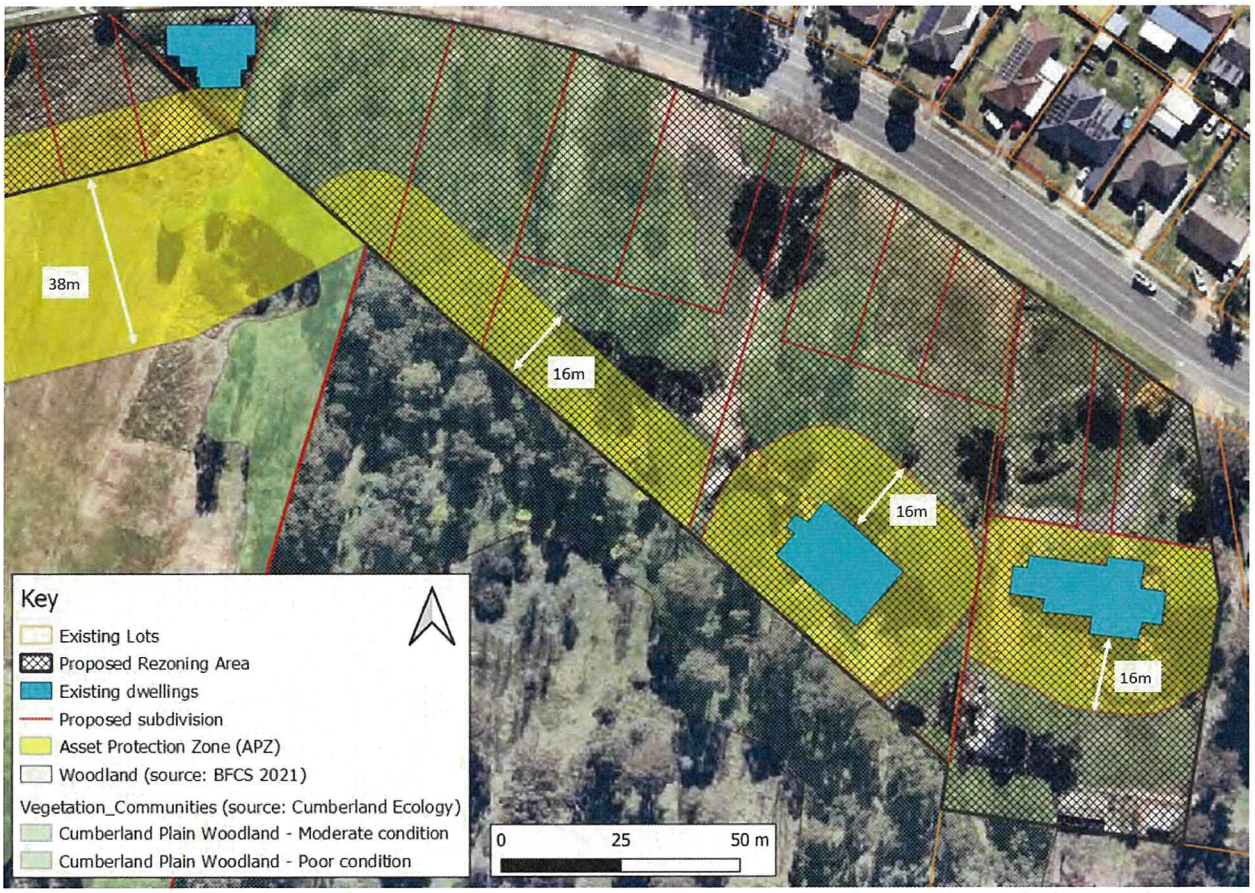


Table A1.12.2 of PBP – Proposed Lots 14 – 25 - Distances for APZs – residential development, FFDI 100 areas (<29kW/m^2, 1090K)

Aspect	Distance from hazard	Vegetation Classification	Slope Under Classified Vegetation	APZ provided
North	>100m	N/A	N/A	>100m
East	>100m	N/A	N/A	>100m
South	8-50m	Woodland	Downslope >0- 5°	16m
West	>100m	N/A	N/A	>100m

Figure 10. APZ – Proposed Lots 14 - 25. Source: NearMap with overlays by BFCS P/L: Aerial Photography Date: 11/08/2021



7.5 Hazard Management & Landscaping

The BAR prepared by Cumberland Ecology recommends that the vegetation within the southern portion of the property is to be retained and could be further enhanced with the establishment of understorey replanting. It is recommended that any enhancement of the existing vegetation should follow the following general guidelines;

- The Grassland to the south of Lots 1 - 14 is currently maintained by mowing and/or grazing. To ensure the ongoing maintenance of this grassland a 50m APZ has been applied to the south of these lots and will be assured via an 88B easement restriction.
- No enhancement planting should occur within 16m of the existing dwellings.

These requirements will be further determined at DA stage.

7.6 Identify Construction Requirements

The appropriate construction requirements for the development are determined by matching the relevant FFDI, vegetation type, the distance measured from the edge of the unmanaged vegetation to the closest external wall to identify the BAL using the relevant tables from PBP. These construction requirements are located in section 3 of AS3959-2018 and will be determined at building construction stage. A summary has been provided below.

PBP Table A1.12.5 Determination of BAL, FFDI 100 – residential developments

Aspect	Distance from hazard	Vegetation Classification	Effective Slope Under Classified Vegetation	Bushfire Attack Level (BAL) required
North	>100	N/A	N/A	N/A
East	>100m	N/A	N/A	N/A
South	>16	Woodland	Downslope >0- 5°	BAL 29 (16-<23m) BAL 19 (23-<32m) BAL 12.5 (32-< 100m)
West	14m	Remnant Woodland	Downslope >0- 5°	BAL 29 (14-<21m) BAL 19 (21-<29m) BAL 12.5 (29-< 100m)

8. Bush Fire Protection Measures

The BPMs for residential and rural residential subdivisions include provisions relating to APZs, access to structures and water supply, fire trail access and provision of water. Electricity and gas services should be provided so that they don't add to the bush fire risk to buildings.

8.1 Asset Protection Zones

PBP Table 5.3a Performance criteria and acceptable solutions for residential and rural residential subdivision

Performance Criteria	Acceptable Solutions/Comment
Potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m² on each proposed lot	Achieved as an APZ of 14m will be provided to the west and 16 – 50m will be provided to south in accordance with Table A1.12.1 of PBP. The 50m APZ exceeds the requirement outlined in PBP
APZs are managed and maintained to prevent the spread of a fire to the building	Achieved as the APZs are managed in accordance with the requirements of Appendix 4 of PBP
The APZ is provided in perpetuity	Achieved as APZs requirements will be specified in the Development Consent conditions at development application stage and can be ensured via the creation of an 88B easement
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised	Achieved as APZ are located on lands with a slope less than 18 degrees. The slope under the site APZ is 0-5°
Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions	Achieved as landscaping will be in accordance with Appendix 4. All fences and gates will be constructed of either hardwood or non-combustible material. If located within 6m of a building, they are to be constructed from non-combustible material only

8.2 Access

Performance criteria	Acceptable solution	Acceptable solution	Performance solution	Comment
Firefighting vehicles are provided with safe, all weather access to structures	Property access roads are two-wheel drive, all-weather roads	☑	☐	Complies
	Perimeter roads are provided for residential subdivisions of three or more allotments	☐	☑	A perimeter road has not been provided. The concept subdivision design provides new lots with direct frontage to Evelyn Street in the north. The proposed 50m APZ to the rear of allotments will increase the bushfire safety for residents and fire fighters and exceeds the minimum requirements out lined in PBP. Firefighting access to the rear of the new allotments can be provided via the driveways associated with the existing dwellings in the south (within proposed Lots 29, 27, 26, 24 & 23)
	Subdivisions of three or more allotments have more than one access in and out of the development	☑	☐	All allotments from direct frontage to Evelyn Street via private driveways

Performance criteria	Acceptable solution	Acceptable solution	Performance solution	Comment
	Traffic management devices are constructed to not prohibit access by emergency services vehicles	☑	☐	Complies
	Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient	☑	☐	Complies
	All roads are through roads	☑	☐	N/A. All new allotments are within 70m of Evelyn Street
	Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200m in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end	☑	☐	N/A. All new allotments are within 70m of Evelyn Street and have direct street frontage

Performance criteria	Acceptable solution	Acceptable solution	Performance solution	Comment
	Where kerb and guttering are provided on perimeter roads, roll top kerbing should be used to the hazard side of the road	☑	☐	N/A
	Where access / egress can only be achieved through forest, woodland or heath vegetation, secondary access shall be provided to an alternate point on the existing public road system	☑	☐	N/A. All driveway access is directly onto Evelyn Street and does not traverse bushland
	One way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression	☑	☐	N/A
The capacity of access roads is adequate for firefighting vehicles	The capacity of perimeter and non-perimeter road surfaces and any bridges / causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes);	☑	☐	Can be a condition of consent at DA stage

Performance criteria	Acceptable solution	Acceptable solution	Performance solution	Comment
	bridges / causeways are to clearly indicate load rating			
There is appropriate access to water supply	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression	☑	☐	Can be a condition of consent at DA stage
	Hydrants are provided in accordance with *AS 2419.1:2005*	☑	☐	Can be a condition of consent at DA stage
	There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available	☑	☐	Can be a condition of consent at DA stage

8.3 Perimeter Roads

Performance criteria	Acceptable solution	Acceptable solution	Performance solution	Comment
Access roads are designed to allow safe access and egress for firefighting	Are two-way sealed roads	☐	☑	N/A
	Minimum 8m carriageway width kerb to kerb			Perimeter roads are not provided. Based on the larger APZ's (50m) the proposed

Performance criteria	Acceptable solution	Acceptable solution	Performance solution	Comment
vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface	Parking is provided outside of the carriageway width			layout will provide safe egress for residents directly onto Evelyn Street. Fire fighting access is available to the woodland areas via the existing driveways associated with proposed Lots 29, 27, 26, 24 & 23 to the south. Oakley Road also provides access for fire fighting operations in the event of a bushfire originating from bushland further south
	Hydrants are located clear of parking areas			
	There are through roads, and these are linked to the internal road system at an interval of no greater than 500m			
	Curves of roads have a minimum inner radius of 6m			
	The maximum grade road is 15° and average grade is 10°			
	The road crossfall does not exceed 3°			

8.4 Non-Perimeter Roads

Performance criteria	Acceptable solution	Acceptable solution	Performance solution	Comment
Access roads are designed to allow safe access and egress for medium rigid firefighting vehicles while residents are evacuating	Minimum 5.5m carriageway width kerb to kerb	☐	☑	N/A There are no additional public roads proposed
	Parking is provided outside of the carriageway width			
	Hydrants are located clear of parking areas			

Performance criteria	Acceptable solution	Acceptable solution	Performance solution	Comment
	Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m			
	Curves of roads have a minimum inner radius of 6m			
	The road crossfall does not exceed 3°			
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided			

8.5 Property Access

Performance criteria	Acceptable solution	Acceptable solution	Performance solution	Comment
Firefighting vehicles can access the dwelling and exit the property safely.	There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph)	☑	☐	All allotments are provided with direct frontage to the public road system. No further requirements are necessary

	that supports the operational use of emergency firefighting vehicles			

8.6 Water Supplies

Performance Criteria	Acceptable Solutions/Comment
An adequate water supply is provided for fire-fighting purposes	Can be a condition of consent at DA stage. Reticulated water is available to the development
Water supplies are located at regular intervals	Can be a condition of consent at DA stage. Fire hydrant spacing, design and sizing is to comply with the relevant clauses of AS 2419.1:2005 Hydrants are not located within any road carriageway
The water supply is accessible and reliable for fire fighting operations	Can be a condition of consent at DA stage. Any new hydrants should not be located within any road carriageway
Flows and pressure are appropriate	Can be a condition of consent at DA stage. Fire hydrant flows and pressures are to comply with the relevant clauses of AS 2419.1:2005
The integrity of the water supply is maintained	Can be a condition of consent at DA stage. All above-ground water service pipes external to the building are to be metal, including and up to any taps

8.7 Electricity Services

Performance Criteria	Acceptable Solutions/Comment
Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings	Where practicable, electrical transmission lines are underground, and where overhead, electrical transmission lines are proposed as follows: lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; and no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines

8.8 Gas Services

Performance Criteria	Acceptable Solutions/Comment
Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings	Where applicable, reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used. All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side, connections to and from gas cylinders are metal. Polymer-sheathed flexible gas supply lines are not used, and above-ground gas service pipes are metal, including and up to any outlets

8.9 Existing Building Upgrade

In accordance with PBP section 5.1.3, the existing dwellings located within proposed Lots 23, 24, 26-29 & 33 may need to be upgraded to provide ember protection at subdivision DA stage. Where applicable, the minimal protection measures outlined in the NSW RFS document 0914 'Development Assessment and Planning, Upgrading of Existing Buildings' (NSW RFS undated) including:

1. All windows in the existing dwelling to be completely covered by a tightly fitting, metal-framed screen with a mesh or perforated sheet with a maximum aperture of 2mm made from corrosion-resistant steel, bronze or aluminium
2. Non-combustible gutter guards are to be fitted to gutters and roof valleys
3. All external side-hung doors are to be fitted with a draft excluder at the base. External screen doors shall be fitted with a mesh or perforated sheet with a maximum aperture of 2mm made from corrosion-resistant steel, bronze or aluminium
4. All gaps, vents or weepholes in the subfloor space shall be covered with a mesh or perforated sheet with a maximum aperture of 2mm made from corrosion-resistant steel, bronze or aluminium. The intent is to stop embers reaching combustible flooring and support elements
5. All gaps under ridge caps, valleys and where roof sheeting meets fascias or walls are to be covered a mesh or perforated sheet with a maximum aperture of 2mm made from corrosion-resistant steel, bronze or aluminium. Alternatively, metal sheet cut specifically to the profile of the roof sheet corrugations may be used to seal gaps. The intent is to stop embers reaching combustible roofing elements.

9. Recommendations

The following recommendations are made for the bushfire measures for the proposed rezoning at 85 Evelyn Street (Lot 40 DP 623486), 87 Evelyn Street (Lot 305 DP 263295), 89 Evelyn Street (Lot 181 DP 834233), 16 Oakley Road (Lot 9 DP 826459), 18 Oakley (Lot 8 DP 826459), 109 Evelyn Street (Lot 100 DP 261125) and the northern portion of 22 Oakley Road (Lot 1 DP 533662), Macquarie Fields. These recommendations are based upon the relevant provisions of the NSW Rural Fire Service Guideline entitled Planning for Bush Fire Protection 2019.

1. Asset Protection Zones

APZs are to be provided to the future residential development. APZs are to be measured from the exposed wall of any dwelling toward the hazardous vegetation. The minimum APZ must be achievable within all lots fronting the bushfire hazard as nominated in Figure 9 & 10.

The APZ is to be managed as an Inner Protection Area (IPA) for a distance of 50m from future dwellings within Lots 1 – 13 and for a minimum distance of 16m from the rear boundary of Lots 14, 15 & 25 as outlined in PBP 2019 Appendix 4.

A formal 88B agreement will be required to burden Lots 29, 28, 27 & 26 to ensure the ongoing maintenance of the Grassland and to limit any enhancement plantings to comply with APZ standards for a distance of 38m from the northern Lot boundaries.

2. Landscaping & future enhancement planting

Any new landscaping or enhancement planting within the APZ is to comply with PBP Appendix 4. No enhancement planting should occur within 16m of the existing dwellings.

3. Water, Electricity and Gas Supply

Water, electricity and gas supply is to comply with the acceptable solutions as provided within Section 5.3.3 of *PBP 2019*.

4. Existing dwelling upgrades

The existing dwellings may need to be upgraded to enhance their resistance to bushfire. Where applicable, the minimal protection measures outlined in the NSW RFS document 0914 'Development Assessment and Planning, Upgrading of Existing Buildings' (NSW RFS undated) including:

1. All windows in the existing dwelling to be completely covered by a tightly fitting, metal-framed screen with a mesh or perforated sheet with a maximum aperture of 2mm made from corrosion-resistant steel, bronze or aluminium
2. Non-combustible gutter guards are to be fitted to gutters and roof valleys
3. All external side-hung doors are to be fitted with a draft excluder at the base. External screen doors shall be fitted with a mesh or perforated sheet with a maximum aperture of 2mm made from corrosion-resistant steel, bronze or aluminium
4. All gaps, vents or weepholes in the subfloor space shall be covered with a mesh or perforated sheet with a maximum aperture of 2mm made from corrosion-resistant steel, bronze or aluminium. The intent is to stop embers reaching combustible flooring and support elements

5. All gaps under ridge caps, valleys and where roof sheeting meets fascias or walls are to be covered a mesh or perforated sheet with a maximum aperture of 2mm made from corrosion-resistant steel, bronze or aluminium. Alternatively, metal sheet cut specifically to the profile of the roof sheet corrugations may be used to seal gaps. The intent is to stop embers reaching combustible roofing elements.

