Camden Council

Attachments

Ordinary Council Meeting
10 October 2017

Camden Council
Administration Centre
70 Central Avenue
Oran Park

ORDINARY COUNCIL

ATTACHMENTS - ORDINARY COUNCIL

:

Camden Council
37 John Street, Camden NSW 2570 DX 25807
PO Box 183, Camden 2570 ABN: 31 117 341 764
Telephone: 02 4654 7777 Fax: 02 4654 7829
Email: mail@camden.nsw.gov.au

Attachment 1 - Recommended Conditions of Consent

(1) **Approved Plans and Documents** - Development shall be carried out in accordance with the following plans and documentation, and all recommendations made therein, except where amended by the conditions of this development consent:

Plan Reference/ Drawing No.	Name of Plan	Prepared by	Date
Issue 6	Site Plan	Designs by Anastasia & Nikolina	13 September 2017
Issue 6	Proposed Floor Plan	Designs by Anastasia & Nikolina	13 September 2017
Issue 6	Elevation East-North	Designs by Anastasia & Nikolina	13 September 2017
Issue 2	Elevation West-South	Designs by Anastasia & Nikolina	13 September 2017
Issue 6	Section A-A/Section A-B	Designs by Anastasia & Nikolina	13 December 2016
Issue 6	Schedule of Finishes	Designs by Anastasia & Nikolina	13 December 2016
Issue 6	Landscape Area	Designs by Anastasia & Nikolina	9 December 2016
Issue 6	Landscape Plan 2	Designs by Anastasia & Nikolina	9 December 2016
Issue 2	Drainage	Designs by Anastasia & Nikolina	9 December 2016

Document Title	Prepared by	Date
BASIX Certificate number: 758247S_02	Anastasia Borak	6 September 2016
Waste Management Plan	Hussein Jaafar	31 October 2016
Bushfire Protection Assessment	Eco Logical Australia Pty	21 November 2016

	Ltd	

(This condition was modified by Section 96 Modification 1247(2)/2016 on 10 October 2017).

(2) **BASIX Certificate** - The applicant shall undertake the development strictly in accordance with the commitments listed in the approved BASIX certificate(s) for the development to which this consent applies.

(3) **Building Code of Australia** - All building work shall be carried out in accordance with the BCA. In this clause, a reference to the BCA is a reference to that Code as in force on the date the application for the relevant Construction Certificate is made.

(4) **Home Building Act** - Pursuant to Section 80A(11) of the *EP&A Act 1979*, residential building work within the meaning of the *Home Building Act 1989* shall not be carried out unless the PCA for the development to which the work relates:

a) in the case of work for which a principal contractor has been appointed:

i. has been informed in writing of the name and licence number of the principal contractor; and
ii. where required has provided an insurance certificate with the name of the insurer by which the work is insured under Part 6 of that Act.

b) in the case of work to be carried out by an owner-builder;

i. has been informed in writing of the name of the owner-builder; and
ii. if the owner-builder is required to hold an owner-builder permit under that Act; has provided a copy of the owner builder permit.

(5) **Shoring and Adequacy of Adjoining Property Works** - If the approved development involves an excavation that extends below the level of the base of the footings of a building, structure or work on adjoining land, the person having the benefit of the consent shall, at the person's own expense:

a) protect and support the adjoining building, structure or work from possible damage from the excavation; and

b) where necessary, underpin the building, structure or work to prevent any such damage.

This condition does not apply if the person having the benefit of the consent owns the adjoining land or the owner of the adjoining land has given consent in writing to that condition not applying

A copy of the written consent must be provided to the PCA prior to the excavation commencing.

(6) This condition was deleted by Section 96 Modification 1247(2)/2016 on 10 October 2017.

(7) **Southern Elevation Windows** - The windows along the southern elevation are to have a minimum sill height of 1.5m as measured from the finished floor level.

This condition was added by Section 96 Modification 1247(2)/2016 on 10 October 2017.

2.0 – Prior to Issue of a Construction Certificate

The following conditions of consent shall be complied with prior to the issue of a Construction Certificate.

(1) **Structural Engineer's Details** - The piers/slabs/footings/structural elements shall be designed and certified by a suitably qualified structural engineer and shall take into consideration the recommendations of any geotechnical report applicable to the site. A statement to that effect shall be provided to the Certifying Authority.

(2) **Building Platform** - This consent restricts excavation or fill for the purposes of creating a building platform. The building platform shall not exceed 2.0m from the external walls of the building. Where the external walls are within 2.0m of any property boundary, no parallel fill is permitted and a deepened edge beam to natural ground level shall be used. Details demonstrating compliance shall be provided to the Certifying Authority with the Construction Certificate application.

(3) **Driveway Gradients and Design** - For all driveways that relate to development for the purposes of a dwelling house, the driveway gradient and design shall comply with AS 2890.1-2004 'Off street car parking' and:

a) the driveway shall comply with Council's Access Driveway Specifications; http://www.camden.nsw.gov.au/assets/pdf/Development/Residential-Vehicle-Crossing-Specification.pdf

b) the driveway shall be at least 1m from any street tree, stormwater pit or service infrastructure;

c) the level for the driveway across the footpath area shall achieve a gradient of 4%; and

d) a Driveway Crossing Approval (PRA) must be obtained prior to the commencement of any works.

Details demonstrating compliance shall be provided to the Certifying Authority prior to issue of a Construction Certificate.

(4) **Salinity (Dwellings & Outbuildings)** - The proposed dwelling, landscaping and associated works for the development shall comply with the requirements of the salinity management plan report titled "Report: on Salinity Management Plan: Proposed Residential Development Harrington Grove East, Project No. 34173H, Dated March 2007."

Alternatively, a site specific analysis including recommendations, prepared by a suitably qualified consultant and referencing Australian Standard AS2870-2011 and Council's Building in a Saline Prone Environment Policy shall be submitted to the Certifying Authority.

Details demonstrating compliance shall be provided to the Certifying Authority with the Construction Certificate application.

(5) **Long Service Levy** - In accordance with Section 34 of the *Building and Construction Industry Long Service Payments Act 1986*, the applicant shall pay a long service levy at the prescribed rate to either the Long Service Payments Corporation or Council for any work that cost $25,000 or more.

(6) This condition was deleted by Section 96 Modification 1247(2)/2016 on 15 September 2017.

(7) **Bushfire Safety** - These conditions have been imposed to ensure that the development is sufficiently protected from the risk of Bushfire in accordance with 'Planning for Bushfire Protection, 2006' as published by the NSW Rural Fire Service and Planning NSW and shall be complied with prior to the issue of an Construction Certificate.

a) In accordance with the document titled 'Bushfire Protection Assessment', prepared by Eco Logical Australia Pty Ltd, the entire development shall be constructed to BAL 12.5 under AS3959-2009 and the requirements of Appendix 3 of Planning for Bushfire Protection 2006;

b) At the commencement of building works and in perpetuity the entire property shall be managed as an Inner Protection Zone, outlined within section 4.1.3 and Appendix 5 of 'Planning for Bush Fore Protection 2006' and the NSW Rural Fire Service's document 'Standards for asset protection zones; and

c) Water, electricity and gas are to comply with section 4.1.3 and 4.2.7 of 'Planning for Bush Fire Protection 2006'.

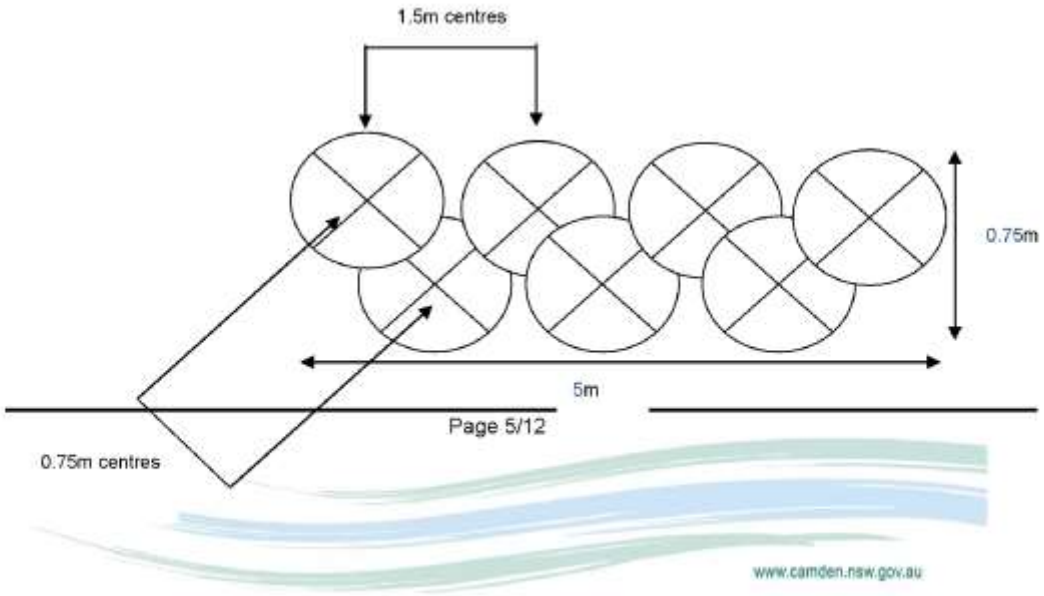
(8) **Hard Surfaces** - No more than 40% of the area in front of the dwelling shall be hard surfaces. Details demonstrating compliance shall be submitted prior to issue of a Construction Certificate.

(9) **Landscaped Area** – A minimum of 30% of the site area is to contain soft landscaping. Details demonstrating compliance shall be submitted prior to issue of a Construction Certificate.

(10) **Landscape Plan** - A landscape plan must be prepared and include the following screen planting specifications;

a. Small trees/tall shrub species capable of reaching a minimum mature height of 4 metres shall be planted on the southern and eastern boundaries of the site and planted in two staggered rows as shown in Figure 1. below. The matrix is to be repeated every 5 metres for the entire length of both the boundaries.
b. Matrix planting area preparation shall consist of sub grade rips 0.5m apart to a minimum depth of 0.4m followed by cultivation of the top soil at a depth of 100mm.
c. Individual planting holes shall be excavated to twice the depth and the width of the new tree root-ball and backfilled with quality garden mix.
d. A 75mm layer of leaf mulch shall be applied evenly over the entire planting area after planting.
e. The planting stock shall consist of minimum 25 litre container stock on the back row of the planting matrix and minimum of 5 litre container stock on the front row of planting and must consist of a mix of at least four different species with known performance in the Camden district. Suggested species; Callistemon, Grevillea, Hakea, Leptospermum, Melaleuca, Pittosporum, Viburnum or Syzygium.
f. The small trees/tall shrub screen must be cared for and maintained until a continuous screen is established. Should any of the trees/tall shrubs die then they shall be replaced with another small tree/tall shrub.
g. Small tree/shrub stock to be sourced in accordance with tests and measures contained within AS2303-2015 – Tree Stock for Landscape Use
h. A landscape plan showing the matrix planting and selected species is required prior to issue of CC.

Figure 1. Planting Matrix



This condition was added by Section 96 Modification 1247(2)/2016 on 21 September 2017.

3.0 - Prior to Commencement of Works

The following conditions of consent shall be complied with prior to any works commencing on the development site.

(1) **Notice of PCA Appointment** - Notice shall be given to Council at least two (2) days prior to subdivision and/or building works commencing in accordance with Clause 103 of the EP&A Regulation 2000. The notice shall include:

a) a description of the work to be carried out;

b) the address of the land on which the work is to be carried out;

c) the registered number and date of issue of the relevant development consent;

d) the name and address of the PCA, and of the person by whom the PCA was appointed;

e) if the PCA is an accredited certifier, his, her or its accreditation number, and a statement signed by the accredited certifier consenting to being appointed as PCA; and

f) a telephone number on which the PCA may be contacted for business purposes

(2) **Notice Commencement of Work** - Notice shall be given to Council at least two (2) days prior to subdivision and/or building works commencing in accordance with Clause 104 of the EP&A Regulation 2000. The notice shall include:

a) the name and address of the person by whom the notice is being given;

b) a description of the work to be carried out;

c) the address of the land on which the work is to be carried out;

d) the registered number and date of issue of the relevant development consent and construction certificate;

e) a statement signed by or on behalf of the PCA to the effect that all conditions of the consent that are required to be satisfied prior to the work commencing have been satisfied; and

f) the date on which the work is intended to commence.

(3) **Construction Certificate Required** - In accordance with the provisions of Section 81A of the *EP&A Act 1979,* construction or subdivision works approved by this consent shall not commence until the following has been satisfied:

a) a Construction Certificate has been issued by a Certifying Authority;

b) a Principal Certifying Authority (PCA) has been appointed by the person having benefit of the development consent in accordance with Section 109E of the *EP&A Act 1979*;

c) if Council is not the PCA, Council is notified of the appointed PCA at least two (2) days before building work commences;

d) the person having benefit of the development consent notifies Council of the intention to commence building work at least two (2) days before building work commences; and

the PCA is notified in writing of the name and contractor licence number of the owner/builder intending to carry out the approved works.

(4) **Sign of PCA and Contact Details** - A sign shall be erected in a prominent position on the site stating the following:

a) that unauthorised entry to the work site is prohibited;

b) the name of the principal contractor (or person in charge of the site) and a telephone number on which that person can be contacted at any time for business purposes and outside working hours; and

c) the name, address and telephone number of the PCA.

The sign shall be maintained while the work is being carried out, and shall be removed upon the completion of works.

(5) **Sydney Water Approval** - The approved development plans shall be approved by Sydney Water.

(6) **Soil Erosion and Sediment Control** - Soil erosion and sediment controls must be implemented prior to works commencing on the site in accordance with

'Managing Urban Stormwater – Soils and Construction ('the blue book') and any Sediment and Erosion plans approved with this development consent.

Soil erosion and sediment control measures shall be maintained during construction works and shall only be removed upon completion of the project when all landscaping and disturbed surfaces have been stabilised (for example, with site turfing, paving or re-vegetation).

4.0 - During Works

The following conditions of consent shall be complied with during the construction phase of the development.

(1) **Construction Hours** - All work (including delivery of materials) shall be restricted to the hours of 7.00am to 5.00pm Monday to Saturday inclusive. Work is not to be carried out on Sundays or Public Holidays.

(2) **Compliance with BCA** - All building work shall be carried out in accordance with the requirements of the BCA.

(3) **Retaining Walls** - The following restrictions apply to any retaining wall erected within the allotment boundaries:

a) retaining walls shall be constructed a minimum of 300mm from any property boundary to ensure all associated drainage and backfill remain wholly within the subject property;

b) adequate provisions shall be made for surface and subsurface drainage of retaining walls and all water collected shall be diverted to, and connected to, a stormwater disposal system within the property boundaries;

c) retaining walls shall not be erected within drainage easements; and

d) retaining walls shall not be erected in any other easement present on the land without the approval of the relevant authority benefited.

(4) **Stormwater – Collection and Discharge Requirements** - The roof of the subject building(s) shall be provided with guttering and down pipes and all drainage lines, including stormwater drainage lines from other areas and overflows from rainwater tanks, conveyed to the street gutter.

Connection to the drainage easement or kerb shall only occur at the designated connection point for the allotment. New connections that require the rectification of an easement pipe or kerb shall only occur with the prior approval of Camden Council.

All roof water shall be connected to the approved roof water disposal system immediately after the roofing material has been fixed to the framing members. The PCA shall not permit construction works beyond the frame inspection stage until this work has been carried out.

(5) **Works by Owner** - Where a portion of the building works do not form part of a building contract with the principal contractor (builder) and are required to be completed by the owner, such works shall be scheduled by the owner so that all works coincide with the completion of the main building being erected by the principal contractor.

(6) **Survey Report** - The building shall be set out by a registered land surveyor. A peg out survey detailing the siting of the building and the masonry fence in accordance with the approved plans shall be provided to the PCA prior to the pouring of concrete.

(7) **Easements** - No changes to site levels, or any form of construction shall occur within any easements that may be located on the allotment.

(8) **This condition was deleted by Section 96 Modification 1247(2)/2016 on 10 October 2017.**.

(9) This condition was deleted by Section 96 Modification 1247(2)/2016 on 10 October 2017.

(10) This condition was deleted by Section 96 Modification 1247(2)/2016 on 10 October 2017.

5.0 - Prior to Issue of an Occupation Certificate

The following conditions of consent shall be complied with prior to the issue of an Occupation Certificate.

(1) **Occupation Certificate Required**- An Occupation Certificate shall be obtained prior to any use or occupation of the development.

(2) **Survey Certificate** - A registered surveyor shall prepare a Survey Certificate to certify that the location of the building and masonry fence in relation to the allotment boundaries complies with the approved plans or as specified by this consent. The Survey Certificate shall be provided to the satisfaction of the PCA.

(3) **Driveway Crossing Construction** – The driveway crossing shall be constructed in accordance with this consent and the Driveway Crossing Approval (PRA) prior to use or occupation of the development.

(4) **Waste Management Plan** - The PCA shall ensure that all works have been completed in accordance with the approved waste management plan referred to in this development consent.

(5) This condition was deleted by Section 96 Modification 1247(2)/2016 on 10 October 2017.

(6) This condition was deleted by Section 96 Modification 1247(2)/2016 on 10 October 2017.

(7) This condition was deleted by Section 96 Modification 1247(2)/2016 on 10 October 2017.

(8) This condition was deleted by Section 96 Modification 1247(2)/2016 on 10 October 2017.

(9) Prior to issue of OC the applicant shall make arrangements for Council's Urban Tree and Landscape Officer to inspect the plantings referred to in the above clauses to ensure that the screen planting is achieved.

This condition was added by Section 96 Modification 1247(2)/2016 on 10 October 2017

6.0 – Ongoing Use

The following conditions of consent are operational conditions applying to the development.

(1) **Residential Air Conditioning Units** - The operation of air conditioning units shall operate as follows:

a) be inaudible in a habitable room during the hours of 10pm – 7am on weekdays and 10pm to 8am on weekends and public holidays; and

b) emit a sound pressure level when measured at the boundary of any neighbouring residential property, at a time other than those specified in (a) above, which exceeds the background (LA90, 15 minutes) by more than 5dB(A). The source noise level shall be measured as a LAeq 15 minute.

(2) **This condition was deleted by Section 96 Modification 1247(2)/2016 on 10 October 2017.**

(3) This condition was deleted by Section 96 Modification 1247(2)/2016 on 10 October 2017.

(4) This condition was deleted by Section 96 Modification 1247(2)/2016 on 10 October 2017.

(5) **Maintenance of Landscaping** - Landscaping shall be maintained in accordance with the approved landscape plan.

This condition was added by Section 96 Modification 1247(2)/2016 on 10 October 2017.

(6) **Landscaping Maintenance Establishment Period -** Commencing from the date of practical completion, the applicant will have the responsibility to establish and maintain all hard and soft landscaping elements associated with this consent.

The 12 month maintenance and establishment period includes the applicant's responsibility for the establishment, care and repair of all landscaping elements including all street tree installations, plantings, lawn and hardscape elements including paths, walls, bins, seats, BBQs, shelters, playground equipment and soft fall treatments.

The date of practical completion is taken to mean completion of all civil works, soil preparation and treatment and initial weed control, and completion of all planting, turf installation, street tree installation and mulching.

At the completion of the 12 month landscaping maintenance and establishment period, all hard and soft landscaping elements (including any nature strip and road verge areas, street trees, street tree protective guards and bollards, etc) shall be in an undamaged, safe and functional condition and all plantings have signs of healthy and vigorous growth.

At the completion of the maintenance and establishment period, the landscaping works shall comply with the approved landscape plans and all improvements be in full working order.

This condition was added by Section 96 Modification 1247(2)/2016 on 10 October 2017.

Reasons for Conditions:

(1) To ensure that the development complies with statutory requirements including the *Environmental Planning and Assessment Act 1979*, the Environmental Planning and Assessment Regulation 2000, the Building Code of Australia and applicable Australian Standards.

(2) To ensure that the development meets the aims, objectives and requirements of the environmental planning instruments, development controls plans, Council policies and Section 94 contribution plans that apply to the site and development.

(3) To ensure that the development complies with the submitted plans and supporting documentation.

(4) To ensure that the development will be constructed/operated in a manner that will minimise impacts upon the environment.

Advisory Conditions:

(1) **Plan Compliance** – The development consent requires compliance with the approved plans and documents that form part of the approval. Specific conditions of consent are also to be complied with, and amendments to achieve compliance with conditions of the consent are permitted.

All other modifications to plans and documents need to be confirmed with either Council or the certifying authority for the development. Changes to a development may require formal modification via Section 96 of the *Environmental Planning and Assessment Act, 1979*.

(2) **Shoring and Adequacy of Adjoining Property** – If the development involves an excavation that extends below the level of the base of the footings of a building on adjoining land, the person having the benefit of the development consent must, at the person's own expense:

- protect and support the adjoining premises from possible damage from the excavation, and
- where necessary, underpin the adjoining premises to prevent any such damage.

This requirement does not apply if the person having the benefit of the development consent owns the adjoining land or the owner of the adjoining land has given consent in writing to this condition not applying.

(3) **Erection of Signs** – A sign must be erected in a prominent position on any site on which building work, subdivision work or demolition work is being carried out:

a) showing the name, address and telephone number of the Principal Certifying Authority (PCA) for the work;
b) showing the name of the 'principal contractor' (if any) for any building work and a telephone number on which that person may be contacted outside working hours; and
c) stating that unauthorised entry to the work site is prohibited.

Any such sign is to be maintained while the building work, subdivision work or demolition work is being carried out, but must be removed when the work has been completed.

This clause does not apply to building work carried out inside an existing building that does not affect the external walls of the building.

The PCA and principal contractor must ensure that signs required by this condition are erected and maintained.

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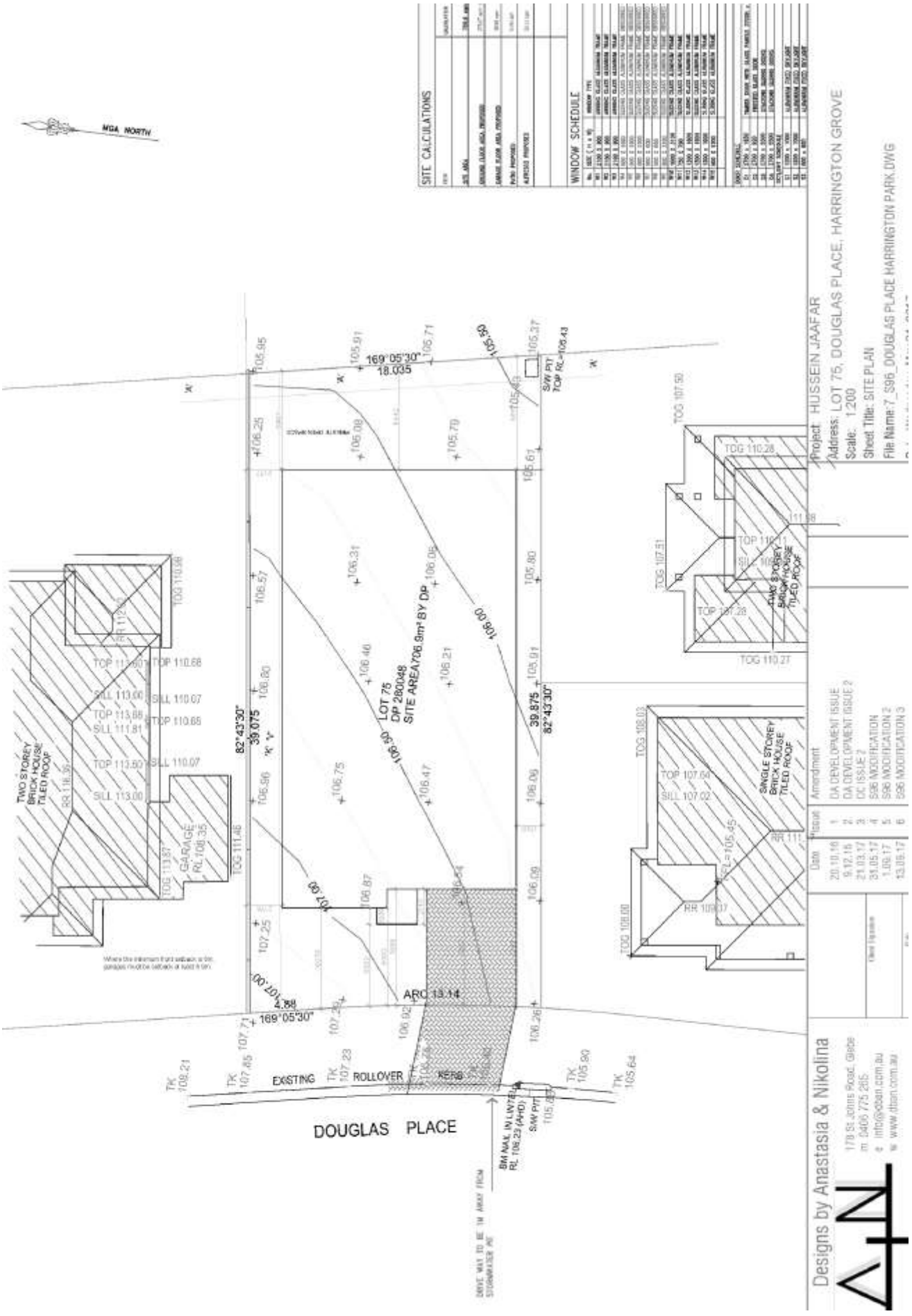
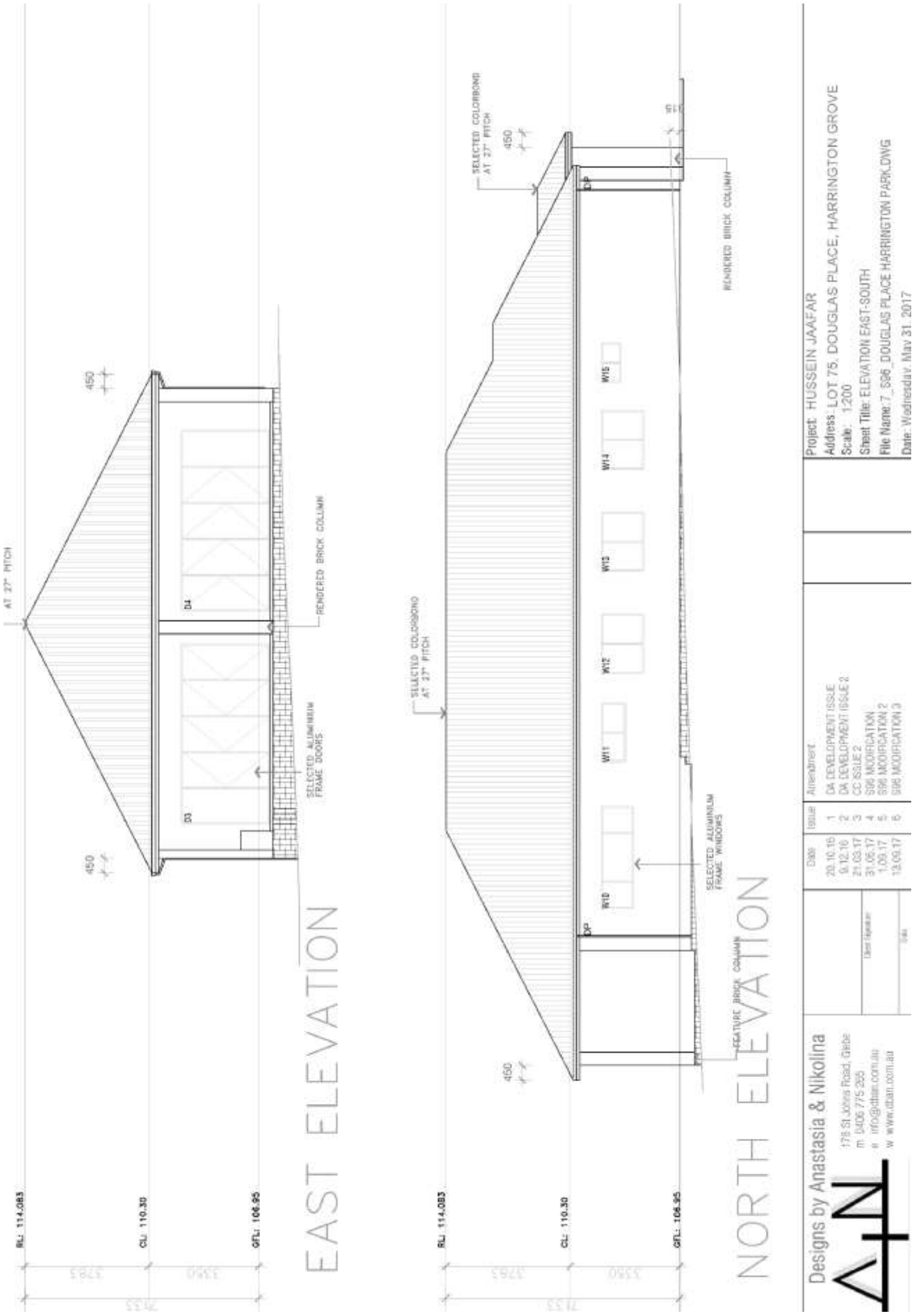
Attachment 2