10. Summary

This report consists of a bush fire assessment for the proposed rezoning at 85 Evelyn Street (Lot 40 DP 623486), 87 Evelyn Street (Lot 305 DP 263295), 89 Evelyn Street (Lot 181 DP 834233), 16 Oakley Road (Lot 9 DP 826459), 18 Oakley (Lot 8 DP 826459), 109 Evelyn Street (Lot 100 DP 261125) and the northern portion of 22 Oakley Road (Lot 1 DP 533662), Macquarie Fields. The report concludes that the proposed development is on designated bushfire prone land and the legislative requirements for development in bushfire prone areas are applicable.

This report has considered all the elements of bushfire attack and finds that the development can achieve APZs equivalent to a minimum BAL 29. The development satisfies the Objectives and Performance requirements of *Planning for Bush Fire Protection 2019*, subject to implementation of the recommendations made by this report.

Notwithstanding the precautions adopted, it should always be remembered that bushfires burn under a wide range of conditions and an element of risk, no matter how small, always remains and although the standard is designed to improve the performance of such buildings, there can be no guarantee because of the variable nature of bushfires that any one building will withstand bushfire attack on every occasion.

This report is a bush fire assessment that provides the required information to assist local Council and the Rural Fire Service in determining compliance in accordance with Planning for Bush Fire Protection. The local Council is the final consenting authority and future subdivision design must comply with the recommendations included in the Council's conditions of consent.

Nicole van Dorst

(a person who is recognised by the NSW Rural Fire Service as a suitably qualified consultant in bush fire risk assessment)

Accredited Bushfire Planning and Design Practitioner

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Grad Dip Bushfire Protection (UWS 2011)

Bachelor of Applied Science (Environmental Management) (SCU 1998)

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Corporate Bronze Member Fire Protection Association Australia

Bushfire Consulting Services Pty Ltd

Tel: 02 4744 5800 | Mob: 0425 833 893

11. References

Cumberland Ecology, 2021, Biodiversity Assessment Report *Evelyn Street, Macquarie Fields Planning Proposal*, Carlingford Court

Cumberland Ecology, 2021, Vegetation Assessment Report *Evelyn Street, Macquarie Fields Planning Proposal*, Carlingford Court

Keith D 2004, *Ocean Shores to Desert Dunes, the Native Vegetation of NSW and the ACT,* Department of Environment and Conservation, Sydney

NearMap 2021, *NearMap Photomap Aerial Imagery*, NearMap Australia, Barrangaroo, NSW

NSW Government 2021a, *NSW Spatial Services*, NSW Department of Finance, Services and Innovation.

NSW Government 2021b, *NSW Planning Portal*, NSW Department of Planning and Environment.

NSW Government 2021c, *Biodiversity Values Map*, NSW Department of Environment and Heritage.

NSW RFS 2019, *Planning for Bush Fire Protection*, NSW Rural Fire Service, Sydney.

Standards Australia 2018, *Australian Standard AS 3959-2018 'Construction of Buildings in Bushfire Prone Areas'*, SAI Global, Australia.

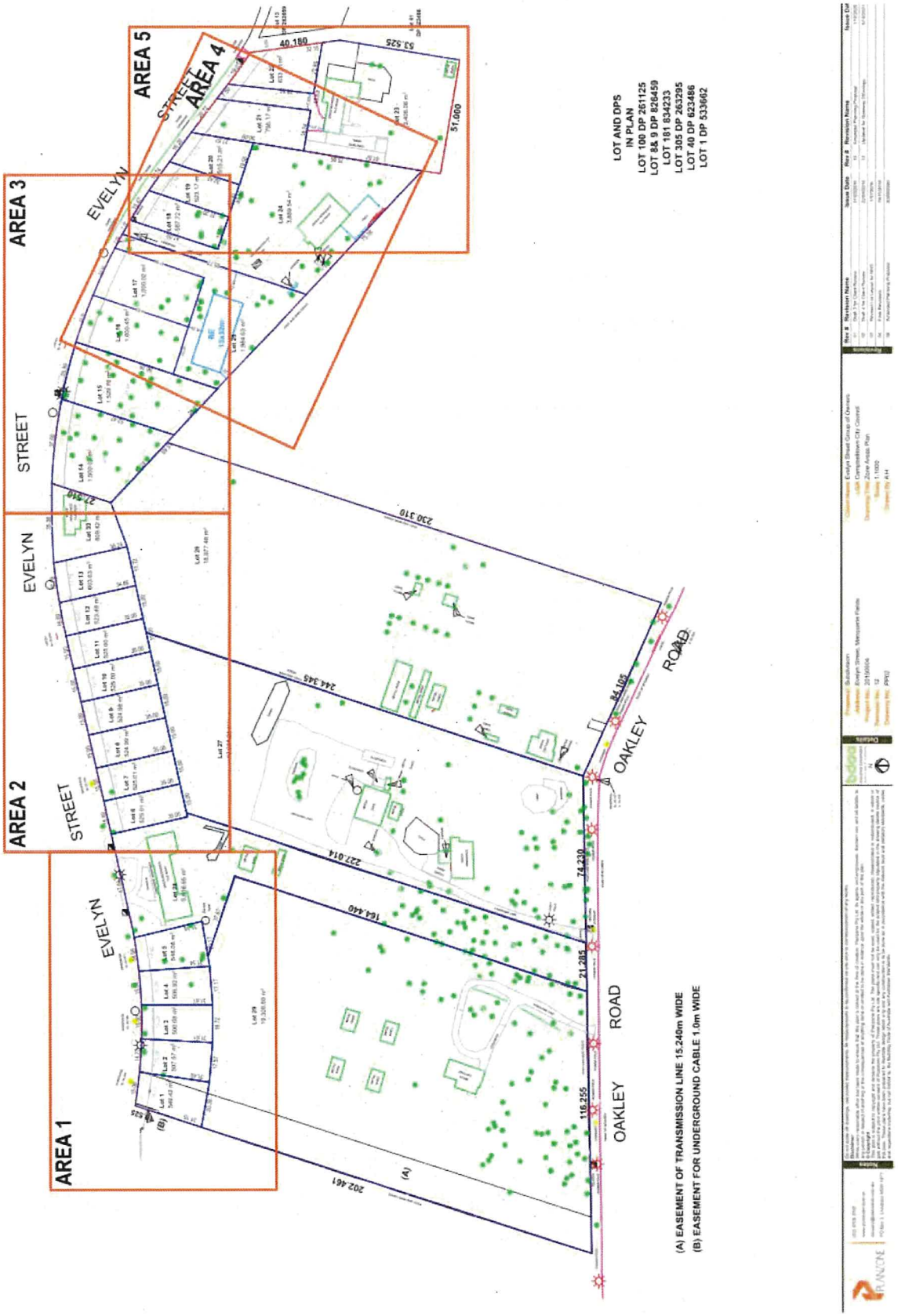
12. Legislation

Environmental Planning & Assessment Act 1979

Rural Fires Act 1997

Rural Fires Regulation 2013

Appendix 1 - Site Plan

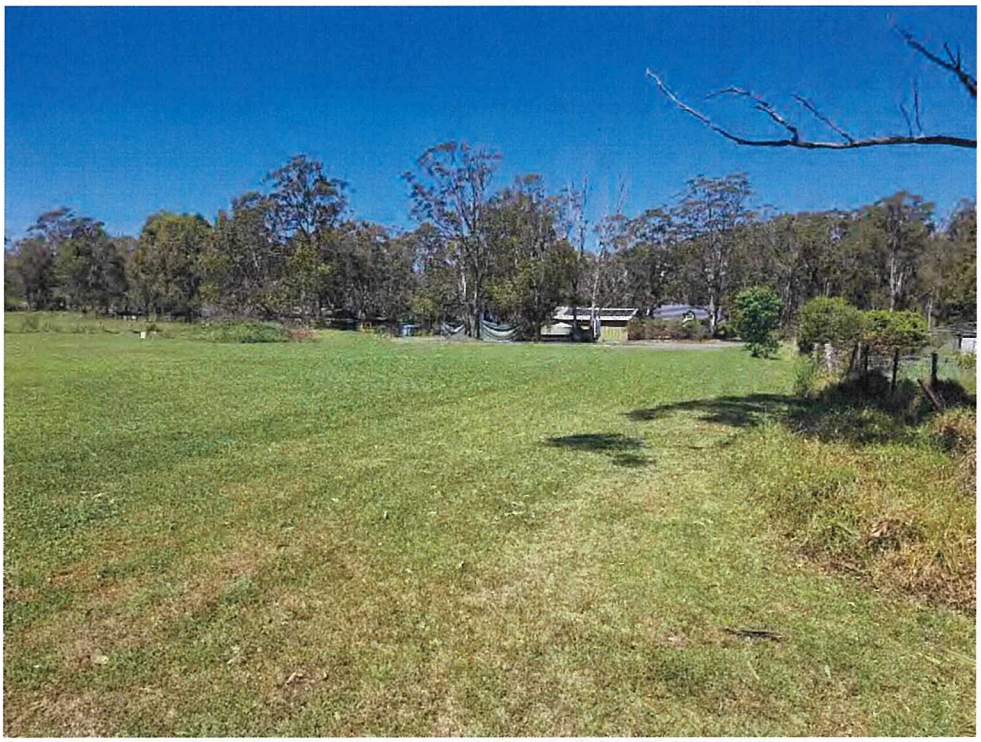


Appendix 2 – Photos of Site and Surrounds

Source: BFCS P/L 06/10/2021

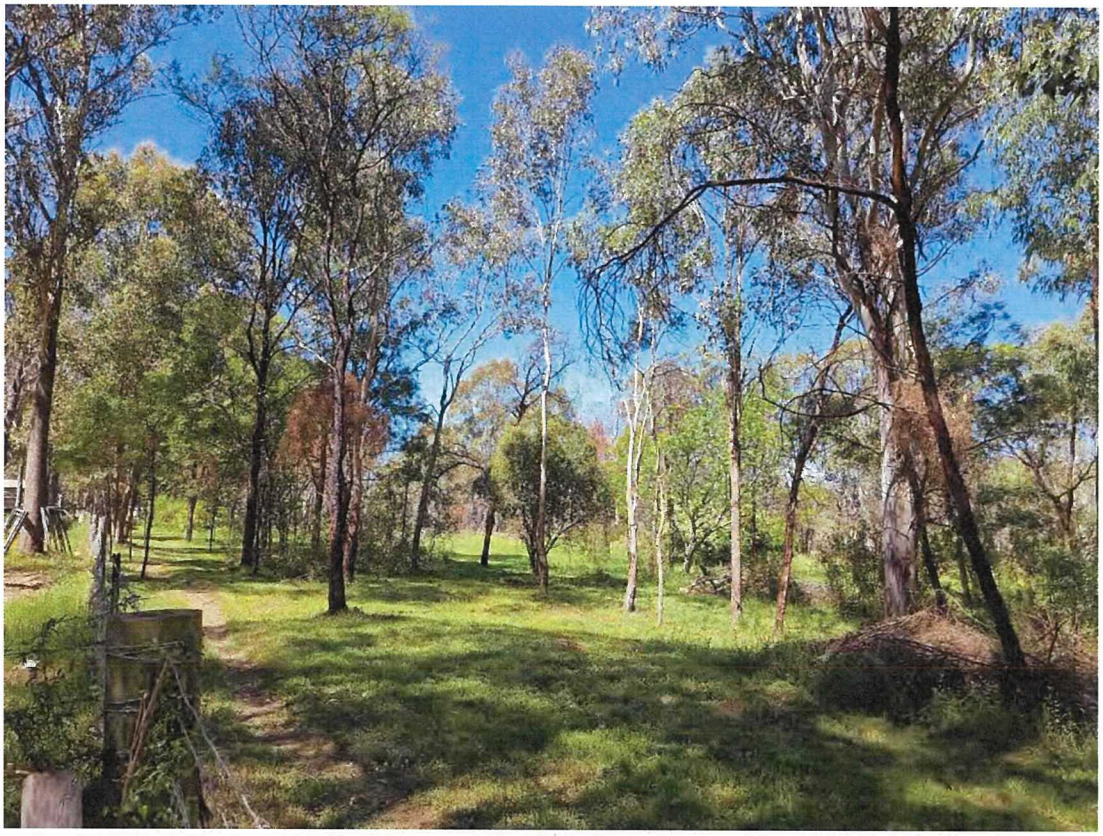
Remnant vegetation to the west

Managed grassland south of Lots 1 - 5



Managed grassland south of Lots 8-10

Managed grassland south of Lots 11-14



Woodland south of Lots 15 & 25

Attachment "B4"

Stormwater Management Report V.2 (as amended)

(Statiker 2 July 2020)

85-109 EVELYN STREET, MACQUARIE FIELD

STORMWATER MANAGEMENT REPORT

VERSION - V.2

JULY 2020

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DOCUMENT CONTROL

Project PROPOSED SUBDIVISION		Ref. No. SW17066
Client PLANZONE		
Prepared by Munaf Alsamara B.E M.I.E Aust, CP.Eng		
Reviewed and approved by Sam Dennawi Senior Project Manager		
Revision	Description	Date
1	Original Issue	10/07/2020

Contents

1. INTRODUCTION

Statiker has been engaged to undertake conceptual design for stormwater drainage for subdivision project located at 85 – 109 Evelyn Street, Macquarie Field.

This stormwater management report has been prepared to support the Development Application for the site. The scope of this report includes an assessment of the stormwater management requirements for the proposed development. Accordingly, the report includes findings of the assessment and proposal of management strategy for stormwater from both quantity and quality aspects.

2. SITE DESCRIPTION

The subject site, 85 – 109 Evelyn Street Macquarie Field is currently occupied with residential buildings and associated amenities accessing from Evely Street and Oxley Road.

The site is a parcel of land of 8.2ha falling toward Oakley Road toward Georges River The site is located approximately on top of a local catchment. Refer to **Appendix A** for the catchment plans.

Figure 1.1 – Site Location

3. PROPOSED DEVELOMENT

The entire site is zoned as R2 (low density residential) which is proposed for 30 residential lots. The development involves retaine the existing residential dwellings and create extra lot with access from Evelyn Street.

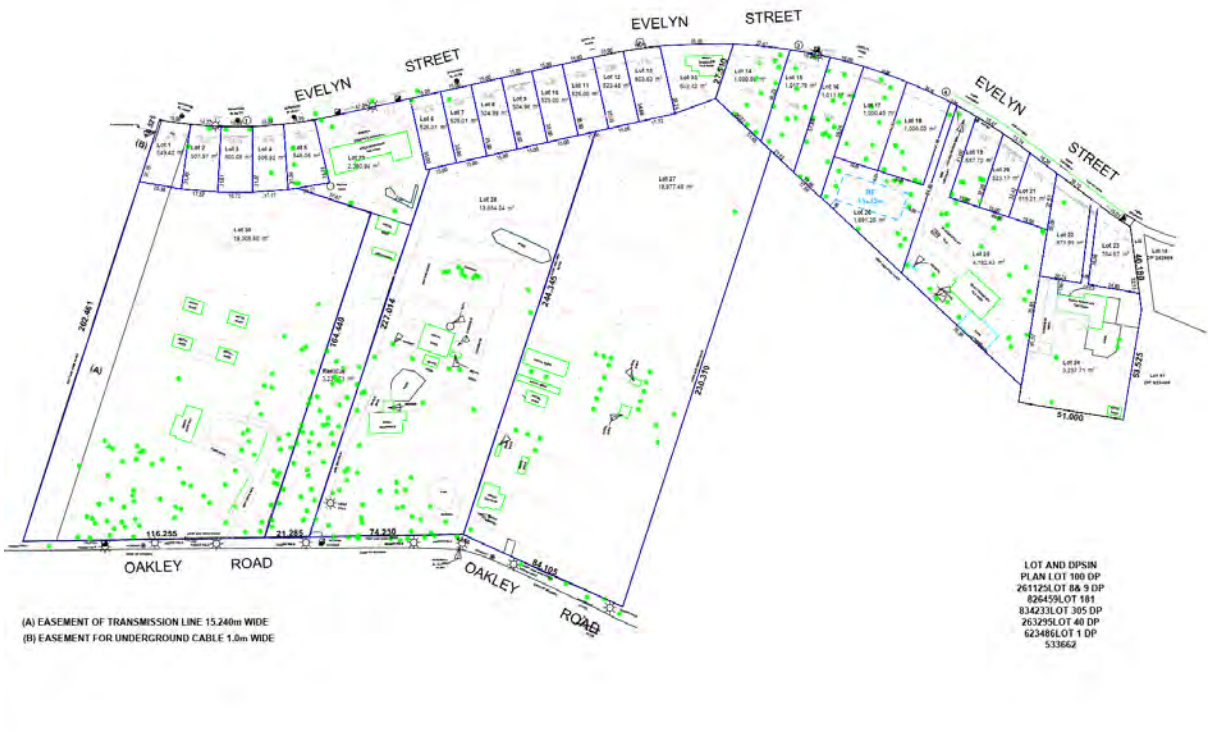


Figure 3.1 – Proposed Road and Lot Layout of The Development

4. STORMWATER MANAGEMENT OBJECTIVES

The key objectives for stormwater management strategy are summarised below:

a) Quantity Objectives

- Ensure that there is no adverse impact from stormwater runoff on downstream properties as a result of development in the catchment for all storm events up to and including a 1% AEP;
- To provide temporary storage of stormwater runoff from developments and restrict discharge from the site at a rate which Council's existing drainage system is capable of accommodating; and
- Ensure the proposed stormwater network is adequate for both interim and ultimate development scenarios.

b) Quality Objectives

- Ensure achievement of council's water quality targets. The key criteria as follows:

Table 4.1 – Water Quality Targets

Stormwater Management Objectives	Water Quality % Reduction in Pollutant Loads		
	Total suspended solids (TSS)	Total phosphorous (TP)	Total nitrogen (TN)
	80	45	45

5. STORMWATER QUANTITY MANAGEMENT STRATEGY

The design principle for stormwater quantity management is to provide a stormwater drainage system in accordance with the "major/minor" system concept as per the design specification D5 - Stormwater Drainage Design.

Minor System

- To manage the flows from frequent runoff events (20% AEP)

Major System

- Provide safe and well defined overland flow paths for rare and extreme storm runoff events

In order to determine the appropriate discharge control for the site, Drains computer software was used to identify the magnitude of the runoff.

6. HYDROLOGY

a) Catchment Delineation

The catchment plan presented in **Appendix A** was determined based on the field survey of the site, Six Maps, and ALS contour map.

b) Analysis Procedure

ILsax model has been used in Drains with ARR2019 procedure to determine the peak flows. To undertake the procedures, the following steps are required:

- Specify that ARR 2019 ensemble rainfall data is to be used in the Project Options property sheet in DRAINS
- Obtain rainfall data from BOM I-F-D website and the ARR Data Hub
- Input this rainfall data into Drains
- Select major and minor annual exceedance probabilities (AEPs) and design storm durations
- Run Drains
- Compare results between pre and post at node **D4.**

Table 7.1 – IlSax Model Parameters

Parameter	Value
Paved area depression storage (mm)	1
Grassed area depression storage (mm)	5
Soil type	3

Table 7.2 – Design Storm Events

Storm Events	
Minor	20% AEP
Major	1% AEP

c) Time of Concentration

The adopted time of concentration for different catchments in pre development and post development scenarios are shown in Table 7.3

Table 7.3 – Time of Concentration (Pre_dev)

Catchment ID	Descriptive Name	T_c (min)
E.CAT_1	Note N1	13
E.CAT_2	Note N2	13
E.CAT_3	Note N3	13

Table 7.4 – Time of Concentration (Post_dev)

Catchment ID	Descriptive Name	T_c (min)	
		for paved area	for pervious area
C1-5	Lot 1-5	7.5	10
C6-13	Lot 6-13	7.5	10
C14&33	Lot 14 &33	7.5	10
C15-18	Lot 15-18	7.5	10
C19-23	Lot 19-23	7.5	10
C24-26	Lot 24-26	7.5	10
C27	Lot 27	10	13
C28	Lot 28	10	13
C29	Lot 29	7.5	10
C30	Lot 30	10	13

d) Hydrological Model Simulation

Two scenarios have been simulated

- Pre_development
- Post_development

e) Hydrological Model Results

Table 7.5 summarises the stormwater peak flows at catchment outlets and receiving nodes.

Table 7.5 – Flow Summary (Pre_dev)

NODE	PRE_DEVELOPMENT - FLOW SUMMARY					
	0.5EY	0.2EY	10%	5%	2%	1%
D4	0.320	0.571	1.400	1.720	2.430	2.770

Table 7.6 – Flow Summary (Post_dev)

NODE	POST_DEVELOPMENT - FLOW SUMMARY					
	0.5EY	0.2EY	10%	5%	2%	1%
D4	0.300	0.570	1.150	1.400	1.930	2.160

7. MANAGE THE RUNOFF

The following drainage components are proposed to manage the stormwater runoff from the site.

- Landscape surface run-off will be collected by surface pit;
- Roof run-off will be collected into rainwater tank with orifice plate to control discharge rate; and
- Stormwater system to be connected to raingarden for treatment prior to discharge to easement pipeline;
- Easement pipe line will be connected to sprearedер system at Oakley Road

8. STORMWATER QUALITY MANAGEMENT STRATEGY

The principle for stormwater quality management is to apply water sensitive urban design (WSUD) approach providing a treatment train including gross pollutant traps (GPT), bioretention basins, bio swales, rain gardens and rainwater tanks.

Applying this strategy will achieve the quality objectives listed in Section 4. The WSUD element – bioretention basin was selected for water quality modelling undertaken with Model for Urban Stormwater Improvement Conceptualisation (MUSIC) in accordance with Campbelltown Engineering Design for Development.

9. WATER QUALITY MODELLING

a) MUSIC Catchment

Catchment has been determined based on the proposed subdivision layout and the finished site grading. The total catchment is 8.2 ha which was broken down into four groups of surface types including roof, driveway/road, other impervious, pervious. Refer to **Appendix B** for the MUSIC catchment plan.

b) MUSIC catchment and treatment breakdown

Table 9.1 – MUSIC catchment/treatment table

Lot Ref.	Total Area (m2)	Roof (m2)	Roof to RWT (m2)	Roof bypass RWT (m2)	Driveway (m2)	POS/ Landscape (m2)	RWT Size (min kL)	Raingarden Filter media (m2)	Raingarden size (WxL m)
Lot 1	549.42	329.65	164.83	164.83	54.94	164.83	5	14.00	2.5x5.6
Lot 2	507.57	304.54	152.27	152.27	50.76	152.27	5	14.00	2.5x5.6
Lot 3	500.08	300.05	150.02	150.02	50.01	150.02	5	14.00	2.5x5.6
Lot 4	506.92	304.15	152.08	152.08	50.69	152.08	5	14.00	2.5x5.6
Lot 5	548.08	328.85	164.42	164.42	54.81	164.42	5	14.00	2.5x5.6
Lot 6	525.01	315.01	157.50	157.50	52.50	157.50	5	14.00	2.5x5.6
Lot 7	525.01	315.01	157.50	157.50	52.50	157.50	5	14.00	2.5x5.6
Lot 8	524.99	314.99	157.50	157.50	52.50	157.50	5	14.00	2.5x5.6
Lot 9	524.98	314.99	157.49	157.49	52.50	157.49	5	14.00	2.5x5.6
Lot 10	525.00	315.00	157.50	157.50	52.50	157.50	5	14.00	2.5x5.6
Lot 11	525.00	315.00	157.50	157.50	52.50	157.50	5	14.00	2.5x5.6
Lot 12	523.48	314.09	157.04	157.04	52.35	157.04	5	14.00	2.5x5.6
Lot 13	603.63	362.18	181.09	181.09	60.36	181.09	5	14.00	2.5x5.6
Lot 14	1000.50	600.30	300.15	300.15	100.05	300.15	10	18.00	3x6
Lot 15	1017.79	610.67	305.34	305.34	101.78	305.34	10	18.00	3x6
Lot 16	1011.67	607.00	303.50	303.50	101.17	303.50	10	18.00	3x6

Lot 17	1000.45	600.27	300.14	300.14	100.05	300.14	10	18.00	3x6
Lot 18	1000.02	600.01	300.01	300.01	100.00	300.01	10	18.00	3x6
Lot 19	587.72	352.63	176.32	176.32	58.77	176.32	5	14.00	2.5x5.6
Lot 20	523.17	313.90	156.95	156.95	52.32	156.95	5	14.00	2.5x5.6
Lot 21	515.21	309.13	154.56	154.56	51.52	154.56	5	14.00	2.5x5.6
Lot 22	871.99	523.19	261.60	261.60	87.20	261.60	5	14.00	2.5x5.6
Lot 23	704.67	422.80	211.40	211.40	70.47	211.40	5	14.00	2.5x5.6
Lot 24	3257.71	1628.86	977.31	651.54	325.77	1303.08	10	18.00	3x6
Lot 25	4182.43	2091.22	1045.61	1045.61	418.24	1672.97	10	18.00	3x6
Lot 26	1691.25	845.63	422.81	422.81	169.13	676.50	10	18.00	3x6
Lot 29	2380.94	1190.47	595.24	595.24	238.09	952.38	10	18.00	3x6
Lot 33	809.42	404.71	202.36	202.36	80.94	323.77	5	14.00	2.5x5.6
Residual	3237.71	n/a	n/a	n/a	323.771	2913.94			

Zone: Rura Residential (RU1)

Lot Ref.	Total Area (m2)	Roof (m2)	Roof to RWT (m2)	Roof bypass RWT (m2)	Driveway (m2)	POS/ Landscape (m2)	RWT Size (min kL)	Raingarden (m2)	
Lot 27	18977.48	759.0992	379.55	379.55	189.77	18028.61	20	26	3.5x7.4
Lot 28	13684.24	547.3696	273.68	273.68	136.84	13000.03	20	26	3.5x7.4
Lot 30	19308.6	772.344	386.17	386.17	193.09	18343.17	20	26	3.5x7.4

c) Method

The water quality modelling was undertaken using MUSIC version 6.2.1. Refer to **Appendix D** for the model schematic representation.

d) Parameters, Rainfall Data and Source Node

The parameters, rainfall data and pollutant concentration source nodes were adopted from MUSIC Link in accordance with the "Campbelltown Engineering Design Guideline"

10. WATER QUALITY TREATMENT MEASURES

A water cycle management for the precincts was undertaken in earlier planning stage. WSUD elements including bio-retention cells have been allocated in the master plan. Once these basins are commissioned providing the precinct wide treatment facilities, stormwater quality discharge shall meet the targets.

However, prior to those control measures being constructed. The development needs treatments onsite on a temporary basis to ensure the stormwater objective listed in Section 4 is met. The temporary treatment measures used in MUSIC model include;

- Rainwater tank (RWT) with a volume of 5.0kL for each residential lot capturing the runoff from 50% of the roof
- Raingarden/bioretention basins for each lot refer to Table 9.1 for detail.

11. WATER QUALITY MODELLING RESULTS

Table 11.1 summarises treatment train effectiveness against the targets.

Table 11.1 – Treatment Train Effectiveness

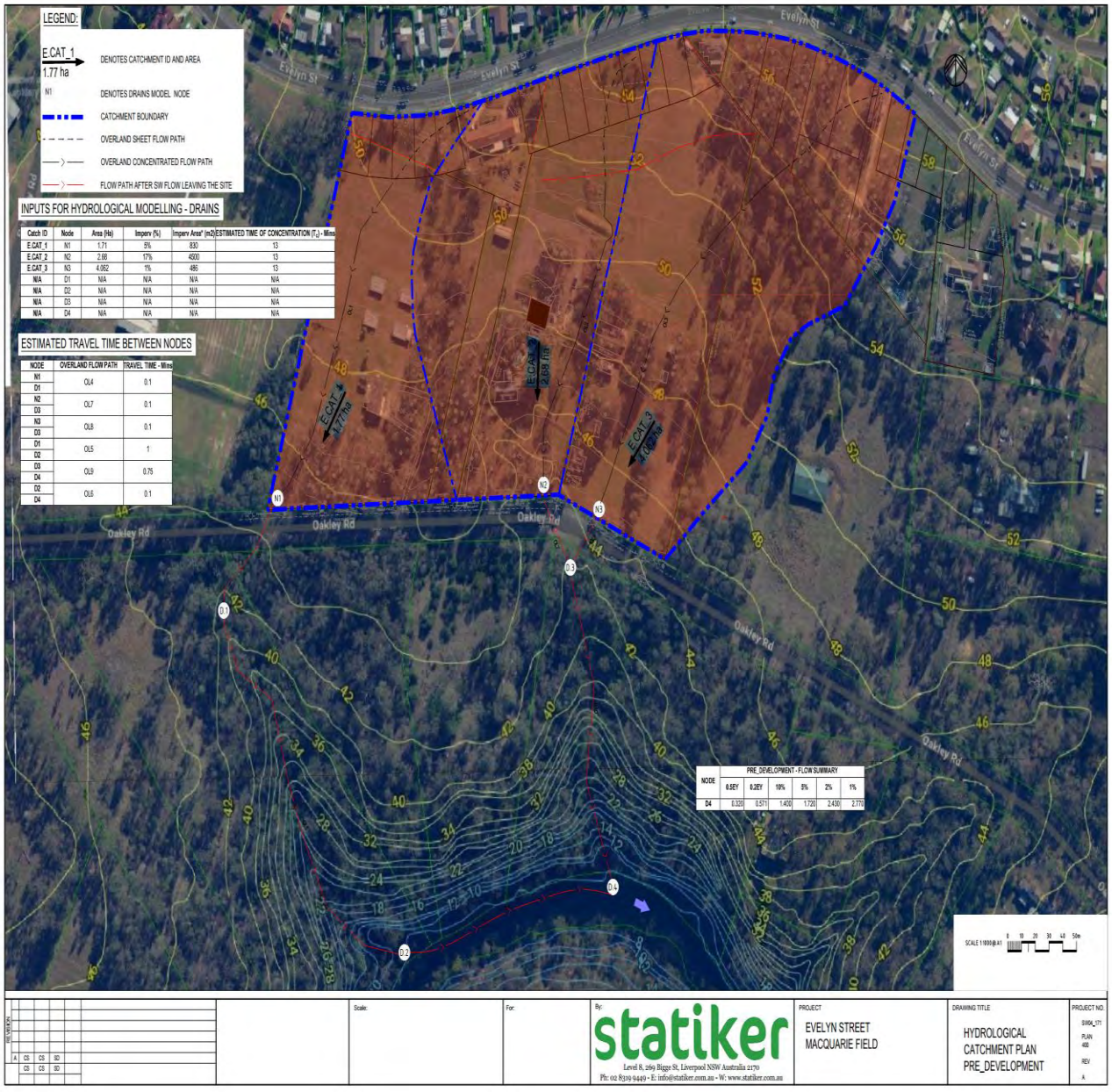
Catchment area (ha)	Treatment Measures	Residual Load		
3.96	Rainwater Tanks Bioretention Basins	TSS (kg/yr)	TP (kg/yr)	TN (kg/yr)
		184	0.784	15.1
		Treatment Train Effectiveness		
Performance (%)		80	76	59
Target (%)		80	45	46

12. CONCLUSION

Successful implementation of the drainage components presented in Section 7 and treatment measures mentioned in Section 10 will achieve both stormwater quantity and quality management objectives. The objective fulfilment allows the proposed development to proceed with certainty.