Attachment 2

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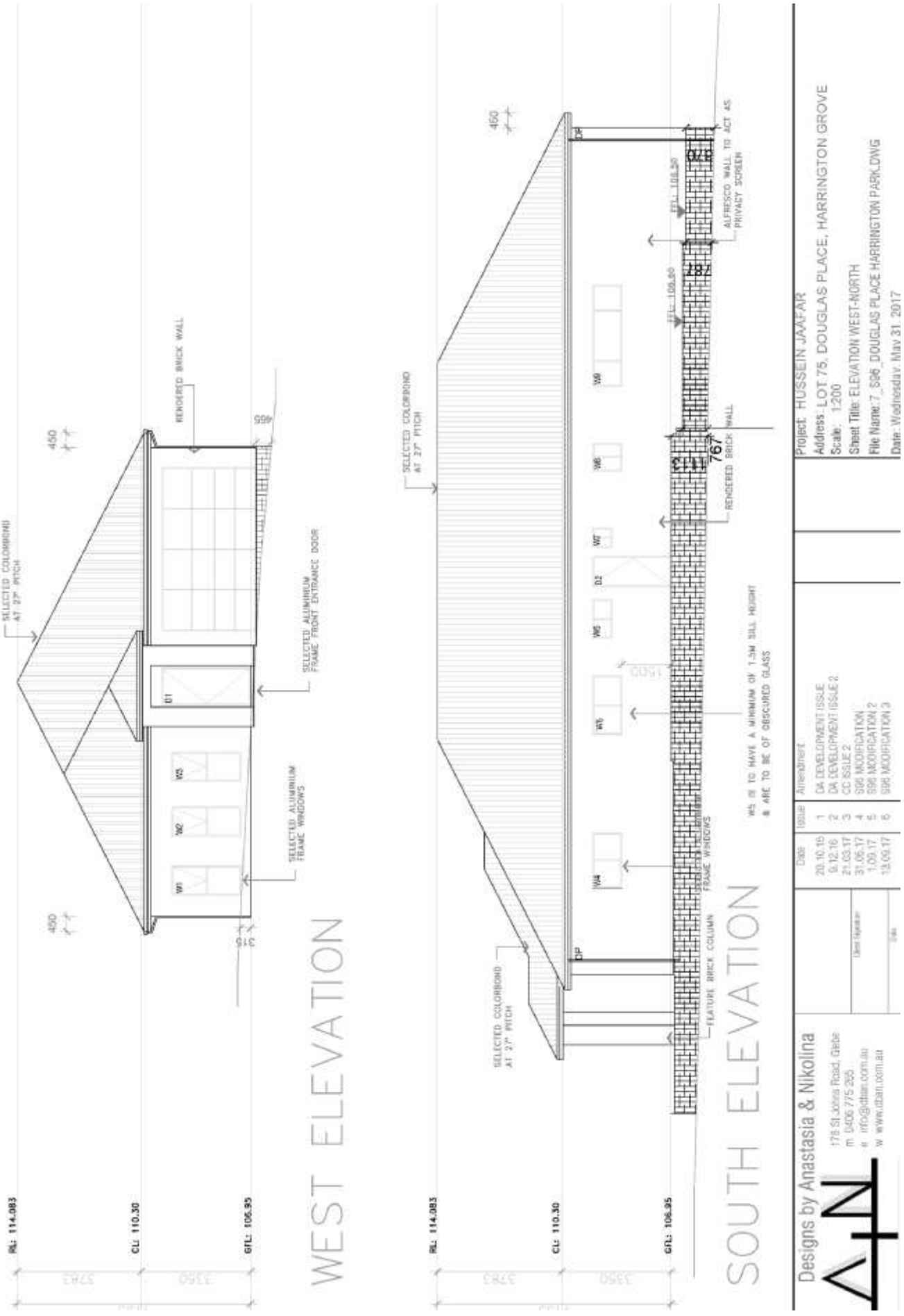
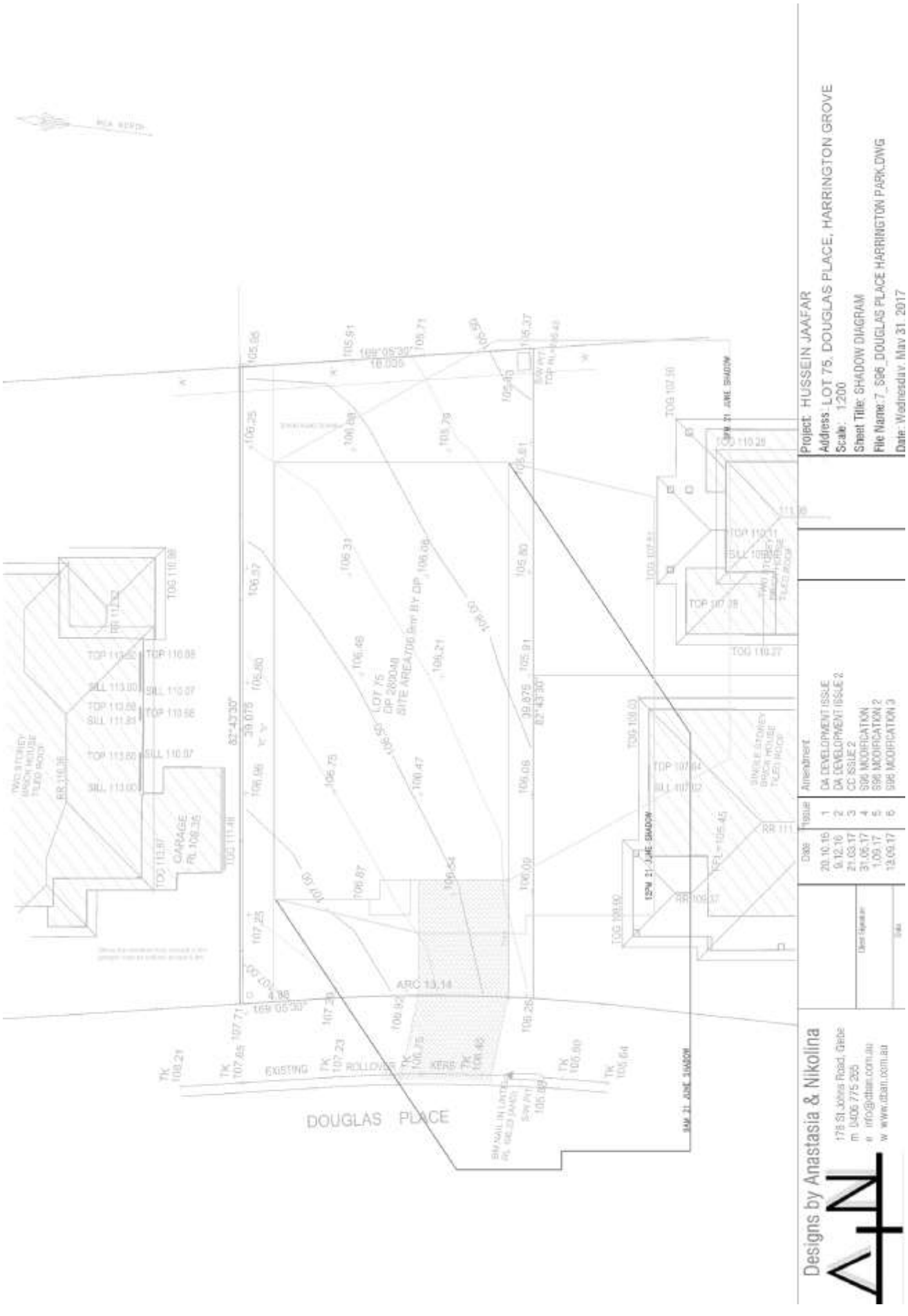
Attachment 2

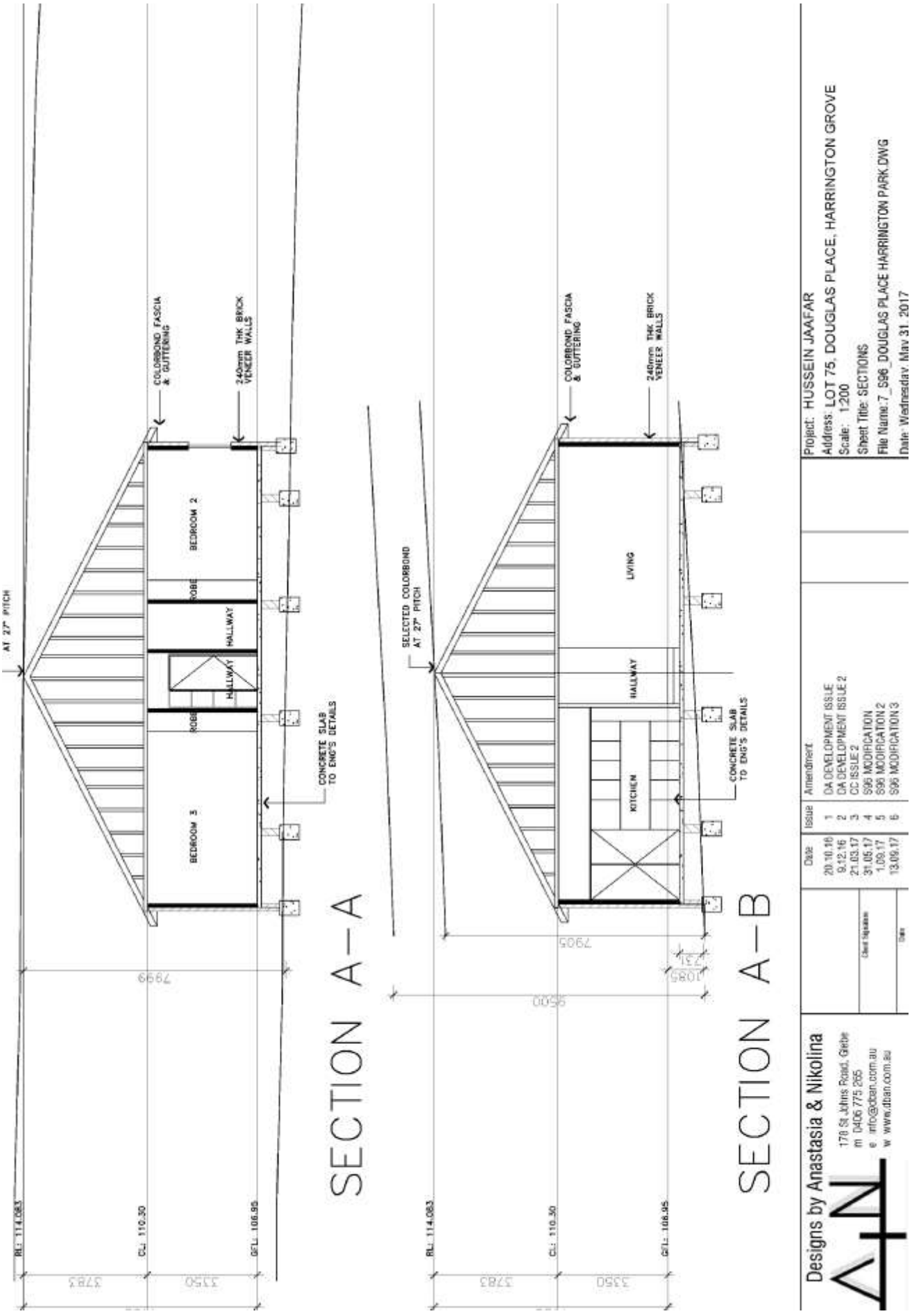




ORD01

Attachment 2

Attachment 2 **ORD01**



Attachment 1: Recommended Conditions of Consent

1.0 - General Conditions of Consent

The following conditions of consent are general conditions applying to the development.

(1) **Approved Plans and Documents** - Development shall be carried out in accordance with the following plans and documentation, and all recommendations made therein, except where amended by the conditions of this development consent:

Plan Reference/ Drawing No.	Description	Prepared by	Date
-	General Arrangement Plan	-	-
170110 - Sheet 1 of 2	Retaining Wall Plan View	D & M Consulting Pty Ltd	12 May 2017
170110 - Sheet 2 of 2	Retaining Walla Detail	D & M Consulting Pty Ltd	12 May 2017
-	Site Plan	Strategic Planning Committee	-

Document Title	Prepared by	Date
Waste Management Plan	-	-

(2) **Building Code of Australia** - All building work shall be carried out in accordance with the BCA. In this clause, a reference to the BCA is a reference to that Code as in force on the date the application for the relevant Construction Certificate is made.

(3) **Shoring and Adequacy of Adjoining Property Works** - If the approved development involves an excavation that extends below the level of the base of the footings of a building, structure or work on adjoining land, the person having the benefit of the consent shall, at the person's own expense:

a) protect and support the adjoining building, structure or work from possible damage from the excavation; and

b) where necessary, underpin the building, structure or work to prevent any such damage.

This condition does not apply if the person having the benefit of the consent owns the adjoining land or the owner of the adjoining land has given consent in writing to that condition not applying

A copy of the written consent must be provided to the PCA prior to the excavation commencing.

(4) **Engineering Specifications** - The entire development shall be designed and constructed in accordance with Council's Engineering Specifications.

(5) **Protect Existing Vegetation and Natural Landscape Features** - Approval must be sought from Council prior to the removal, pruning, impact upon or any disturbance of the existing vegetation and natural landscape features, other than any existing vegetation and/or natural landscape feature authorised for removal, pruning, impact upon or disturbance by this development consent.

The following procedures shall be strictly observed:

a) no additional works or access/parking routes, transecting the protected vegetation shall be undertaken without Council approval; and

b) pedestrian and vehicular access within and through the protected vegetation shall be restricted to Council approved access routes.

The protection of existing trees and other landscape features, other than any existing trees and natural landscape features authorised for removal, pruning, impact upon or disturbance by this Consent, must be carried out as specified in the Australian Standard AS 4970-2009 Protection of Trees on Development Sites.

All initial procedures for the protection of existing trees and landscape features, as detailed in AS 4970-2009, must be installed prior to the commencement of any earthworks, demolition, excavation or construction works on the Development site.

The works and procedures involved with the protection of existing trees and other landscape features, are to be carried out by suitable qualified and experienced persons or organisations.

(6) **Noxious Weeds Management** - Any noxious or environmentally invasive weed infestations that occur during or after works must be fully and continuously suppressed and destroyed by appropriate means. New infestations must be reported to Council.

Pursuant to the *Noxious Weeds Act 1993*, the applicant must at all times ensure that any machinery, vehicles or other equipment entering or leaving the site are clean and free from any noxious weed material.

Earth moved containing noxious weed material must be disposed of at any approved waste management facility and be transported in compliance with the *Noxious Weeds Act 1993*.

2.0 – Prior to Issue of a Construction Certificate

The following conditions of consent shall be complied with prior to the issue of a Construction Certificate.

(1) **Structural Engineer's Details** - The piers/slabs/footings/structural elements shall be designed and certified by a suitably qualified structural engineer and shall take into consideration the recommendations of any geotechnical report applicable to the site. A statement to that effect shall be provided to the Certifying Authority.

(2) **Soil, Erosion, Sediment and Water Management** - An erosion and sediment control plan shall be prepared in accordance with Council's Engineering Specifications. Details demonstrating compliance shall be provided to the Certifying Authority with the Construction Certificate application.

(3) **Damages Bonds** - The applicant is to lodge a bond with Council to ensure any damage to existing public infrastructure is rectified in accordance with Council's Development Infrastructure Bonds Policy.

Note – An administration fee is payable upon the lodgement of a bond with Council.

3.0 - Prior to Commencement of Works

The following conditions of consent shall be complied with prior to any works commencing on the development site.

(1) **Notice of PCA Appointment** - Notice shall be given to Council at least two (2) days prior to subdivision and/or building works commencing in accordance with Clause 103 of the EP&A Regulation 2000. The notice shall include:

a) a description of the work to be carried out;

b) the address of the land on which the work is to be carried out;

c) the registered number and date of issue of the relevant development consent;

d) the name and address of the PCA, and of the person by whom the PCA was appointed;

e) if the PCA is an accredited certifier, his, her or its accreditation number, and a statement signed by the accredited certifier consenting to being appointed as PCA; and

f) a telephone number on which the PCA may be contacted for business purposes.

(2) **Notice of Commencement of Work** - Notice shall be given to Council at least two (2) days prior to subdivision and/or building works commencing in accordance with Clause 104 of the EP&A Regulation 2000. The notice shall include:

a) the name and address of the person by whom the notice is being given;

b) a description of the work to be carried out;

c) the address of the land on which the work is to be carried out;

d) the registered number and date of issue of the relevant development consent and construction certificate;

e) a statement signed by or on behalf of the PCA/developer (only where no PCA is required) to the effect that all conditions of the consent that are required to be satisfied prior to the work commencing have been satisfied; and

f) the date on which the work is intended to commence.

(3) **Construction Certificate Required** - In accordance with the provisions of Section 81A of the *EP&A Act 1979*, construction or subdivision works approved by this consent shall not commence until the following has been satisfied:

a) a Construction Certificate has been issued by a Certifying Authority;

b) a Principal Certifying Authority (PCA) has been appointed by the person having benefit of the development consent in accordance with Section 109E of the *EP&A Act 1979*;

c) if Council is not the PCA, Council is notified of the appointed PCA at least two (2) days before building work commences;

d) the person having benefit of the development consent notifies Council of the intention to commence building work at least two (2) days before building work commences; and

e) the PCA is notified in writing of the name and contractor licence number of the owner/builder intending to carry out the approved works.

(4) **Sign of PCA and Contact Details** - A sign shall be erected in a prominent position on the site stating the following:

a) that unauthorised entry to the work site is prohibited;

b) the name of the principal contractor (or person in charge of the site) and a telephone number on which that person can be contacted at any time for business purposes and outside working hours; and

c) the name, address and telephone number of the PCA.

The sign shall be maintained while the work is being carried out, and shall be removed upon the completion of works.

(5) **Site is to be Secured** - The site shall be secured and fenced.

(6) **Soil Erosion and Sediment Control** - Soil erosion and sediment controls must be implemented prior to works commencing on the site in accordance with 'Managing Urban Stormwater – Soils and Construction ('the blue book') and any Sediment and Erosion plans approved with this development consent.

4.0 - During Works

The following conditions of consent shall be complied with during the construction phase of the development.

(1) **Approved and Prepared Plans and Reports to be Complied With** - All plans and reports approved by, and required to be prepared by this development consent, must be complied with.

(2) **Construction Hours** - All work (including delivery of materials) shall be restricted to the hours of 7.00am to 5.00pm Monday to Saturday inclusive. Work is not to be carried out on Sundays or Public Holidays.

(3) **Compliance with BCA** - All building work shall be carried out in accordance with the requirements of the BCA.

(4) **Site Management** - The following practices are to be implemented during construction:

a) stockpiles of topsoil, sand, aggregate, spoil or other material shall be kept clear of any drainage path, easement, natural watercourse, kerb or road surface and shall have measures in place to prevent the movement of such material off site;

b) builder's operations such as brick cutting, washing tools, concreting and bricklaying shall be confined to the building allotment. All pollutants from these activities shall be contained on site and disposed of in an appropriate manner;

c) waste shall not be burnt or buried on site or any other properties, nor shall wind-blown rubbish be allowed to leave the site. All waste shall be disposed of at a licenced waste disposal facility;

d) a waste control container shall be located on the site;

e) all building materials, plant, equipment and waste control containers shall be placed on the building site. Building materials, plant and equipment (including water closets), shall not to be placed on public property (footpaths, roadways, public reserves, etc);

f) toilet facilities shall be provided at, or in the vicinity of, the work site at the rate of 1 toilet for every 20 persons or part thereof employed at the site. Each toilet shall:

i) be a standard flushing toilet connected to a public sewer; or

ii) have an on-site effluent disposal system approved under the *Local Government Act 1993*; or

iii) be a temporary chemical closet approved under the *Local Government Act 1993*.

(5) **Vehicles Leaving the Site** - The construction supervisor must ensure that:

a) all vehicles transporting material from the site cover such material so as to minimise sediment transfer;

b) the wheels of vehicles leaving the site:

iv) do not track soil and other waste material onto any public road adjoining the site; and

v) fully traverse the site's stabilised access point.

(6) **Removal of Waste Materials** - Where there is a need to remove any identified materials from the site that contain fill/rubbish/asbestos, the waste material shall be assessed and classified in accordance with the NSW EPA Waste Classification Guidelines 2014 (refer to: www.epa.nsw.gov.au/wasteregulation/classify-guidelines.htm)

Once assessed, the materials shall be disposed of to a licensed waste facility suitable for that particular classification of waste. Copies of tipping dockets shall be retained and supplied to Council upon request.

(7) **Soil, Erosion, Sediment and Water Management – Implementation** - All requirements of the erosion and sediment control plan and/or soil and water management plan shall be maintained at all times during the works and any measures required by the plan shall not be removed until the site has been stabilised.

(8) **Noise During Work** - Noise levels emitted during works shall be restricted to comply with the construction noise control guidelines set out in Chapter 171 of the NSW Environment Protection authority's Environmental Noise Control Manual.

(9) **Location of Stockpiles** - Stockpiles of soil shall not be located on / near any drainage lines or easements, natural watercourses or water bodies, footpath or roadway without first providing suitable protective measures adequate to protect these water bodies. All stockpiles of contaminated materials shall be suitably covered to prevent dust and odour nuisance.

(10) **Fill** – No fill is to be imported to the site.

(11) **Offensive Noise, Dust, Odour and Vibration** - All work shall not give rise to offensive noise, dust, odour or vibration as defined in the *Protection of the Environment Operations Act 1997* when measured at the property boundary.

(12) **Erosion and Sedimentation Control** - Soil erosion and sedimentation controls are required to be maintained for the duration of the works. The controls must be undertaken in accordance with version 4 of the Soils and Construction – Managing Urban Stormwater manual (Blue Book).

Soil erosion and sediment control measures shall only be removed upon completion of the works when all landscaping and disturbed surfaces have been stabilised (for example, with site turfing, paving or re-vegetation).

(13) **Unexpected Finds Contingency (General)** - Should any suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos, ash material, etc.) be encountered during any stage of works (including earthworks, site preparation or construction works, etc.), such works shall cease immediately until a qualified environmental specialist has be contacted and conducted a thorough assessment.

In the event that contamination is identified as a result of this assessment and if remediation is required, all works shall cease in the vicinity of the contamination and Council shall be notified immediately.

Where remediation work is required, the applicant will be required to obtain consent for the remediation works.

(14) **Unexpected Finds Contingency (Heritage)** - In the event that an Archaeological object having interest due to its age or association with the past is uncovered during the course of the work:

(a) All work must stop immediately in that area, and

(b) The Office of Environment and Heritage must be advised of the discovery.

Depending on the significance of the object uncovered, an archaeological assessment and excavation permit under the Heritage Act 1997 may be required before further the work can continue.

5.0 - Prior to Issue of an Occupation Certificate

The following conditions of consent shall be complied with prior to the issue of an Occupation Certificate.

(1) **Waste Management Plan** - The PCA shall ensure that all works have been completed in accordance with the approved waste management plan referred to in this development consent.

(2) **Occupation Certificate Required**- An Occupation Certificate shall be obtained prior to any use or occupation of the development.

Reasons for Conditions:

(1) To ensure that the development complies with statutory requirements including the *Environmental Planning and Assessment Act 1979*, the Environmental Planning and Assessment Regulation 2000, the Building Code of Australia and applicable Australian Standards.

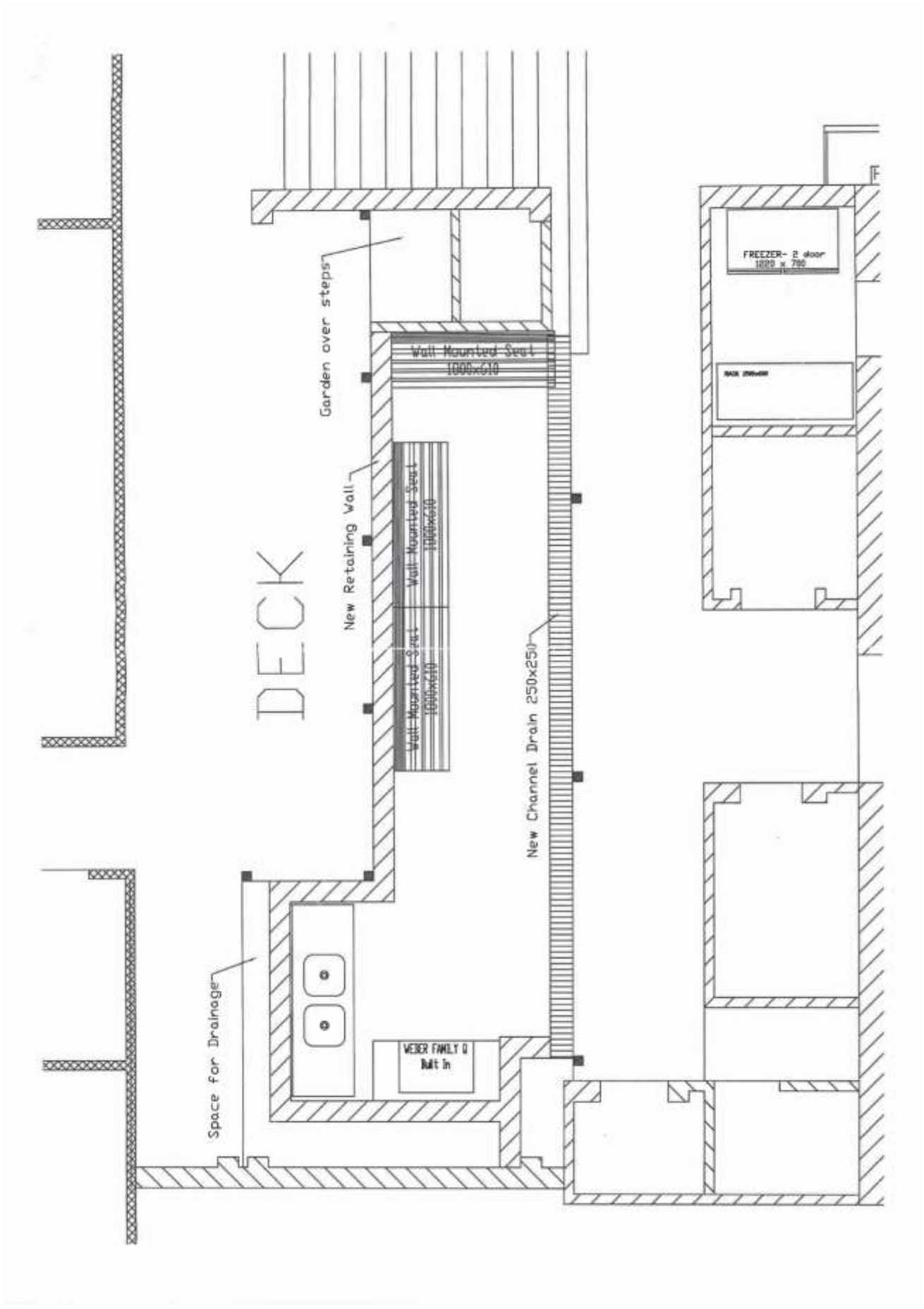
(2) To ensure that the development meets the aims, objectives and requirements of the environmental planning instruments, development controls plans, Council policies and Section 94 contribution plans that apply to the site and development.

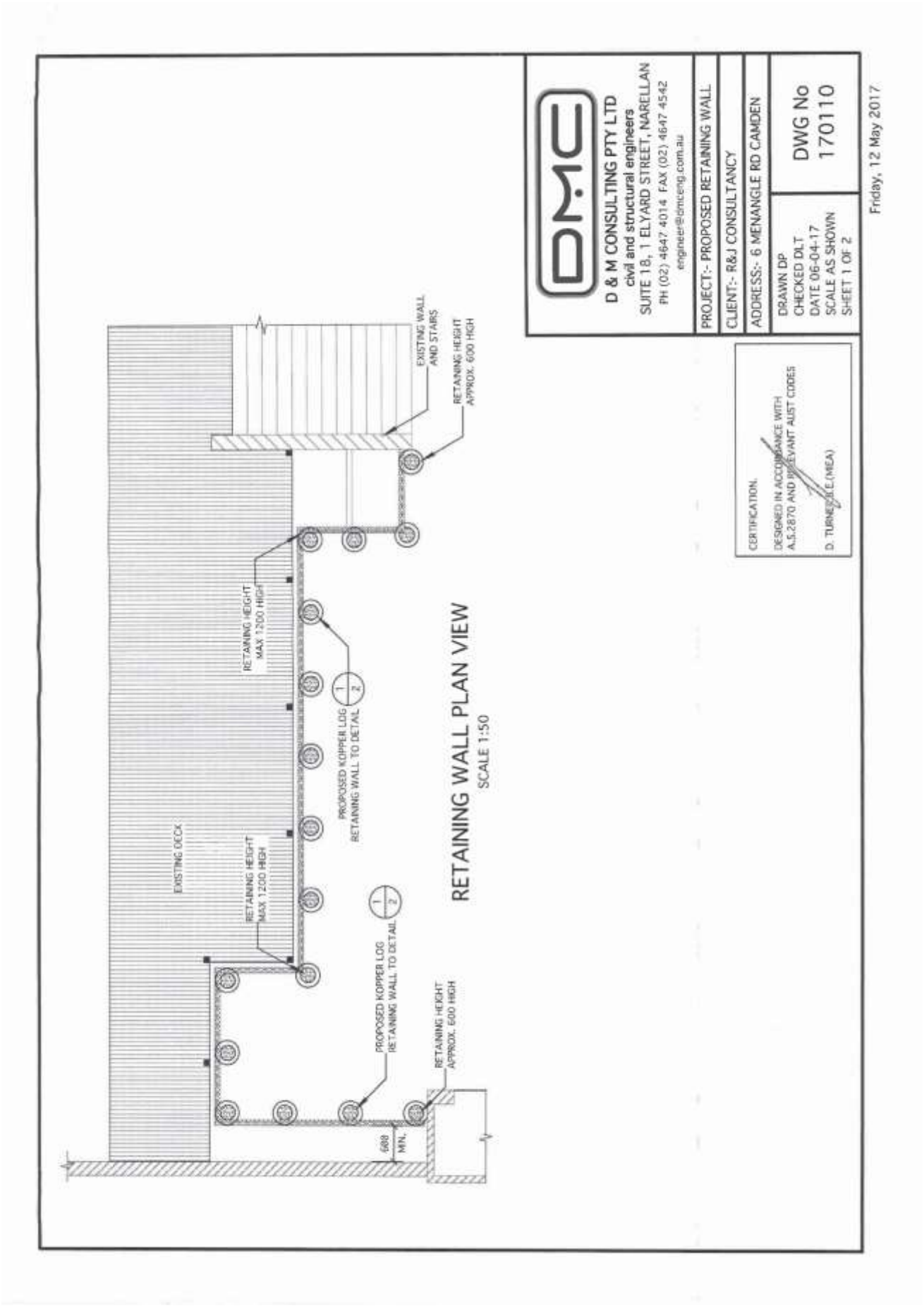
(3) To ensure that the development complies with the submitted plans and supporting documentation.

(4) To ensure that the development will be constructed/operated in a manner that will minimise impacts upon the environment.

Advisory Conditions:

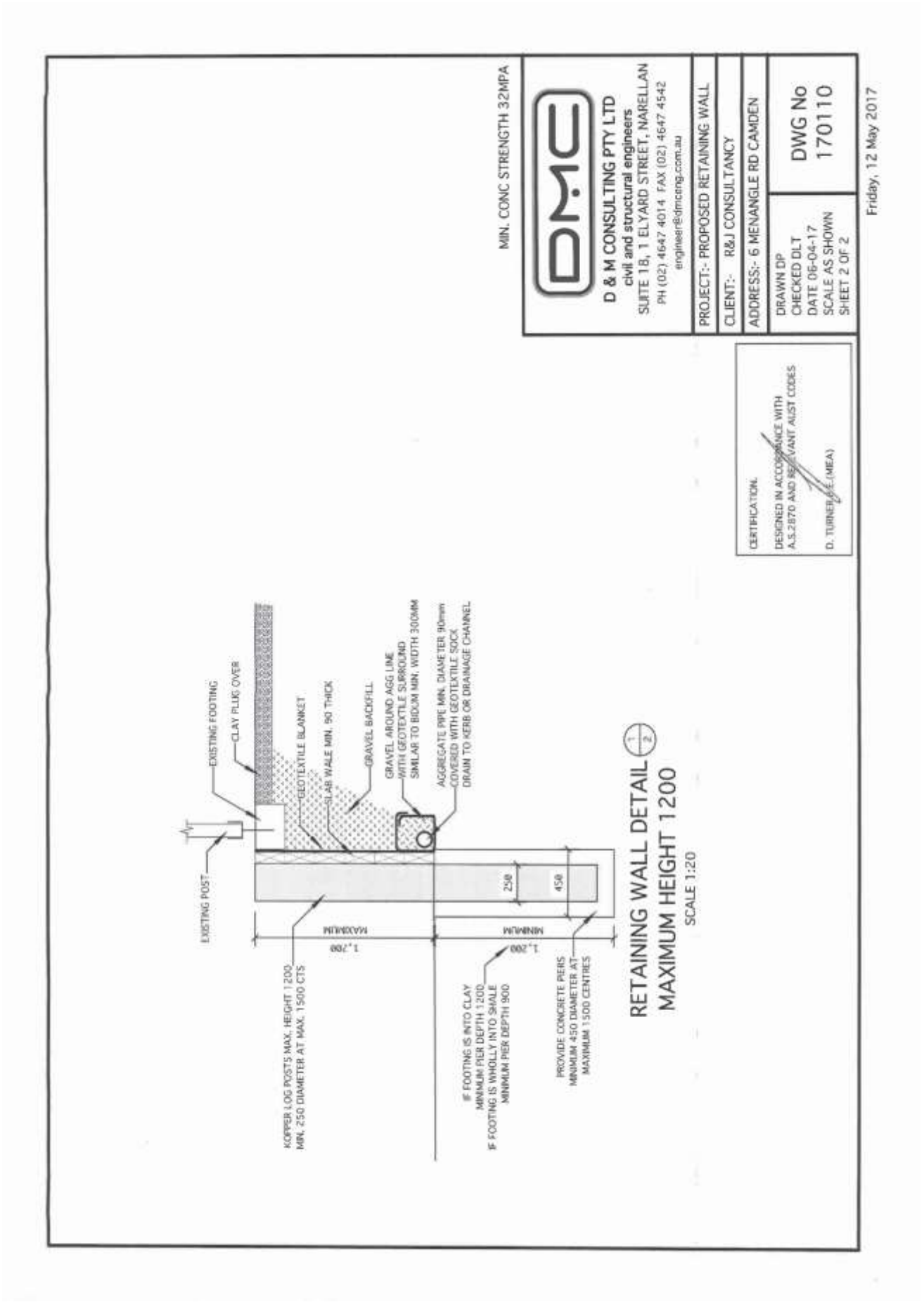
nil


Garden over steps
Wall Mounted Seat
1000x610
New Retaining Wall
DECK
Wall Mounted Seat
1000x610
Wall Mounted Seat
1000x610
New Channel Drain 250x250
FREEZER- 2 door
1200 x 700
Space for Drainage
WEBER FAMILY Q
Built In


RETAINING WALL PLAN VIEW
SCALE 1:50
EXISTING DECK
RETAINING HEIGHT MAX 1200 HIGH
PROPOSED KOPPER LOG RETAINING WALL TO DETAIL
RETAINING HEIGHT MAX 1200 HIGH
EXISTING WALL AND STAIRS
RETAINING HEIGHT APPROX. 600 HIGH
PROPOSED KOPPER LOG RETAINING WALL TO DETAIL
RETAINING HEIGHT APPROX. 600 HIGH
600 MIN.
D & M CONSULTING PTY LTD
civil and structural engineers
SUITE 18, 1 ELYARD STREET, NARELLAN
PH (02) 4647 4014 FAX (02) 4647 4542
engineer@dmceng.com.au
PROJECT:- PROPOSED RETAINING WALL
CLIENT:- R&J CONSULTANCY
ADDRESS:- 6 MENANGLE RD CAMDEN
DRAWN DP
CHECKED DLT
DATE 06-04-17
SCALE AS SHOWN
SHEET 1 OF 2
DWG No 170110
CERTIFICATION.
DESIGNED IN ACCORDANCE WITH A.S.2870 AND RELEVANT AUST CODES
D. TURNER B.E.(MEA)
Friday, 12 May 2017

ORD02

Attachment 2



St John's Anglican Church
CAMDEN
Putting lives on the right track

Retaining Wall
excavation

(PROPOSAL)

Prepared by the
Strategic Planning Committee

Details of Conditions:

1.0 - General Conditions of Consent

The following conditions of consent are general conditions applying to the development.

(1) **Approved Plans and Documents** - Development shall be carried out in accordance with the following plans and documentation, and all recommendations made therein, except where amended by the conditions of this development consent:

Plan Reference/ Drawing No.	Name of Plan	Prepared by	Date
Project No. 4595, Sheet A01, Issue F	A01 – Site/Analysis & Ground Floor Plan	Algorry Zappia & Associates Pty Ltd	20 September 2017
Project No. 4595, Sheet A02, Issue	A02 – Elevations & Sections	Algorry Zappia & Associates Pty Ltd	22 August 2017
Drawing No. 58-16.00, 01 and 02 Issue C	Landscape Plans	Distinctive Living Design	21 August 2017

Document Title	Prepared by	Date
Statement of Environmental Effects	C.C. Weston & Associates	February 2017
Acoustic Report	Sebastian Giglio	August 2017

(2) **Separate Approval for Signs** - A separate development application for any proposed signs shall be provided to, and approved by, the Consent Authority prior to the erection or display of those signs (unless the erection or display of those signs is exempt or complying development pursuant to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

(3) **Building Code of Australia** - All building work shall be carried out in accordance with the BCA. In this clause, a reference to the BCA is a reference to that Code as in force on the date the application for the relevant Construction Certificate is made.

(4) **Works in Road Reserves** - Where any works are proposed in a public road reservation, a Road Opening Permit shall be obtained from Council in accordance with Section 138 of the *Roads Act 1993* prior to works commencing.

(5) **Engineering Specifications** - The entire development shall be designed and constructed in accordance with Council's Engineering Specifications.

(6) **Reflectivity** - The reflectivity of glass index for all glass used externally shall not exceed 20%.

(7) **Acoustic Compliance Report** – A report shall be prepared by an independent acoustic consultant (not previously involved with this proposal). The Compliance Assessment is to be carried out at the time the centre achieves 80% attendance

rates. The report is to be assessed against the criteria outline in the approved Acoustic Assessment prepared by Sebastian Giglio and dated August 2017.

For any non-compliance, the acoustic compliance report must make recommendations for compliance or further attenuation of noise sources and these recommendations will be enforced by Council at the cost of the owner / occupier. The owner / occupier must then provide a supplementary acoustic report to Council certifying that all compliance works have been completed and that noise levels comply with the above criteria.

2.0 – Prior to Issue of a Construction Certificate

The following conditions of consent shall be complied with prior to the issue of a Construction Certificate.

(1) **Traffic Management Plan** - A Traffic Management Plan (TMP) shall be prepared in accordance with Council's Engineering Specifications and AS 1742.3. Details demonstrating compliance shall be provided to the Certifying Authority with the Construction Certificate application.

(2) **Dilapidation Report – Council Property** - A Dilapidation Report prepared by a suitably qualified person, including a photographic survey of existing public roads, kerbs, footpaths, drainage structures, street trees and any other existing public infrastructure within the immediate area of the subject site. Details demonstrating compliance shall be provided to the Certifying Authority prior to issue of a Construction Certificate.

(3) **Structural Engineer's Details** - The piers/slabs/footings/structural elements shall be designed and certified by a suitably qualified structural engineer and shall take into consideration the recommendations of any geotechnical report applicable to the site. A statement to that effect shall be provided to the Certifying Authority.

(4) **External Walls and Cladding Flammability** – The external walls of the building, including attachments, must comply with the relevant requirements of the National Construction Code (NCC). Prior to the issue of a Construction Certificate the Certifying Authority must:

a) be satisfied that suitable evidence is provided to demonstrate that the products and systems proposed for use in the construction of external walls, including finishes and claddings such as synthetic or aluminium composite panels, comply with the relevant requirements of the NCC; and

b) ensure that the documentation relied upon in the approval processes includes an appropriate level of detail to demonstrate compliance with the NCC as proposed.

(5) **Civil Engineering Plans** - Civil engineering plans indicating drainage, roads, accessways, earthworks, pavement design, details of line-marking, traffic management, water quality and quantity facilities including stormwater detention and disposal, shall be prepared in accordance with the approved plans and Council's Engineering Design and Construction Specifications. Details demonstrating compliance shall be provided to the Certifying Authority with the Construction Certificate application.

A stormwater plan is to be submitted to the Certifying Authority prior to the augmentation of the existing drainage system to accommodate drainage from the

approved development and to protect other property to the satisfaction of the Certifying Authority.

Note – Under the *Roads Act 1993*, only the Roads Authority can approve commencement of works within an existing road reserve.

(6) **Soil, Erosion, Sediment and Water Management** - An erosion and sediment control plan shall be prepared in accordance with Council's Engineering Specifications. Details demonstrating compliance shall be provided to the Certifying Authority with the Construction Certificate application.

(7) **Detailed Landscape Plan** - A detailed landscape plan must be prepared in accordance with Council's Engineering Specifications. Details demonstrating compliance shall be provided to the Certifying Authority.

(8) **Long Service Levy** - In accordance with Section 34 of the *Building and Construction Industry Long Service Payments Act 1986*, the applicant shall pay a long service levy at the prescribed rate to either the Long Service Payments Corporation or Council for any building work that cost $25,000 or more.

(9) **Damages Bonds** - The applicant is to lodge a bond with Council to ensure any damage to existing public infrastructure is rectified in accordance with Council's Development Infrastructure Bonds Policy.

Note – An administration fee is payable upon the lodgement of a bond with Council.

(10) **Acoustic Report** - The development shall be constructed in accordance with Proposed Childcare at Lot 5314 DP 1210459 No. 36 Rosecomb Road and Lot 5315 DP 1210459 No. 37 Danvers Road, Spring Farm – Acoustic Report (Ref No. 2737/D07) prepared by Sebastian Giglio Acoustic Consultant dated August 2017. Details demonstrating compliance shall be provided to the Certifying Authority with the Construction Certificate application. Required measures are to include the following:

- Windows to western facade – Windows on the western façade are to be fixed glass (minimum 6.38mm laminated) or glass bricks in accordance with Figure 4-5 of the approved Acoustic report.
- Acoustic absorption panels – Acoustic absorption panels are to be installed to the ceiling and walls of each playroom as outlined in Section 5 of the approved Acoustic Assessment.
- Acoustic treatment to awnings – The underside of all proposed awnings are to be treated as per Figure 4.2 of the approved Acoustic Assessment.
- Acoustic noise barriers – Acoustic noise barriers are to be constructed in accordance with Figure 4.1 of the approved acoustic assessment. All barriers are to be constructed as per Option B of Figure 4.3 'Proposed Noise Barrier Design to Outdoor Play Areas'.
- Mechanical plant – Mechanical plant and equipment is to be installed and operated in accordance with the guidelines outlined in Section 7 of the approved Acoustic Assessment.

(11) **Lighting Plan** - A detailed lighting plan shall be submitted to the Certifying Authority prior to the issue of the Construction Certificate for building works. The plan must demonstrate that the orientation and intensity of lights will comply with the Australian

Standard 4282-1997 "Control of the obtrusive effects of outdoor lighting" for residential receivers.

3.0 - Prior to Commencement of Works

The following conditions of consent shall be complied with prior to any works commencing on the development site.

(1) **Public Liability Insurance** - The owner or contractor shall take out a Public Liability Insurance Policy with a minimum cover of $20 million in relation to the occupation of, and works within, public property (i.e. kerbs, gutters, footpaths, walkways, reserves, etc) for the full duration of the proposed works. Evidence of this Policy shall be provided to Council and the Certifying Authority.

(2) **Notice of PCA Appointment** - Notice shall be given to Council at least two (2) days prior to subdivision and/or building works commencing in accordance with Clause 103 of the EP&A Regulation 2000. The notice shall include:

a) a description of the work to be carried out;

b) the address of the land on which the work is to be carried out;

c) the registered number and date of issue of the relevant development consent;

d) the name and address of the PCA, and of the person by whom the PCA was appointed;

e) if the PCA is an accredited certifier, his, her or its accreditation number, and a statement signed by the accredited certifier consenting to being appointed as PCA; and

f) a telephone number on which the PCA may be contacted for business purposes.

(3) **Notice of Commencement of Work** - Notice shall be given to Council at least two (2) days prior to subdivision and/or building works commencing in accordance with Clause 104 of the EP&A Regulation 2000. The notice shall include:

a) the name and address of the person by whom the notice is being given;

b) a description of the work to be carried out;

c) the address of the land on which the work is to be carried out;

d) the registered number and date of issue of the relevant development consent and construction certificate;

e) a statement signed by or on behalf of the PCA/developer (only where no PCA is required) to the effect that all conditions of the consent that are required to be satisfied prior to the work commencing have been satisfied; and

f) the date on which the work is intended to commence.

(4) **Construction Certificate Required** - In accordance with the provisions of Section 81A of the *EP&A Act 1979*, construction or subdivision works approved by this consent shall not commence until the following has been satisfied:

a) a Construction Certificate has been issued by a Certifying Authority;

b) a Principal Certifying Authority (PCA) has been appointed by the person having benefit of the development consent in accordance with Section 109E of the *EP&A Act 1979*;

c) if Council is not the PCA, Council is notified of the appointed PCA at least two (2) days before building work commences;

d) the person having benefit of the development consent notifies Council of the intention to commence building work at least two (2) days before building work commences; and

e) the PCA is notified in writing of the name and contractor licence number of the owner/builder intending to carry out the approved works.

(5) **Sign of PCA and Contact Details** - A sign shall be erected in a prominent position on the site stating the following:

a) that unauthorised entry to the work site is prohibited;

b) the name of the principal contractor (or person in charge of the site) and a telephone number on which that person can be contacted at any time for business purposes and outside working hours; and

c) the name, address and telephone number of the PCA.

The sign shall be maintained while the work is being carried out, and shall be removed upon the completion of works.

(6) **Sydney Water Approval** – The approved construction certificate plans must also be approved by Sydney Water to determine if sewer, water or stormwater mains or easements will be affected by any part of the development. Go to www.sydneywater.com/tapin to apply.

A copy of the approval receipt from Sydney Water must be submitted to the PCA.

(8) **Soil Erosion and Sediment Control** - Soil erosion and sediment controls must be implemented prior to works commencing on the site in accordance with 'Managing Urban Stormwater – Soils and Construction ('the blue book') and any Sediment and Erosion plans approved with this development consent.

(9) **Traffic Management Plan** - A traffic management plan shall be prepared in accordance with Council's Engineering Specifications and AS 1742.3. The plan must be submitted to the PCA.

(10) **Construction Waste Management Plan** - A construction waste management plan must be prepared for all construction work on the site. The plan must incorporate the concept of recycling and reuse where practicable, include the requirement to dispose of material not suitable for reuse or recycling at a licenced waste facility. The plan must be kept on site for compliance until the completion of all construction works.

(11) **Environmental Management Plan** - An environmental management plan (EMP) prepared in accordance with Council's Engineering Design Specification shall be provided to the PCA.

The EMP shall address the manner in which site operations are to be conducted and monitored to ensure that adjoining land uses and the natural environment are not unacceptably impacted upon by the proposal. The EMP shall include but not be necessarily limited to the following measures:

a) measures to control noise emissions from the site;

b) measures to suppress odours and dust emissions;

c) soil and sediment control measures;

d) measures to control air emissions that includes odour;

e) measures and procedures for the removal of hazardous materials that includes waste and their disposal;

f) any other recognised environmental impact;

g) work, health and safety; and

h) community consultation.

(12) **Protection of Existing Street Trees** - No existing nature strip, street tree, tree guard, protective bollard, garden bed surrounds or root barrier installation shall be disturbed, relocated, removed or damaged during earthworks, demolition, excavation (including any driveway installation), construction, maintenance and/or establishment works applicable to this consent, without Council agreement and/or consent.

The protection methods for existing nature strip, street tree, tree guard, protective bollard, garden bed surrounds or root barrier installation during all works approved by this development consent shall be installed in accordance with AS 4970-2009 Protection of Trees on Development Sites.

4.0 - During Works

The following conditions of consent shall be complied with during the construction phase of the development.

(1) **Approved and Prepared Plans and Reports to be Complied With** - All plans and reports approved by, and required to be prepared by this development consent, must be complied with.

(2) **Construction Hours** - All work (including delivery of materials) shall be restricted to the hours of 7.00am to 5.00pm Monday to Saturday inclusive. Work is not to be carried out on Sundays or Public Holidays.

(3) **Construction Noise Levels** - Noise levels emitted during construction works shall be restricted to comply with the construction noise control guidelines set out in

Chapter 171 of the NSW EPA's Environmental Noise Control Manual. This manual recommends;

Construction period of 4 weeks and under:

The L10 level measured over a period of not less than 15 minutes when the construction site is in operation must not exceed the background level by more than 20 dB(A).

Construction period greater than 4 weeks:

The L10 level measured over a period of not less than 15 minutes when the construction site is in operation must not exceed the background level by more than 10 dB(A).

(4) **Compliance with BCA** - All building work shall be carried out in accordance with the requirements of the BCA.

(5) **Site Management** - The following practices are to be implemented during construction:

a) stockpiles of topsoil, sand, aggregate, spoil or other material shall be kept clear of any drainage path, easement, natural watercourse, kerb or road surface and shall have measures in place to prevent the movement of such material off site;

b) builder's operations such as brick cutting, washing tools, concreting and bricklaying shall be confined to the building allotment. All pollutants from these activities shall be contained on site and disposed of in an appropriate manner;

c) waste shall not be burnt or buried on site or any other properties, nor shall wind-blown rubbish be allowed to leave the site. All waste shall be disposed of at a licenced waste disposal facility;

d) a waste control container shall be located on the site;

e) all building materials, plant, equipment and waste control containers shall be placed on the building site. Building materials, plant and equipment (including water closets), shall not to be placed on public property (footpaths, roadways, public reserves, etc);

f) toilet facilities shall be provided at, or in the vicinity of, the work site at the rate of 1 toilet for every 20 persons or part thereof employed at the site. Each toilet shall:

i) be a standard flushing toilet connected to a public sewer; or

ii) have an on-site effluent disposal system approved under the *Local Government Act 1993*; or

iii) be a temporary chemical closet approved under the *Local Government Act 1993*.

(6) **Survey Report** - The building shall be set out by a registered land surveyor. A peg out survey detailing the siting of the building in accordance with the approved plans shall be provided to the PCA prior to the pouring of concrete.

(7) **Traffic Management Plan Implementation** - All traffic management procedures and systems identified in the approved traffic management plan shall be introduced and maintained during construction of the development to ensure safety and to minimise the effect on adjoining pedestrian and traffic systems.

(8) **Site Signage** - A sign shall be erected at all entrances to the subdivision site and be maintained until the subdivision has been registered with Land and Property Information. The sign shall be constructed of durable materials, be a minimum of 1200mm x 900mm, and read as follows:

"WARNING UP TO $8,000 FINE. It is illegal to allow soil, cement slurry or other building materials to enter, drain or be pumped into the stormwater system. Camden Council (02 4654 7777) – Solution to Pollution."

The wording shall be a minimum of 120mm high and the remainder a minimum of 60mm high. The warning and fine details shall be in red bold capitals and the remaining words in dark coloured lower case letters on a white background, surrounded by a red border.

(9) **Soil, Erosion, Sediment and Water Management – Implementation** - All requirements of the erosion and sediment control plan and/or soil and water management plan shall be maintained at all times during the works and any measures required by the plan shall not be removed until the site has been stabilised.

(10) **Noise During Work** - Noise levels emitted during works shall be restricted to comply with the construction noise control guidelines set out in Chapter 171 of the NSW Environment Protection authority's Environmental Noise Control Manual.

(11) **Location of Stockpiles** - Stockpiles of soil shall not be located on / near any drainage lines or easements, natural watercourses or water bodies, footpath or roadway without first providing suitable protective measures adequate to protect these water bodies. All stockpiles of contaminated materials shall be suitably covered to prevent dust and odour nuisance.

(12) **Disposal of Stormwater** - Water seeping into any site excavations is not to be pumped into the stormwater system unless it complies with relevant EPA and ANZECC standards for water quality discharge.

(13) **Fill Material (VENM)** - Prior to the importation and/or placement of any fill material on the subject site, a validation report and sampling location plan for such material must be provided to and approved by the PCA.

The validation report and associated sampling location plan must:

a) be prepared by a person with experience in the geotechnical aspects of earthworks; and

b) be endorsed by a practising engineer with Specific Area of Practice in Subdivisional Geotechnics; and

c) be prepared in accordance with;

Virgin Excavated Natural Material (VENM):

i) the Department of Land and Water Conservation publication "Site investigation for Urban Salinity;" and

ii) the Department of Environment and Conservation - Contaminated Sites Guidelines "Guidelines for the NSW Site Auditor Scheme (Second Edition) - Soil Investigation Levels for Urban Development Sites in NSW."

d) confirm that the fill material;

i) provides no unacceptable risk to human health and the environment;
ii) is free of contaminants;

iii) has had salinity characteristics identified in the report, specifically the aggressiveness of salts to concrete and steel (refer Department of Land and Water Conservation publication "Site investigation for Urban Salinity");

iv) is suitable for its intended purpose and land use; and

v) has been lawfully obtained.

Sampling of VENM for salinity of fill volumes:

e) less than 6000m^3 - 3 sampling locations; and

f) greater than 6000m^3 - 3 sampling locations with 1 extra location for each additional 2000m^3 or part thereof.

For e) and f) a minimum of 1 sample from each sampling location must be provided for assessment.

Sampling of VENM for contamination and salinity must be undertaken in accordance with the following table:

Classification of Fill Material	No of Samples Per Volume	Volume of Fill (m^3)
Virgin Excavated Natural Material	1 (see Note)	1000 or part thereof

Note – Where the volume of each fill classification is less than that required above, a minimum of 2 separate samples from different locations must be taken.

(14) **Offensive Noise, Dust, Odour and Vibration** - All work shall not give rise to offensive noise, dust, odour or vibration as defined in the *Protection of the Environment Operations Act 1997* when measured at the property boundary.

(15) **Erosion and Sedimentation Control** - Soil erosion and sedimentation controls are required to be maintained for the duration of the works. The controls must be undertaken in accordance with version 4 of the Soils and Construction – Managing Urban Stormwater manual (Blue Book).

Soil erosion and sediment control measures shall only be removed upon completion of the works when all landscaping and disturbed surfaces have been stabilised (for example, with site turfing, paving or re-vegetation).

(16) **Unexpected Finds Contingency (General)** - Should any suspect materials (identified by unusual staining, odour, discolouration or inclusions such as building rubble, asbestos, ash material, etc.) be encountered during any stage of works (including earthworks, site preparation or construction works, etc.), such works shall cease immediately until a qualified environmental specialist has be contacted and conducted a thorough assessment.

In the event that contamination is identified as a result of this assessment and if remediation is required, all works shall cease in the vicinity of the contamination and Council shall be notified immediately.

Where remediation work is required, the applicant will be required to obtain consent for the remediation works.

(17) **Salinity Management Plan** - All approved development that includes earthworks, imported fill, landscaping, buildings and associated infrastructure must be carried out or constructed in accordance with the management strategies as contained within the report 'Contamination and Salinity Assessment Land at Springs Road, Spring Farm, NSW For Starhill Property Group and AV Jennings Properties Pty Ltd Report No. 14/2775 prepared by SMEC Testing Services Pty Ltd and dated December 2014'.

5.0 - Prior to Issue of an Occupation Certificate

The following conditions of consent shall be complied with prior to the issue of an Occupation Certificate.

(1) **Occupation Certificate Required**- An Occupation Certificate shall be obtained prior to any use or occupation of the development.

(2) **Fire Safety Certificates** - A Fire Safety Certificate shall be provided to the PCA in accordance with the requirements of the EP&A Regulation 2000.

(3) **Survey Certificate** - A registered surveyor shall prepare a Survey Certificate to certify that the location of the building in relation to the allotment boundaries complies with the approved plans or as specified by this consent. The Survey Certificate shall be provided to the satisfaction of the PCA.

(4) **External Walls and Cladding Flammability –** The external walls of the building, including attachments, must comply with the relevant requirements of the National Construction Code (NCC). Prior to the issue of an Occupation Certificate the Principal Certifying Authority must:

c) be satisfied that suitable evidence is provided to demonstrate that the products and systems used in the construction of external walls, including finishes and claddings such as synthetic or aluminium composite panels, comply with the relevant requirements of the NCC; and

d) ensure that the documentation relied upon in the approval processes includes an appropriate level of detail to demonstrate compliance with the NCC as built.

(6) **Waste Management Plan** - The PCA shall ensure that all works have been completed in accordance with the approved waste management plan referred to in this development consent.

(7) **Completion of Landscape Works** - All landscape works, including the removal of noxious weed species, are to be undertaken in accordance with the approved landscape plan and conditions of this development consent.

(8) **Waste Collection Contract** - The building owner shall ensure that there is a contract with a licensed contractor for the removal of all waste. A copy of the contract is to be held on the premises at all times.

(9) **Lot Consolidation** – Lots 5314 and 5315 are to be consolidated. A copy of the registered plan of consolidation shall be provided to the PCA.

(10) **Compliance with Acoustic Requirements** - Documentary evidence shall be provided to the PCA confirming the building/s has been constructed in accordance with the approved acoustic report Proposed Childcare at Lot 5314 DP 1210459 No. 36 Rosecomb Road and Lot 5315 DP 1210459 No. 37 Danvers Road, Spring Farm – Acoustic Report (Ref No. 2737/D07) prepared by Sebastian Giglio Acoustic Consultant dated August 2017.

(11) **Operational Plan of Management** – The applicant must prepare an Operational Plan of Management. A copy of the finalised Operational Plan of Management must be submitted with the Application for an Occupation Certificate and must include measures to address the following matters:

1. Numbers of staff;
2. Staff working hours;
3. The minimisation of impact on the nearby residents by traffic and parking associated with the development;
4. Child drop off and pick up procedures by vehicle;
5. Child check in and check out procedures;
6. Common area use;
7. Noise control;
8. Internal security procedures;
9. Public access to building and surrounds on site;
10. Delivery and service tradespeople access and their functioning within and around the building;
11. Emergency evacuation;
12. Measures to minimise / address littering;
13. Neighbourhood complaint management, including:
    - Maintaining and operating a complaints procedure and policy to deal with neighbour complaints;
    - Maintaining a neighbour complaints register, which is accessible to neighbours on a regular basis;
    - Ensure that any complaints management register is updated and maintained to ensure up to date contact details for the benefit of neighbours;
    - Procedure for dealing with neighbour complaints reasonably and efficiently; and
    - Regular evaluation and improvement of the complaints register and complaints management generally.

14. Compliance with relevant conditions of approval.

6.0 – Ongoing Use

The following conditions of consent are operational conditions applying to the development.

(1) **Maintenance of Landscaping** - Landscaping shall be maintained in accordance with the approved landscape plan.

(2) **Landscaping Maintenance Establishment Period** - Commencing from the date of practical completion, the applicant will have the responsibility to establish and maintain all hard and soft landscaping elements associated with this consent.

The 12 month maintenance and establishment period includes the applicant's responsibility for the establishment, care and repair of all landscaping elements including all street tree installations, plantings, lawn and hardscape elements including paths, walls, bins, seats, BBQs, shelters, playground equipment and soft fall treatments.

The date of practical completion is taken to mean completion of all civil works, soil preparation and treatment and initial weed control, and completion of all planting, turf installation, street tree installation and mulching.

At the completion of the 12 month landscaping maintenance and establishment period, all hard and soft landscaping elements (including any nature strip and road verge areas, street trees, street tree protective guards and bollards, etc) shall be in an undamaged, safe and functional condition and all plantings have signs of healthy and vigorous growth.

At the completion of the maintenance and establishment period, the landscaping works shall comply with the approved landscape plans and all improvements be in full working order.

(3) **Manoeuvring of Vehicles** - All vehicles shall enter and exit the site in a forward direction.

(4) **Removal of Graffiti** - The owner/manager of the site is responsible for the removal of all graffiti from the building and fences within 48 hours of its application.

(5) **Hours of Operation** - The property is only to be open for business and used for the purpose approved within the following hours:

Day	Hours of Operation
Monday	7.00am to 6.00pm
Tuesday	7.00am to 6.00pm
Wednesday	7.00am to 6.00pm
Thursday	7.00am to 6.00pm
Friday	7.00am to 6.00pm
Saturday	Closed
Sunday and Public Holidays	Closed

(6) **Security Gates** – The security gates servicing the car parking area shall be locked at all times the facility is closed to ensure that there is no unauthorised access to the premises at night or on weekends.

(7) **Storage of Goods** - The storage of goods and materials shall be confined within the building. At no time shall goods, materials or advertising signs be displayed or placed within the designated car parking spaces, landscaped areas or road reserve.

(8) **Amenity** - The approved development shall be conducted and patrons controlled at all times so that no interference occurs to the amenity of the area, the footpath, adjoining occupations or residential/business premises.

(9) **Parking Areas to be Kept Clear** - At all times, the loading, car parking spaces, driveways and footpaths shall be kept clear of goods and shall not be used for storage purposes.

(10) **Offensive Noise** - The use and occupation of the premises including all plant and equipment shall not give rise to any offensive noise within the meaning of the *Protection of the Environment Operations Act 1997* and shall comply with the NSW Industrial Noise Policy 2000 (as amended).

(11) **Food Premises** - All equipment (including pie warmers, hot food display units, etc) used for the display or storage of hot food shall maintain the food at a temperature of not less than 60°C.

All equipment used for the display or storage of cold food shall maintain the food at a temperature of not more than 5°C.

A food business must, at food premises where potentially hazardous food is handled, have a temperature measuring device (eg probe thermometer) that:

a) Is readily accessible; and
b) Can accurately measure the temperature of potentially hazardous food to +/- 1oC

A suitable waste contractor(s) must be engaged for the removal of wastes generated at the premises. All bins and waste storage facilities at the premises are to be sealed and emptied on a regular basis to prevent odour, vermin and fire hazards from occurring.

(12) **Number of Children** - The centre is approved to accommodate a maximum of forty (40) children. However this maximum number shall be reduced to any lower number of children that is separately approved for the centre by the Department of Education.

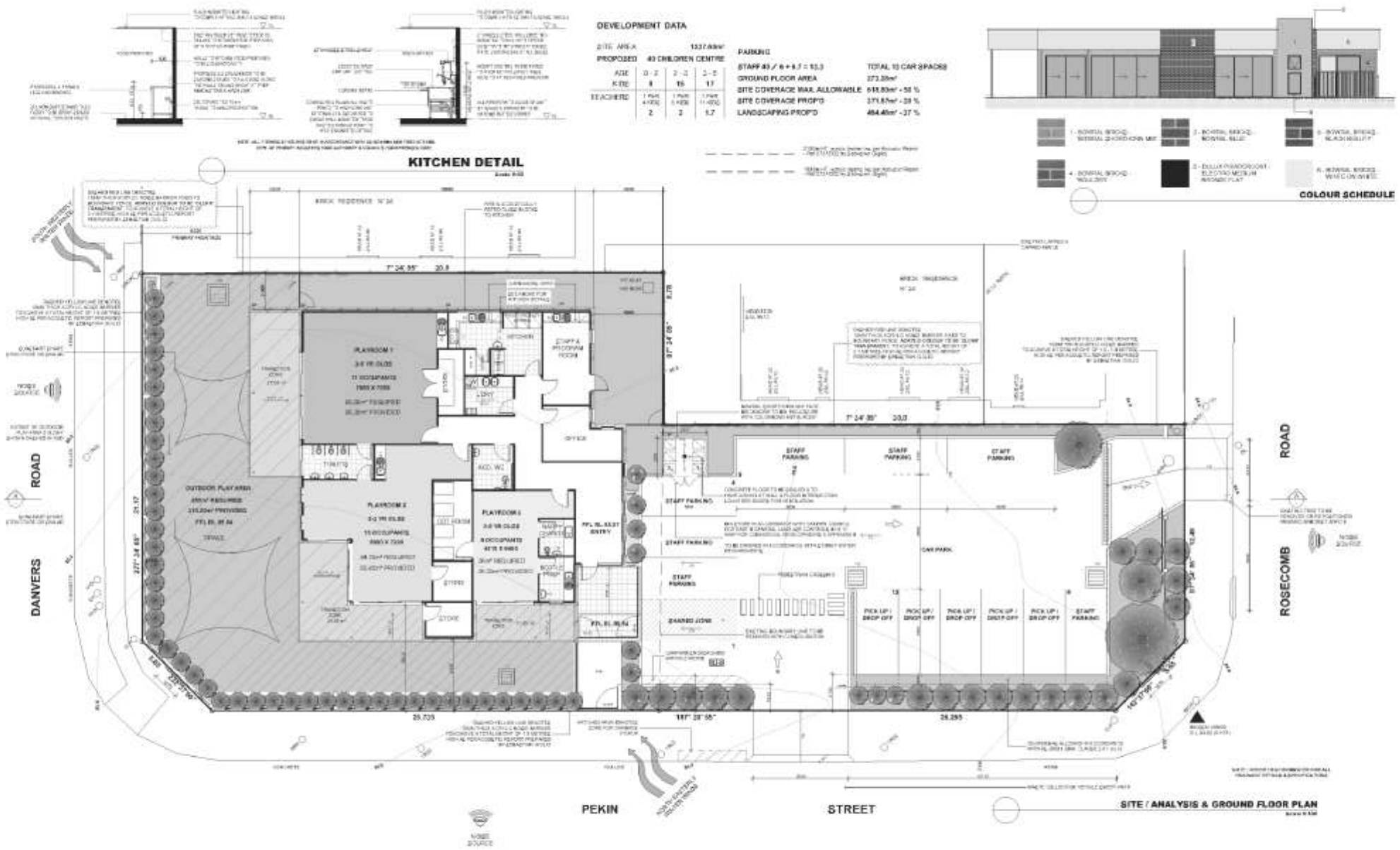
(13) **Amplified Music** – The use of amplified music in outdoor areas of the centre is prohibited.

(14) **Vehicle Movements** - All vehicle movements, deliveries and any other operations associated with the use of the premises must be restricted to approved hours of operation. Any alteration to these hours will require the prior approval of the Consent Authority.

(15) **Department of Education Approval** - The centre must comply with all requirements of the Department of Education. A letter from the Department of Education which details the approved number and age of children to be accommodated at the centre,

and any operational conditions, must be submitted to Council prior to the centre becoming operational.

Should the Department of Education approval be subsequently amended at any time the operator of the centre must submit a copy of the amended approval to Council.