APPENDIX A

CATCHMENT PLANS



Catch. Ref	Drains _ Combined Catchment (m^2)	
	Impervious Area (m^2)	Pervious Area (m^2)
C1-5	1828.449	783.821
C6-13	2993.970	1283.130
C14&33	1186.00	623.92
C15-18	2820.95	1208.98
C19-23	2241.93	960.83
C24-26	5478.83	3652.56

Lot Ref.	Detention Vol* (kL)	Surface Area (m^2)	Depth (m)	Equivalent Orifice size (m)	Equivalent Overflow Pipe (m)
Lot1-5	35	17.327	2.020	0.016	0.123
Lot6-13	56	27.723	2.020	0.156	0.283
Lot14-&33	25	13.441	1.860	0.092	0.141
Lot15-18	60	29.703	2.020	0.140	0.200
Lot19-23	50	24.752	2.020	0.123	0.224
Lot24-26	120	53.333	2.250	0.182	0.173
Lot29	28	13.861	2.020	0.100	0.100
Lot27	18	8.911	2.020	0.085	0.100
Lot28	15	7.426	2.020	0.068	0.100
Lot30	18	8.911	2.020	0.088	0.100

* RAINWATER TANK OR EQUIVALENT

Lot Ref.	Required Detention Vol (m^3)	Orifice size (mm)	Overflow pipe size (mm)
Lot 1	7	55	100
Lot 2	7	55	100
Lot 3	7	55	100
Lot 4	7	55	100
Lot 5	7	55	100
Lot 6	7	55	100
Lot 7	7	55	100
Lot 8	7	55	100
Lot 9	7	55	100
Lot 10	7	55	100
Lot 11	7	55	100
Lot 12	7	55	100
Lot 13	7	55	100
Lot 14	15	65	100
Lot 15	15	70	100
Lot 16	15	70	100
Lot 17	15	70	100
Lot 18	15	70	100
Lot 19	7	55	100
Lot 20	7	55	100
Lot 21	7	55	100
Lot 22	15	55	100
Lot 23	14	55	100
Lot 24	40	105	100
Lot 25	40	105	100
Lot 26	40	105	100
Lot 28	28	100	100
Lot 33	10	55	100
Lot 27	18	85	100
Lot 28	15	68	100
Lot 30	18	88	100

Lot Ref.	Node	Total Area (m2)	Impervious Area (m^2)	Pervious Area (m^2)	Imper. Percentage (%)
Lot 1	C1	549.42	384.59	164.83	0.7
Lot 2	C2	507.57	355.30	152.27	0.7
Lot 3	C3	500.08	350.06	150.02	0.7
Lot 4	C4	506.92	354.84	152.08	0.7
Lot 5	C5	548.08	383.66	164.42	0.7
Lot 6	C6	525.01	367.51	157.50	0.7
Lot 7	C7	525.01	367.51	157.50	0.7
Lot 8	C8	524.99	367.49	157.50	0.7
Lot 9	C9	524.98	367.49	157.49	0.7
Lot 10	C10	525.00	367.50	157.50	0.7
Lot 11	C11	525.00	367.50	157.50	0.7
Lot 12	C12	523.48	366.44	157.04	0.7
Lot 13	C13	603.83	422.54	181.09	0.7
Lot 14	C14	1000.50	700.35	300.15	0.7
Lot 15	C15	1017.79	712.45	305.34	0.7
Lot 16	C16	1011.67	708.17	303.50	0.7
Lot 17	C17	1000.45	700.32	300.14	0.7
Lot 18	C18	1000.02	700.01	300.01	0.7
Lot 19	C19	587.72	411.40	176.32	0.7
Lot 20	C20	523.17	366.22	156.95	0.7
Lot 21	C21	515.21	360.65	154.56	0.7
Lot 22	C22	871.99	610.39	261.60	0.7
Lot 23	C23	704.67	493.27	211.40	0.7
Lot 24	C24	3257.71	1954.63	1303.08	0.6
Lot 25	C25	4182.43	2509.46	1672.97	0.6
Lot 26	C26	1691.25	1014.75	676.50	0.6
Lot 27	C27	18977.48	948.87	18028.61	0.05
Lot 28	C28	13884.24	694.21	13000.03	0.05
Lot 29	C29	2380.94	1428.56	952.38	0.6
Lot 30	C30	18306.6	965.43	18343.17	0.05
Lot 33	C33	809.42	485.65	323.77	0.6
Residual	C31	3237.71	323.771	2913.94	0.05

NODE	OVERLAND FLOW PATH	TRAVEL TIME - Mins
N1	OL4	0.1
D1		
N2	OL7	0.1
D3		
N3	OL8	2
D3		
D1	OL5	1
D2		
D3	OL9	0.75
D4		
D2	OL6	0.1
D4		

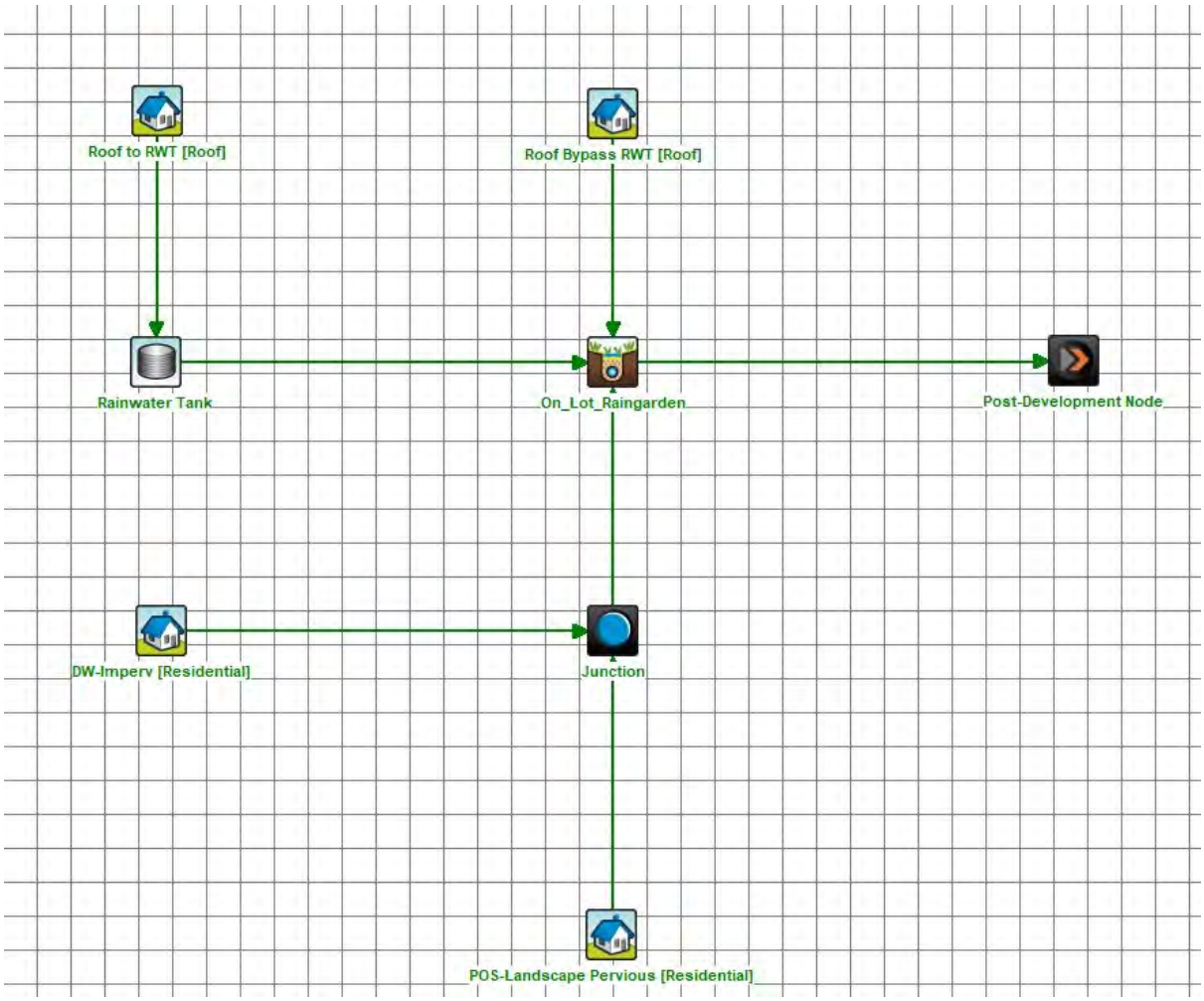
NODE	POST_DEVELOPMENT - FLOW SUMMARY					
	0.5EY	0.2EY	10%	5%	2%	1%
D4	0.300	0.570	1.150	1.400	1.930	2.160

APPENDIX B

MUSIC MODEL CATCHMENT PLAN

APPENDIX D

MUSIC MODEL SCHEMATIC



PREPARED BY:

statiker
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Ph: 02 8319 9449 - E: info@statiker.com.au - W: www.statiker.com.au

TOWN PLANNER:

PLANZONE

COUNCIL:

CAMPBELLTOWN CITY COUNCIL

DRAWING LIST

SHEET No.	SHEET TITLE	REV
GENERAL		
000	COVER SHEET	A
100	GENERAL ARRANGEMENT AND LEGEND	A
200	STORMWATER CONCEPT - SHEET 1 OF 7	A
250	STORMWATER CONCEPT - SHEET 2 OF 7	A
300	STORMWATER CONCEPT - SHEET 3 OF 7	A
301	STORMWATER CONCEPT - SHEET 4 OF 7	A
302	STORMWATER CONCEPT - SHEET 5 OF 7	A
303	STORMWATER CONCEPT - SHEET 6 OF 7	A
304	STORMWATER CONCEPT - SHEET 7 OF 7	A
400	HYDROLOGICAL CATCHMENT PLAN - PRE_DEV	A
401	HYDROLOGICAL CATCHMENT PLAN - POST_DEV	A
402	MUSIC CATCHMENT	A
500	STORMWATER DETAILS	A

85 - 109 EVELYN STREET, MACQUARIE FIELD

STORMWATER CONCEPT

ISSUED FOR : PLANNING PROPOSAL REQUEST

NOT FOR CONSTRUCTION

REVISION: B

11 JULY 2020 **JOB NO: 17066**

INDIVIDUAL LOT SHALL HAVE

- RAIN WATER TANK TO COMPLY WITH BASIX REQUIREMENT
- RAIN GARDEN AS PER MUSIC MODELLING TO MEET WATER WUALITY REQUIREMENT. REFER TO MUSIC CATCHMENT PLAN - SHEET 402 FOR MORE DETAILS
- MINIMUM DETENTION VOLUME AS PER DRAIN MODELLING TO MEET STORMWATER QUANTITY REQUIREMENT. REFER TO CATCHMENT PLAN - SHEET 400 & 401 FOR MORE DETAILS

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A	CS	CS	SD	05/06/17	ISSUED FOR PLANNING PROPOSAL REQUEST
	CS	CS	SD		
	DES	DRAWN	CHECK	DATE	ISSUED FOR

Scale:
SCALE 1:500@A1
0 5 10 15 20 25m

For:

By:
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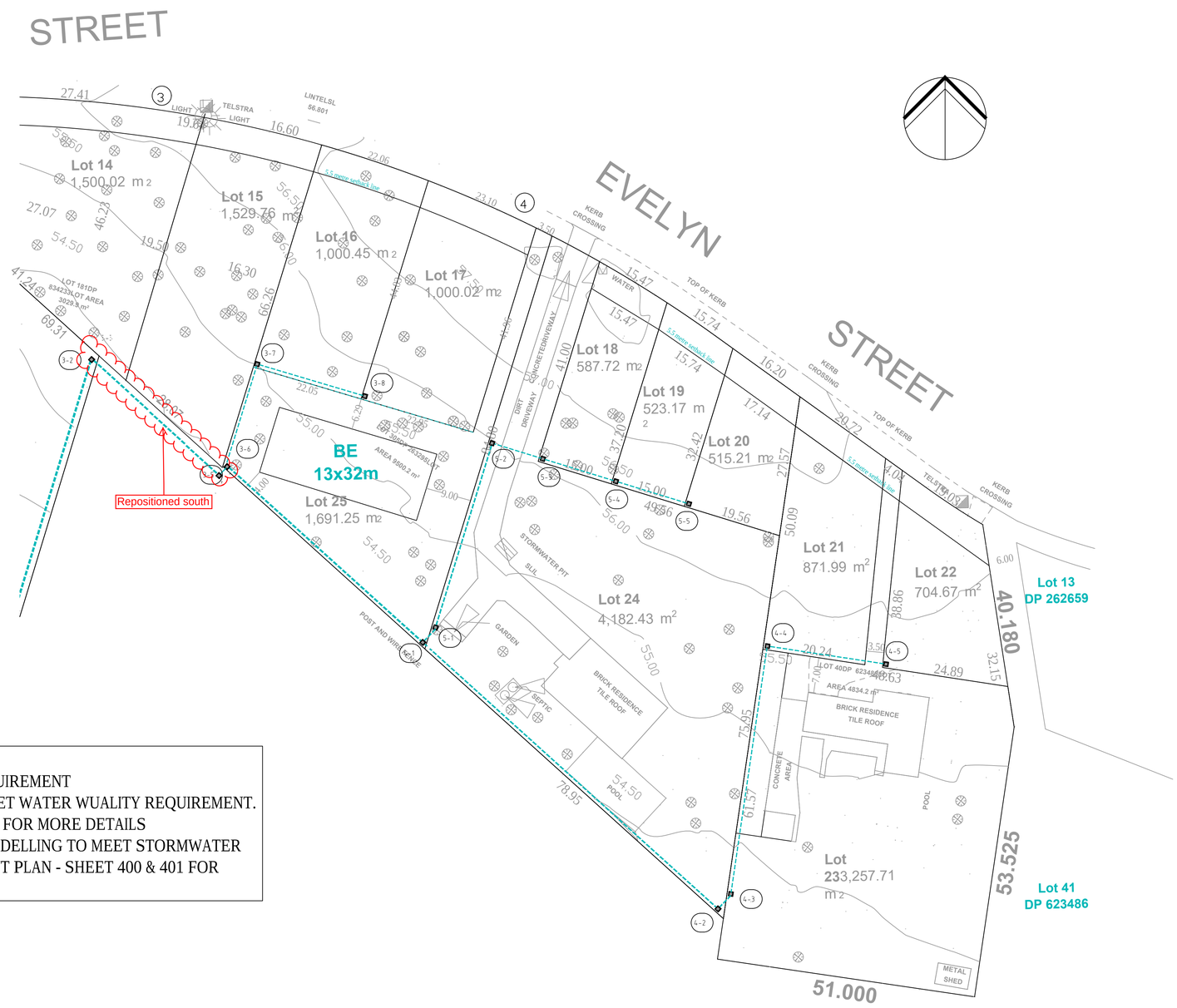
PROJECT
85-109 EVELYN STREET
MACQUARIE FIELDS

DRAWING TITLE
STORMWATER CONCEPT
SHEET 1 OF 7

PROJECT NO.
17066
PLAN
200
REV
A



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PROJECT
85-109 EVELYN STREET
MACQUARIE FIELDS

DRAWING TITLE
STORMWATER CONCEPT
SHEET 2 OF 7

PROJECT NO.
17066
PLAN
250
REV
A

INDIVIDUAL LOT SHALL HAVE

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- RAIN GARDEN AS PER MUSIC MODELLING TO MEET WATER WUALITY REQUIREMENT. REFER TO MUSIC CATCHMENT PLAN - SHEET 402 FOR MORE DETAILS
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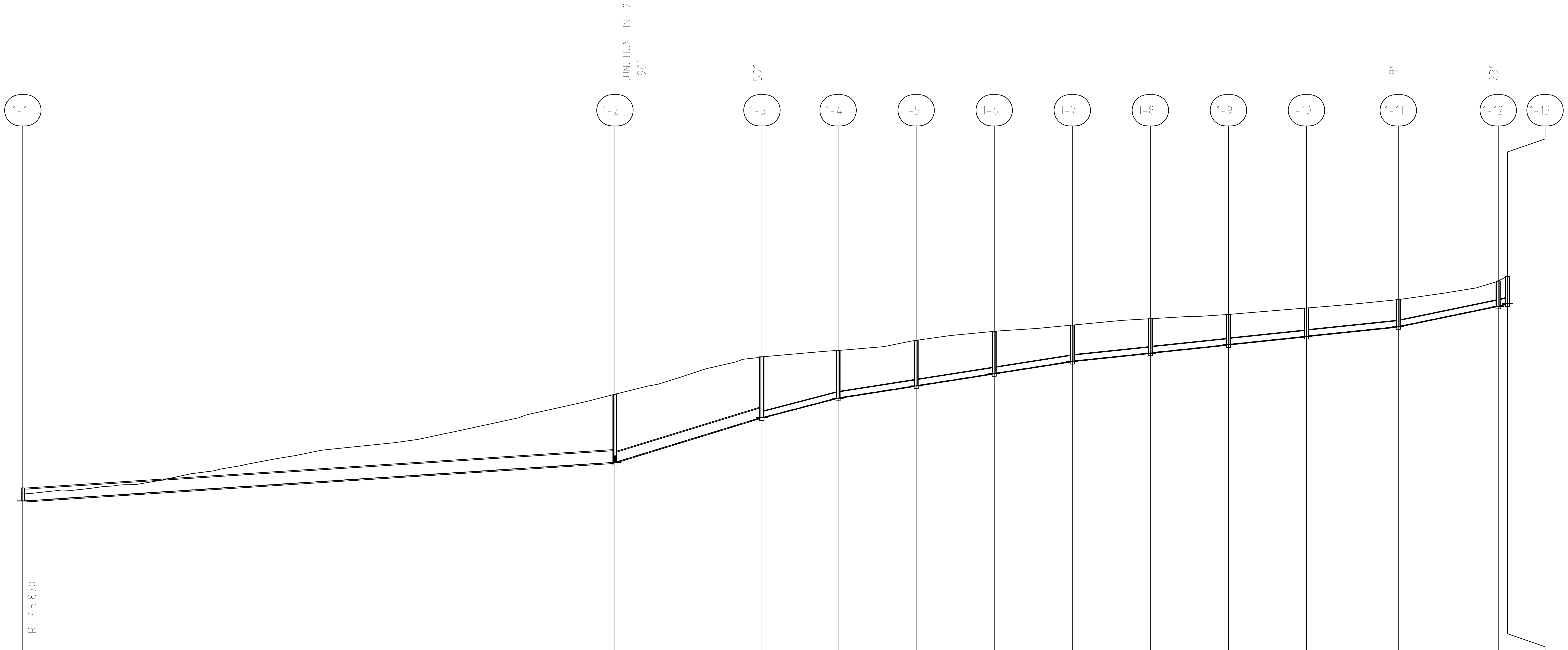
MACQUARIE FIELDS