ALGORRY ZAPPIA & ASSOCIATES

PROPOSED CHILD CARE CENTRE
LOTS 5314 & 5315, DP 1210465, ROSECOMB
& DANVERS, ROWAN & OWENS STREET SPRING FARM

MRS DEL BEKTAS

SITE, ANALYSIS, PLAN & MATERIALS SCHEDULE

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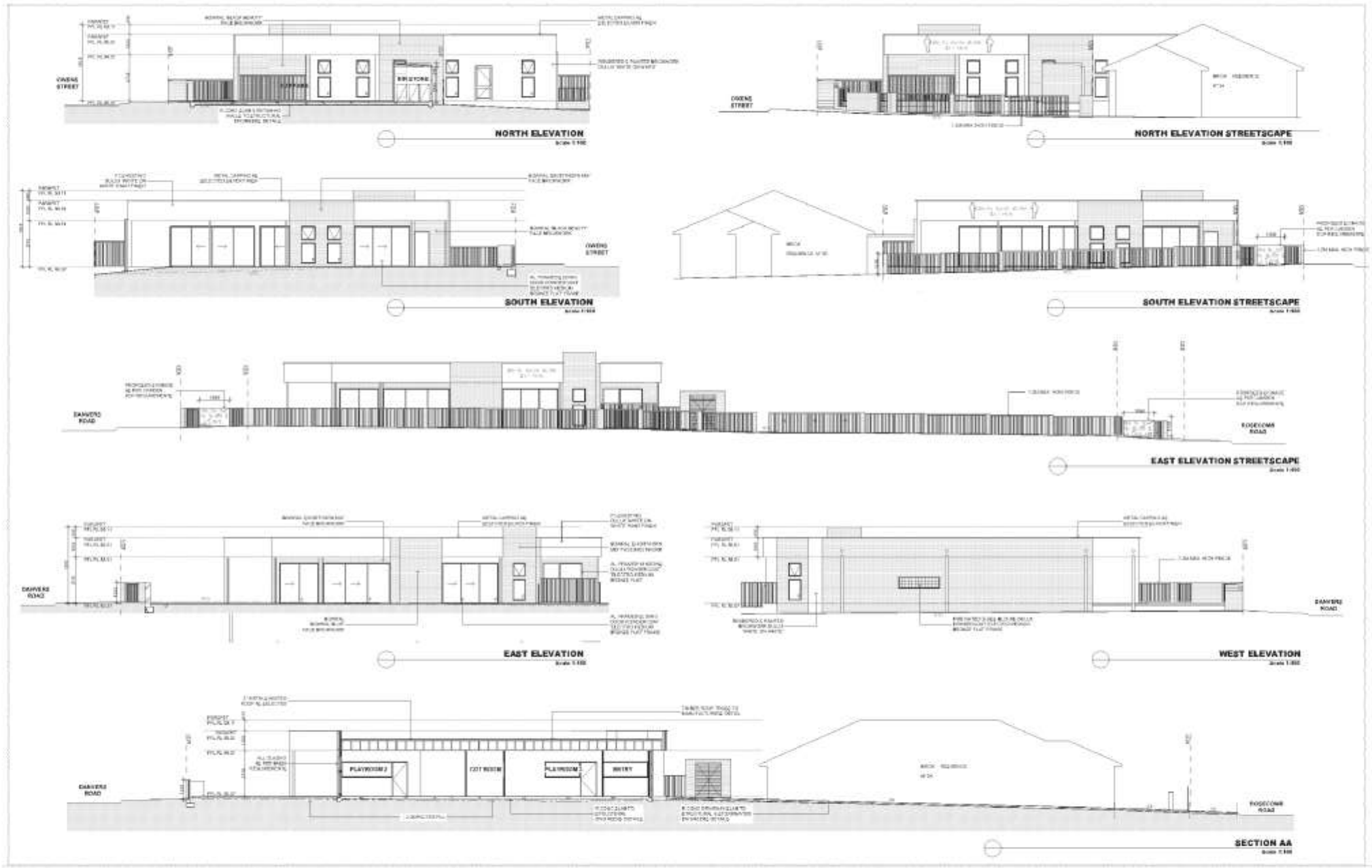
NORTH ELEVATION
NORTH ELEVATION STREETSCAPE
SOUTH ELEVATION
SOUTH ELEVATION STREETSCAPE
EAST ELEVATION STREETSCAPE
EAST ELEVATION
WEST ELEVATION
SECTION AA
PLAYROOM 2
COT ROOM
PLAYROOM
ENTRY
ALGORRY ZAPPIA & ASSOCIATES
PROPOSED CHILD CARE CENTRE
MRS DEL BEKTAS
ELEVATIONS & SECTION
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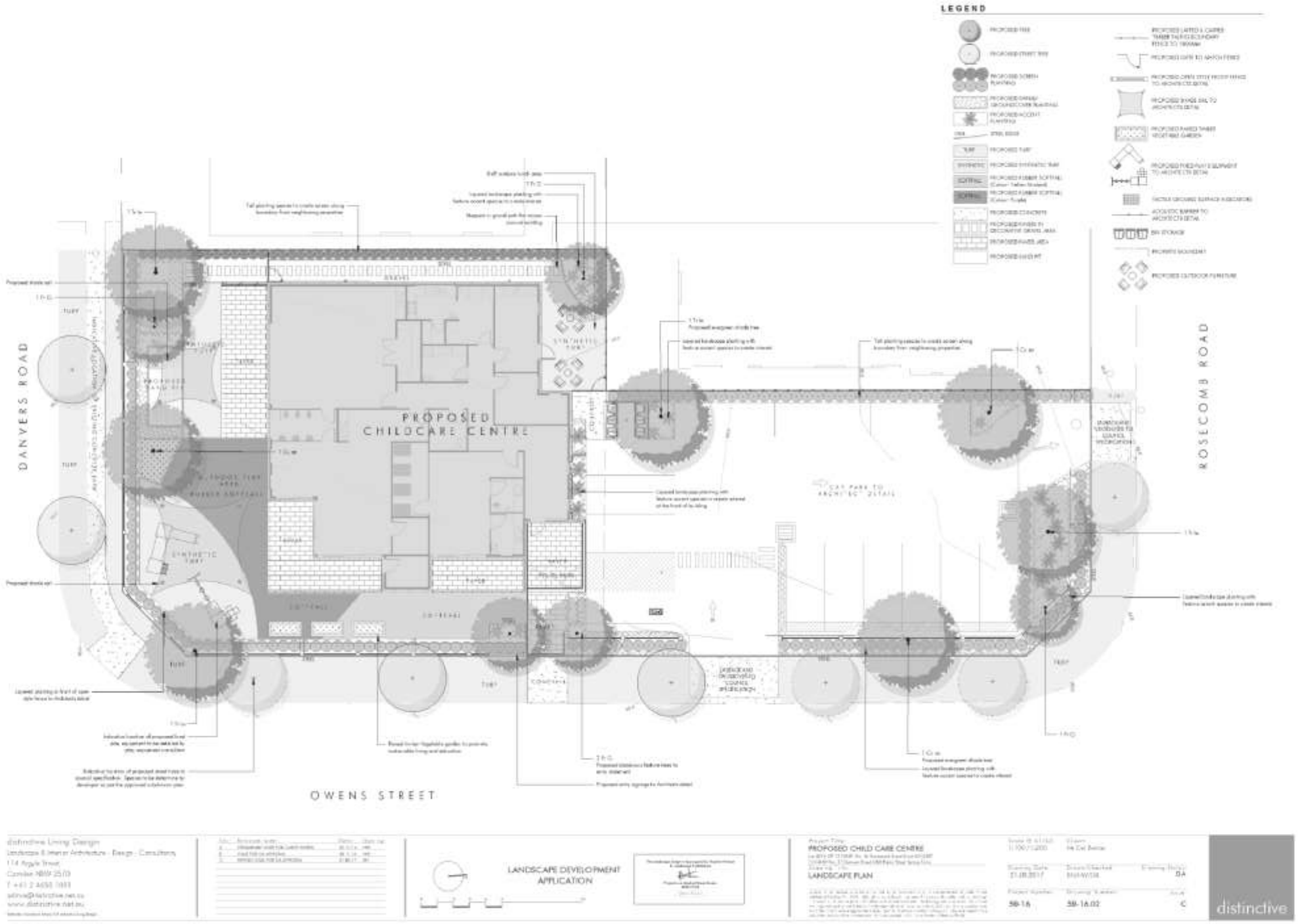

LEGEND
PROPOSED CHILDCARE CENTRE
DANVERS ROAD
ROSECOMB ROAD
OWENS STREET
distinctive Living Design
Landscape & Interior Architecture - Design - Consultancy
114 Argyle Street
Camden NSW 2570
T +61 2 4655 1933
admin@distinctive.net.au
www.distinctive.net.au
LANDSCAPE DEVELOPMENT APPLICATION
PROPOSED CHILD CARE CENTRE
LANDSCAPE PLAN
58-16
58-16.02
C
distinctive

Correspondence:
Jindurra Ave, Castle Hill NSW 2154

phone: (02) 8850 2788
ail: david@thompsonstanbury.com.au
yafeng@thompsonstanbury.com.au
thompsonstanbury.com.au

BILE PHONES: *David Thompson: 0418 262 125* *Yafeng Zhu: 0450 747 401*

TSA

ABN: 79 943 737 3

28 June 2017

The General Manager
Camden Council
PO Box 183
CAMDEN
NSW 2570

Attention: Clifford To

Your reference: DA No. 226/2017

Dear Sir,

PROPOSED CHILD CARE CENTRE
LOTS 5314 – 5315 IN DP1210459 OWENS STREET, SPRING FARM

This Practice was previously engaged by Mr. Del Bektas (the subject applicant) to prepare a Traffic Impact Statement dated December 2016 for a proposed 40 place child care centre located on the western side of Owens Street bound by Rosecomb Street to the north and Danvers Street to the south.

This Practice has been retained by the subject applicant to respond to those items relating to parking and traffic raised by the community contained within the 10 letters of objection following the exhibition period. The following provides a summary of the items raised in relation to parking and traffic issues by objectors and responses from this Practice as applicable:

1. *Perceived lack of on-site parking to adequately accommodate the peak parking demands associated with the proposed child care centre.*

Comment

It is noted that the Traffic Impact Statement (TIS) prepared by this Practice on December 2016, provided an objective parking assessment with respect to the proposed parking provision for the child care centre, based on the relevant planning controls specified within Table B8 Part B of Camden Council's Development Control Plan (DCP) 2011. This document provides off-street car parking rates that is understood to be locally sensitive to the potential parking generation associated with various land uses within the surrounding precinct. Table B8 Part B of DCP 2011 specify the following parking requirement in relation to child care centres:

1 car parking space per 4 children

Based on a proposed peak enrolment of up to 40 children, the proposed development is required to provide up to 10 off-street car parking spaces in accordance with DCP 2011. The proposed parking provision of 13 on-site car parking spaces, proposed to service the subject development exceeds Council's minimum parking requirements and is therefore not anticipated to result in on-street parking during peak operational periods. As such, it is considered most unlikely that the proposed child care centre will have any impacts on the overall availability of on-street parking facilities within the immediate vicinity.

In addition to the above, it is noted that the objectors who have raised the issue of the inadequacy of the proposed on-site parking provision have not considered other factors such as alternative forms of transport (i.e. walk trips), sibling rates and the staggered arrival and departure times of children pick-up and drop-off activity, which would reduce the peak parking demand on site at any one time. Further, it was recommended in the December 2016 TIS that an operational traffic and pedestrian management plan should be prepared and implemented to better manage vehicular parking and circulation on-site to reduce the impact on the adjoining road network. Such a measure could be reasonably imposed as a Condition of Consent, should Council feel necessary.

2. *The carriageway width of the adjoining road network (Rosecomb Road) is too narrow to accommodate parking along both sides in conjunction with two-way traffic flow.*

Comment

It is noted within the December 2016 TIS that Rosecomb Road provide a carriageway width of 7.5m between rolled kerbs. Whilst the current configuration is insufficient to support two passing vehicles between parked vehicles along both sides of the road, it is acknowledged that this is an existing condition approved by Council. Our recent and previous observations have indicated that on-street parking demands within the adjoining road network in the immediate vicinity of the site is generally low during peak weekday periods, which enables two-way traffic flow to be serviced with minimal impedance. Further our observations have identified vacant/unoccupied spaces within the public on-street parking provision within the adjoining road network during peak periods, which provide passing opportunities for one vehicle to pass another assisted by rolled kerbs, provided common driver courtesy is exercised.

In addition to the above, it is also noted within the response to item 1 and the December 2016 TIS that the subject development provides on-site parking that exceeds Council's minimum parking requirements. As such, the additional parking demand generated by the subject development is expected to be adequately accommodated on site, without impedance on the on-street parking facilities and two-way traffic flow. In any case, should Council consider necessary, "No-Parking" restrictions can be imposed along the southern side of Rosecomb Road adjacent to the northern property alignment. Such restrictions would prohibit parking along the southern side of Rosecomb Road thereby only leaving the northern Rosecomb Road kerb alignment for parking and allowing two way traffic flow at all times in the immediate vicinity of the site.

3. *The existing surveyed traffic demands at the junction of Springs Road and Norfolk Boulevard contained within the December 2016 TIS to be low and the additional traffic generated by the child care centre development is expected to compromise the existing amenity experienced by local residents.*

Comment

The December 2016 TIS presented peak hour traffic surveys, undertaken at the junction of Springs Road and Norfolk Boulevard, which identified traffic demands within this junction to be low during peak periods. As such, our observations and analysis of this peak hour traffic data based on guidelines specified within RMS' "*Guide to Traffic Generating Developments*" indicated that motorists generally experienced a good level of service. In this regard, motorists were observed to be able to manoeuvre throughout the surrounding road network in the vicinity of the subject site with minimal delay and impedance to other vehicles on the road.

In light of recent concerns raised regarding the increased traffic demands during peak periods generated by new developments within the surrounding precinct in the last six months, an updated peak hour traffic survey was recently undertaken by staff of this Practice (between 5:00pm – 6:00pm) at the same location (junction of Springs Road and Norfolk Boulevard). **Figure 1** provides a graphical representation of the recently surveyed peak hour traffic volumes.

FIGURE 1
EXISTING (2017) WEEKDAY PEAK HOUR TRAFFIC VOLUMES
JUNCTION OF WITH SPRINGS ROAD & NORFOLK BOULEVARD

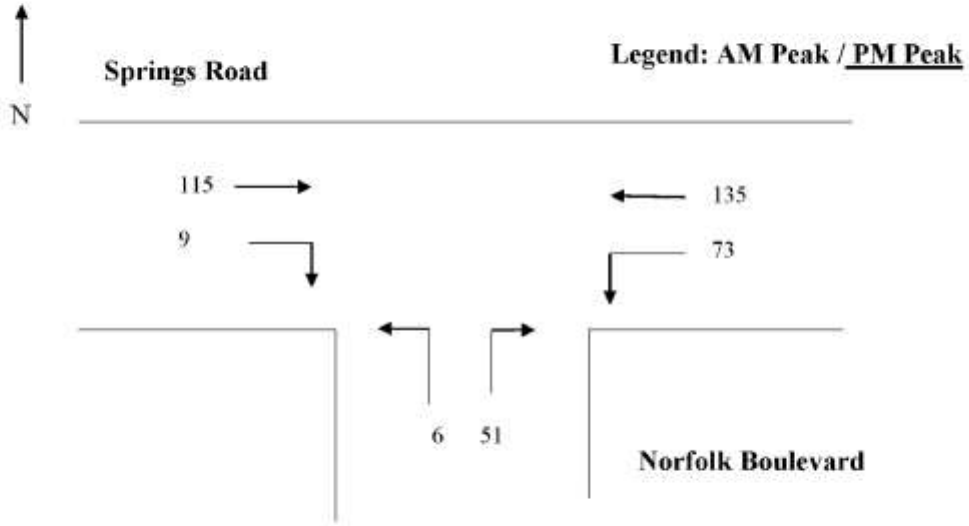


Figure 1 indicates the following:

- Springs Road accommodates bidirectional peak hour traffic demands of between 300 - 350 vehicles; and

- Norfolk Boulevard accommodates bidirectional peak hour traffic demands of less than 100 vehicles per hour.

In order to estimate the existing peak efficiency of the above surveyed junction Springs Road and Norfolk Boulevard, a SIDRA computer intersection analysis has been undertaken. SIDRA is a computerised traffic arrangement program which, when volume and geometrical configurations of an intersection are imputed, provides an objective assessment of the operation efficiency under varying types of control (i.e. signs, signal and roundabouts). Key indicators of SIDRA include level of service where results are placed on a continuum from A to F, with A providing the greatest intersection efficiency and therefore being the most desirable by the Roads and Maritime Services.

SIDRA uses detailed analytical traffic models coupled with an iterative approximation method to provide estimates of the abovementioned key indicators of capacity and performance statistics. Other key indicators provided by SIDRA are average vehicle delay, the number of stops per hour and the degree of saturation. Degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Degree of saturation is a useful and professionally accepted measure of intersection performance. SIDRA provides analysis of the operating conditions that can be compared to the performance criteria set out in **Table 1** below (being the RMS NSW method of calculation of Level of Service).

TABLE 1
LEVELS OF SERVICE CRITERIA FOR INTERSECTION

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

The existing conditions have been modelled utilising the peak hour traffic volumes presented within **Figure 1**. **Table 2** overleaf provides a summary of the SIDRA output data.

TABLE 2 SIDRA OUTPUT – EXISTING WEEKDAY PEAK HOUR PERFORMANCE JUNCTION OF SPRINGS ROAD AND NORFOLK BOULEVARD	
Norfolk Boulevard South	
Delay	6.7
Degree of Saturation	0.06
Level of Service	A
Springs Road East	
Delay	5.6
Degree of Saturation	0.11
Level of Service	A
Springs Road West	
Delay	6.2
Degree of Saturation	0.07
Level of Service	A
Total Intersection	
Delay	6.7
Degree of Saturation	0.06
Level of Service	A

Table 2 indicates that the junction of Springs Road and Norfolk Boulevard operates with a level of service 'A' representing good conditions with spare capacity and minimal delay based on the recently surveyed peak hour traffic demands. It is noted that whilst these volumes are somewhat higher than the existing peak hour traffic surveys contained in the December 2016 TIS, the existing level of service/operation of the surrounding road network has not changed from the assessment provided in the original traffic report.

Further to the above, the 2016 TIS indicated that the proposed 40 place child care centre is anticipated to generate up to 28 vehicle trips corresponding to the evening peak period based on the traffic generation rates specified within Roads & Maritime Services' *Guide to Traffic Generating Developments*. The additional traffic potentially generated by the proposed development represents one additional vehicle movement every two minutes, which is not expected to alter the existing level of service on the adjoining road network. In this regard, motorists are expected to enter and exit abutting developments within the surrounding precinct with minimal impedance on the adjoining through traffic flow.

With respect to the local amenity of the area, the Roads & Maritime Services within their *Guide to Traffic Generating Developments* provide environmental capacity performance standards to measure the level of amenity experienced by the general community, not just motorists. RMS *Guide* specify an environmental capacity for local roads of 300 vehicles in both directions in any one hourly period. The existing surveyed peak hourly traffic demands within Norfolk Boulevard are approximately less than 100 vehicle movements based on recent traffic surveys contained in **Figure 1**. It is noted that Norfolk Boulevard provides a local collector function to a number of abutting lower order side streets (including Rosecomb Road, which directly service the subject site), which have been observed to carry less traffic during peak periods.

In any case, taking the higher order peak hour traffic volumes observed within Norfolk Boulevard as a worst case assessment, coupled with the additional 28 peak hour vehicles likely to be generated by the proposed development during the evening peak, the identified threshold for local roads of 300 vehicles per hour as well as the

desirable threshold of 200 vehicles per hour specified within the *Guide to Traffic Generating Developments* is still maintained. In this regard, it is reiterated that the proposed development is unlikely to generate any noticeable impacts for traffic flow within the adjoining road network that would compromise the existing residential amenity.

It would be appreciated if the additional information contained within this correspondence could be incorporated in Council's ongoing assessment of the subject application.

Yours faithfully,

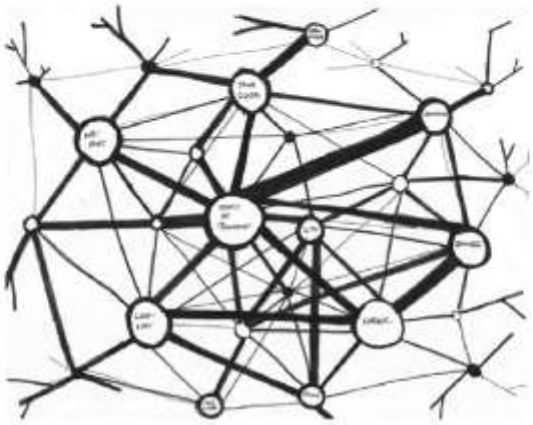
David Thompson
Transport Planner.

TSA

ABN: 79 943 737 368

TRAFFIC AND PARKING IMPACT STATEMENT

PROPOSED CHILD CARE CENTRE (CNR OF DANVERS ROAD AND PEKIN STREET SPRING FARM)



Date:
December 2016

Office:
Suite 15/9 Hoyle Ave., Castle Hill
NSW 2154

All Correspondence:
75 Gindurra Ave., Castle Hill NSW
2154

Ph: (02) 8850 2788

Mob:
0418 262 125 (David Thompson)
0450 747 401 (Yafeng Zhu)

Email:
david@thompsonstanbury.com.au
yafeng@thompsonstanbury.com.au

Website:
www.thompsonstanbury.com.au

TABLE OF CONTENTS

1. INTRODUCTION

The Practice of Thompson Stanbury Associates has been engaged by Algorry Zappia Architects, on behalf of Mr Del Bektas, to prepare a traffic and parking impact assessment to accompany a Development Application (DA) to be lodged with Camden Council.

The subject DA involves the construction of a child care centre capable of accommodating up to 40 children, on land located at the corner of Danvers Road and Pekin Street, Spring Farm.

External traffic impacts of the entire Spring Farm Release Area have been assessed by others as part of master planning of the Spring Farm Release. The external traffic impact assessment has adopted a road network as shown in Council's Spring Farm Development Control, Plan, along with an associated funding arrangement for the required road network.

The purpose of this report is therefore to primarily assess the traffic and parking impact close to the subject development site. Specifically, this report:

- Describes the existing and planned road network in the immediate vicinity of the subject development site;
- Assesses the suitability of the proposed direct vehicular access arrangement based on standards specified by relevant Australian Standards;
- Assesses the adequacy, or otherwise, of the proposed off-street car parking provision having regard to the rates specified by the Camden Council's Development Control Plan 2011 Part B - General Controls; and
- Assesses the proposed parking, internal circulation and servicing layout with respect to internal circulation and vehicle manoeuvrability.

In addition, the report addresses traffic related requirements, raised at the Camden Council Pre-Lodgement meeting held on the application. The requirements are: -

- a traffic report which addresses adequacy of the proposed access arrangement, car parking layout, traffic impact on the surrounding road network, and ensuring that the car park layout complies with Australian Standard AS 2890.1.

Throughout the report, reference has been made to the following documents:

- The Roads & Maritime Services (RMS) *Guide to Traffic Generating Developments*;
- Camden Council Development Control Plan 2011 - C7 *(Spring Farm)*;
- Camden Local Environmental Plan No 121—Spring Farm and Master Plan

- Australian Standard for *Parking Facilities Part 1: Off Street Car Parking* (AS2890.1-2004) and *Part 6: Off-Street Parking for People with Disabilities* (AS2890.6-2009).

This report should be read in conjunction with architectural plans prepared by Algorry Zappia Architects.

2. BACKGROUND

2.1 Spring Farm Master Plan

As indicated in Section 1, the subject site is within the Spring Farm Release Area. The release area is being subdivided and develop for urban land uses.

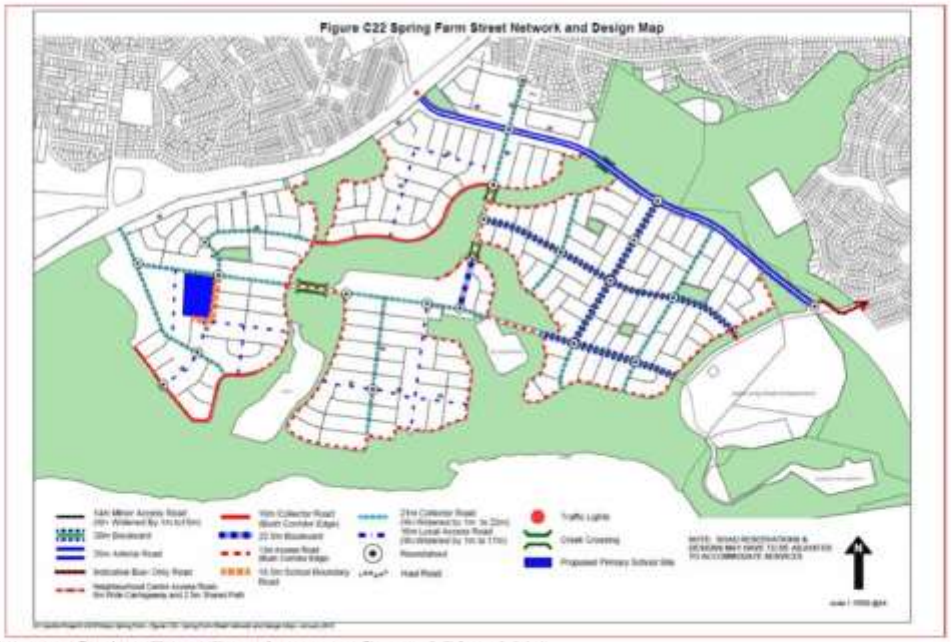
The long-term strategic vision for future development within the Spring Farm Release Area, is guided by the Spring Farm Master Plan which has identified a broad subdivision pattern for the area. The master plan has a target density of 15 dwellings per hectare, and residential yield of between 3720-4080 dwellings.

The master planning examined future land uses, through a number of specialist studies including biodiversity, transport and access, flooding and drainage, heritage, noise and odour, land capability, and visual landscape.

These technical studies assisted in the determination of the location of various land uses, and has been used in the preparation of the *Camden Council Development Control Plan 2011 C7* - Spring Farm. The DCP outlines that development of Spring Farm will comprise a series of urban villages - made up of five villages, i.e. western, eastern, southern, northern and central villages. The site subject is within the central village.

One of the technical studies which informed the master planning was a Traffic and Transport Report (Oct 2002) by Masson Wilson Twiney. The report assessed traffic impacts of the release area and recommended transport infrastructure upgrades and other measures to maximise traffic efficiency and road safety within and on surrounding road network. The adopted road network is as shown in Figure 1.

FIGURE 1 - SPRING FARM MASTERPLAN ROAD NETWORK



Source: Spring Farm Development Control Plan 2011

3. SITE DETAILS

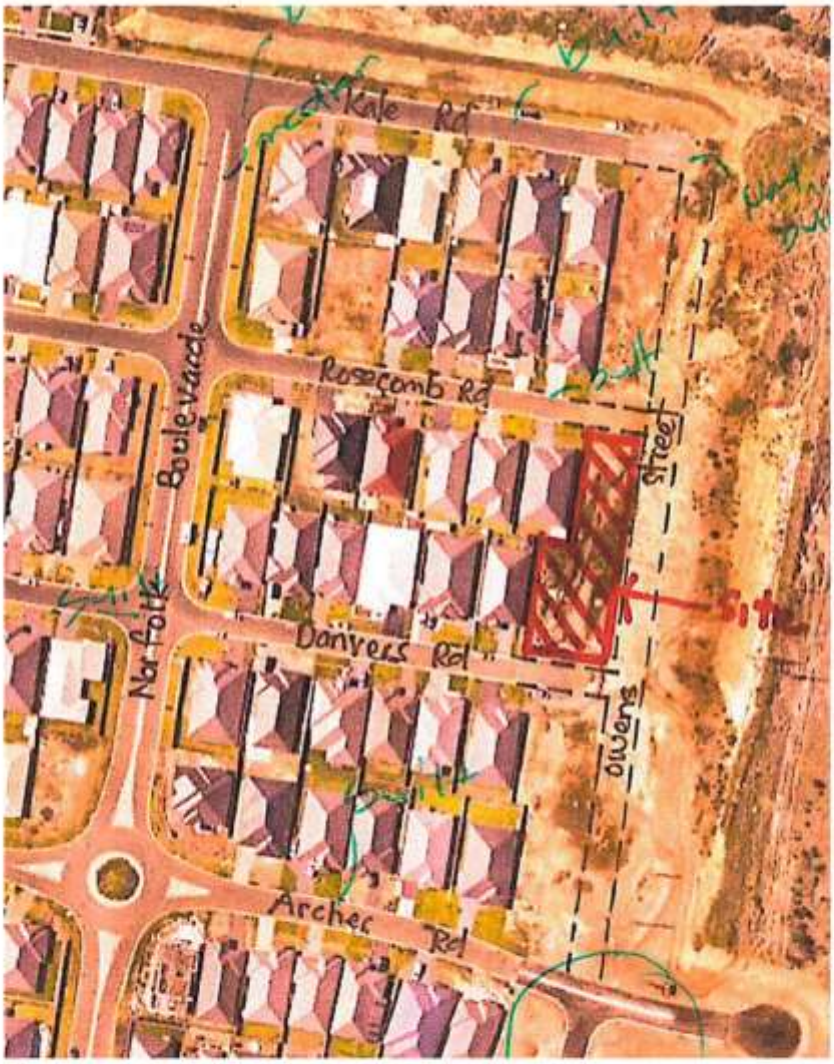
3.1 Site Location

The subject site is situated on the north-western corner of Pekin Street and Danvers Road, Spring Farm.

The subject site is bounded by Rosecomb Road to the north, Pekin Street to the east, Danvers Road to the south and residential dwellings fronting both Rosecomb Road and Danvers Road to the west.

The location in the context of the surrounding road network, (an extract from Google Maps), is as shown in **Figure 2** below.

FIGURE 2 – LOCALITY MAP



3.2 Site Description

The subject site is made of two residential lots legally described as Lots 5314 and 5315 within Deposited Plan 1210459, Spring Farm.

The subject site generally forms a shaped parcel of land, with frontages to Pekin Street and Danvers Road, as shown in **Figure 2**. The site has a total area of approximately 1,237.6 m^2.

3.3 Existing and Surrounding Land Uses

The subject site is currently vacant and undeveloped. The subject site is also surrounded by vacant and undeveloped properties lands, which are being subdivided for detached residential development.

4. PROPOSED DEVELOPMENT

4.1 Proposed Child Care Centre

The proposal seeks consent for the establishment of a 40 place child care centre comprising three playrooms, and ancillary areas such as a staff room, cot room, an office, a reception area and other amenities, located within the northern portion of the site.

The development includes a provision of 13 car parking spaces within an at-grade passenger vehicle parking area, located at the eastern part of the development site fronting Pekin Street and Rosecomb Road.

Access arrangement to the subject site, consist of a 5.5m wide combined entry/exit driveway off Pekin Street, as the main driveway, and a secondary 3.5 m wide driveway off Rosecomb Road.

4.2 Proposed Operations

The child care centre is being designed to cater up to 40 children, consisting of the following age groups:

- 0-2 years - 8 children
- 2-3 years - 15 children
- 3-6 years - 17 children

Under Department of Community Service (DoCS) guidelines, the proposed child care centre will require the following minimum staffing requirements as outlined in **Table 1** below:

TABLE 1- DoCS GUIDELINE

CHILDREN AGE (YEARS)	REQUIREMENTS	REQUIRED NO. OF EMPLOYEES
0-2	1 employee per 4 children	**2** (8/4)
2-3	1 employee per 5 children	**3** (15/5)
3-5	1 employee per 10 children	**1.7** (17/10)
	Total	**6.7 ≈ 7**

The proposed child care centre therefore requires a minimum of 7 staff to meet the supervision requirements of DoCS.

The child care centre is proposed to operate between the hours of 7am and 6pm Monday to Friday.

4.3 Council Off-Street Parking Requirement

To assess the proposed car parking provision, reference has been made to Camden Development Control Plan 2011 (DCP 2011). The DCP specifies parking requirements

for various land use developments, to ensure that such developments provide adequate off street parking to accommodate car demand.

Part B: General Land Use Controls of DCP 2011 establishes the following parking requirements, for child care centres:

- *1 car parking space per 4 children*
- *1 of the car parking spaces shall be designed for people with a disability.*

For the purposes of this calculation, the number of employees is based on the staffing requirements of the Children's Service Regulation 2004. Based on a total enrolment of up to 40 children, the proposed child care centre is required to provide a total of 10 parking spaces (inclusive of one disabled parking space) in accordance with the above rate.

The proposed parking provision of 13 car parking spaces, inclusive of one accessibility spaces for people with a disability exceeds Council's minimum requirement and is therefore considered to be satisfactory. It is noted that four of these spaces are to be allocated to visitors/parents, primarily associated with pick-up and drop-off.

4.4 Access Arrangements

Access is proposed to be provided via a combined 5.5m wide ingress/egress driveway off Pekin Street, approximately 15.40m south of Rosecomb Road, and a secondary 3.40 m exit only driveway off Rosecomb Road, approximately 6.0m east of Pekin Street.

The proposed access arrangement and car park layout is as shown in **Figure 3**. It would permit safe and efficient two-way traffic movements.

FIGURE 3 –PROPOSED ACCESS ARRANGEMENT

For an assessment of the design of the proposed access arrangement, reference has been made to Australian Standard AS 2890.1-2004. The Standard specifies driveway design requirements based on the proposed primary land use, function of the access road (major or minor) and the number of car parking spaces the driveway is to serve.

Sections of Pekin Street and Rosecomb Road, fronting the development site, are considered to perform minor road function. Hence based on Tables 3.1 and 3.2 of AS 2890.1-2004, a proposed driveway to 13 off-street car parking spaces, is a Category 1 type driveway, requiring a minimum combined entry/exit width of 3-6 m.

The proposed 5.5 m wide combined entry/exit driveway, off Pekin Street, along with the 3.5m wide secondary driveway off Rosecomb Road, therefore comply with the minimum AS2890.1-2004 specifications and accordingly, is considered to be satisfactory.

Sections of Pekin Street and Rosecomb Road where the driveway are proposed have consistent vertical and horizontal alignment, and would provide motorists with good sight distances, for turning movements in and out of the development site.

In consideration of this and the abovementioned discussion, the proposed site access arrangement is considered to be satisfactory.

4.5 Internal Manoeuvrability and Circulation

The off-street park area is made up of a total of 10 two rows of 90-degree parking spaces and three parallel staff parking spaces. The internal circulation of the parking areas has been designed to accord with the relevant requirements of AS2890.1-2004 and AS2890.6-2009, providing the following base dimensions:

- 90 degree parking space width = 2.4m;
- Parallel parking space width = 2.1m;
- 90-degree parking space bay lengths (minimum) = 5.5m;
- End parallel parking space length = 6.2m;
- Middle parallel parking space length = 5.9m;
- Adjoining parking aisle width = 6.6m; and
- Two-way straight roadway width = 6.0m

These dimensions would accommodate the swept paths, as specified in the AS2890.1-2004, for 85th percentile vehicles, to enable passenger vehicles to enter and exit the proposed car park in a forward direction. The proposed site layout as it relates to passenger vehicle manoeuvrability is considered satisfactory.

In addition, in order to demonstrate the internal passenger vehicle manoeuvrability within the off-street parking area, the designer has prepared a number of swept path

plans showing turning paths which have been provided on the plans generated using Autoturn software and derived from B85 and B99 vehicle specifications provided within AS2890.1-2004. The swept path plans indicate that passenger vehicles can manoeuvre throughout and enter and exit the most difficult passenger vehicle parking spaces within the parking areas.

5. EXISTING TRANSPORT CONDITIONS

5.1 Road Network

The road network close to the subject site which would be expected to attract noticeable traffic volume increase are sections of Spring Farm Drive, Norfolk Boulevard, Rosecomb Road and Danvers Road and Pekin Street, close to the subject site.

The local road is as shown in Figure 4. The following subsection provides a description of the surrounding road network in the close to the development site.

Spring Farm Drive performs a sub-arterial or distributor road function, off Spring Farm Road. Both Springs Road and Spring Farm Drive, are the under the care and control of Camden Council.

Springs Road is a two lane east -west road off MacArthur Drive, which in turn, is off Camden Bypass. Spring Farm Drive is a north-south and east-west distributor road off Springs Road.

Spring Farm Drive provides a road link between Springs Road, to the north and Norfolk Boulevarde to the south. Close to the development site, Spring Farm Drive is two lane road, providing a single traffic lane in each direction. It provides access to a number of side streets including Redcap Road, Derbyshire Road, Kale Street, Rosecomb Road and Danvers Road; and direct vehicular access to a number of dwellings including New Living Homes Exhibition Home.

Spring Farm Drive, has 21m road reservation with 3m traffic lane, 1.5m bicycle lane and 2.0 parking bays, in each direction. It forms T-intersections with the above-mentioned side streets, under major/minor priority control with traffic movements along Spring Farm Drive being the priority movement. As a residential street, it has the default urban residential speed limit of 50km/hr.

Norfolk Boulevard – is another north-south collector road in the Spring Farm release area in the planned central village, under the care and control of Camden Council

It is planned to provide a link between Springs Road, to the north and Spring Farm Drive, to the south. The southern section has been constructed.

It has a road reservation, permitting a single traffic lane, and a parking bay, in each direction. It forms T-intersections with Springs Road, and four-way intersections with a number of side streets including Rosecomb Road, Danvers Road and Archer Road. The intersection with Archer Road has a roundabout. As a residential street, it has the default urban residential speed limit of 50km/hr.

Rosecomb Road and **Danvers Road** perform local access road functions. They are under the care and control of Camden Council. They provide east-west road links off Spring Farm Drive and a planned section of Pekin Street.

They have approximately 340 m long and have carriageways of 7.5m permitting single traffic lanes in each direction, in conjunction with unrestricted parallel parking along both sides.

As residential streets, Rosecomb Road and Danvers Road have the default urban residential speed limit of 50km/hr.

Pekin Street also performs a local access function under the care and control of Camden Council. It provides an east-west and north-south road link between Spring Farm Drive and Kale Road.

The east-west section and almost half of the north-south section from the south to Archer Road have been constructed. The remaining section between Archer Road and Kale Road is being progressively constructed as subdivision proceeds.

The constructed section has a carriageway of approximately 7.5m, accommodating a single traffic lane in each direction in conjunction with parallel parking along both sides.

FIGURE 4 -LOCAL ROAD NETWORK

5.2 Existing Traffic Volumes

In order to obtain an indication of the existing traffic conditions close to the subject site, evening peak hour traffic survey was undertaken by staff of this Practice along the section of Spring Farm Drive at its intersection with Norfolk Boulevard.

The traffic survey was undertaken between 5:00pm - 6:00pm on 16 November 2016. **Figure 5** provides a graphical representation of the surveyed peak hour traffic volumes (full details are available upon request).

The survey time was selected to reflect the traffic conditions within the adjoining road network corresponding to the finishing time of the proposed child care centre.

FIGURE 5 -- EXISTING PEAK HOUR TRAFFIC VOLUMES
SPRING FARM DRIVE AND NORFOLK BOULEVARD INTERSECTION

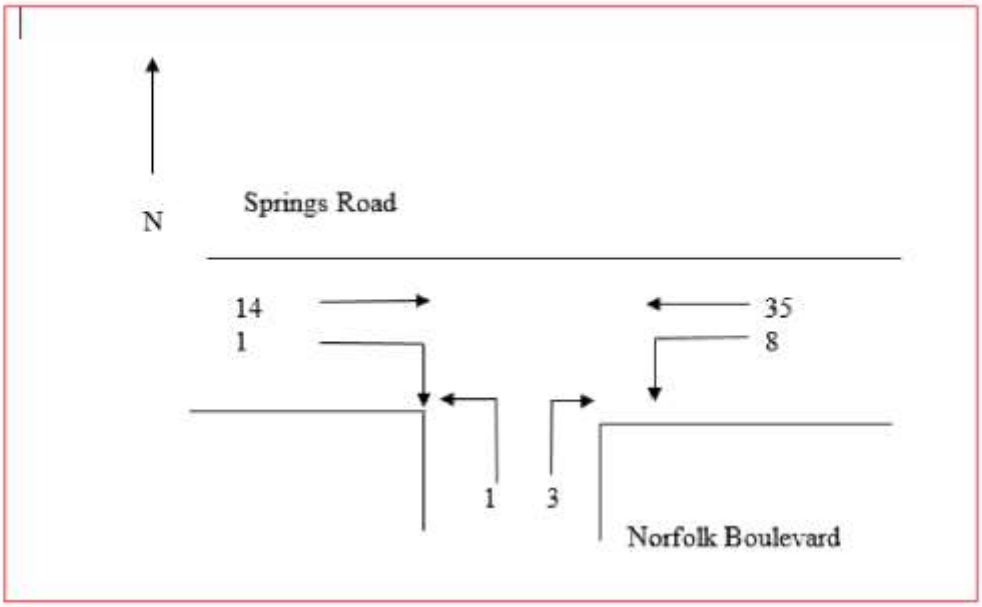


Figure 5 indicates the following:

- Spring Farm Drive is currently carrying a two traffic volume in the order of 60 vehicles per hour (veh/hr) during the evening peak period; and
- Norfolk Boulevard is carrying a low two-way traffic volume of 14 veh/hr during the evening peak period.

5.3 Existing Road Network Operation

In order to undertake an assessment of the operational performance of Spring Farm Drive and Norfolk Boulevard, close to the subject site, reference has been made to the RMS "*Guide to Traffic Generating Developments*".

The *Guide* outlines that based on their road functions, with **Spring Farm Drive** as a sub-arterial road, that it has a road capacity of between 900 – 1,000 veh/hr in each direction, whilst Norfolk Boulevard, as a collector road has a road capacity of between 600 – 900 veh/hr in each direction.

In accordance with the RMS *Guide*, the current low traffic volumes of 60 veh/hr along Spring Farm Drive and 14 veh/hr along Norfolk Boulevard, indicate that both roads are operating with very good Level of Service (LoS) A.

This indicates that traffic is operating with free flow traffic conditions and drivers are unaffected by others in the traffic stream, and drivers are able to select their desired speeds and to manoeuvre within the traffic stream.

The above traffic conditions are commensurate with the overall traffic conditions observed by this Practice close to the subject site. This indicates that the two roads, as well as the other local roads, close to the subject site have spare capacity to accommodate the expected additional traffic likely to be generated by the proposed development.

6. PROJECTED TRANSPORT CONDITIONS

6.1 Traffic Generation

The RMS has published vehicular generation rates based on surveys of existing land uses throughout the Sydney metropolitan area, in its *Guide to Traffic Generating Developments* (2002).

The *Guide* specifies traffic generation rates for child care centres, as indicated in the Table 2 below.

TABLE 2 - TRAFFIC GENERATION RATES FOR CHILD CARE CENTRES

	Peak Vehicle Trips/Child		
	7.00 - 9.00am	2.30 - 4.00pm	4.00 - 6.00pm
Pre-school	1.4	0.8	-
Long-day care	0.8	0.3	0.7
Before/after care	0.5	0.2	0.7

The proposed child care centre is best described as a long day care centre, accommodating 40 children. Using the above RMS traffic generation rates, the proposed development is likely to generate the following traffic flows, during the morning and afternoon peak periods:

- Morning peak period, between 7.00am – 9.00am - 32 vehicle trips
- Afternoon peak period, between 2.30pm – 4.00pm - 12 peak vehicle trips
- Evening peak period, between 4.00pm – 6.00pm - 28 vehicle trips

The traffic generation during the morning period of 32 vehicle trips, will comprise 16 ingress movements to the site and 16 egress movements associated with the drop off of children, (in the morning).

Similarly, during the evening period between 4.00 - 6.00pm, the traffic generation of 28 peak vehicle trips, will comprise 14 ingress and 14 egress movements associated with the pick-up of children (in the evening).

The corresponding traffic generation during the afternoon period between 2.30pm and 4.00pm, 12 vehicle trips, will comprise 6 ingress and 6 egress movements, to and from the site, associated with the collection of children.

6.2 Traffic Impacts

6.2.1 Short Term Traffic Impact

As indicated above, the subject proposal is forecast to generate up to 32 vehicle trips and 28 vehicle trips during the morning and evening peak periods respectively. These traffic volumes are not significant.

As outlined in Section 5.3, sections of Spring Farm Drive and Norfolk Boulevard, close to the subject site are operating with very good LoS A. In accordance with the RMS

Guide to Traffic Generating Developments, with the forecast additional traffic likely to be generated by child care centre, traffic conditions along these road sections would not be adversely affected, and would continue to operate very good LoS A.

The forecast additional traffic will therefore not have significant and noticeable traffic impact on the performance of the surrounding road network.

6.2.2 Long Term Traffic Impact

Cumulative traffic impact of the Spring Farm Release Area was assessed by a Traffic and Transport Report (Oct 2002) by Masson Wilson Twiney. The report informed the road network and traffic management works specified in the Spring Farm DCP.

The subject site is in the planned central village of the Spring Farm DCP, which is now approximately 25% developed. At full development, traffic volumes along sections of Spring Farm Drive and Norfolk Boulevard would be expected to increase to approximately 4 times, the current volume, i.e. two-way traffic volume of 240 veh/hr. along Spring Farm Drive and 52 veh/hr. along Norfolk Boulevard.

With these traffic volumes, road sections of Spring Farm Drive and Norfolk Boulevard, close to the subject development site, would be expected to operate with very good LoS B along Spring Farm Drive and LoS A along Norfolk Boulevard.

The forecast traffic generation from the proposed development is low (as indicated in Section 6.1 of between 28 and 32 veh/hr) and in the long term, the development is not expected to have significant or adverse traffic impact on the local road network.

7. CONCLUSIONS AND RECOMMENDATIONS

This Practice has undertaken an assessment of the potential traffic related consequences resulting from the proposed long day child care centre development on two residential allotments, located at north-western corner of Pekin Street and Danvers Road.

Based on our assessment, the following conclusions can be made:

- The proposed off-street parking provision suitably accords with Council's relevant DCP requirements and is accordingly considered to be satisfactory;
- The proposed access arrangements and internal circulation arrangement are in accordance with Australian Standards AS 2890.1, and would provide motorists with safe and efficient vehicle and pedestrian conditions;
- The proposed development is forecast to generate approximately 32 vehicles per hour and 28 vehicles per hour, during the mornings and evening peak hours respectively;
- The surrounding road network has spare capacity to accommodate the forecast additional traffic
- The surrounding road network operates with good level of service A during peak periods and would continue to operate with good LoS A, after the proposed child care, in the short term, and LoS A/B in the long term.
- However, to minimise the traffic impacts, it is recommended that the child care centre develop an operational management plan that guides safe and efficient internal operations within the child care centre. The plan is to be adopted by staff, parents and other stakeholders of the development, to maintain safe and efficient traffic/pedestrian movements and minimise the traffic impacts of the development.

Based on the conclusions and recommendations contained within this report, we are of the opinion that there are no traffic-related issues that should preclude approval of the subject application. Accordingly, we are in support of the proposed development.

Endeavour Energy

14 March 2016

Del Bektas
37 Danvers Road, Spring Farm

ELECTRO MAGNETIC FIELD INFORMATION – FEEDER 306

POWER LINE INFORMATION
Feeder 306 near 37 Danvers Road, Springfarm is a 33,000 Volt transmission line that is presently used as a feeder between Nepean Transmission Substation to Cawdor Zone Substation.

Feeder 306 is used as one of two normal electricity supply lines to Cawdor Zone Substation and this line typically only carries 25% of the maximum rated line capacity. The magnetic field produced by transmission lines varies with the community's use of electricity (when more electricity is being used the EMF level will be higher).

The highest possible magnetic field level directly underneath these transmission lines is calculated to be a maximum of 17.03mG. These calculations assume that the transmission lines will be carrying load at its maximum rated capacity when in reality the load and therefore magnetic field levels will be much lower. Note also that the magnetic field levels decrease significantly as the distance away from the transmission lines increases (see Figure 1 below). The distance between the child care centre and directly beneath the transmission lines is approximately 30m, which produces a maximum possible magnetic field of 3.5mG (at rated capacity).

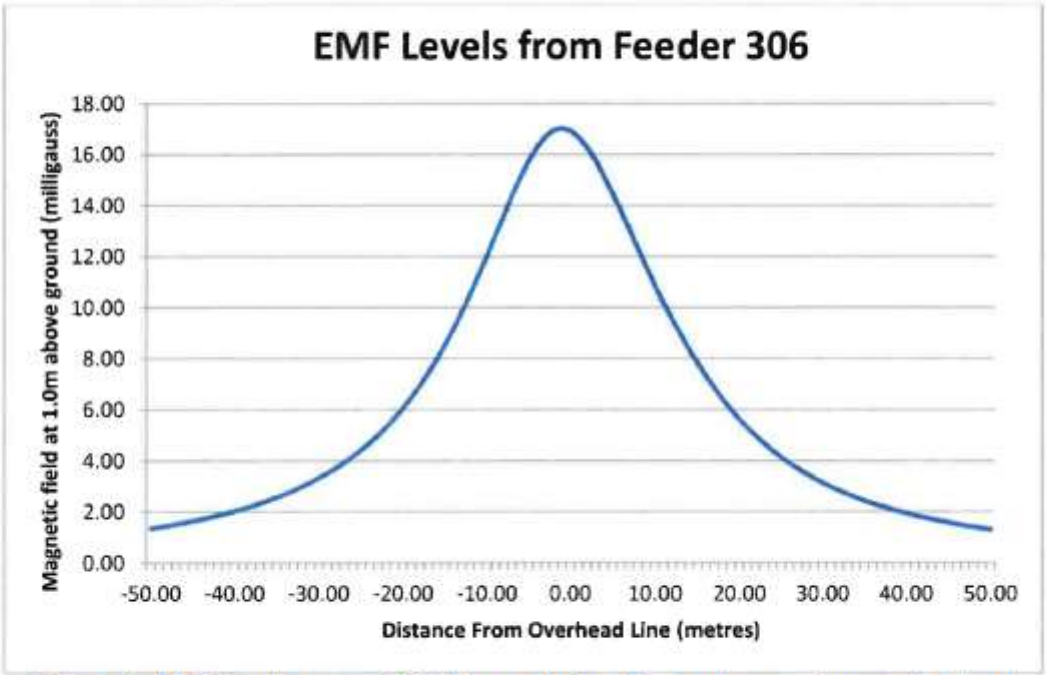


Figure 1: EMF levels across 33kV transmission line under maximum rated load conditions

51 Huntingwood Drive Huntingwood NSW 2148
PO Box 811, Seven Hills NSW 1730
T: 131 081 • F: 61 2 9853 6000
www.endeavourenergy.com.au

Endeavour Energy

For comparison, the table below shows some examples of the typical magnetic field levels that can be found with the use of common household appliances.

Typical magnetic field levels (in milligauss)

Item	Typical Measurement	Range of measurement
Stove	6	2-30
PC	5	2-20
TV	1	0.2-2
Electric blanket	20	5-30
Hair dryer	25	1-70
Refrigerator	2	2-5
Toaster	3	2-10
Kettle	3	2-10
Fan	1	0.2-2

Electromagnetic field limits

The National Health and Medical Research Council of Australia have adopted international interim guidelines for limits of exposure to power frequency (50/60 Hz) electromagnetic fields. These guidelines state that the general public should not be exposed to electromagnetic fields greater than **2,000** milligauss (mG) on a continuous basis.

L. Seaford.

Luke Seaford
Electrical Engineer - Earthing
Network Engineering

51 Huntingwood Drive Huntingwood NSW 2148
PO Box 811 Seven Hills NSW 1730
T: 131 081 F: 61 2 9853 6000
www.endeavourenergy.com.au

1. The proposal does not meet the objectives of Zone B5 Business Development contained within State Environmental Planning Policy (Sydney Region Growth Centres) 2006 pursuant to *Section 79C(1)(a)(i) of the Environmental Planning and Assessment Act, 1979.*

2. The proposal does not meet the requirements of Clause 4.1E of State Environmental Planning Policy (Sydney Region Growth Centres) 2006 pursuant to *Section 79C(1)(a)(i) of the Environmental Planning and Assessment Act, 1979.*

3. The proposed development does not comply with the objectives and development controls of Turner Road Growth Centre Precincts Development Control Plan pursuant to *Section 79C(1)(a)(iii) Environmental Planning & Assessment Act, 1979.*

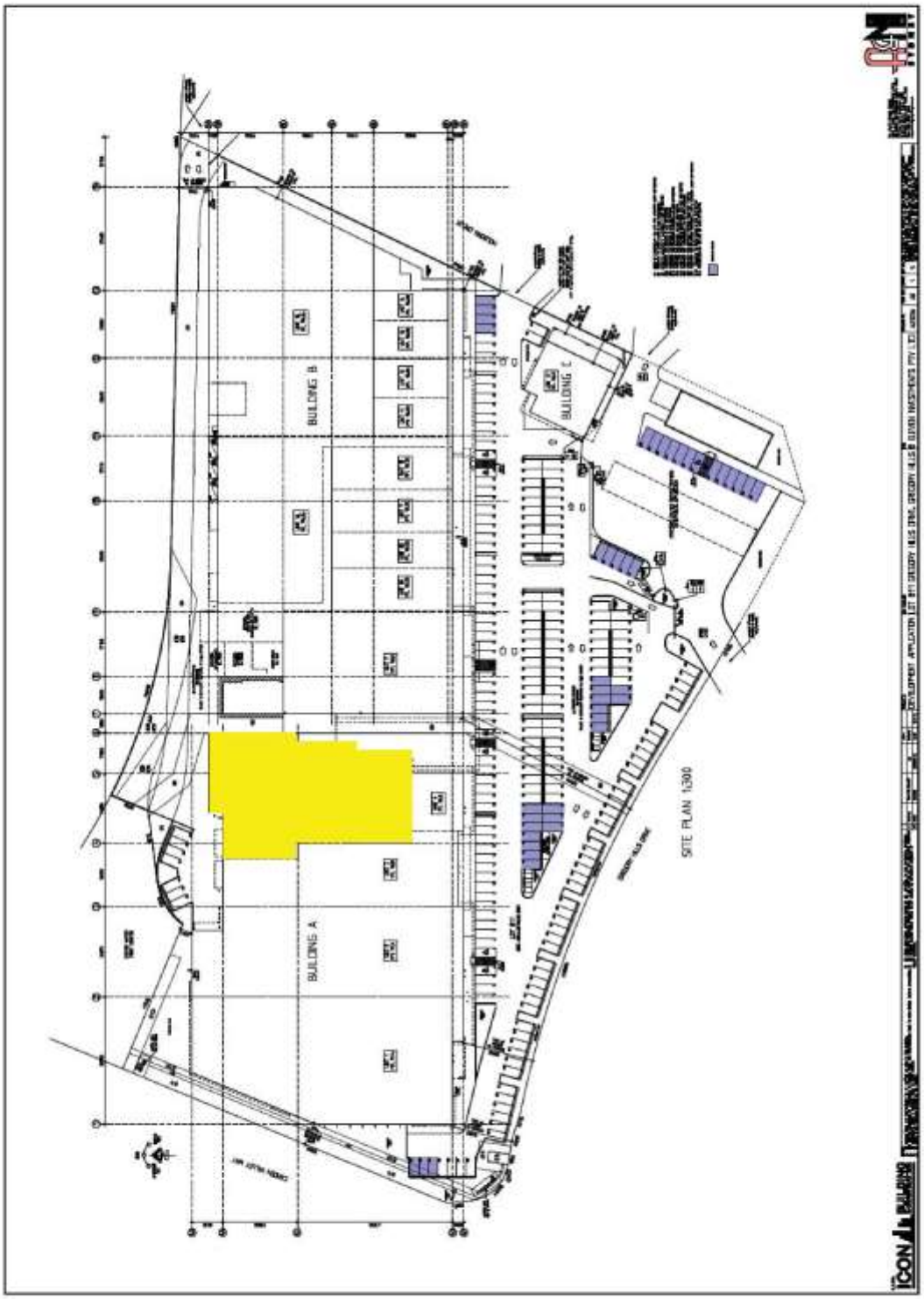
4. Insufficient information has been submitted to enable a proper consideration of the application and its likely impacts pursuant to *Section 79C(1)(b) of the Environmental Planning and Assessment Act, 1979.*

5. Due to the non-compliance with Clause 4.1E of the State Environmental Planning Policy (Sydney Region Growth Centres) 2006, the site is considered unsuitable for the proposed use pursuant to *Section 79C(1)(c) of the Environmental Planning and Assessment Act, 1979.*

6. Due to the non-compliance with Clause 4.1E of the State Environmental Planning Policy (Sydney Region Growth Centres) 2006, The application is not considered to be in the public interest pursuant to *Section 79C(1)(e) of the Environmental Planning and Assessment Act, 1979.*

ORD04

Attachment 2



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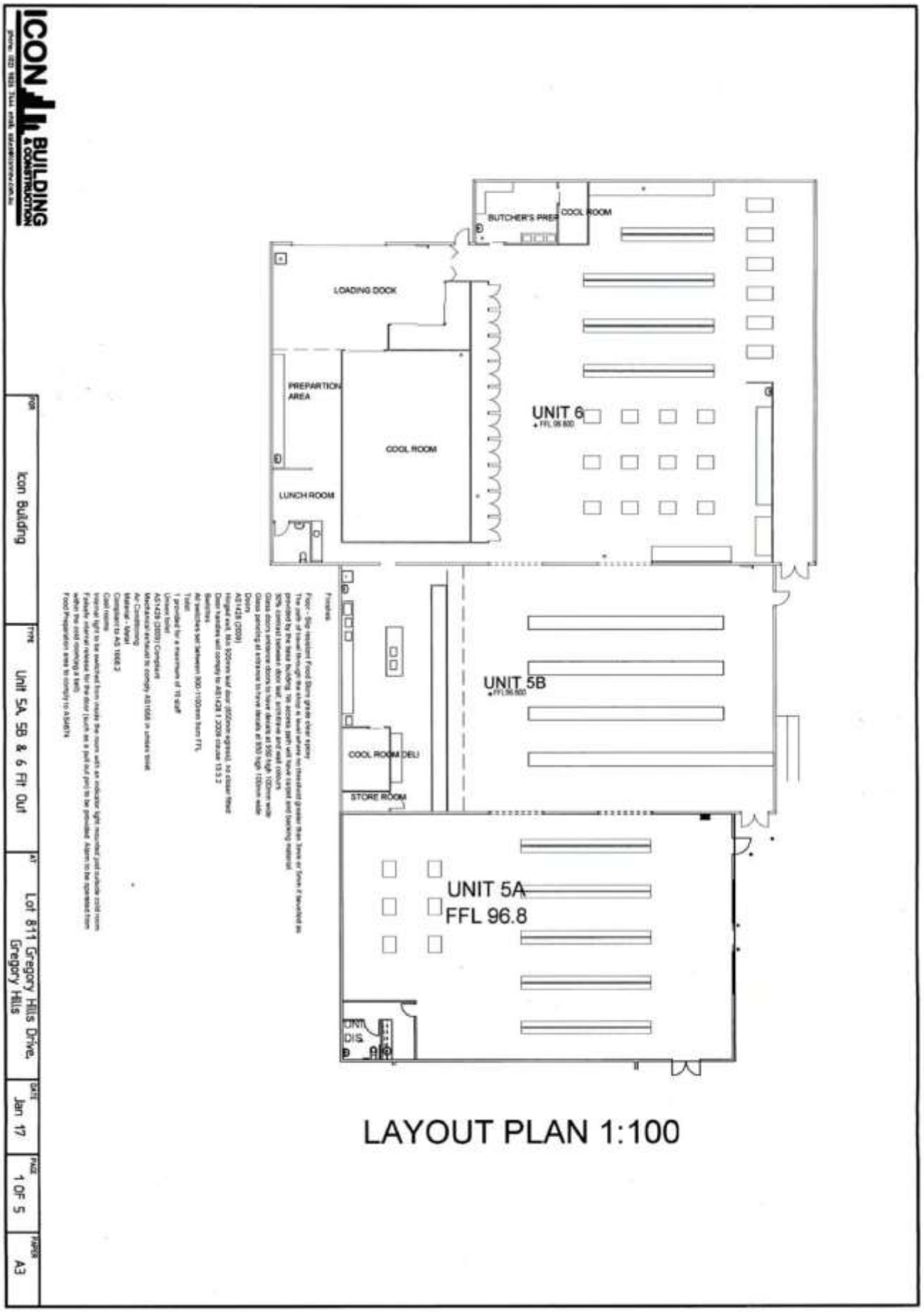

LAYOUT PLAN 1:100

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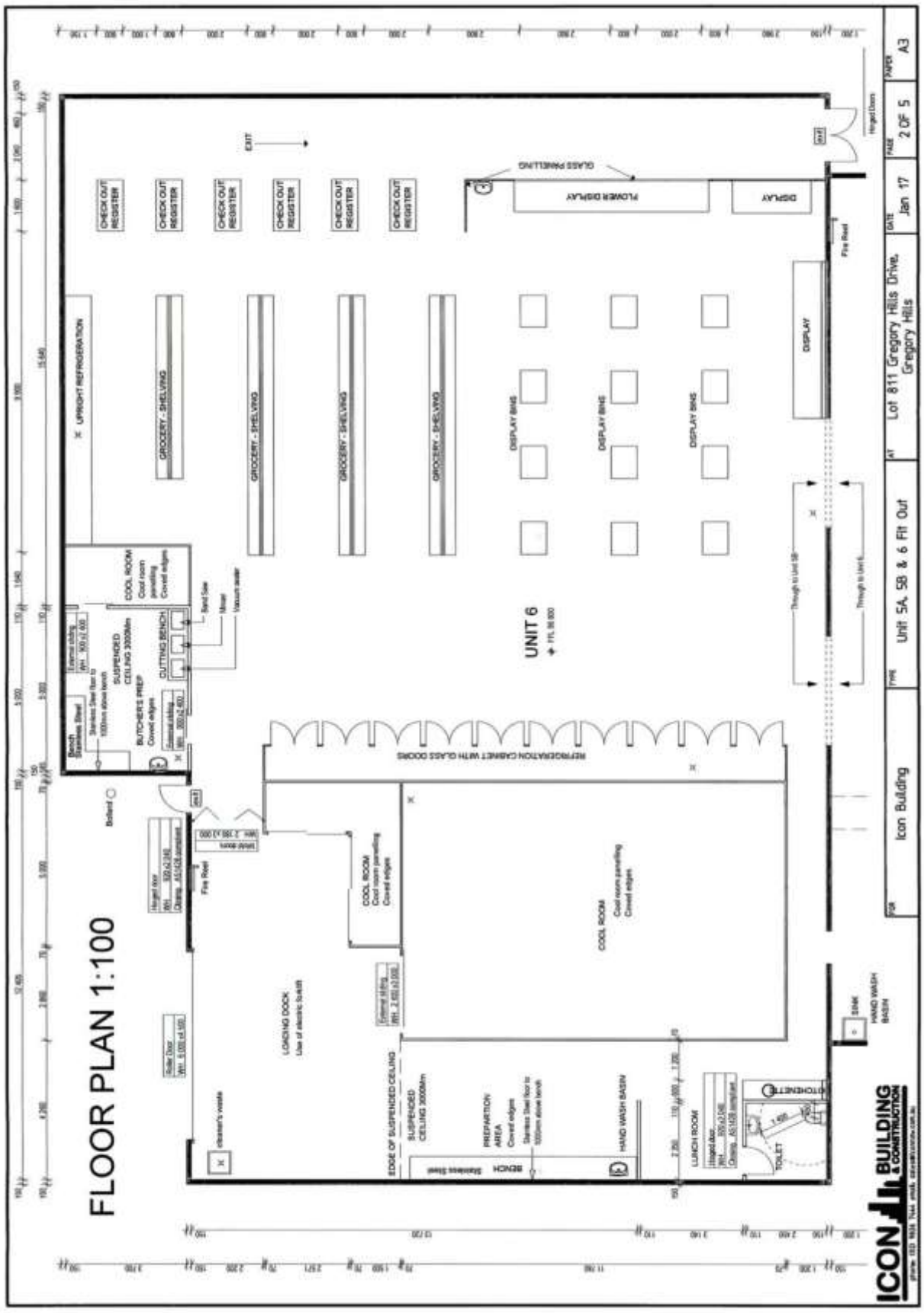