DRAWING TITLE
STORMWATER CONCEPT
SHEET 1 OF 7

PROJECT NO.
17066
PLAN
300
REV
A



Pipe section	VELOCITY (m/s)	GRADE (%)	PIPE FLOW (m3/s)	PIPE SIZE(mm) & CLASS	Length
1-1 to 1-2	0.000	1.30%	0.000	450Ø -RCP	113.773
1-2 to 1-3	0.000	6.00%	0.000	375Ø -RCP	28.248
1-3 to 1-4	0.000	5.00%	0.000	225Ø -RCP	14.628
1-4 to 1-5	0.000	3.00%	0.000	225Ø -RCP	15.000
1-5 to 1-6	0.000	3.00%	0.000	225Ø -RCP	15.000
1-6 to 1-7	0.000	3.00%	0.000	225Ø -RCP	15.000
1-7 to 1-8	0.000	2.00%	0.000	225Ø -RCP	15.000
1-8 to 1-9	0.000	2.00%	0.000	225Ø -RCP	15.000
1-9 to 1-10	0.000	2.00%	0.000	225Ø -RCP	15.000
1-10 to 1-11	0.000	2.00%	0.000	225Ø -RCP	17.641
1-11 to 1-12	0.000	4.00%	0.000	225Ø -RCP	19.204
1-12 to 1-13	0.000	4.00%	0.000	225Ø -RCP	1.784

DRAINAGE LINE 1

DATUM 29.000

Pit	DEPTH TO INVERT (in)	DEPTH TO INVERT (out)	HYDRAULIC GRADE LINE (in)	HYDRAULIC GRADE LINE (out)	INVERT LEVEL (in)	INVERT LEVEL (out)	DESIGN SURFACE LEVEL	CHAINAGE
1-1	0.270	0.270	45.600		45.600	45.600	46.100	0.000
1-2	2.617	2.597	47.079	47.099	47.079	47.099	49.696	113.773
1-3	2.341	2.321	48.794	48.814	48.794	48.814	51.135	142.021
1-4	1.835	1.815	49.545	49.565	49.545	49.565	51.381	156.649
1-5	1.750	1.730	50.015	50.035	50.015	50.035	51.765	171.650
1-6	1.626	1.606	50.485	50.505	50.485	50.505	52.112	186.649
1-7	1.396	1.376	50.955	50.975	50.955	50.975	52.352	201.649
1-8	1.322	1.302	51.275	51.295	51.275	51.295	52.597	216.649
1-9	1.165	1.145	51.595	51.615	51.595	51.615	52.760	231.649
1-10	1.093	1.073	51.915	51.935	51.915	51.935	53.008	246.649
1-11	1.043	1.023	52.288	52.308	52.288	52.308	53.331	264.290
1-12	0.971	0.951	53.076	53.096	53.076	53.096	54.047	283.494
1-13	1.058		53.168		53.168		54.226	285.278

LINE 1

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SCALE 1:100 @ A1 VERTICAL 0 1 2 3 4 5m

For:

By:
statiker
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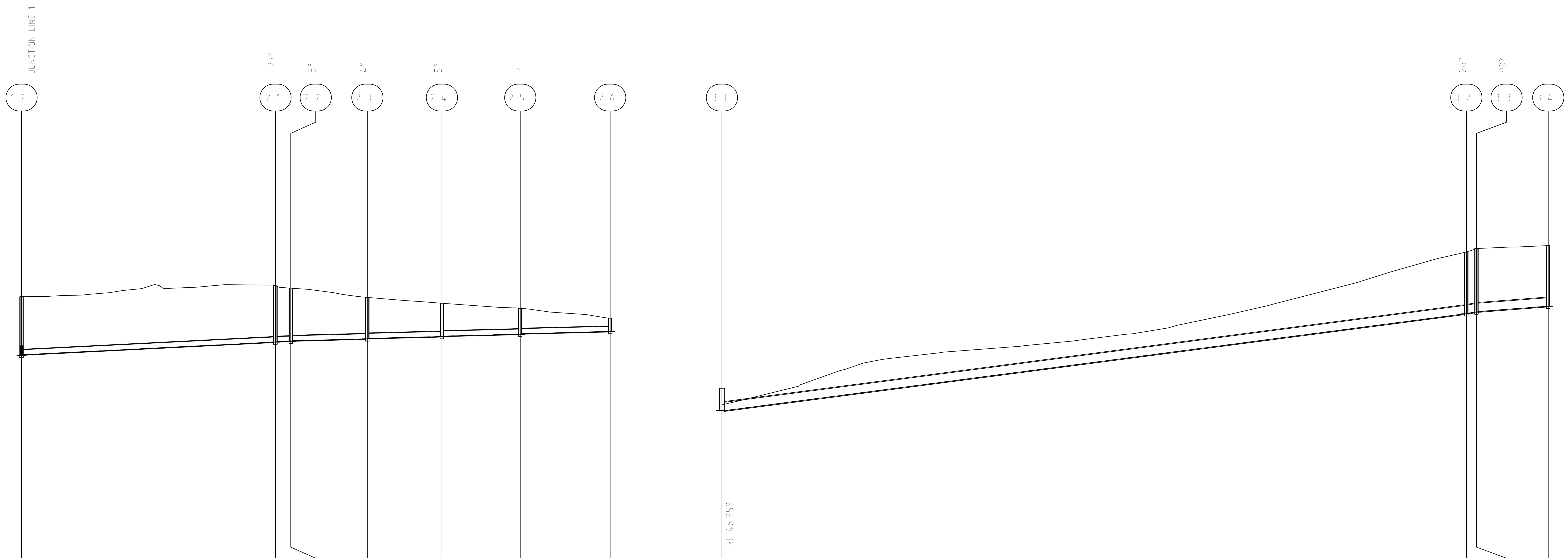
PROJECT
85-109 EVELYN STREET
MACQUARIE FIELDS

DRAWING TITLE
STORMWATER CONCEPT
SHEET 4 OF 7

PROJECT NO.
17066
PLAN
301
REV
A



LINE 2

	1-2		2-1		2-2		2-3		2-4		2-5		2-6
VELOCITY (m/s)		0.000		0.000		0.000		0.000		0.000		0.000	
GRADE (%)		1.00%		0.50%		0.50%		0.50%		0.50%		0.50%	
PIPE FLOW (m3/s)		0.000		0.000		0.000		0.000		0.000		0.000	
PIPE SIZE(mm) & CLASS		225Ø-RCP		225Ø-RCP		225Ø-RCP		225Ø-RCP		225Ø-RCP		225Ø-RCP	
DRAINAGE LINE		2											
DATUM	27.000												
DEPTH TO INVERT	2.617 / 2.597		2.517 / 2.497		2.373 / 2.353		1.854 / 1.834		1.490 / 1.470		1.156 / 1.136		0.595
HYDRAULIC GRADE LINE	47.079 / 47.099		47.667 / 47.687		47.704 / 47.724		47.810 / 47.830		47.913 / 47.933		48.021 / 48.041		48.141
INVERT LEVEL	47.079 / 47.099		47.667 / 47.687		47.704 / 47.724		47.810 / 47.830		47.913 / 47.933		48.021 / 48.041		48.141
DESIGN SURFACE LEVEL	49.696		50.184		50.077		49.664		49.403		49.177		48.736
CHAINAGE	0.000	56.809	56.809	3.419	60.227	17.129	77.356	16.680	94.036	17.526	111.562	20.112	131.674

LINE 3

	3-1		3-2		3-3		3-4
VELOCITY (m/s)		0.000		0.000		0.000	
GRADE (%)		2.60%		2.60%		1.50%	
PIPE FLOW (m3/s)		0.000		0.000		0.000	
PIPE SIZE(mm) & CLASS		375Ø-RCP		375Ø-RCP		375Ø-RCP	
DRAINAGE LINE		3					
DATUM	29.000						
DEPTH TO INVERT	0.258 / 0.258		2.765 / 2.745		2.840 / 2.820		2.711
HYDRAULIC GRADE LINE	46.600		50.930 / 50.950		51.009 / 51.029		51.269
INVERT LEVEL	46.600 / 46.600		50.930 / 50.950		51.009 / 51.029		51.269
DESIGN SURFACE LEVEL	47.600		53.694		53.849		53.981
CHAINAGE	0.000	166.527	166.527	2.266	168.794	16.055	184.849

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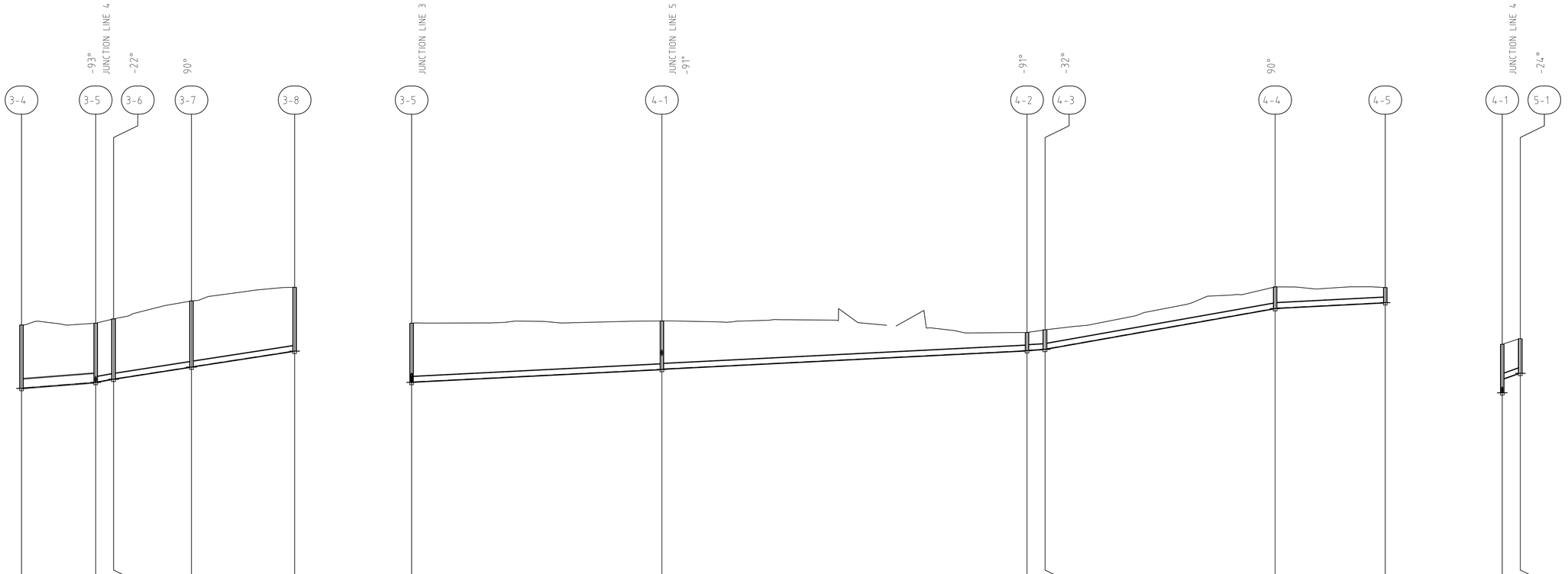
PROJECT
85-109 EVELYN STREET
MACQUARIE FIELDS

DRAWING TITLE
STORMWATER CONCEPT
SHEET 5 OF 7

PROJECT NO.
17066
PLAN
302
REV
A



LINE 3

LINE 4

LINE 5

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SHEET 6 OF 7

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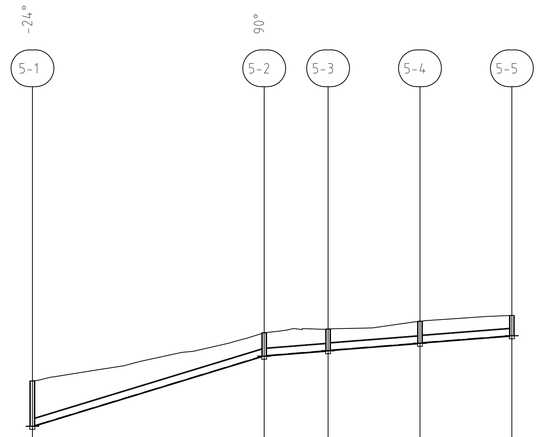

VELOCITY (m/s)	0.000	0.000	0.000	0.000	
GRADE (%)	6.00%	1.50%	1.50%	1.50%	
PIPE FLOW (m3/s)	0.000	0.000	0.000	0.000	
PIPE SIZE(mm) & CLASS	225Ø -RCP	225Ø -RCP	225Ø -RCP	225Ø -RCP	
DRAINAGE LINE		5			
DATUM	33.000				
DEPTH TO INVERT	1.480 1.460	0.764 0.744	0.707 0.687	0.716 0.696	0.662
HYDRAULIC GRADE LINE	52.914 52.934	55.204 55.224	55.381 55.401	55.626 55.646	55.871
INVERT LEVEL	52.914 52.934	55.204 55.224	55.381 55.401	55.626 55.646	55.871
DESIGN SURFACE LEVEL	54.394	55.968	56.088	56.342	56.533
CHAINAGE	3.864 37.831	41.695 53.429	52.124 15.001	67.125 14.999	82.124

LINE 5

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PROJECT
85-109 EVELYN STREET
MACQUARIE FIELDS

DRAWING TITLE
STORMWATER CONCEPT
SHEET 7 OF 7

PROJECT NO.
17066
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304
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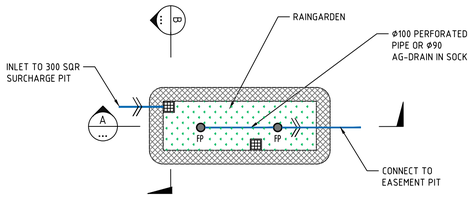


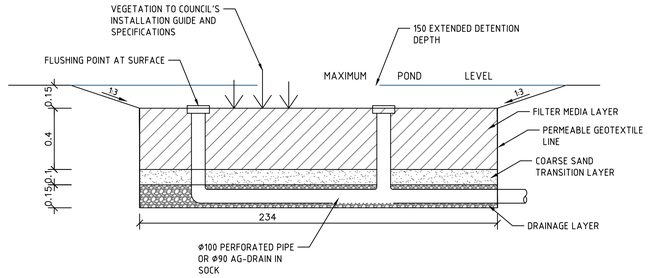
RAIN GARDEN PLAN
NTS

BIORETENTION SYSTEM (RAIN-GARDEN) - VEGETATION

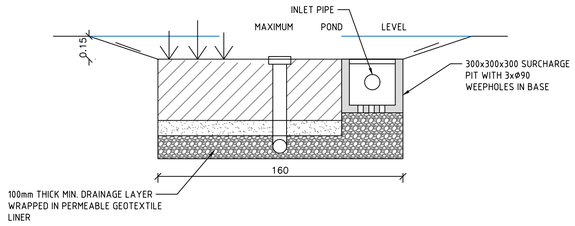
VEGETATION MINIMUSES SURFACE CLOGGING AND ASSISTS IN POLLUTANT REMOVAL VIA BIOLOGICAL PROCESSES. SOME PLANT SPECIES THAT CAN BE USED INCLUDE:

- CAREX APPRESSA (TUSSOCK SEDGE) - RECOMENDED,
- IMPERATA CYLINDRICA (BLADY GRASS),
- FICINIA NODOSA (SYN. ISOLEPIS NODOSA) (KNOBBY CLUB RUSH),
- JUNCUS USITATUS (COMMON RUSH),
- LOMANDRA LONGIFOLIA (MATRUSH),
- POA SIEBREIANA (GREY TUSSOCK GRASS),
- THEMEDA AUSTRALIS (KANGAROO GRASS),
- DIANELLA CAERULEA (BLUE FLAX-LILY),
- BAUMEA JUNCEA,
- GOODENIA OVATA,
- MELALEUCA INCANA

PLANT BIOFILTERS WITH 8-12 PLANTS/m^2 FOR GROUNDCOVERS, GRASSESS, SEDGES AND RUSHES. THIS INVESTMENT IN DENSE VEGETATION WILL BE REWARDED WITH MORE EFFECTIVE WATER TREATMENT AND REDUCED MAINTENANCE REQUIREMENTS.