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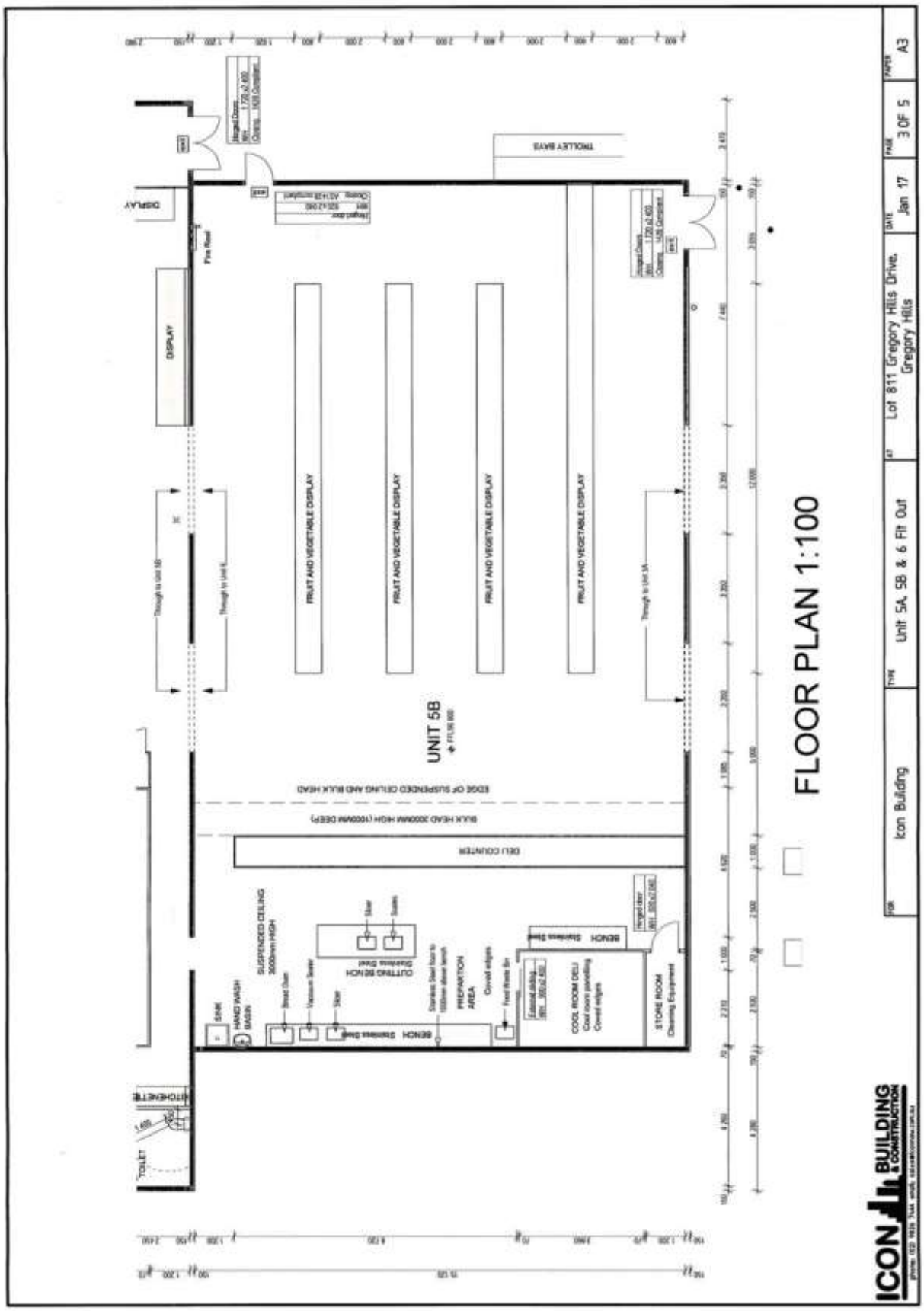

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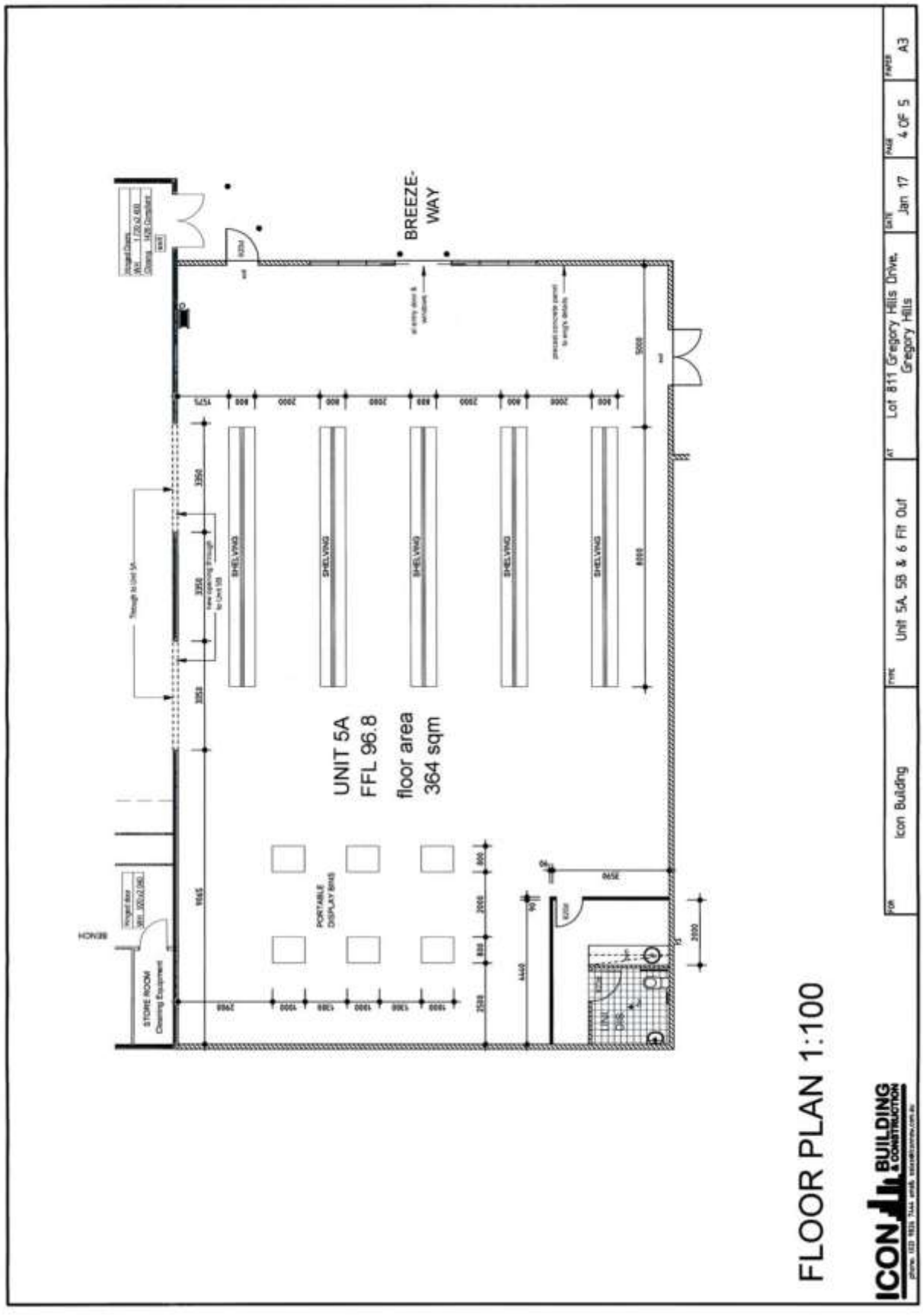

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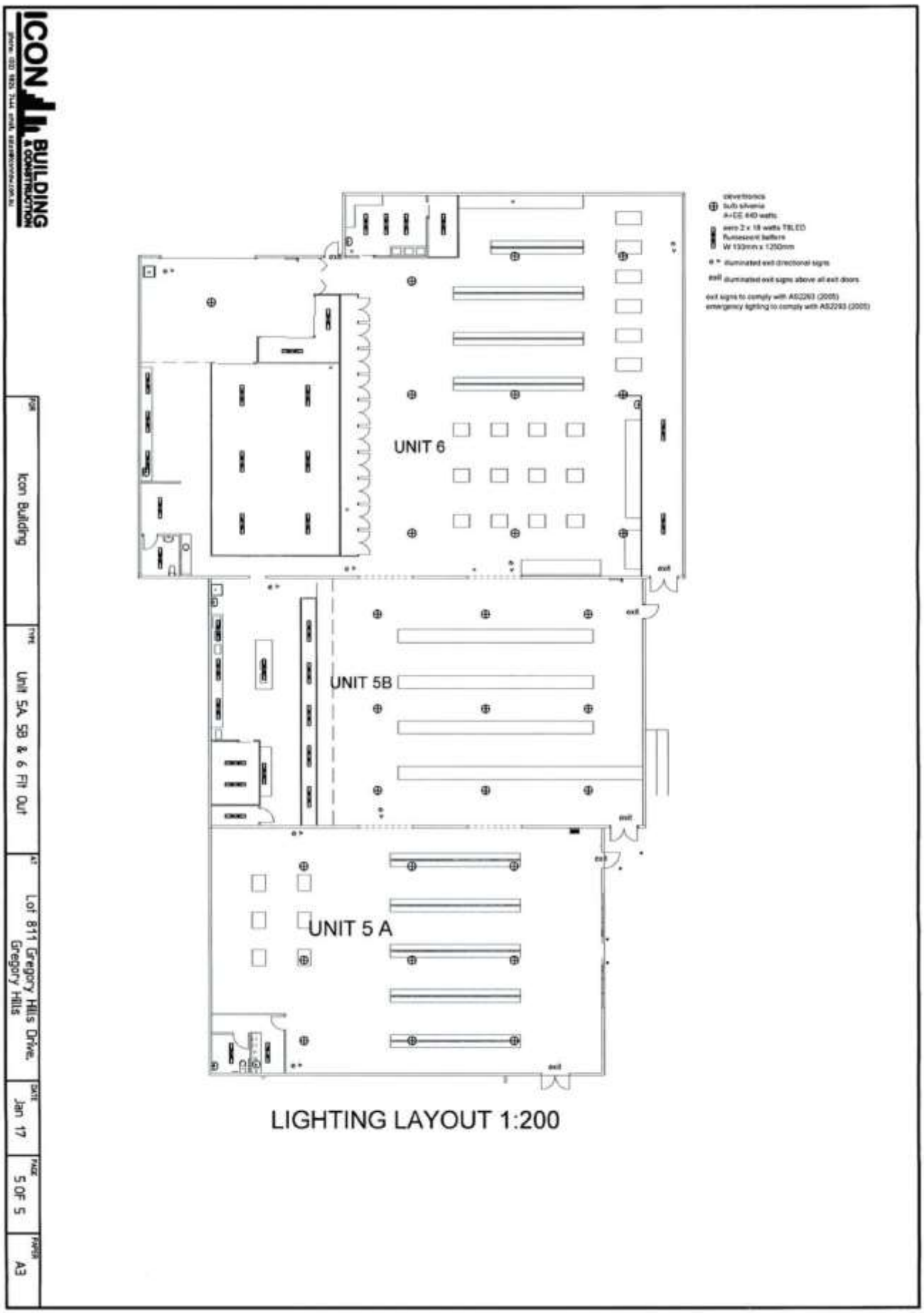

ORD04

Attachment 3

MacroPlan Australia
SETTING NEW STANDARDS

March 2007

FINAL REPORT – EMPLOYMENT LAND STUDY

ORAN PARK AND TURNER ROAD PRECINCTS

Prepared for

Growth Centres Commission

MACROPLAN AUSTRALIA PTY LTD

ABN 38 657 106 626

SYDNEY
Suite 502, Level 5, Fairfax House, 19-31 Pitt St
Sydney, NSW, 2000
t. 02 9252 1199 f. 02 9241 6002

MELBOURNE
Level 4, 107-109 Flinders Lane,
Melbourne, Vic. 3000
t. 03 9663 6826 f. 03 9663 2896

MacroPlan Australia
SETTING NEW STANDARDS

Contact

PROJECT DIRECTOR
Gary Prattley (National Director, Planning)
Sydney

PROJECT MANAGER
Jenny Rudolph (Director, Planning)
Sydney

PROJECT CONTACT
Richard Brice (Associate Director, Economic Analysis)
Level 4, 107-109 Flinders Lane,
Melbourne, Vic. 3000
t. 61 3 9663 6826 f. 61 3 9663 2896
e. brice@macroplan.com.au

Signed *

Dated

* This document has been reviewed by the National Director of Planning MacroPlan Australia.

MacroPlan Australia
SETTING NEW STANDARDS

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Executive Summary

BACKGROUND

1. MacroPlan Australia has been engaged by the Growth Centres Commission (GCC) to undertake an employment land and retail floorspace study in respect to the proposed Oran Park town centre and Turner Road employment precinct in Sydney's South West Growth Centre.

2. The assessment provides an overview of the South West Sydney industrial land and retail floorspace market, and identifies industrial property trends and segments to assess the opportunity for the establishment of employment land development in Oran Park and Turner Road over the next 15 – 20 years.

3. The assessment provides advice on the likely timing, staging and release of retail floorspace and industrial floorspace subject to the:
   - Employment needs of residents
   - Market demand for the product

4. In practice what this means is that MacroPlan's advice on the release of employment land at Turner Road and retail floorspace at the Oran Park town centre, has been tested by the consideration of the employment needs of residents against the realities of market demand.

5. Unlike more established suburbs in Sydney, fringe areas of Sydney – including South West Sydney – do not supply enough jobs for their working populations. This is a constraint on sustainability as it forces residents to commute further for employment opportunities and retailing.

6. An opportunity therefore exists to address this imbalance in South West Sydney but this can only be done in the context of what the market is prepared to absorb. Market absorption of employment land and retail floorspace will be subject to:
   - Growth in the local and regional economies (i.e. the Camden municipality and South West Sydney)
   - Population growth in the precincts of the South West Growth Centre and in surrounding established suburbs
   - Changes in the demand for different employment land parcels and sizes over time
   - Providing employment land products that meet the needs of industry and that attract businesses that match the skills of residents.

7. The future growth in Sydney's population and labour force will require more jobs and more employment sites. There are projected to be up to 500,000 additional jobs in Sydney by 2031, 80,000 of which will be required in South West Sydney. According to estimates in the Sydney Metropolitan Strategy a further 7,500 hectares of employment land may be needed in addition to the current 15,000 hectares.

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THE SOUTH WEST GROWTH SECTOR

8. In July 2006 the NSW Government gazetted the South West and North West Growth area structure plans with the associated promulgation of the Growth Centres State Environmental policy.

9. The South West Growth Centre is to accommodate approximately 118,000 dwellings across 18 precincts. Oran Park, Turner Road & Edmondson Park are the first precincts released for development by government.

10. The SEPP identified Liverpool and Camden as the primary major towns in the growth area, with the new regional town being Leppington. In terms of the policy of a hierarchy of centres, new town centres will include Oran Park, Austral, Catherine Fields and Rossmore. Each of the precincts may also include local "hubs" including a mix of community uses, local open space facilities or local convenient retail uses.

11. Major employment lands identified in the SEPP are Badgery's Creek, Lowes Creek, Marylands, Kemp Creek, and Turner Road.

12. THE SW structure plan appearing in the SEPP was compiled using broader, high level studies as well as extensive consultation. In now preparing a detailed precinct plan, MacroPlan is required to produce advice on the ILP to either verify the structure plan or produce details and justification for the inclusion of amendments or further details to be included in the precinct plan of Oran Park and Turner Road.

13. Both Oran Park and Turner Road will fill strategically important roles for the early success of the South West Growth Centre. Along with Turner Road, Oran Park will lead the early supply of residential lots and provide a town centre that will have an important local function – particularly if the delivery of Leppington is delayed.

14. Leppington is the primary regional centre within the South West Growth Centre. It is scheduled to begin delivery from 2012, in line with the proposed rail extension at that time. However land supply around Leppington is highly fragmented and land co-ordination will therefore take time.

SOUTH WEST SYDNEY EMPLOYMENT LAND SUPPLY CONTEXT

15. In March 2007 the NSW government released the "Employment Lands of Sydney Action Plan" (ELDP). Among the five key sections identified by the government to address future employment land needs in Metropolitan Sydney is 'Action2' – 'Release more Greenfield land to overcome a shortage of supply'.

16. The document specifically notes under this Action that:

- To further ensure sufficient employment land in Western Sydney, The Department of Planning, the department of State and Regional Development and the Growth Centres Commission will investigate policy and planning options to accelerate the early development of employment lands in the South West and North West growth centres.
- New Employment land totalling 2,000 hectares have been proposed in both the growth centres and Central Coast structure planning work, with a further 2,600 hectares of sites investigation.
- Detailed planning will ensure a range of lot sizes to encourage diversity of economic activities for the growing residential population and workforce in the surrounding areas.

- As part of the ELDP the Department of Planning will also consider the designation of a Western Sydney Employment Lands Investigation Area in the area between the Western Sydney Employment Hub and Badgery's Creek to the North of Elizabeth Drive. The aim is to investigate medium-long term needs and integrate this into the development of both the Western Sydney Employment Hub and the South West growth centres.

17. MacroPlan has reviewed the volume of zoned industrial land that is currently in the South West Sydney market, including vacancy rates. This review assists our estimation of the relative importance of Turner Road as a future industrial land development.

18. There is currently 2,346 hectares of industrial land in the municipalities of Camden, Campbelltown, Liverpool and Wollondilly. Of this land 470 hectares or nearly 20% is vacant.

19. The following points can be made from the analysis in the report:
    - Smeaton Grange and Moorebank are the two largest nodes in terms of available land
    - Land in Campbelltown has the lowest vacancy rates of the municipalities assessed
    - Wollondilly offers longer term opportunities in Maldon
    - Vacant sites are not evenly distributed throughout South West Sydney and are tightly held across limited locations and parcel sizes.

20. Strong levels of supply are important as they limit price increases and maintain different product types (which are important for encouraging a mix of industry and job opportunities). If there are an insufficient number of land owners, competition is constrained and the local economy will suffer from reduced growth in employment opportunities.

21. The supply equation in the South West points to a strong opportunity for Turner Road, particularly from 2008 onwards.

SOUTH WEST SYDNEY INDUSTRIAL LAND DEMAND

22. The overall macroeconomic drivers for industrial land are positive in Sydney. Imports and exports continue to grow strongly in line with the national economy. Containerised cargo continues to grow across Australian ports with the Port of Sydney experiencing consistent growth over 2006.

23. Port Botany is now reaching capacity and plans for its expansion are being settled. The expansion of the Port will lead to growth in the demand for warehousing and distribution functions throughout Sydney. Distribution centres and functions that serve them will continue to move to more affordable locations including the South West region of Sydney.

24. Annual absorption of industrial floorspace in the South West region of Sydney reached 125,800m2 in 2005 and is expected to average 260,000m2 over the coming two years as 73 new development projects are completed[1].

25. This level of absorption will equate to a demand for industrial land of around 50 hectares per year in the South West. Constraints in available land on the market from 2008 will require more new land releases at that time.

[1] CB Richard Ellis – Sydney Industrial Market View Report – June 2006

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INDUSTRIAL LAND TRENDS AND LABOUR MARKET NEED

26. As part of the assessment of the appropriateness of the Turner Road masterplan, MacroPlan has assessed trends in industrial land products. We have also reviewed the need for industrial land derived from the expected resident labour force at Oran Park and Turner Road.

27. Product trends for industrial land and accompanying development are relevant in shaping Turner Road. The manufacturing sector is seeking low cost locations to maintain competitiveness. This means locations with low land cost, low transport costs and low labour costs. Industries requiring larger sites are therefore seeking locations away from the inner city areas to green field sites with good transport infrastructure and accessibility.

28. There has been a growing emphasis on logistics and distribution, with the supply chain from production to delivery effectively becoming shorter and more efficient. The role of manufacturing with warehousing may be combined whilst the retail stage may be reduced. Many functions (sales/ admin/ warehouse/ distribution) will increasingly take place under the one roof.

29. In addition there will continue to be a requirement for industrial land servicing the needs of local trades, including those involved in the building industry, and maintenance and repairs e.g. auto repairs.

30. According to the Growth Centres Commission development code highlighted in more detail in this report, as many jobs as possible should be provided locally to encourage employment self containment and self sufficiency. Employment self-sufficiency represents the proportion of the local employed workforce that could potentially find employment within the local area.

31. Using the benchmark yield of 40 blue collar jobs per hectare of industrial land across Sydney, the following table outlines the industrial land supply required for Turner Road. The target level of supply in this table achieves full employment self sufficiency for the expected Oran Park and Turner Road blue collar labour force.

Oran Park and Turner Road catchment							
	2008	2010	2012	2014	2016	2018	2023
Population	772	5,873	13,134	21,631	29,125	33,065	35,479
Employed (45% of total population)	347	2,643	5,910	9,734	13,106	14,879	15,966
Blue Collar (37% of total employed)	129	978	2,187	3,602	4,849	5,505	5,907
Industrial Land Required (self sufficiency) - 40 jobs / ha	3	24	55	90	121	138	148

32. The industrial land required for blue collar employment self sufficiency has been estimated at approximately 148 hectares by 2023 based on the labour force catchment of Turner Road and Oran Park. MacroPlan has not reviewed the need for employment land at Turner Road subject to the populations of Catherine Fields and Marylands and the expected supply of employment land in other precincts. This assessment will need to occur when more certainty around the timing of land release at these precincts exists.

33. Around 100 hectares of employment land is appropriate across Oran Park and Turner Road for the following reasons:

- The industrial premises likely to establish across the two precincts will lead to an adequate mix of employment opportunities for blue collar workers residing in Turner Road and Oran Park and provide some local white collar employment (as part of ancillary office functions)

- Many of the blue collar workers at Oran Park and Turner Road will seek employment opportunities at Lowes Creek or Bringelly in the medium to longer term as those industrial nodes begin development. The land supply in these developments needs to be reviewed further.
- Higher yields for employment could be reached if some of the land is used for bulky good or industry service retailing however the Growth Centres Commission will need to consider how consistent this may be with any existing or proposed 'out of centre' retailing policies. As explained below bulky goods at the Turner Road Precinct would be likely to compete with the Oran Park Town Centre.

IMPLICATIONS FOR TURNER ROAD INDICATIVE LAYOUT PLAN

34. A supply of 85 hectares of employment land at Turner Road and 15 hectares on the Northern Road in the Oran Park Precinct will be adequate with regard to meeting the needs of the local labour force if:
    - Higher employment yield industries are attracted in industrial service sectors including panel beaters, machinists, small manufacturers, building suppliers etc
    - Lower employment yield industries such as warehousing and distribution is kept to a minimum (this can be achieved by restricting the supply of larger land parcels)
    - Provision for industries that include office and administrative components are included such as regional head office functions

35. Even though Turner Road does have access to Camden Valley Way and Narellan Road, it is not necessarily as suited to a distribution / warehousing node as some other industrial complexes in South West Sydney due to its lack of direct access to the F5. It could act as an industrial service employment node with some distribution functions for the southern half of the South West Growth Centre.

36. The supply of 85 hectares of employment land at Turner Road would yield around 3,000 blue collar jobs and an additional 400 to 500 white collar jobs. It could be delivered over 10 years without suffering constraints from market demand.

37. Turner Roads medium and longer term role as an employment node within the South West Growth Centre will be subject to:
    - The timing of the release of other employment nodes (in particular industrial land releases) in the South West Growth Centre including Lowes Creek and Bringelly
    - The industrial land products and land parcels released at competing / complementary industrial land releases in the South West Growth Centre
    - The timing of the Southern Freight line and the release of industrial land at Menangle Park and other developments outside the South West Growth Centre

38. While the supply of employment land at Turner Road will not lead to full employment self sufficiency at the Oran Park and Turner Road precincts, it is important to note that a wide range of employment opportunities will be made available at Lowes Creek and Bringelly for blue collar workers and at Leppington for white collar workers.

39. An opportunity may exist to supply a restricted supply of bulky goods on industrial land adjacent to Badgally Road and Camden Valley Way in the medium to longer term. This would have a limited impact on the Oran Park Town Centre under the following scenarios:

- Lots are released at Catherine Fields from 2015 at a rate of 200 to 300 per annum increasing the growth in the retail expenditure pool, and providing impetus for the sustainable supply of additional retail
- Badgally Road is upgraded from 2012 - 2014 providing for a potentially wider retail catchment from Campbelltown
- Marylands is also co-ordinated and released from 2015 at a rate of 400 to 500 lots per annum providing additional support for the Oran Park Town Centre, however this is unlikely given the supply of lots envisaged from Oran Park and the competition they would provide.

40. This scenario could only occur under a strong Sydney housing market. If the supply of bulky goods envisaged in the Turner Road indicative layout plan was pursued, the growth of retail floorspace at Oran Park Town Centre would be restricted. This would constrain sales of medium and high density dwellings at Oran Park and reduce opportunities for commercial floorspace there.

ORAN PARK TOWN CENTRE AND OTHER CENTRES

41. MacroPlan has assessed the projected population trade catchment for the purposes of calculating likely levels of sustainable retail floorspace for the Oran Park town centre and other centres within the Oran Park and Turner Road precincts. We have undertaken a review of the location of existing primary regional shopping centres and an assessment of Oran Park's potential role in the hierarchy of the outer south-western Sydney retail market.

42. The retail trade area has been split into the following two catchments:
    - Primary Catchment – Oran Park
    - Secondary Catchment – Turner Road, Catherine Fields and Marylands

43. The results of the sustainable floorspace assessment for the Oran Park Trade Area, combined with potential levels of retention indicate that by 2036, the trade area categories will generate demand for 70,048 m2 of retail floorspace across Oran Park and Turner Road. The retail floorspace sustainable at both precincts by type appears in the table below.

Development Potential (retention based on escape exp)	Forecast 2011	2016	2021	2026	2031	2036
Regional						
Supermarket	2,194	7,989	12,143	14,101	16,241	17,438
Catering (Restaurant and Café')	1,347	4,900	7,528	8,668	10,336	11,121
Clothing and Assessorires	914	3,334	4,988	5,664	6,401	6,849
Furniture and Whitegoods	642	2,474	4,299	5,816	7,646	8,855
Electrical	180	695	1,207	1,633	2,147	2,486
Houseware and Softgoods	383	1,476	2,565	3,470	4,562	5,284
Hardware	836	3,221	5,597	7,571	9,954	11,529
Sports and Hobbies	222	799	1,348	1,776	2,248	2,453
Services	758	2,759	4,207	4,907	5,672	6,094
Newsagent and Chemist	494	1,803	2,669	2,984	3,327	3,551
Bottle-shop	228	833	1,228	1,366	1,516	1,616
Total	**8,199**	**30,283**	**47,779**	**58,156**	**70,048**	**77,278**

44. The analysis detailed in this report identifies the justification for a retail town centre of approximately 50,000 to 55,000m2 in Oran Park (including associated bulky goods) at the end of the development timeframe for the retail catchment.

45. This is likely to incorporate two full line discount department stores, two supermarkets and approximately 100 specialty stores. This offering will provide extensive coverage of a broad range of retail needs and a wide range of shopper facilities and amenities.

46. With up to 50,000m2 of floorspace the Oran Park town centre will have a significant function within the region as a service centre and employment generator.

47. Other retail centres in the Oran Park Precinct would include two 5,000m2 neighbourhood centres west of the Northern Road in the Oran Park precinct. Both these centres should have caps of 1,500m2 on supermarket size to limit competition with the town centre. The Turner Road precinct would supply a 10,000m2 retail centre, with other retailing functions supplied at the Golf Course site.

48. In addition to the supply of a large hardware store (that would be consistent with industrial uses in the area) an opportunity may exist to supply some bulky goods adjacent to Badgally Road and Camden Valley Way at the Turner Road Precinct in the medium to longer term. This would have a limited impact on the Oran Park Town Centre under the following scenarios:

- Lots are released at Catherine Fields from 2015 at a rate of around 300 per year or more adding to the retail expenditure pool and providing impetus for the sustainability supply of additional retail
- Badgally Road is upgraded from 2012 - 2014 providing for a potentially wider retail catchment from Campbelltown
- Marylands is also co-ordinated and released with a rapid lot supply of up to 500 lots per annum from 2015 providing additional support for the Oran Park Town Centre, however this is unlikely given the supply of lots envisaged from Oran Park and the competition they would provide.

49. The volume of lot supply highlighted in the scenario above would be required to minimise competition with the Oran Park Town Centre. However this level of lot supply (and associated populations) may be difficult to achieve at these volumes if the housing market was depressed at the time.

50. Likely employment yields at the Oran Park Town Centre are as follows:
    - Retail 45,000m2 – supporting 1,800 jobs at 1 position per 25m2
    - Office and other administrative – supporting 250 jobs at 1 position per 20m2

STRATEGIC IMPLEMENTATION – ORAN PARK PRECINCT

51. The role of the Oran Park Town Centre in the development of the Southern half of the South West Growth Centre will be influenced by a number of factors. However, one of the primary drivers of its growth as a retail and commercial centre will be the timing of Leppington.

52. It is currently assumed that Leppington (and surrounding populations) will begin delivery between 2016 and 2018. However this timing is contingent upon the Growth Centres Commission achieving a co-ordinated release of land.

53. MacroPlan recommends that the Growth Centres Commission takes a flexible position on the role of the Oran Park town centre in the future recognising that a delay in the delivery of Leppington will require the Oran Park town centre to have a more significant role, particularly as a commercial centre.

54. Further, if Leppington is delayed and if dwellings are delivered from 2016 in Marylands and Catherine Fields, the Oran Park Town Centre will have a more important regional role as a town centre and will need to be developed in a way that ensures that local business activity is captured and not leaked to other more established regions of Sydney.

STRATEGIC IMPLEMENTATION – TURNER ROAD PRECINCT

55. In relation to the Turner Road Precinct, MacroPlan has noted that landowners in Turner Road have a preference for supplying bulky goods and retail showrooms on land adjacent to Badgally Road and Camden Valley Way. We have concerns with this land use strategy for the following reasons:

- It will reduce the supply of land for industrial purposes in South West Sydney of which there is a current and emerging future shortfall
- It will impact on the timing of the supply of retail floorspace in and around the Oran Park Town Centre by competing with retail floorspace there
- It would increase the volume of private vehicle trips for the purpose of shopping as there would be limited public transport options at Turner Road relative to the Oran Park Town Centre

56. The supply of bulky goods adjacent to the Oran Park Town Centre is a better option as it will increase retail trade and the absorption of floorspace there. This will make commercial and high density residential uses more attractive.

CONCLUSION

57. The primary aim of the South West Growth Centre is sustainable residential accommodation, which in turn requires higher residential densities than have traditionally been delivered in fringe areas of Sydney.

58. It is important for the Growth Centres Commission to recognise that the delivery of higher density living in the South West Growth Centre will be difficult to achieve in the context of the residential market. Apartments and townhouses in established centres within South West Sydney (including Liverpool and Campbelltown) are becoming difficult to sell.

59. Apartments sold in new development fronts such as Oran Park are unlikely to be offered at a discount to apartments in established town centres. It is therefore important to note that the supply of high density housing in new development fronts will need planning assistance in terms of the provision of job opportunities in the town centre and commercial floorspace.

60. Buyers of medium and high density dwellings will only trade off dwelling size if a wide range of services are available on there doorstep. This is the primary driver behind our advice to consolidate as many functions in the Oran Park Town Centre as possible including retail and commercial floorspace.

61. In conclusion, MacroPlan re-iterates that there are a number of unknown variables that are likely to influence the most appropriate land use strategy across both precincts in the future including:

- The timing of residential land co-ordination in other precincts (including the management of small land holder price expectations)
- The timing of infrastructure supply and connections (including road and rail)

- Market acceptance of medium and high density dwellings in new development fronts

62. All of these factors have proven to be constraints on the delivery of residential land in Sydney in recent years and they are likely to continue to remain so.

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1 Introduction

1.1 Project Scope

The report addresses the Economic and Employment Land Study brief and MacroPlan's proposal for this work by providing:

- Overview of the South West Sydney industrial land market
- Reviews the likely employment product appropriate at Turner Road and Oran Park
- Reviews the timing and product mix that will enhance employment self sufficiency and self containment in the South West Growth Centre
- Provides advice on sizing and timing for the Oran Park retail and commercial centre and employment lands at Turner Road

The report is set out as follows:

- Section 2 - reviews the project background, study area location and methodology.
- Section 3 – is an industrial land supply assessment for the South West Sydney region including a review of the latest available data on supply from MACROC by key industrial nodes in Camden, Campbelltown and Liverpool.
- Section 4 - provides a demand assessment for industrial land, with an assessment of recent consumption of industrial land in South West Sydney.
- Section 5 – provides an overview of industrial land trends and products in the national market and reviews the need for industrial land at Turner Road and Oran Park based on the expected resident labour force in the proposed precincts.
- Section 6 –reviews implications for the Turner Rd masterplan and compares labour market need with the reality of the industrial land market size. It assesses the potential strategic role for Turner Rd in the context of the South West Growth Centre and South West Sydney.
- Section 7 – provides a recommended sizing and configuration for the Oran Park Town Centre including estimates of supported employment.
- Section 8 – provides a conclusion to the report

This report supports the exhibition of the SEPP for the proposed Oran Park and Turner Road precinct plans and verifies the indicative layout plans for each precinct.

1.2 Limitations

This report is prepared on the instructions of the party to whom it is addressed and is thus not suitable for the use other than that by that party. As the report involves future forecasts, it can be affected by a number of unforeseen variables. It represents for the party to whom or which it is addressed the best estimates of MacroPlan Australia Pty Ltd, but MacroPlan Australia Pty Ltd can give no assurance that any forecasts will be achieved.