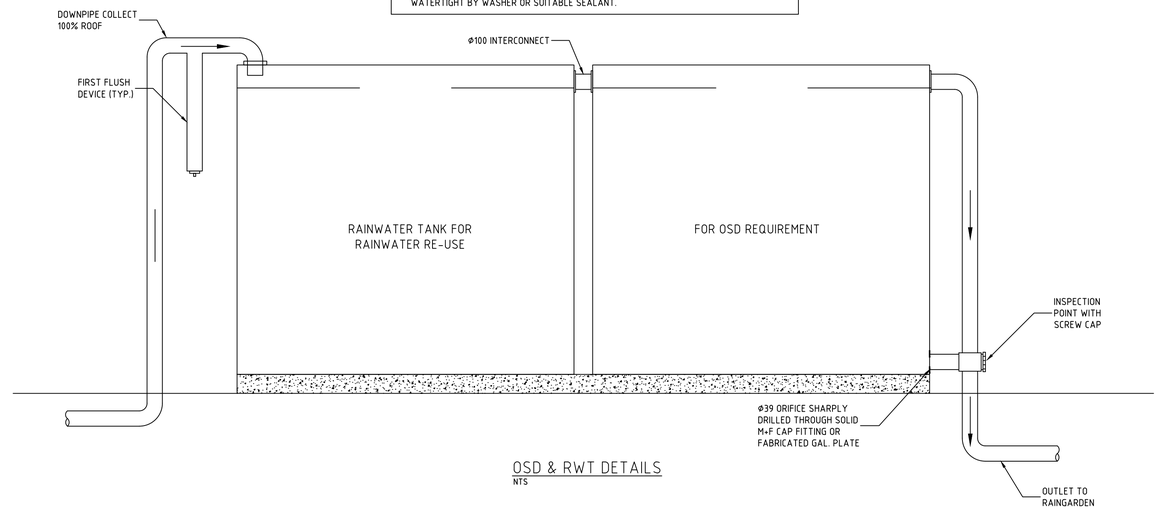
RAIN GARDEN - SECTION A
NTS



RAIN GARDEN - SECTION A
NTS

RAINWATER TANK NOTES:

1. RAINWATER TANKS BY KINGSPAN (TEL: 1300 736 562) OR SIMILAR.
2. DIMENSIONS ARE INDICATIVE ONLY. EXACT DETAILS TO MANUFACTURER'S SPECIFICATIONS.
3. A FIRST FLUSH DEVICE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS SHALL BE FITTED TO RAINWATER TANK SYSTEM TO FLUSH OUT THE FIRST 0.5mm OF RUN-OFF FROM THE ROOF AREA THAT DRAINED INTO THE TANK (E.G. 0.5L/m2).
4. PUMP SIZE & SPECIFICATION TO BE NOMINATED BY MANUFACTURER
5. ORIFICE PLATE INSTALLATION TO BE PERFORMED BY QUALIFIED PLUMBER AND TO BE MADE WATERTIGHT BY WASHER OR SUITABLE SEALANT.



OSD & RWT DETAILS
NTS

MINIMUM PIPE COVER NOTES:

LOCATION	MINIMUM COVER
NO SUBJECT TO VEHICLE LOADING	100mm SINGLE RESIDENTIAL
SUBJECT TO VEHICLE LOADING	450mm WHERE NOT IN A ROAD
UNDER A SEALED ROAD	600mm
UNSEALED ROAD	750mm
PAVED DRIVEWAY	100mm PLUS DEPTH OF CONCRETE

SEE AS2032 INSTALLATION OF UPVC PIPES FOR FURTHER INFORMATION.

CONCRETE PIPE COVER SHALL BE IN ACCORDANCE WITH AS3725-1989 LOADS ON BURIED CONCRETE PIPES, HOWEVER A MINIMUM COVER OF 450mm WILL APPLY.

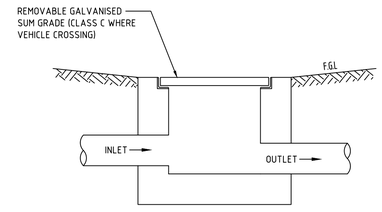
WHERE INSUFFICIENT COVER IS PROVIDED, THE PIPE SHALL BE COVERED AT LEAST 50mm THICK OVERLAY AND SHALL BE PAVED WITH AT LEAST:

- 150 mm REINFORCED CONCRETE WHERE SUBJECT TO HEAVY VEHICLE TRAFFIC
- 75mm THICKNESS OF BRICK OR 100mm OF CONCRETE PAVING WHERE SUBJECT TO LIGHT VEHICLE TRAFFIC; OR
- 50mm THICK BRICK OR CONCRETE PAVING WHERE NOT SUBJECT TO VEHICLE TRAFFIC

SURFACE STORMWATER PIT NOTES:

PIT DEPTH (mm)	MINIMUM PIT SIZE (mm)
UP TO 600 mm	450 x 450
FROM 600mm TO LESS THAN 900mm	600 x 600
FROM 900mm	900 x 900

ALL TRAFFICABLE PIT TO BE FITTED WITH HEAVY DUTY CLASS C GRATE & FRAME



SURFACE PIT DETAILS
NTS

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Scale:

For:

By:

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PROJECT
85-109 EVELYN STREET
MACQUARIE FIELDS

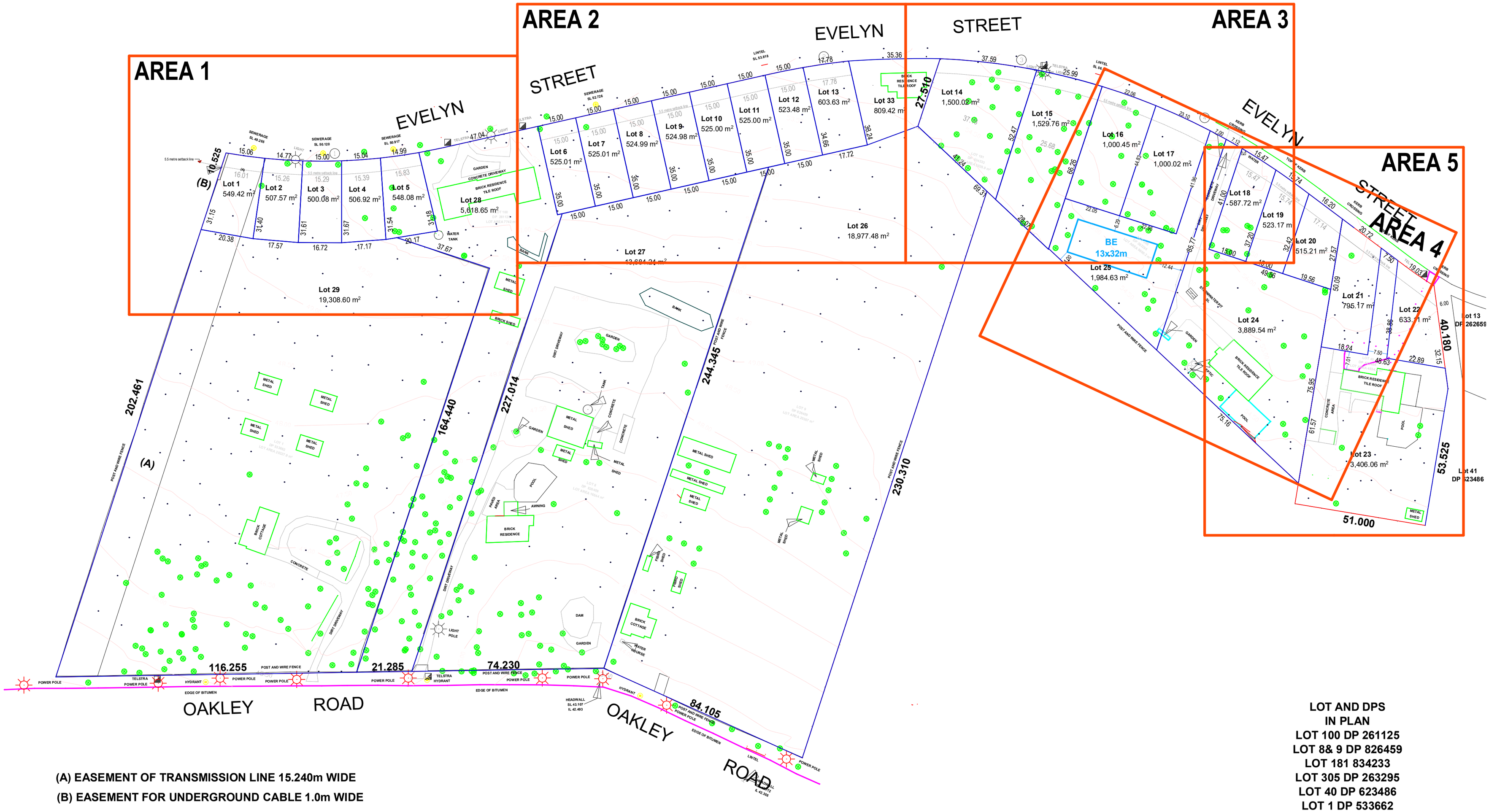
DRAWING TITLE
STORMWATER DETAILS

PROJECT NO.
17066
PLAN
500
REV
A

Attachment "B5"

Amended concept Plan, Zoning Map and Minimum Lot Size Map

(Planzone and Drawings Revision No. 12)



(A) EASEMENT OF TRANSMISSION LINE 15.240m WIDE

(B) EASEMENT FOR UNDERGROUND CABLE 1.0m WIDE

LOT AND DPS IN PLAN
LOT 100 DP 261125
LOT 8& 9 DP 826459
LOT 181 834233
LOT 305 DP 263295
LOT 40 DP 623486
LOT 1 DP 533662

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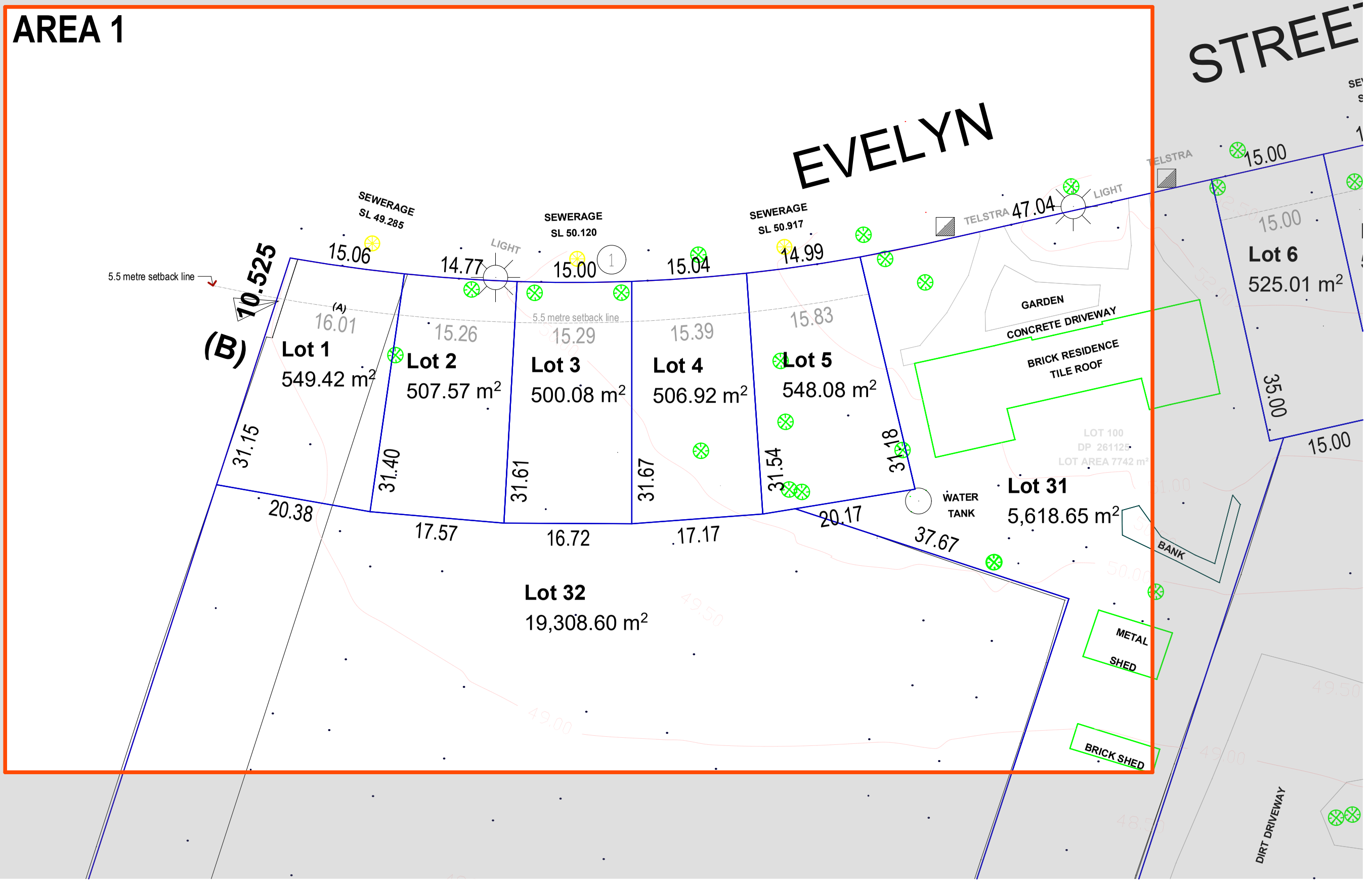
Details

Proposal	Subdivision
Address	Evelyn Street, Macquarie Fields
Project No.	20150604
Revision No.	12
Drawing No.	PP02
Client Name	Evelyn Street Group of Owners
LGA	Campbelltown City Council
Drawing Title	Zone Areas Plan
Scale	1:1000
Drawn By	A H

Revisions

Rev #	Revision Name	Issue Date	Rev #	Revision Name	Issue Date
01	Draft 3 for Client Review	31/03/2016	10	Amended Planning Proposal	1/10/2020
02	Draft 4 for Client Review	22/04/2016	12	Updated for Gateway 2/Ecology	5/10/2021
03	Revised Lot Layout for NKG	1/07/2016			
04	Final Revisions	19/11/2019			
09	Amended Planning Proposal	20/08/2020			

AREA 1



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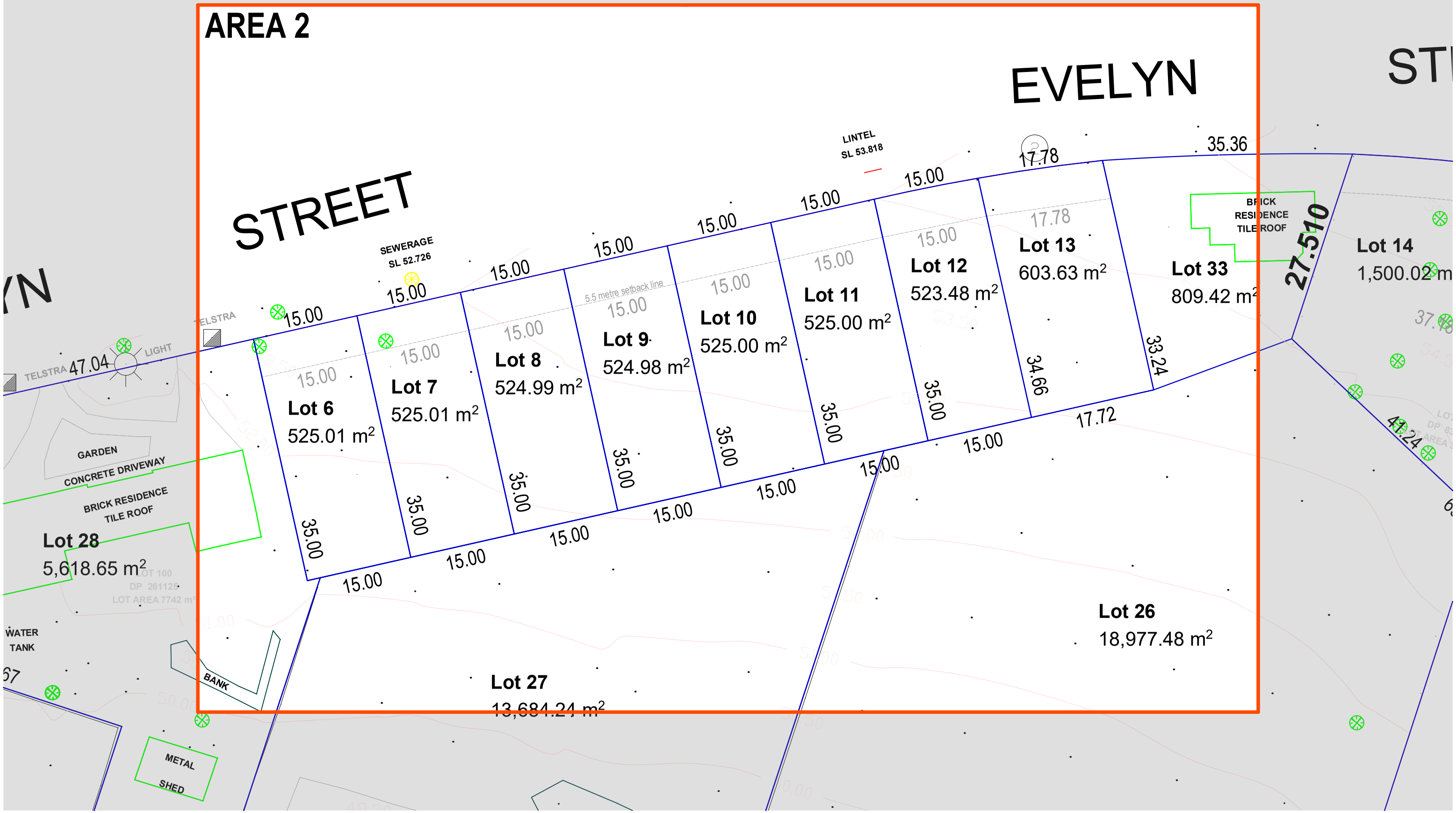
Proposal	Subdivision	**Client Name**	Evelyn Street Group of Owners
Address	Evelyn Street, Macquarie Fields	**LGA**	Campbelltown City Council
Project No.	20150604	**Drawing Title**	Area 1 Detail Plan
Revision No.	12	**Scale**	1:500
Drawing No.	PP03	**Drawn By**	A H

Revisions

Rev #	Revision Name	Issue Date
03	Revised Lot Layout for NKG	1/07/2016
04	Final Revisions	19/11/2019
09	Amended Planning Proposal	20/08/2020
10	Amended Planning Proposal	1/10/2020
12	Updated for Gateway 2/Ecology	5/10/2021



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Proposal	Subdivision	**Client Name**	Evelyn Street Group of Owners
Address	Evelyn Street, Macquarie Fields	**LGA**	Campbelltown City Council
Project No.	20150604	**Drawing Title**	Area 2 Detail Plan
Revision No.	12	**Scale**	1:500
Drawing No.	PP04	**Drawn By**	A H

Revisions

Rev #	Revision Name	Issue Date
03	Revised Lot Layout for NKG	1/07/2016
04	Final Revisions	19/11/2019
09	Amended Planning Proposal	20/08/2020
10	Amended Planning Proposal	1/10/2020
12	Updated for Gateway 2/Ecology	5/10/2021

AREA 3

STREET

EVELYN

VELYN

Lot 14
1,500.02 m²

Lot 15
1,529.76 m²

Lot 16
1,000.45 m²

Lot 17
1,000.02 m²

Lot 18
587.72 m²

Lot 19
523.17 m²

Lot 20
515.21 m²

Lot 21

Lot 25
1,984.63 m²

Lot 26
18,977.48 m²

Lot 33
809.42 m²

BE
13x32m

BRICK RESIDENCE TILE ROOF

LINTEL SL 56.801

TELSTRA LIGHT

LIGHT

5.5 metre setback line

KERB CROSSING

TOP OF KERB

WATER

CONCRETE DRIVEWAY

DIRT DRIVEWAY

STORMWA

35.36
37.59
25.99
22.06
23.10
7.00
7.12
15.47
15.74
16.20
27.510
33.24
17.72
52.47
44.83
41.96
66.26
41.24
69.31
28.07
22.05
6.29
22.95
4.00
12.44
85.77
41.00
37.20
32.42
15.00
49.56
19.56
27.57
50.09
17.14

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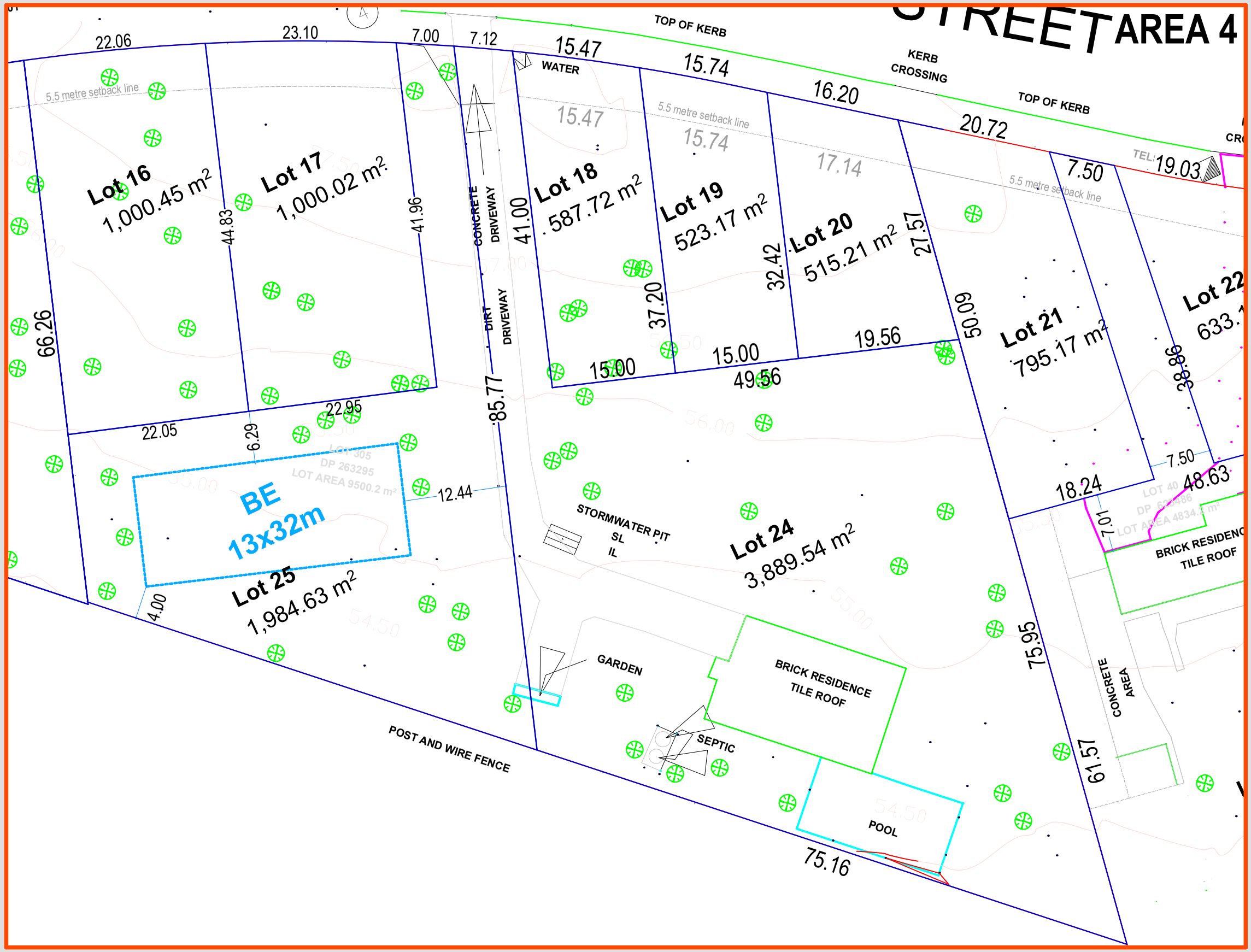
Proposal	Subdivision	**Client Name**	Evelyn Street Group of Owners
Address	Evelyn Street, Macquarie Fields	**LGA**	Campbelltown City Council
Project No.	20150604	**Drawing Title**	Area 3 Detail Plan
Revision No.	12	**Scale**	1:500
Drawing No.	PP05	**Drawn By**	A H

Revisions

Rev #	Revision Name	Issue Date
03	Revised Lot Layout for NKG	1/07/2016
04	Final Revisions	19/11/2019
09	Amended Planning Proposal	20/08/2020
10	Amended Planning Proposal	1/10/2020
12	Updated for Gateway 2/Ecology	5/10/2021



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Proposal	Subdivision	**Client Name**	Evelyn Street Group of Owners
Address	Evelyn Street, Macquarie Fields	**LGA**	Campbelltown City Council
Project No.	20150604	**Drawing Title**	Area 4 Detail Plan
Revision No.	12	**Scale**	1:500
Drawing No.	PP06	**Drawn By**	A H

Revisions

Rev #	Revision Name	Issue Date
01	Revised Lot Layout for NKG	1/07/2016
02	Final Revisions	19/11/2019
09	Amended Planning Proposal	20/08/2020
10	Amended Planning Proposal	1/10/2020
12	Updated for Gateway 2/Ecology	5/10/2021

EVELYN STREET

AREA 5

Lot 18
587.72 m²

Lot 19
523.17 m²

Lot 20
515.21 m²

Lot 21
795.17 m²

Lot 22
633.11 m²

Lot 24
3,889.54 m²

Lot 23
3,406.06 m²

Lot 13
DP 262659

Lot 41
DP 623486

KERB CROSSING
TOP OF KERB
WATER
5.5 metre setback line
CONCRETE DRIVEWAY
DIRT DRIVEWAY
STORMWATER PIT
SL
GARDEN
SEPTIC
BRICK RESIDENCE
TILE ROOF
POOL
CONCRETE AREA
METAL SHED
TEL
LOT 40
DP 623486
LOT AREA 4834.3 m²

23.10
7.00
7.12
15.47
15.74
16.20
20.72
19.03
7.50
6.00
40.180
32.15
22.89
48.63
7.01
18.24
7.50
38.86
27.57
50.09
32.42
37.20
41.00
41.96
85.77
15.00
15.00
49.56
19.56
75.95
61.57
75.16
53.525
51.000

Rev #	Revision Name	Issue Date
03	Revised Lot Layout for NKG	1/07/2016
04	Final Revisions	19/11/2019
09	Amended Planning Proposal	20/08/2020
10	Amended Planning Proposal	1/10/2020
12	Updated for Gateway 2/Ecology	5/10/2021

Revisions

Client Name Evelyn Street Group of Owners
LGA Campbelltown City Council
Drawing Title Area 5 Detail Plan
Scale 1:500
Drawn By A H

Proposal Subdivision
Address Evelyn Street, Macquarie Fields
Project No. 20150604
Revision No. 12
Drawing No. PP07

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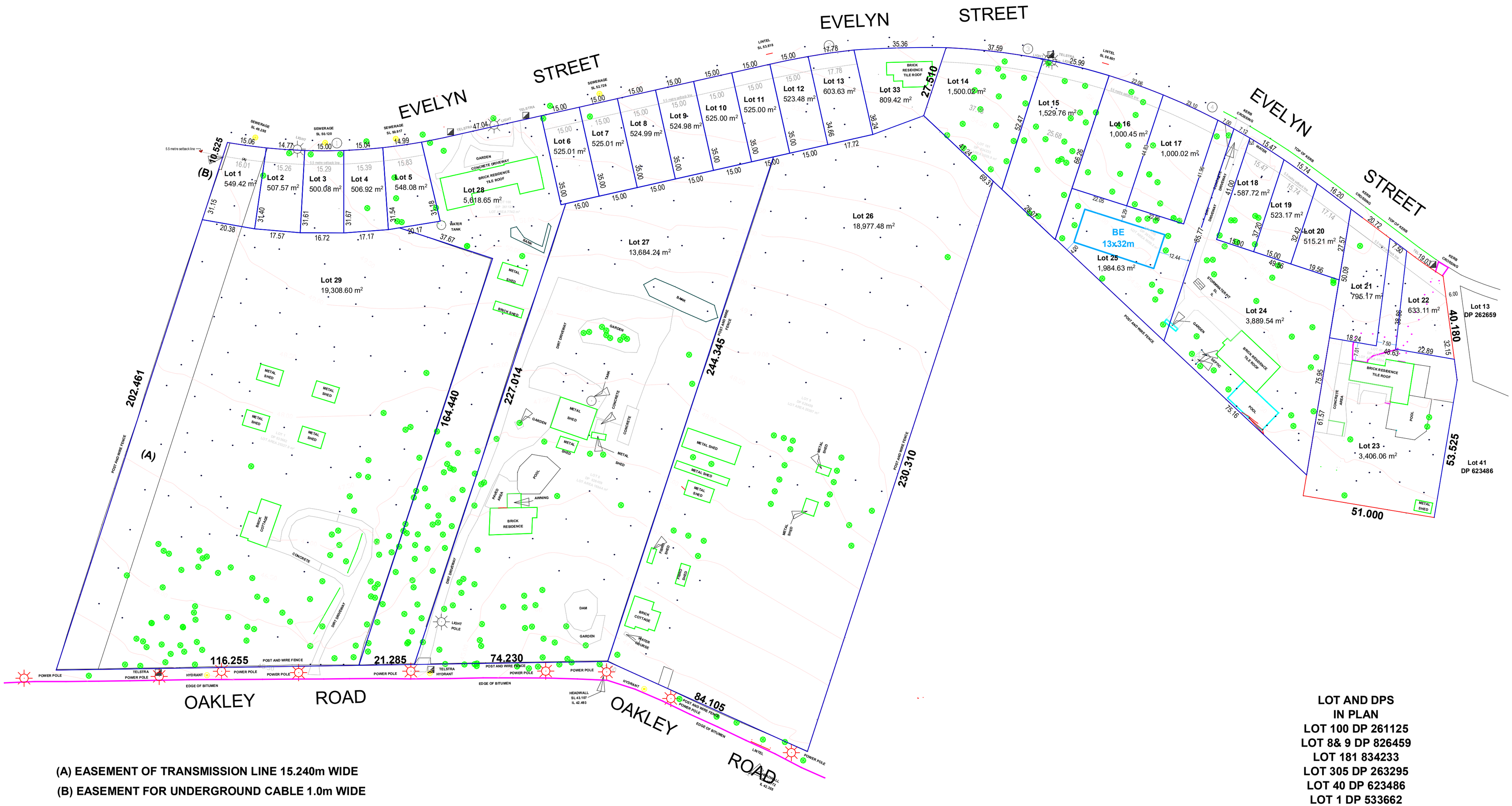

(A) EASEMENT OF TRANSMISSION LINE 15.240m WIDE

(B) EASEMENT FOR UNDERGROUND CABLE 1.0m WIDE

LOT AND DPS IN PLAN
LOT 100 DP 261125
LOT 8& 9 DP 826459
LOT 181 834233
LOT 305 DP 263295
LOT 40 DP 623486
LOT 1 DP 533662

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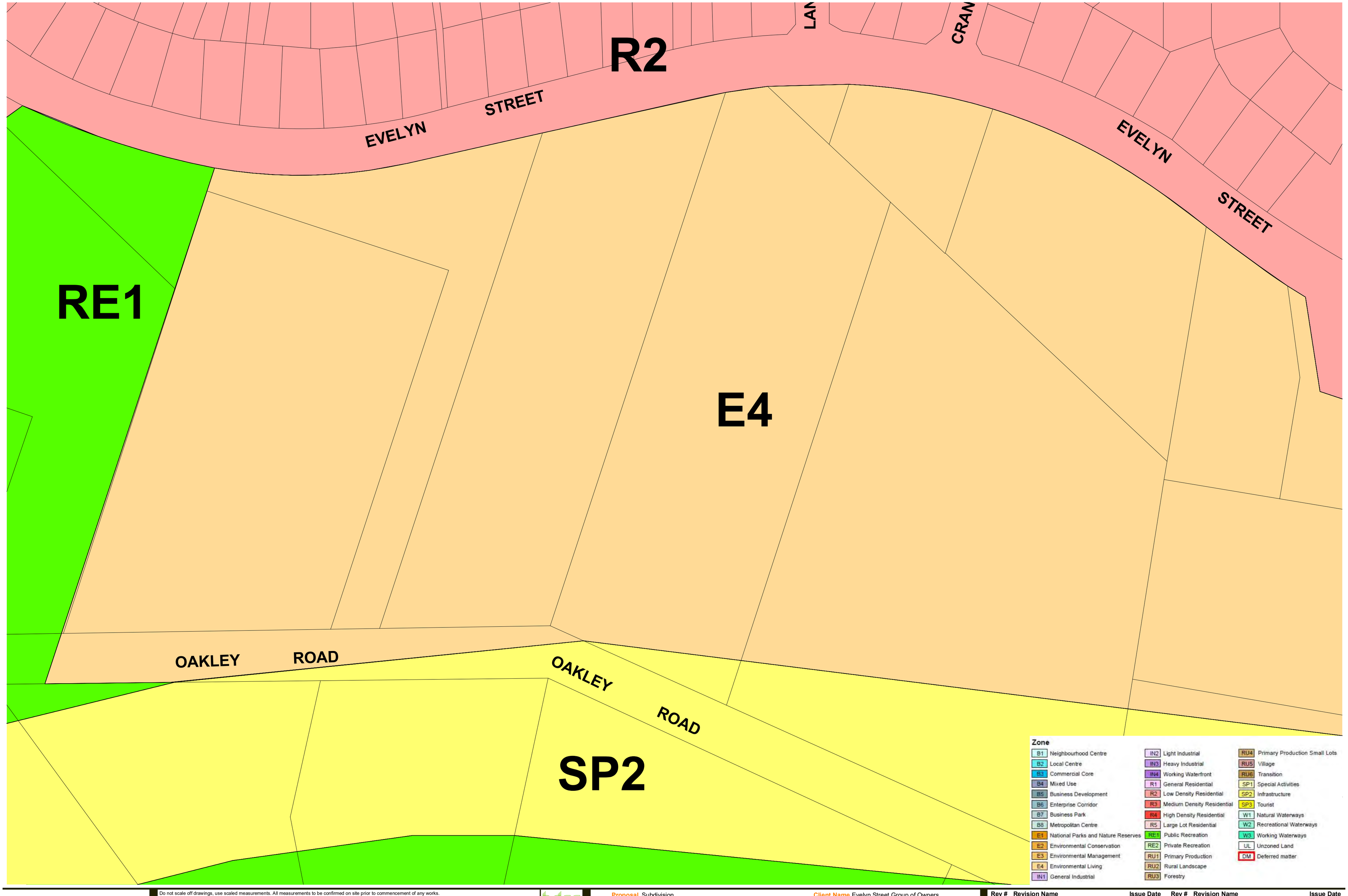
Details