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2 Background and methodology

This section of the report provides a background assessment of Sydney's employment need, particularly in South West Sydney, an overview of the Oran Park and Turner Road precincts and a discussion of MacroPlan's approach.

2.1 Background

2.1.1 Sydney's employment need

The future growth in Sydney's population and labour force will require more jobs and more employment sites. There are projected to be up to 500,000 additional jobs in Sydney by 2031, to a total of 2.5 million jobs.

According to estimates in the Sydney Metropolitan Strategy a further 7,500 hectares of employment land may be needed in addition to the current 15,000 hectares.

Almost half of all new jobs are expected to be located in Western Sydney; however the South West and South West Growth Centre will need to provide an adequate mix of employment in locations that are accessible to its future residents.

Maintaining Sydney's competitiveness and accommodating the growth in its future labour force will require support for existing businesses and more land for the establishment of new business. Over the next 25 years, around 15 million square metres of new industrial floor space may be required across the metropolitan area, according to NSW Planning.

A review of employment land zonings reveals that there is now almost 15,000 hectares of land in the Sydney Region zoned for industrial, employment and enterprise purposes. This excludes Specialised Centres such as Macquarie Park and Norwest.

Around 450,000 people are employed in these areas, giving an average overall employment density of 30 jobs per hectare. While employment densities are increasing in enterprises with a high share of office jobs, they can be as low as 10 jobs per hectare in areas of Western Sydney where some employment land is being developed for warehouses and distribution centres. These functions are still important to the trade function of a global city. If future employment densities averaged 20 jobs per hectare, 7,500 hectares more employment land would be required in Sydney to accommodate future needs[2]

2.1.2 Regional employment planning

The structure planning for the North West and South West growth centres identified a number of proposed employment land areas and potential areas for investigation.

The proposed sites highlighted in this structure planning process total about 2,000 hectares in area and areas for investigation total about 2,600 hectares. These areas provide an initial basis to meet the future need for additional employment land.

[2] Sydney Metropolitan Strategy – Employment Statement

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The Metropolitan Strategy takes a subregional approach to planning for employment growth. The Strategy seeks to more closely integrate employment and population growth in subregions, particularly to ensure that job growth matches population growth in rapidly growing subregions.

This strategy is important as the co-location of jobs and population encourages residents to work near their place of residence and in turn reduces the call on infrastructure and the cost to the economy.

Table 1 Metro Strategy regional employment targets

TABLE A1 EMPLOYMENT TRENDS AND EMPLOYMENT CAPACITY TARGETS BY SUBREGION

Subregion	1981	2004	2031 employment capacity target	2004–31 growth	2004–31 % growth	2004 job share	2031 job share
Sydney City	366,835	400,755	465,000	58,245	**14.3%**	19.9%	18.6%
East	94,976	132,365	155,000	17,635	**12.8%**	6.7%	6.2%
South	143,637	190,940	212,000	21,060	**11.0%**	9.3%	8.5%
Inner North	167,721	245,628	300,000	54,372	**22.1%**	12.0%	12.0%
North	85,869	82,453	90,500	8,047	**9.8%**	4.0%	3.6%
North East	57,666	67,237	103,500	16,263	**18.6%**	4.3%	4.1%
Inner West	96,159	102,090	112,000	9,910	**9.7%**	5.0%	4.5%
West Central	257,310	323,550	358,500	34,950	**10.8%**	16.8%	14.3%
North West	118,639	242,736	346,500	98,764	**39.9%**	12.1%	13.9%
South West	62,601	127,281	207,000	79,719	**62.6%**	6.2%	8.3%
Central Coast	45,639	94,962	150,000	55,048	**58.0%**	4.6%	6.0%
TOTAL	1,475,509	2,045,989	2,500,000	454,013	**22.2%**	100.0%	100.0%

Source: Sydney Metropolitan Strategy – Economy and Employment

Table 1 above reveals the expected employment growth in each region of Sydney and the capacity targets.

Employment in South West Sydney is estimated at 127,281 jobs in 2004. This is expected to increase by 79,719 or 63% over the period to 2031. As part of this increase the South West Growth Centre will need to supply a significant share of employment.

2.2 Locational overview

The South West Growth Centre is approximately 15,000 hectares in area and has been divided into 18 precincts which will contain about 118,000 new homes over the coming years. Oran Park and Turner Road are both included in these precincts.

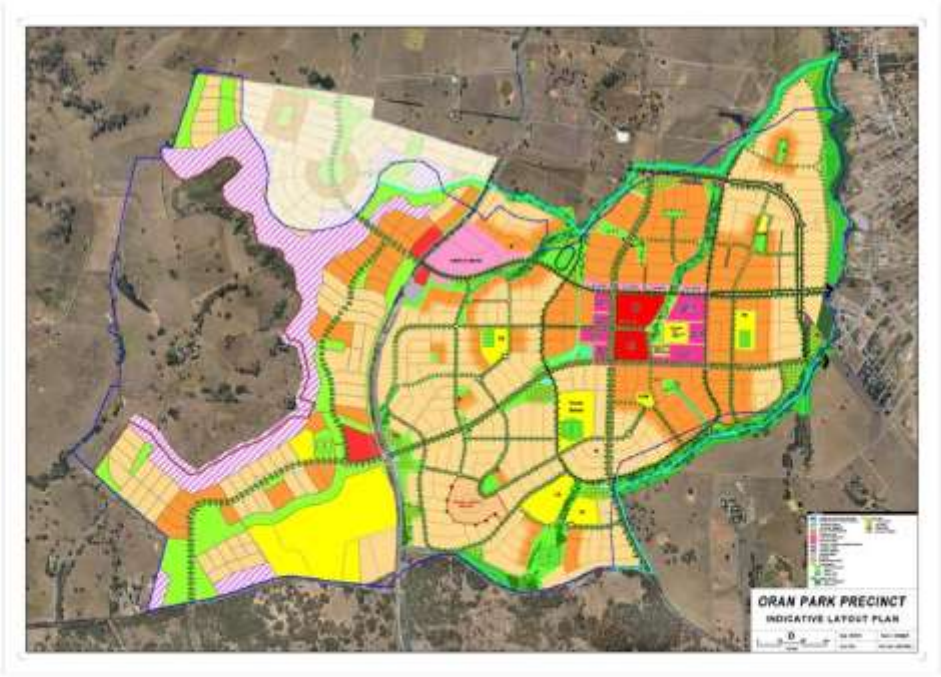
2.2.1 Oran Park

Oran Park is in the Camden local government area. The South West Structure Plan defines Oran Park as one of the 16 precincts in the South West Growth Centre. Surrounding the centralised town centre will be six to seven neighbourhood centres, with 8,000 dwellings accommodating a population of around 23,000.

Oran Park town centre would be located on a new north-south boulevard which provides a direct link to other precincts in the west of the Growth Centre. From the South, Oran Park will have direct access to The Northern Road and Camden Valley Way, two of the primary arterial roads in the region.

Oran Park will include a town centre with around 50,000m2 of retail floorspace (including 10,000m2 of bulky goods adjacent to the town centre). Around 5,000m2 of office would also be provided. It is split by the Northern Rd with higher dwelling densities envisaged around the town centre and lower densities to the west of Northern Rd. Two additional neighbourhood shopping centres are envisaged for the communities located west of the Northern Road.

Figure 1. Oran Park masterplan



Source: Inspire

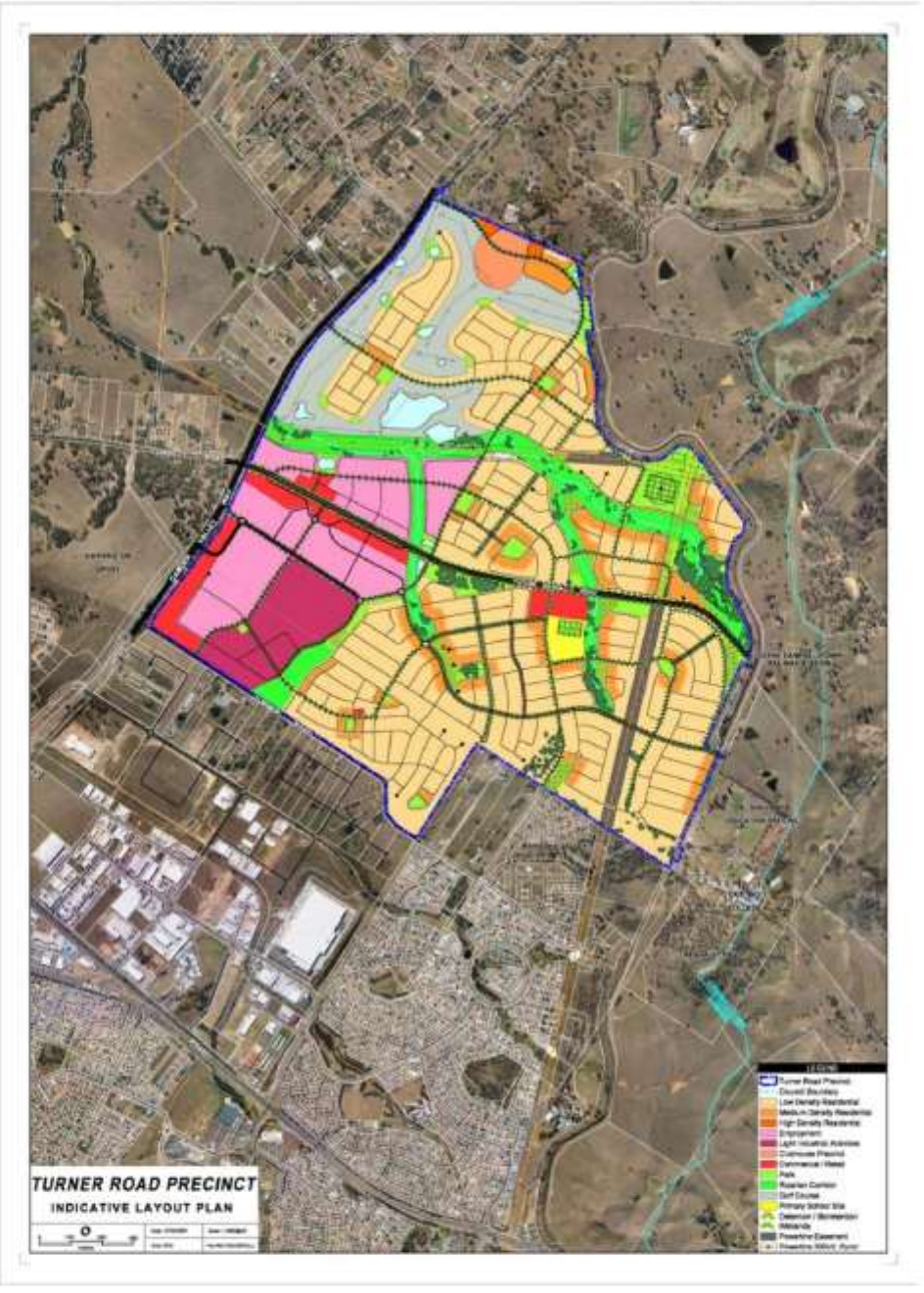
An employment land opportunity has been highlighted at the north of the Oran Park Precinct fronting the Northern Road. This 15 hectare site could be used as a bulky goods / service centre however the land uses on this employment area must be compatible and support the growth of the town centre. The supply of a large volume of bulky goods at this site early in the development phase of Oran Park would influence the growth of the town centre.

2.2.2 Turner Road Precinct

The Turner Rd Precinct is the most strategically located precinct in the South West Growth Centre with regard to the provision of a regionally significant employment land node. The precinct is located south of Camden Valley Way and east of Turner Road, adjacent to the Smeaton Grange industrial area. The Turner Road precinct will include around 85 hectares of employment land as well as a retail centre.

The precinct will act as a supplier of job opportunities for residents at Oran Park and Turner Road but also for residents at Marylands and Catherine Fields. The indicative layout plan for the precinct layout is depicted below.

Figure 2. Turner Road Precinct



Source: Inspire

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2.2.3 The strategic location of both precincts

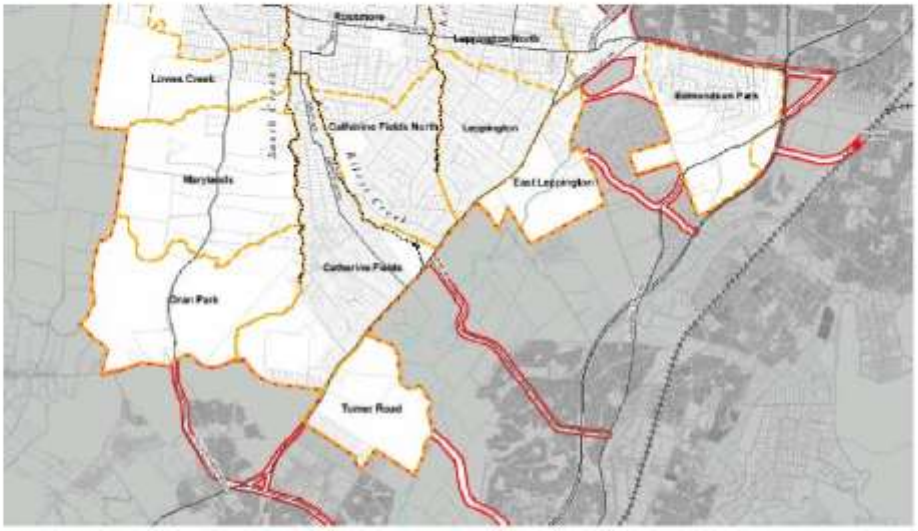
Both Oran Park and Turner Road precincts will fill strategically important roles that will influence the early success of the South West Growth Centre.

Oran Park will lead the early supply of residential lots and provide a town centre that will have an important local function – particularly if the delivery of Leppington is delayed.

The Leppington town centre is scheduled to begin delivery from 2012, in line with the proposed rail extension at that time. However land supply around Leppington is highly fragmented and land co-ordination and development could therefore take longer than expected. It is possible that the delivery of the first stage of the Leppington town centre could occur between 2015 and 2020 which will mean that Oran Park residents may need to rely on their own town centre for a wider range of goods and services in the short to medium term.

As discussed above, Turner Road will have an important function of satisfying the employment demands of residents throughout surrounding precincts and the wider region. The required volume of employment land at Turner Rd will be highly dependent on the industry operating there. Transport and Distribution functions only yield around 20 jobs per hectare whereas smaller manufacturing and engineering service firms can yield up to 100 jobs per hectare. The parcels of land that are delivered at Turner Road including lot sizes and timing will influence industry mixes and employment yields, however the successful delivery will be subject to market demand.

Figure 3. Southern half of South West Growth Centre



Source: NSW Department of Planning

The Oran Park and Turner Rd precincts are depicted above. They have different characteristics due to their likely land use mix and locational advantages and disadvantages.

Firstly with regard to the Turner Road precinct, MacroPlan notes the following features:

- The precinct is well located to primary road infrastructure with direct access to Camden Valley Way and proposed access to the F5 freeway in the future

- It provides an opportunity to supply employment to its own residents and residents in Oran Park with industries that will match the skills of many new residents
- It also has the capacity to provide employment opportunities for residents in the Marylands and Catherine Fields precincts
- Turner Road will face competition from other employment land nodes, including Menangle Park, during its development cycle

In relation to Oran Park, MacroPlan notes that:

- It is one of the key parcels of unfragmented residential land for the South West Growth Centre and is crucial to the early delivery of lots
- It will be crucial to build local employment opportunities near Oran Park to encourage sustainable commuting behaviour wherever possible
- It will include a retail centre that will function as a service centre for residents in Turner Road, Catherine Fields and Marylands.
- It will be important for the Oran Park Town Centre to complement rather than compete against the existing Camden town centre and Narellan.

2.3 Methodology

The approach to this project has involved three separate assessments including:

- Assessment of the need for employment land at Turner Road and Oran Park subject to the likely future labour force
- Assessment of the demand for employment land at Turner Road subject to the growth in South West Sydney's industrial sector
- Assessment of the demand for retail floorspace at the Oran Park town centre and at Turner Road subject to expected household growth in these and surrounding precincts

The assessment provides an overview of the South West Sydney industrial land and retail floor space market, and identifies industrial property trends and segments to assess the opportunity for the establishment of employment land development in Oran Park and Turner Road over the next 15 – 20 years.

The assessment provides advice on the likely timing, staging, size and release of employment land and industrial floorspace subject to:

- Employment needs of residents
- Market demand for the product

In practice what this means is that MacroPlan's advice on the release of employment land at Turner Road and retail and office floorspace and employment land at Oran Park, has been tested by the consideration of the employment needs of residents against the realities of market demand.

2.3.1 Assessing the need for employment land

The need for employment land is subject to meeting the principles of:

- Employment self sufficiency whereby a region provides an adequate mix of jobs for its resident labour force

- Employment self containment whereby we review the proportion of the labour force from within a region and from outside a region who may work in that region

Employment land is calculated subject to:

- the number of households,
- expected labour force participation,
- the skills of the labour force,
- the industries the labour will work in
- the number of business floorspace that will be required on average for each job
- the employment that will yield this floorspace by industry

2.3.2 Assessing the market demand for employment land

While a calculation of the volume of land or floorspace is important, the expected market size for employment land and the growth in industry needs to be reviewed. Market growth provides assistance when we provide advice on timing and staging of land release.

Therefore the assessment of timing and supply of employment land at the Turner Rd and Oran Park precincts has been calculated based on demand drivers including:

- Historical take up of employment land across South West Sydney
- Growth in employment in total and by industry across South West Sydney
- Longer term expectations of industry growth in Sydney and in the region
- The movement of business from regions closer to Sydney's CBD to fringe areas like the South West Growth Centre due to land prices

These demand drivers are then compared to expectations of competing supply in and around the precincts that we have assessed.

2.3.3 Calculating demand for the Oran Park Town Centre

The calculation of the demand for floorspace at Oran Park Town Centre has been undertaken subject to the expected expenditure levels of the town centres catchment. Details of the methodology appear in section 7 of this report.

MacroPlan has assumed that the Oran Park precinct will act as a primary catchment, and that households in Turner Road, Marylands and Catherine Fields will act as secondary catchments with significant expenditure leakages to other retail centres.

Details on our assumptions around the timing of household formation, sustainable retail floorspace and the expenditure catchment are including in part 7 of this report.

The expected employment in the retail and commercial centre is also calculated in part 7 of this report.

2.4 Growth Centres Commission Development Code

The Growth Centres Commission Development Code provides the basis for the planning and design of the Precincts, and in this case, the Oran Park and Turner Road Precincts. The Development Code (the "Code") provides a link to the Growth Centres SEPP and Structure Plan by ensuring good design principles in the planning system and layout.

The Code acknowledges:-

- that employment opportunities play a key role in the creation of viable, sustainable and prosperous communities,
- employment strategies should promote the availability of jobs locally and in the region thus facilitating self containment,
- employment types can be grouped into retail centres, industrial/employment lands and mixed uses,
- communities should have easy access to a range of shops, recreational facilities and services, and these can form focal points in the new precincts,
- that retail centres have a distinct hierarchy, namely from major towns with major retail outlets and specialist shops, to village centres with supermarkets and local shops.

For this reason, the economic assessment and strategy for Oran Park and Turner Road Precinct has taken into consideration, and undertaken a brief analysis against the objectives of the Development Code.

The Economic Strategy for Oran Park and Turner Road require around 100 hectares of employment lands (namely, or including industrial and bulky goods) located on major routes and highly visual and suitable lands. The employment lands and economic opportunities are as a result of population growth, employment creation for the local and regional market and anticipated market demand. The hierarchy of centres in these precinct plans includes Oran Park as a major town centre (with a capacity of 50 000m2) within the subregion, with supporting local neighbourhood centres that support the principles of the Development Code. The location and degree of local neighbourhood with retail and employment opportunities will rely on population catchments and market demand.

The Code provides guidelines for the location and extent of employment lands, such as taking into account riparian corridors, informed by contaminated lands (if necessary) or aspects such as land capability. The location of employment land is also dependant on the topography of the land, visual catchment and good access. In particular the Code outlines that mixed use that mixed use town centres, like Oran Park, should be located at major intersections to maximise accessibility and retail exposure. The Code has an objective of "creating centres and neighbourhoods which are readily able to accommodate a broad range of employment opportunities on an ongoing adaptive basis". The Oran Park and Turner Road precincts have taken these guidelines into account and are consistent with them.

The economic strategy for the Oran Park and Turner Road Precincts has taken the "locational" guidelines of the Code into consideration. Although there are guidelines for lot layout, street layout/block sizes for mixed use town centres, the Code does not provide detailed guidelines for the layout of employment lands; except to indicate that employment lands should be "able to accommodate a wide array of employment opportunities".

The Code provides broad structural and principle guidelines for employment and mixed use centres, however further detailed design guidelines will be required to capture and create the character and environment for the precincts. In the town centres and neighbourhood centres detailed guidelines may be encouraged to attract investment, however a balance in design is required to allow for flexibility and growth over time. Further detailed guidelines for industrial and employment lands may be considered depending on the market and character being created.

The Code acknowledges the importance of the principles for mixed use co-location, whether commercial and retail or bulky good and retail. In mixed use town centres it is important to provide public transport within walking distance.

The objective of the Code to provide for flexibility to allow the centres and employment lands to develop over time and in stages, is important. Employment opportunities in Oran Park and Turner Road Precincts require staging of the floor area of retail in association with the population growth and residential market demand. Employment lands will also require to be staged to accommodate the growth over a 10 to 15 year period.

To encourage economic growth of the region and to enable a high degree of self containment and regional containment, the employment lands and mixed use retail centres need to have a flexible zoning. This is key to enable some interim uses to be accommodated while the region is developing, and within the medium term enable change of uses to accommodate the market demand. Within the Oran Park and Turner Road Precinct, the Oran Park town centre at the early stages will provide a catalyst, but also enable local needs to be met, while Turner Road employment land will enable employment opportunities and generation.

In conclusion, the Code provides initial guidelines to ensure the hierarchy of centres and location of employment lands and town centres. Further design details could be considered in the Precinct Plans provided that the employment land and town centre have flexibility to grow and develop.

3 South West Sydney Supply Context

The Department of Planning currently does not report on the volume of industrial land that is zoned in South West Sydney on a regular basis. However a number of reports have been prepared in recent times on volumes of supply and levels of vacancy.

The South West region of Sydney has grown in importance to Sydney's industrial land market over recent years. Minto and Moorebank already account for 5.3% of Sydney's industrial floorspace. Two key industrial estates, the Keylink Industrial Centre and Moorebank Business Pak both have the potential to add over 200,000m2 of warehousing floorspace to the market in the next few years.

3.1 Current supply in the South West

The major existing industrial nodes are reviewed in below. This review of industrial land supply below was completed in 2006 by MACROC using updated estimates from a Hill PDA report prepared in 2003.

Total market size across Camden, Liverpool, Campbelltown and Wollondilly is 2,346 hectares.

3.1.1 Liverpool

Industrial zoned land in Liverpool is distributed across six primary nodes:

- Chipping Norton – 97 hectares
- Cross Roads – 46 hectares
- Moorebank – 196 hectares
- Orange Grove – 40.5 hectares
- Prestons – 224 hectares
- Sappho Road / Warwick Farm – 40 hectares

3.1.2 Camden

Industrial zoned land in Camden is distributed across three primary nodes:

- Camden – 2.85 hectares
- Narellan – 40.94 hectares
- Smeaton Grange – 230.2 hectares

3.1.3 Campbelltown

Industrial zoned land in Campbelltown is distributed across three primary nodes:

- Campbelltown – 160.44 hectares
- Ingleburn – 735.8 hectares
- Minto – 318.8 hectares

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3.1.4 Wollondilly

Industrial zoned land in Camden is distributed across three primary nodes:

- Appin – 11 hectares
- Bargo – 2 hectares
- Maldon – 104 hectares
- Picton – 32 hectares
- Warragamba / Silverdale – 64 hectares

3.2 Available supply in existing nodes

Given the total volume of industrial land it is important to review available supply – particularly unconstrained supply as large proportions of zoned industrial land are often unavailable to the market.

The table below provides an overview of available supply.

Table 2. Zoned industrial land and vacant land by key nodes – South West Sydney

	Total land	Vacant land	Vacant as share of site	Vacant as share of total vacant
Camden	273.99	93.86	34.3%	
- Camden	2.85	0.19	6.7%	0.2%
- Narellan	40.94	9.56	23.4%	10.2%
- Smeaton Grange	230.2	84.11	36.5%	89.6%
Campbelltown	1215.02	112.21	9.2%	
- Campbelltown	160.44	29.86	18.6%	26.6%
- Ingleburn	735.79	45.6	6.2%	40.6%
- Minto	318.79	36.75	11.5%	32.8%
Liverpool	644.2	182.61	28.3%	
- Chipping Norton	97.3	3.62	3.7%	2.0%
- Cross Roads	46.1	23.68	51.4%	13.0%
- Moorebank	196	85.34	43.5%	46.7%
- Orange Grove	40.5	5.62	13.9%	3.1%
- Prestons	224	64.35	28.7%	35.2%
- Sappho Road / Warwick Farm	40.3	0	0.0%	0.0%
Wollondilly	213	81.82	38.4%	
- Appin	11	3.1	28.2%	3.8%
- Bargo	2	0.1	5.0%	0.1%
- Maldon	104	55.4	53.3%	67.7%
- Picton	32	4.52	14.1%	5.5%
- Warragamba / Silverdale	64	18.7	29.2%	22.9%

Source: MACROC

The following points can be made from the analysis in the table above:

- Smeaton Grange and Moorebank are the two largest nodes in terms of available land
- Land in Campbelltown has the lowest vacancy rates of the municipalities assessed
- Wollondilly offers longer term opportunities in Maldon

- Vacant sites are not evenly distributed throughout South West Sydney and are tightly held across limited locations and parcel sizes.

Strong levels of supply are important as they limit price increases and maintain different product types (which are important for encouraging a mix of industry and job opportunities). If there are an insufficient number of land owners, competition is constrained and the local economy will suffer from reduced growth in employment opportunities.

The supply equation in the South West points to a strong opportunity for Turner Road, particularly from 2008 onwards.

4 South West Sydney Industrial Land Demand

4.1 Market overview

The overall macroeconomic drivers for industrial land are positive in Sydney.

Imports and exports continue to grow strongly in line with the national economy. Containerised cargo continues to grow across Australian ports with the Port of Sydney experiencing consistent growth over 2006.

Port Botany is now reaching capacity and plans for its expansion are being settled. The expansion of the Port will lead to growth in the demand for warehousing and distribution functions throughout Sydney. Distribution centres and functions that serve them will continue to move to more affordable locations including the South West region of Sydney.

Land values in the South West of Sydney for sites less than 0.25 hectares continue to average around $300 to $400 per m2 which is cheaper than the Outer West of Sydney at between $400 and $500 per m2. This will continue to drive the competitiveness of South West Sydney as a region to locate industrial business.

4.1.1 The NSW economy

The NSW economy has performed only modestly in 2005/06 relative to the national economy, weakened by moderate population growth and the constraint on consumer confidence from declining housing prices.

Access Economics expects that NSW industrial production will have increased by 2.3% in 2006 and 4.5% in 2007. Growth over the medium term in New South Wales is also expected to track at or above the national average over 2007 and 2008.

4.2 Annual Land absorption

Prospects for industrial land absorption in the South West of Sydney are predicted to be strong over coming years. The Westlink M7 has given firms operating in the South West more direct access to distribution networks. In addition the Southern Sydney Freight line should drive further growth in the region when it is built however there is uncertainty as to its timing.

Annual absorption of industrial floorspace in the South West region of Sydney reached 125,800m2 in 2005 and is expected to average 260,000m2 over the coming two years as 73 new development projects are completed[3]. This level of absorption will equate to a demand for industrial land of around 50 hectares per year. However constraints in available land on the market from 2008 will require new land releases at that time.

[3] CB Richard Ellis – Sydney Industrial Market View Report – June 2006

5 Industrial Land Trends and Labour Market Need

This section provides an overview of the following:

- National trends and opportunities
- Industrial market segments
- Demand drivers for South West Sydney
- The best specification of industrial land at Turner Road given the likely labour force catchment.

5.1 National Trends and Opportunities

The global economy emphasises innovation and specialisation. Creating and transforming knowledge have emerged as the drivers, or keys, to competitiveness.

The drive to more efficient and low cost manufacturing has meant that industry is establishing new modes of production, with greater reliance on imported components, more automated manufacturing and a greater emphasis on establishing market niches.

The manufacturing sector is seeking low cost locations to maintain competitiveness. This means locations with low land cost, low transport costs and low labour costs. Industries requiring larger sites are therefore seeking locations away from the inner city areas to green field sites with good transport infrastructure and accessibility.

The increased reliance on imported components in the manufacturing sector has resulted in an increased focus on assembly and packaging processes with lower overall value add. Industrial property has enjoyed strong growth in line with economic growth over the past 5 years.

There has been a growing emphasis on logistics and distribution, with the supply chain from production to delivery effectively becoming shorter and more efficient. The role of manufacturing and warehousing may be combined with the retail function being reduced. Many functions (sales/ admin/ warehouse/ distribution) will increasingly take place under the one roof.

In addition there will continue to be a requirement for industrial land servicing the needs of local trades, including those involved in the building industry, and maintenance and repairs eg auto repairs.

5.2 Industry Segments

Five basic demand/ user segments have been identified in the industrial property market. These are identified below with an indication of the key features of these sectors.

- Heavy/Noxious/Offensive Industry (5 – 50 ha)
  - heavy industries e.g. Oil Refinery, aluminium smelter.
- Transport/Warehouse/Storage (2+ hectares)
  - Trend in manufacturing/ importing to outsourcing storage - distribution combined. Major transport routes emerging as transport and distribution hub.
- Manufacturing / Component Assembly

- Component assembly manufacturers vary from extensive land areas to less than 2 hectares.

- Light Industrial & Trade Park
  - In this sector, greatest demand is for smaller blocks – 500-1,000 m2 ranging up to 1 ha for light industrial/ small local businesses e.g. engineering and mechanical workshops. Less attention is paid to aspects such as landscaping, signage and setbacks.
- Service Business Park (SBP)/ Technology Park
  - SBP's attract a wide range of service providers and can include manufacturing and processing/ packaging/ distribution industries seeking a high amenity location as well as equipment hiring, places of worship, funeral directors and police and emergency services.
  - Technology Parks - similar block sizes, but high amenity values with high standards of landscaping and built form more akin to an office park.
  - Land parcel sizes 1000 – 2000 sq m (up to 5000 sq m).
- Specific Uses
  - Restricted Retail - large scale Homemaker Centres and Showrooms
  - Highway Uses - car, boat and truck sale yards
  - Recreation/Entertainment - indoor complexes e.g. tennis, squash, basketball/netball, indoor cricket stadiums & outdoor activities such as motor sports e.g. go carts

5.3 Drivers for South West Sydney

There are a number of emerging trends in employment and economic activity having direct and indirect impacts on urban structure. These impacts are particularly pronounced in the outer urban growth areas such as South West Sydney.

There are a number of push factors from the inner Sydney areas to outer areas which are influencing the fringe industrial market. This includes:

- Decline of traditional and major manufacturing
- High and increasing land values in inner Sydney
- Land taxes
- Opportunities for higher value redevelopment – for example commercial, residential and high technology industrial
- Land loss to infrastructure upgrades such as arterial road works

There are also a number of pull factors to the outer fringe of Sydney that are influencing the industrial market. These include:

- Access to blue collar workers who are generally living further way from the CBD
- Demand for service industries in new and growing urban areas
- Lower land values in outer regions
- Larger land size providing opportunities to plan for future expansion
- Attraction of new road works and major urban change
- Positive local government approaches to new industry

These trends have prompted the need for strategic employment sites to be identified and made more attractive for investment to create new and diverse opportunities in outer suburban areas, particularly those with good transport infrastructure.

5.4 The Need for Industrial Land – Labour Market Demand

This section assesses the future demand for employment of residents in the Oran Park and Turner Road precincts and converts this to an industrial land requirement to support high levels of employment self sufficiency.

MacroPlan has assessed a catchment including the likely labour force populations of the Oran Park and Turner Road precincts. In this draft report we have not considered the employment need of residents at Catherine Fields or Marylands as it is currently unclear whether these precincts will be offering their own employment generating land. The timing of the lot release at these precincts also needs to be agreed confirmed.