Proposal	Subdivision
Address	Evelyn Street, Macquarie Fields
Project No.	20150604
Revision No.	12
Drawing No.	PP01
Client Name	Evelyn Street Group of Owners
LGA	Campbelltown City Council
Drawing Title	Proposed Subdivision Plan
Scale	1:1000
Drawn By	A H

Revisions

Rev #	Revision Name	Issue Date	Rev #	Revision Name	Issue Date
02	Draft 2 for Client Review	23/03/2016	08	Lot 14~24 Amendment	13/05/2020
03	Draft 3 for Client Review	31/03/2016	09	Amended Planning Proposal	20/08/2020
04	Draft 4 for Client Review	22/04/2016	10	Amended Planning Proposal	1/10/2020
05	Revised Lot Layout for NKG	1/07/2016	11	Amended Lot 23 Access Handle	20/10/2020
06	Final Revisions	19/11/2019	12	Updated for Gateway 2/Ecology	5/10/2021



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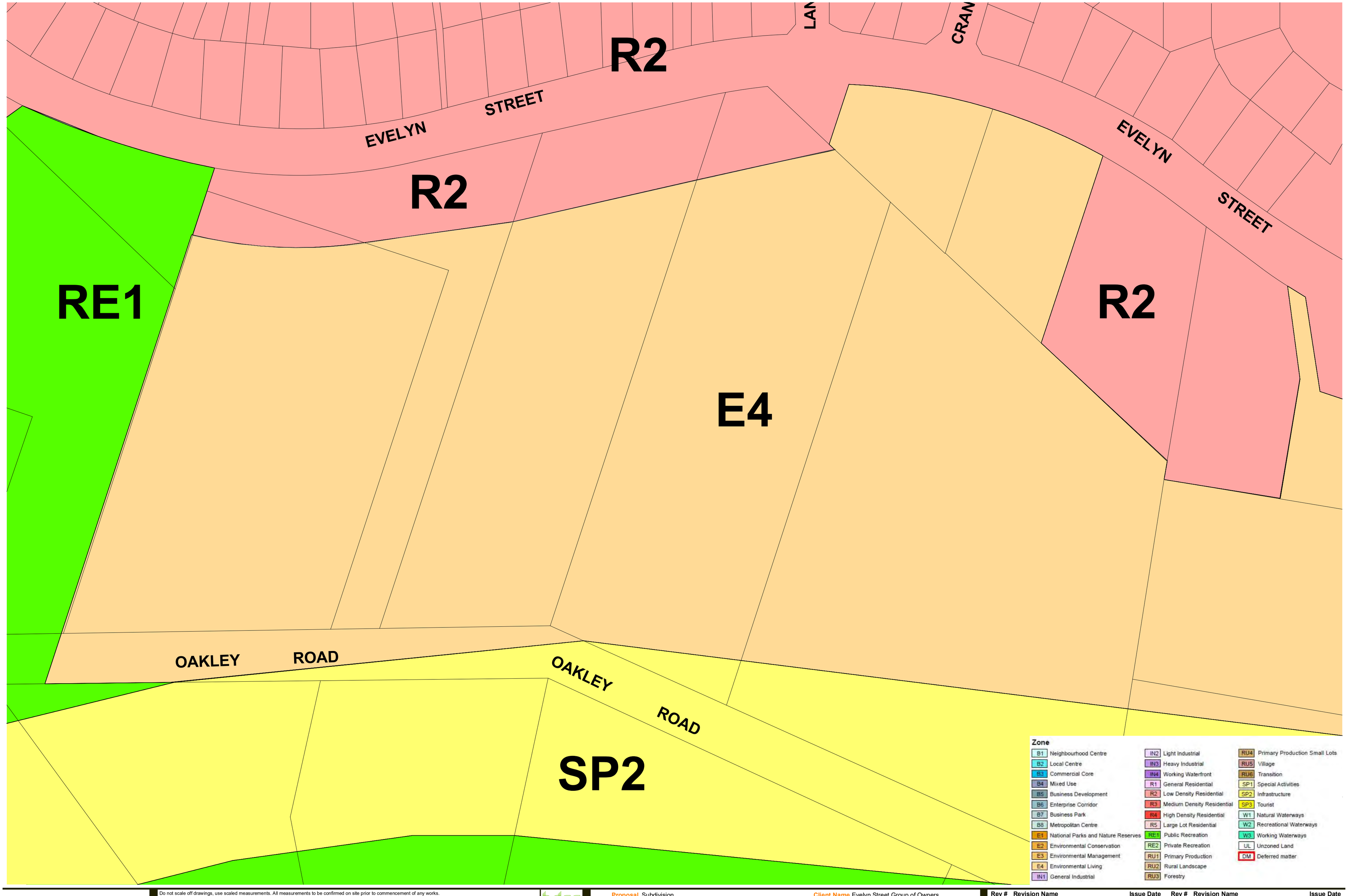
Proposal	Subdivision
Address	Evelyn Street, Macquarie Fields
Project No.	20150604
Revision No.	12
Drawing No.	RZ01
Client Name	Evelyn Street Group of Owners
LGA	Campbelltown City Council
Drawing Title	Existing Land Use Zoning
Scale	1:1000, 1:2.09
Drawn By	A H

Revisions

Rev #	Revision Name	Issue Date
01	Final Revisions	17/08/2016
09	Amended Planning Proposal	20/08/2020
10	Amended Planning Proposal	1/10/2020
12	Updated for Gateway 2/Ecology	5/10/2021

Rev #	Revision Name	Issue Date



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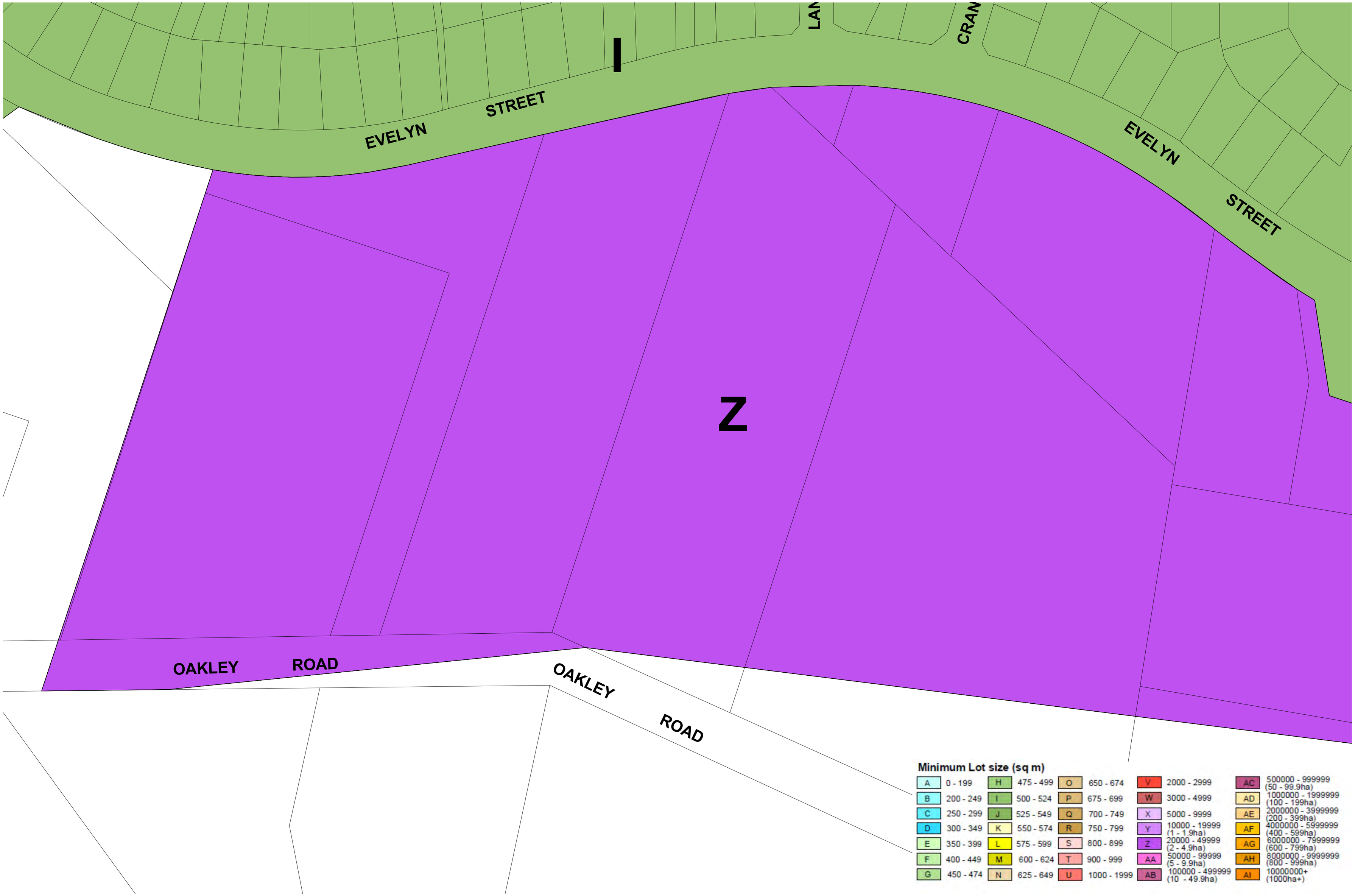
Details

Proposal	Subdivision
Address	Evelyn Street, Macquarie Fields
Project No.	20150604
Revision No.	12
Drawing No.	RZ02
Client Name	Evelyn Street Group of Owners
LGA	Campbelltown City Council
Drawing Title	Proposed Land Use Zoning
Scale	1:1000, 1:2.09
Drawn By	A H

Revisions

Rev #	Revision Name	Issue Date
01	Final Revisions	17/08/2016
09	Amended Planning Proposal	20/08/2020
10	Amended Planning Proposal	1/10/2020
12	Updated for Gateway 2/Ecology	5/10/2021

Rev #	Revision Name	Issue Date



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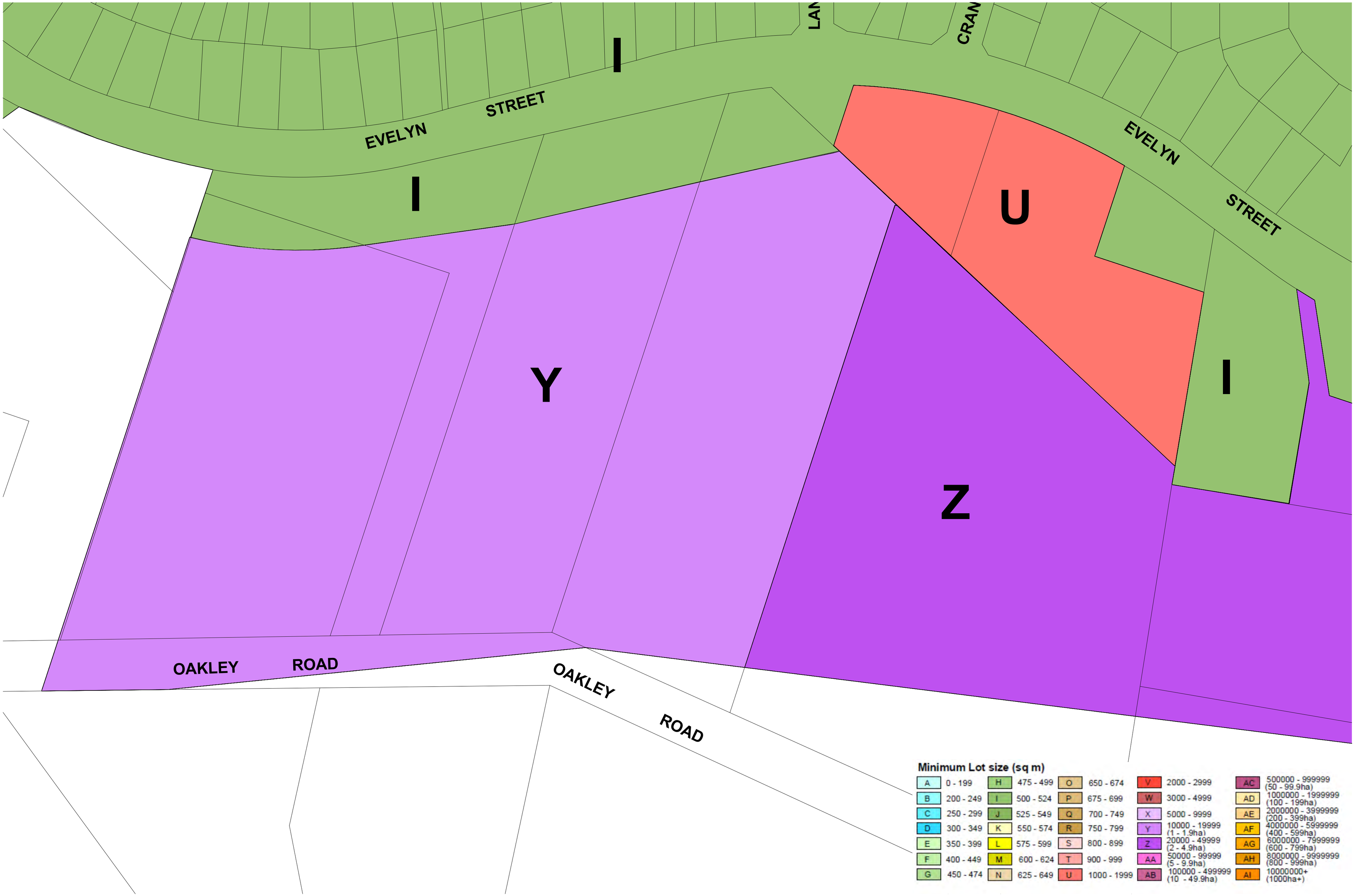
Details

Proposal	Subdivision
Address	Evelyn Street, Macquarie Fields
Project No.	20150604
Revision No.	12
Drawing No.	LSZ01
Client Name	Evelyn Street Group of Owners
LGA	Campbelltown City Council
Drawing Title	Existing Minimum Lot Size
Scale	1:1000, 1:1.90
Drawn By	A H

Revisions

Rev #	Revision Name	Issue Date
01	Final Revisions	17/08/2016
09	Amended Planning Proposal	20/08/2020
10	Amended Planning Proposal	1/10/2020
12	Updated for Gateway 2/Ecology	5/10/2021

Rev #	Revision Name	Issue Date



Minimum Lot size (sq m)

A	0 - 199	H	475 - 499	O	650 - 674	V	2000 - 2999	AC	500000 - 999999 (50 - 99.9ha)
B	200 - 249	I	500 - 524	P	675 - 699	W	3000 - 4999	AD	1000000 - 1999999 (100 - 199ha)
C	250 - 299	J	525 - 549	Q	700 - 749	X	5000 - 9999	AE	2000000 - 3999999 (200 - 399ha)
D	300 - 349	K	550 - 574	R	750 - 799	Y	10000 - 19999 (1 - 1.9ha)	AF	4000000 - 5999999 (400 - 599ha)
E	350 - 399	L	575 - 599	S	800 - 899	Z	20000 - 49999 (2 - 4.9ha)	AG	6000000 - 7999999 (600 - 799ha)
F	400 - 449	M	600 - 624	T	900 - 999	AA	50000 - 99999 (5 - 9.9ha)	AH	8000000 - 9999999 (800 - 999ha)
G	450 - 474	N	625 - 649	U	1000 - 1999	AB	100000 - 499999 (10 - 49.9ha)	AI	10000000+ (1000ha+)

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Details

Proposal	Subdivision
Address	Evelyn Street, Macquarie Fields
Project No.	20150604
Revision No.	12
Drawing No.	LSZ02
Client Name	Evelyn Street Group of Owners
LGA	Campbelltown City Council
Drawing Title	Proposed Minimum Lot Size
Scale	1:1000, 1:1.90
Drawn By	A H

Revisions

Rev #	Revision Name	Issue Date	Rev #	Revision Name	Issue Date
01	Final Revisions	17/08/2016			
09	Amended Planning Proposal	20/08/2020			
10	Amended Planning Proposal	1/10/2020			
12	Updated for Gateway 2/Ecology	5/10/2021			

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Details

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Address	Evelyn Street, Macquarie Fields
Project No.	20150604
Revision No.	12
Drawing No.	SP01
Client Name	Evelyn Street Group of Owners
LGA	Campbelltown City Council
Drawing Title	The Subject Site
Scale	1:1000
Drawn By	A H

Revisions

Rev #	Revision Name	Issue Date
08	Lot 14~24 Amendment	13/05/2020
09	Amended Planning Proposal	20/08/2020
10	Amended Planning Proposal	1/10/2020
12	Updated for Gateway 2/Ecology	5/10/2021

Rev #	Revision Name	Issue Date