In the interim we have made the assumption that land would not be released at Catherine Fields and Marylands until around 2020. However for the purposes of assessing the demand for retail floorspace at the Oran Park town centre we have considered secondary demand from Catherine Fields and Marylands.

Employment self-sufficiency represents the proportion of the local employed workforce that could potentially find employment within the local area. For example, in an area containing 10,000 job opportunities and 20,000 employed residents, the local employment self-sufficiency of the area would be one in two or 50%.

The figure below reveals the calculation of the ratio.

Figure 4. Employment self sufficiency ratio

$$\textit{Employment Self-sufficiency ratio} = \frac{\textit{Local job stock}}{\textit{Employed local workforce}}$$

Source: MacroPlan Australia

The precincts of Oran Park and Turner Road sit within the Camden Shire. MacroPlan has assessed them communities that are likely to have a labour force structure similar to the existing residents of Camden Shire.

5.4.1 Assessment assumptions

MacroPlan has made a number of assumptions in our assessment of the need for employment land. These assumptions are likely to be refined further prior to the completion of the final report:

- The Oran Park and Turner Road precincts will begin lot supply in 2008.
- Both the Oran Park and Turner Road precincts will supply lots at the rate of 500 per annum until all residential stages are built out.
- Lot supply at both precincts has been based on assumed population take up by Elton Consulting as part of their assessment.
- The blue collar component of the resident labour force is likely to average around 37% which will drive the relative need for local industry serving these trade related skills (this is based on census statistics for the region)

- Up to 50% of workers will work in the municipality of Camden and in addition, industrial land at Turner Road will provide much needed jobs for the labour force of surrounding municipalities including Campbelltown and Liverpool.

5.4.2 Population Projections

Population in the Oran Park and Turner Road catchment is projected to increase significantly between 2008 and 2023, from 5,873 in 2008 (as the first stages of lots are released) to 35,479 by 2023.

This population growth assumption is sourced from Elton Consulting and is used as a basis for examining the most appropriate timing for the release of industrial land at Turner Road.

Table 3. Oran Park and Turner Road catchment Population Projections

Oran Park and Turner Road catchment	2008	2010	2012	2014	2016	2018	2023
Population	772	5,873	13,134	21,631	29,125	33,065	35,479

Source: MacroPlan Australia 2007

5.4.3 Projected Growth in Blue Collar Jobs

The significant increase in the catchments' population will result in an increased requirement for employment. By 2012, the number of Oran Park and Turner Road residents seeking employment is expected to be approximately 5,910. This equates to approximately 45% of the total resident population.

In order to project the labour force size and the need for employment up to 2023, the share of employment to the population has been assumed to remain constant at 45% over this period (this is based on census data for Camden at 2001). By 2023, there will be a labour force of approximately 15,966 workers in the catchment across all industries. Many of these workers will have a preference for working locally.

Table 4. Catchment Labour Force – 2001 - 2023

Oran Park and Turner Road catchment	2008	2010	2012	2014	2016	2018	2023
Population	772	5,873	13,134	21,631	29,125	33,065	35,479
Employed (45% of total population)	347	2,643	5,910	9,734	13,106	14,879	15,966

Source: MacroPlan Australia (2007)

In 2001, 37% of the Camden labour force worked in blue collar jobs. For the purpose of this assessment, blue collar jobs have been defined as Tradespersons, workers in the Production and Transport sector and Labourers.

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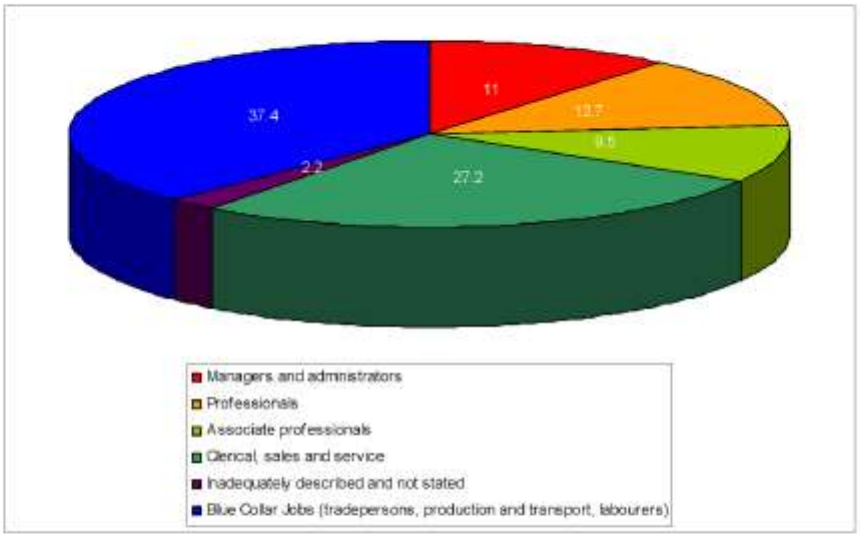
Figure 5. Occupations in South West Sydney



Source: ABS Census Populating and Housing; MacroPlan Australia (2006)

This allows us to forecast the number of Oran Park and Turner Road residents who will be in the blue collar labour force and therefore working on industrial premises or related industry. The number of residents in the blue collar labour force is likely to increase from 2,187 in 2012 to 5,907 in 2023.

Table 5. Blue Collar Employment

Oran Park and Turner Road catchment							
	2008	2010	2012	2014	2016	2018	2023
Population	772	5,873	13,134	21,631	29,125	33,065	35,479
Employed (45% of total population)	347	2,643	5,910	9,734	13,106	14,879	15,966
Blue Collar (37% of total employed)	129	978	2,187	3,602	4,849	5,505	5,907

Source: ABS Census Populating and Housing; MacroPlan Australia (2007)

5.4.4 The Self Sufficiency Requirement

This section assesses the likely industrial land supply required to support blue collar employment self sufficiency in the Oran Park and Turner Road catchment. Clearly not all of the blue collar labour force will want to or will be able to find employment near their place of residence. However the Sydney Metropolitan Strategy does aim to deliver adequate levels of employment opportunities co-located to new residential developments.

For the purpose of identifying the employment self sufficiency requirement, the ratio of workers in blue collar jobs relative to Sydney's total industrial land supply, is used as a benchmark to calculate the likely volume of blue collar jobs yielded per hectare of industrial land. This benchmark has been applied to the Oran Park and Turner Road catchment to determine how much employment land should be supplied to meet the needs of the expected resident labour force.

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Australian Benchmarks

MacroPlan has reviewed national benchmarks for employment yields per hectare to obtain an overview of the likely need for employment land at Turner Road. Table 6 below, shows blue collar job yields per hectare (occupied and total) in five capital cities based on:

- Industrial land supply sourced from State Departments of Infrastructure and Savills research
- Employment by capital city sourced from ABS Labour Force Statistics 2004-05
- Blue collar share of employment sourced from the 2001 Census of Population and Housing
- Derived estimate blue collar jobs by capital city
- Derived estimate of blue collar jobs per occupied hectare and blue collar jobs per hectare (including vacant land).

Table 6. Blue Collar Jobs Per Hectare Benchmarks

	Occupied Industrial Land (ha)	Vacant Industrial Land (ha)	Total Industrial Land (ha)	Employed (2004-05)	Blue Collar Share (2001)	Blue Collar Jobs	Blue Collar Jobs Per Occupied Hectare	Blue Collar Jobs Per Hectare
Sydney	13,621	2,806	16,427	2,123,100	26%	544,156	33	40
Melbourne	17,325	5,207	22,532	1,822,300	28%	503,365	22	29
Brisbane	6,980	2,282	9,262	916,700	28%	259,534	28	37
Adelaide	9,000	1,800	10,800	537,800	27%	144,105	13	16
Perth	8,340	3,060	11,400	749,100	28%	212,574	19	25
Total	55,266	15,155	70,421	6,149,000		1,663,734	24	30

Source: MacroPlan Australia

The industrial land requirement ranges between 13 jobs/ha to 33 jobs/ha (based on occupied industrial land). Higher employment yields are likely to be due to a number of factors including:

- Mature market
- Industries with a high share of office jobs
- Integrated industry/business parks
- Technology parks

While employment densities are increasing in cities such as Sydney with a high share of office jobs, they are relatively low to as few as 10 jobs per hectare in areas of Western Sydney. Employment land in this region is being developed for warehouses and distribution centres which make up an important trade function of major cities.

The ratio of blue collar jobs to the hectares of industrial land varies across Australia and in regions of Sydney depending on industry mix in different industrial developments. Across Sydney around 40 blue collar jobs are supplied per hectare of industrial land.

This assessment only provides a general understanding of the self sufficiency requirement and is limited by:

- Not all blue collar jobs are in industrial areas
- Many industrial activities now have a higher office component which will increase the number of 'white collar' workers in industrial areas. This means that more jobs can be located in employment lands with existing and potential public transport access
- There will also be demand for blue collar employment in the South West Growth Centre from residents who live in established suburbs.

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Despite these limitations, MacroPlan believe it provides a reasonable approximation of the employment self sufficiency requirement.

5.4.5 Converting the labour market to required supply

Using the benchmark of 40 blue collar jobs per hectare of industrial land (as highlighted above), the following table provides an indication of the potential industrial land supply required for Oran Park and Turner Road to achieve blue collar employment self sufficiency.

Table 7. Self Sufficiency - Supply Required

Oran Park and Turner Road catchment	2008	2010	2012	2014	2016	2018	2023
Population	772	5,873	13,134	21,631	29,125	33,065	35,479
Employed (45% of total population)	347	2,643	5,910	9,734	13,106	14,879	15,966
Blue Collar (37% of total employed)	129	978	2,187	3,602	4,849	5,505	5,907
Industrial Land Required (self sufficiency) - 40 jobs / ha	3	24	55	90	121	138	148

Source: MacroPlan Australia (2006)

Industrial land in the existing masterplans for Oran Park and Turner Road is around 100 hectares if the 15 hectare employment node on Oran Park on the Northern Rd is included.

The industrial land required for blue collar employment self sufficiency has been estimated at approximately 148ha by 2023. This equates to absorption of approximately 10 hectares per year if this full amount was supplied.

However a supply of 100 hectares in the Oran Park and Turner Road precincts would be adequate for the following reasons:

- Only around 50% of Oran Park and Turner Rd residents will work in the region and only around 30% or less will actually work in a business located at or associated directly with the industrial land nodes at Turner Road
- Many of the blue collar workers at Oran Park and Turner Road will seek employment opportunities at Lowes Creek or Bringelly in the medium to longer term as those industrial nodes begin development.

However as a cautionary note it is worth noting that the product mix in the early stages of development is likely to be lower employment yield uses such as warehousing and distribution. This means that the estimated employment yield of 40 jobs per hectare may not be achieved in the early years. The employment yield could be as low as 10 jobs per hectare if warehousing and transport industries are the first to take up land parcels.

This will increase the requirement for industrial land supply in the short term in other uses including industrial service centres, if employment self containment is to be maximised.

The likely supported employment at Turner Road with the supply of 85 hectares would be between 3,000 and 3,500 jobs at 40 jobs per hectare but lower if the mix of uses is more aligned to transport and distribution.

In conclusion MacroPlan notes that:

- The supply of employment land at Turner Road will not lead to full self sufficiency in employment for the Turner Rd and Oran Park precincts

- Full employment self sufficiency in fringe development areas is difficult to deliver in the early stages of a residential development due to a lack of labour supply across various skills and the need for industry clusters to form.
- The volume of employment land at Turner Road is adequate with regard to the market need and the development of a local economy.
- It will provide a wide mix of local employment opportunities for new residents
- An opportunity for an evolution of employment land uses toward more of a business park environment could lead to higher employment yields per hectare later in the development cycle
- The Lowes Creek, Bringelly and Leppington precincts will be the primary providers of employment opportunities for the South West Growth Centre labour force.

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6 Implications for Turner Road Masterplan

6.1 Supply of Industrial Land

From MacroPlan's review of the potential for future development in the Turner Rd industrial estate, there appears to be a number of key timeframes.

In the early stages of the development of Oran Park and Turner Road residential communities it will be important for Turner Road to provide as much local employment opportunities as possible. This will assist in the establishment of Turner Road as a vibrant local economy and begin to entrench sustainable commuting behaviour at an early stage for local residents.

Turner Roads medium and longer term role as an employment node within the South West Growth Centre will be subject to:

- The timing of the release of other employment nodes (in particular industrial land releases) in the South West Growth Centre including Lowes Creek and Bringelly
- The industrial land products and land parcels released at competing / complementary industrial land releases in the South West Growth Centre
- The timing of the Southern Freight line and the release of industrial land at Menangle Park and other developments outside the South West Growth Centre

6.2 Timing

6.2.1 Market size

At this stage our recommended supply of industrial land at Turner Road has been framed around the needs of the resident labour force. However the timing and product mix will be subject to the size of the market and its ability to absorb land.

As confirmed in part 3 of this report the total size of the industrial land market in Campbelltown, Camden, Liverpool and Wollondilly equates to over 2,400 hectares. Vacant industrial land in this market equates to 470 hectares or nearly 20% of supply.

Estimates are that with no additional supply this vacant land could be fully absorbed within five to six years. The absorption of various parcels of industrial land and in particular lot sizes can be uneven. Smaller lots tend to be sold fairly quickly and larger lots take time to sell as they are only of interest to particular industry sectors.

A release of 85 hectares of industrial land at Turner Road Precinct (as indicated in the masterplan) would add equate to only just over 3 per cent of the South West Sydney market and increase the supply of vacant land by 17 per cent.

6.2.2 Regional employment targets

As another guide to timing it is important to note that the Metro Strategy has released an employment target for the period 2004 to 2031. Over this period up to 80,000 jobs are expected to be provided in South West Sydney or an average of nearly 3,000 per year. At least 1,000 per year will need to be in blue collar trade related sectors.

Further if we assumed that Turner Road may supply up to 15 per cent of this employment need for the South West region of Sydney over its development cycle, we could establish the following delivery time frame.

- A target of 150 to 200 jobs per annum at Turner Road
- Requiring around 5 hectares per year of land sold across a number of stages of 16 years.
- This could be accelerated to 8 years (or 10 hectares per year) if Turner Road was considered to have a more important role in the supply of local blue collar jobs.

6.3 Segmentation

From MacroPlan's review of the potential for future development in the industrial estate, there appears to be a number of key roles

- Local servicing (short term) including construction and manufacturing suppliers.
- Local and Regional distribution
- Major national and State level tenant
- Potential for a mixed use/ transit oriented role (medium term)
- Potential horticulture/ intensive agricultural uses

The opportunity to develop a balanced mix of regional distribution, light/ service industry and business park development will require the viability of a number of uses. The following discusses the opportunities for a range of industrial uses in the Turner Rd Industrial Node.

6.3.1 Warehouse and Distribution

Regional warehouse and distribution centres will continue to be sought after in the region in the short term allowing Turner Rd to act as a local distribution centre, servicing the growing populations of Camden. Typical site requirements would be in the range of 1-2 hectares (10,000 sq m floorspace and above) with up to 4 hectare site required. In the longer term the centres could be focused on a regional distribution level, servicing the whole South West Growth Centre

Site Requirements

Minimum lot size: 4,000 sq m - 1 hectare

Locational requirements: Good access to arterial roads. Low density of employment means it is not critical to locate near residential development.

6.3.2 National Tenant, including light manufacturing and engineering

There is significant demand to provide for the long term industrial needs of the region, catering for both large and small enterprise. Concept planning should accommodate National tenants (5,000 to 10,000m^2 floorspace). Provision should be made for anchor tenants with requirements up to 15 hectare.

These tenants seek gateway locations with higher profile and higher visibility. Experience in Sydney and Melbourne has seen these types of tenants moving on a regular basis with the average length of lease around 7 years. There is the opportunity to attract these tenants from other locations with a well presented business environment.

Site Requirements

Minimum lot size: 4,000 sq m – 1 hectare

Locational requirements: Good access to arterial roads. High exposure site preferred.

6.3.3 Service/ Light Industrial

The demand for a smaller lots size environment could be achieved with a Master planned estate (or several estates) with appropriate amenity controls, including building materials, set backs, landscaping and car parking and storage. In the short term, this could be directed to meeting demand from local businesses for sites between 1,500 and 4,000m².

Site Requirements

Minimum lot size: 2,000 sq m

Locational requirements: Good access to arterial roads including Camden Valley Way. Accessibility to locations within the South West Growth Centre is also important.

6.3.4 Business Park (Office/ Warehouse)

Business Park development would provide a mix of uses including industrial; office; bulky goods; recreation and entertainment and service centres. There are a number of fundamentals that indicate that there could be a strong market for this activity. This includes:

- Current high level of regional population growth
- Increasing levels of wealth in the regional population
- Growing service industry in the region

The Turner Rd precinct already identified provides a number of key competitive advantages for this type of development including:

- Extensive frontage to a major arterial with possible direct access to the F5 freeway
- Exposure from passing traffic
- Opportunity for high amenity, buffered from the Freeway and major roads on all sides.

Typical examples of world class successful Business Park developments include areas in the order of 30 hectares to create critical mass in the office component offer.

However, the type of office likely to be offered at Turner Road would be ancillary to other uses including manufacturing and warehousing. A stand alone office park would be better accommodated near or in the Oran Park Town Centre.

Site Requirements

Minimum lot size: 2,000 sq m

Locational requirements: Good access to arterial roads. Require high amenity development environment and high exposure

6.4 Supply and product mix in Turner Road sites

Subject to the broad timing estimates and market segmentation opportunities highlighted above, MacroPlan has reviewed the suggested supply of employment land in different areas of the Turner Road precinct.

6.4.1 Camden Valley Golf site

The Camden Valley Golf site has the following land distribution:

- 24 hectares of employment land
- 5.6 hectares allocated for retail / commercial land
- 4.2 hectares allocated for 'other economic land'

The employment land parcel is adjacent to Badgally Road and could be delivered from 2009 as part of an initial release of land parcels over 4 years at 6 hectares per year. A mix of parcels between 2,500m2 and 10,000m2 could be provided with a handful of 2 and 3 hectare parcels for anchor uses including distribution or manufacturing.

The retail/commercial land will accommodate 2,500m2 of retail facilities at the Golf Club and 1,000m2 of retail floorspace adjacent to Badgally Road.

MacroPlan notes that up to 30,000m2 of office floorspace is muted in the Masterplan. This would be difficult to deliver earlier in the project due to limited market demand. It would also encroach on the viability and sustainability of the Oran Park town centre – especially given that only 5,000m2 of office floorspace is to be delivered there. We believe this level of office supply would be better suited to the Oran Park Town Centre or Leppington.

6.4.2 Marist Brothers Site

The Marist Brothers site has the following land distribution:

- 45 hectares of employment land
- 3.2 hectares allocated for retail / commercial land

The Marist Brothers site will be the key employment land node at Turner Road supplying 45 hectares of land across a number of parcels with access to Badgally Road and Camden Valley Way. MacroPlan notes that some of the industrial land has been allocated for retail or bulky goods purposes along Camden Valley Way and the southern side of Badgally Road. We would caution this use as again it will threaten the viability of the Oran Park Town centre which will also be supplying this type of floorspace.

It is MacroPlan's view that land allocated for employment purposes at Turner Road should be reserved for these purposes and that bulky goods retailing should only be supplied if residential development at Catherine Fields comes on before 2015. Without early development of other adjoining precincts in the South West Growth Centre, the resident expenditure pools of Turner Road and Oran Park would not be adequate to sustain this level of retail floorspace.

The employment land within the Marist Brothers site could be supplied in conjunction with the Camden Valley Golf site in alternative stages over 7 to 10 years from 2009.

The land allocated for retail uses includes land at the local town centre whereby around 10,000m2 of retail floorspace is envisaged. The supply of floorspace and configuration is discussed in more detail in part 7.7 of this report.

7 Oran Park Town Centre Sizing

This section provides an assessment of future retailing opportunities for a proposed town centre at Oran Park in the context of outer south-western Sydney. The retail trade assessment will highlight the most appropriate size of the town centre in terms of retail floorspace. It will also provide advice on the growth in demand for retail floorspace in the defined trade area based on average household expenditure and population growth.

7.1 Trends in Retailing

The overwhelming trend in the supply of retailing over the past thirty years has been the development and expansion of large enclosed shopping centres. Enclosed shopping centres around Australia have expanded at unprecedented rates since the 1970's.

These type of centres have become popular with consumers who wish to purchase a large range of items in one location and more recently they have served as recreational outlets with cinemas, food courts and personal care providers including gyms.

7.1.1 Big Box Retailing

Large format warehouses (e.g. Harvey Norman, Ikea, Bunning's etc) developing on highway frontages (industrial land) with low rents. Stores retail a wider range of goods than traditional types of peripheral sales stores. There has been significant development during the 1990's in across Australia. With catchment saturation in metropolitan centres, these big box retailers are identifying viable opportunities in regional townships. A site selection criterion in regional locations is cheap land with high volumes of passing trade. Stores are generally half the size of their metropolitan counterparts.

7.1.2 24 Hour, 7 days a week trading

A response to changing work and lifestyle patterns has altered traditional shopping patterns and requires all traders to adapt to compete. National supermarket chains are capitalising on allowing access to higher frequency visitation and a wider customer base. Many supermarkets have commenced 24-hour operation to serve the needs of shift workers.

7.1.3 Internet shopping

With increasing home PC purchases and internet connections, internet shopping is growing in popularity every year. Sales are concentrated in books, travel, computer software, toys and electrical goods. Current estimates vary, however none exceed more than 1% of retail sales in Australia. Very few companies are returning a profit from web sales alone.

7.1.4 Credit

Ready accessibility to credit has lead to increased purchases over the past decade. Larger stores offering interest free terms and no deposit have created credit competition.

The format from which retailing is provided is only part of the story when analysing changes in the retailing industry. Understanding consumer lifestyles and household structures helps develop the whole picture of the dynamic retailing environment. Dominant changes to lifestyles include increased female participation in the workforce, increased disposable incomes and increased expenditure on services and luxury items, decreasing household sizes (single person households), decreased traditional families and the aging of the population.

7.2 Current Supply in Outer South-Western Sydney

MacroPlan has referred to the NSW / ACT Shopping Centre Directory – 2006 in its assessment of current retail floorspace supply servicing the major existing residential release areas within outer south-western Sydney (e.g. Liverpool and Campbelltown).

The NSW / ACT Shopping Centre Directory provides detailed information on regional and local shopping centre floorspace (including the type of retailers) but it does not survey retail floorspace analogous to the primary shopping centres (i.e. strip shops and speciality stores outside centres)

7.3 NSW / ACT Shopping Centre Directory

The table below provides an overview of retail floorspace across the major centres in the outer south-western Sydney region.

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Table 8. Outer South-Western Sydney Retail Centres

Shopping Centre Name	Suburb	Total Retail Area m2 (GLAR)	Major Tenants
North East Region			
Bonnyrigg Plaza	Bonnyrigg	20,100	Big W - 8,373m2 Woolworths - 4,030m2 Franklins - 2,620m2
Valley Plaza	Hinchinbrook	9,834	Coles - 3,561m2 Woolworths - 2,271m2
Miller Community Shopping Centre	Miller	9,653	Woolworths - 3,551m2 Franklins - 1,543m2 Mitre 10 - 925m2
Carnes Hill Marketplace	Hemingway Park	13,493	Big W - 4,500m2 Woolworths - 3,000m2 Dan Murphy's - 1,500m2
Westfield Liverpool	Liverpool	99,940	Myer - 18,799m2 Target - 8,250m2 Woolworths - 3,639m2 Toys 'R' Us - 3,269 Coles - 2,085m2 Best & Less - 1,189m2
Liverpool Plaza Shopping Centre	Liverpool	6,373	Franklins - 1,300m2
Megacentre Liverpool	Liverpool	29,296	Harvey Norman - 10,147m2 Domayne - 4,806m2
East Region			
Casula Mall	Casula	15,383	Kmart - 7,815m2 Coles - 5,307m2 Franklins - 2,271m2
Glenquarie Shopping Centre	Macquarie Fields	10,988	Coles - 3,149m2 Franklins - 2,054m2 Go-Lo - 1,237m2
Ingleburn Fair	Ingleburn	7,431	Bi-Lo - 1,418m2 Target Country - 1,202m2
South East Region			
Minto Mall Shopping Centre	Minto	25,333	Aldi Supermarket - 1,070m2 Kmart - 6,596m2 Coles - 2,571m2 Woolworths - 1,745m2
Eagle Vale Marketplace	Eagle Vale	7,606	Woolworths - 4,111m2
Campbelltown Mall	Campbelltown	34,897	Kmart - 8,544m2 Target - 7,093m2 Coles - 3,825m2 Woolworths - 2,725m2 Franklins - 1,380m2 Best and Less - 1,046m2
Domayne Centre	Campbelltown	7,462	Domayne - 4,838m2
Marketfair Campbelltown	Campbelltown	7,932	IGA - 2,680m2
Macarthur Square	Ambarvale	77,477	David Jones - 12,243m2 Big W - 8,793m2 Woolworths - 4,185m2 Coles - 2,740m2 Baby Target - 1,744m2 Rebel Sport - 1,663m2 Target - 1,463m2 Dick Smith - 1,385m2
Rosemeadow Marketplace	Rosemeadow	6,369	Woolworths - 3,677m2
South Region			
Narellan Town Centre	Narellan	28,368	Big W - 6,904m2 Woolworths - 3,760m2 Bi-Lo - 3,398m2 Go-Lo - 1,143m2 Best and Less - 1,129m2
Mt Annan Marketplace	Mount Annan	4,916	Woolworths - 3,660m2
Camden Central Shopping Centre	Camden	30,000 (estimate)	Coles

Source: Property Council of Australia

This assessment reveals that the main retail competition to Oran Park is located to the South, which includes the Narellan Town Centre, Mt Annan Marketplace and Camden Central Shopping Centre.

7.4 Projecting Retail Demand

MacroPlan has assessed the projected population catchment for the purposes of calculating likely levels of sustainable retail floorspace. We have undertaken a review of the location of primary regional shopping centres and an assessment of Oran Park's role in the hierarchy of the outer south-western Sydney retail market.

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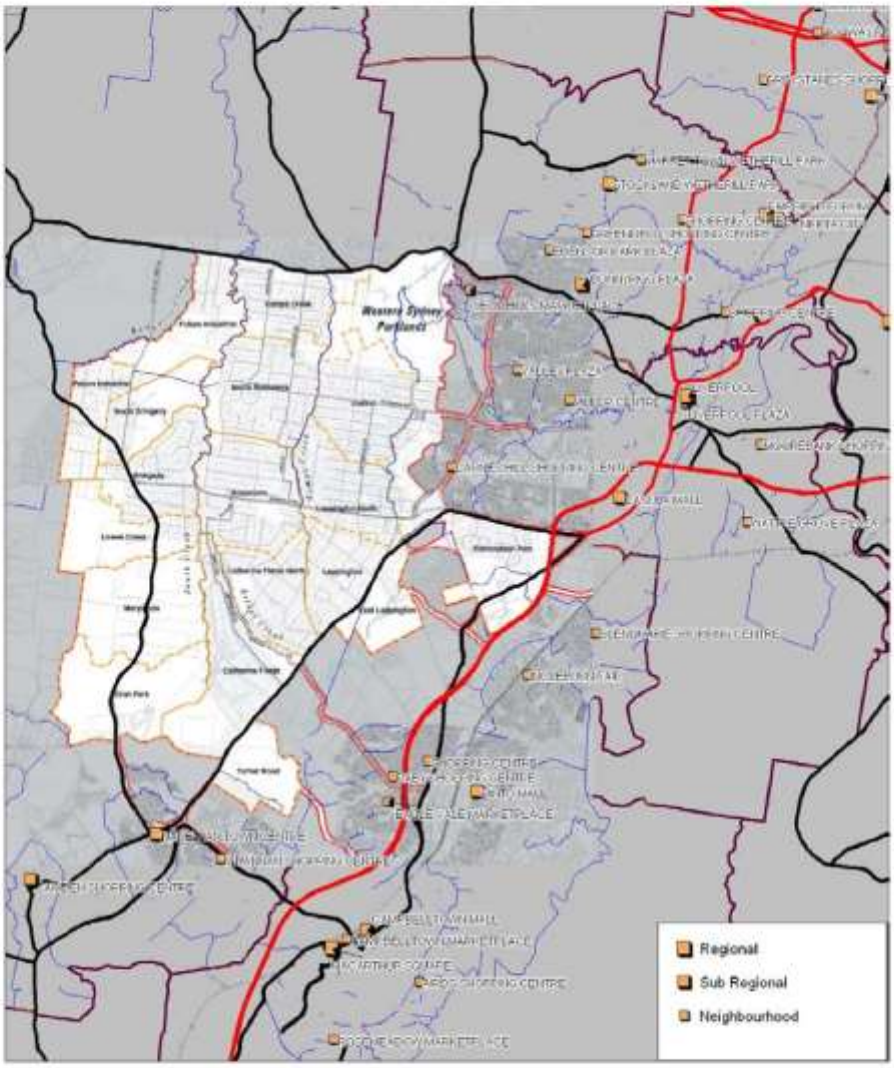
The figure below provides an overview of the location of primary retail nodes in the outer south-west Sydney region.

Figure 6. Retail Centre Overview



Source: MacroPlan Australia

The projected population for the Oran Park trade area is provided in the table below. Oran Park is likely to be developed first, with land being released around 2008. MacroPlan has assumed that Catherine Fields and Marylands will not be released until 2018. Retail demand at Oran Park is likely to expand after 2018, as additional retail demand is generated from a wider trade catchment.

The expected populations for the primary and secondary catchments are listed in the table below.

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Table 9. Projected Population

Development Potential (based on shopping centre retention)	Forecast 2011	2016	2021	2026	2031	2036
Population Forecasts						
Primary (Oran Park)	4,948	17,152	23,155	23,155	23,155	23,155
Secondary (Turner Rd, Catherine Fields & Marylands)	4,326	19,824	27,324	39,824	52,324	54,824
Trade Area	**9,272**	**36,976**	**50,479**	**62,979**	**75,479**	**77,979**

Source: MacroPlan (2007)

The retail trade area has been split into the following two catchments:

- Primary Catchment – Oran Park
- Secondary Catchment – Turner Road, Catherine Fields and Marylands

Depending on competition and the geography of the surrounding area, primary trade areas commonly provide 60-70% of sales for a given centre whilst secondary trade areas can provide for 15-25% of sales.

7.4.1 The expenditure pool - residents

MacroPlan has calculated the current and future retail expenditure pool in the Camden Statistical Local Area (SLA) subject to population and expected retail expenditure per capita. The Camden SLA is used to project the expenditure profile of the future Oran Park and Turner Road residents. This provides a conservative estimate of the trade area expenditure pool.

The expenditure profile of Oran Park and Turner Road residents is detailed below. It reveals the volume of expenditure from household income that is allocated to retail trade for products sold directly by the retail sector. The expenditure profile is in line with the average for South West Sydney.

The retail catchment includes a limited expenditure pool from residents in Catherine Fields and Marylands. It is assumed populations in these precincts are supplied from 2015 onwards.

The total expenditure on retail trade per capita is currently $10,666 per annum as at 2006 with the largest allocations to expenditure at Supermarkets ($3,787), Clothing and Accessories ($1,285), Restaurants and Café's ($1,369) and Furniture and Whitegoods ($774).

Table 10. Expenditure Profile – Camden SLA

Expenditure Profile	($) 2006
Supermarket	3,787
Catering (Restaurant and Café')	1,369
Clothing and Assessorires	1,285
Furniture and Whitegoods	774
Electrical	521
Houseware and Softgoods	380
Hardware	616
Sports and Hobbies	436
Services	441
Newsagent and Chemist	784
Bottle-shop	568
TOTAL	**10,666**

Source: Marketinfo, MacroPlan (2007)

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Total retail expenditure levels within the trade area in 2006 and future years are assessed by combining the population forecasts presented in the previous section with expenditure profile levels allowing for real growth in retail sales. This is presented in the table below.

Table 11. Expenditure Pool – residents

Expenditure Pool ($m)	Forecast					
	2011	2016	2021	2026	2031	2036
Catchment						
Supermarket	36	131	220	290	368	401
Catering (Restaurant and Café')	13	47	80	105	133	145
Clothing and Assessorires	12	44	75	99	125	136
Furniture and Whitegoods	8	30	53	75	101	117
Electrical	5	20	36	50	68	79
Houseware and Softgoods	4	15	26	37	49	58
Hardware	6	24	42	59	80	93
Sports and Hobbies	4	15	25	33	42	46
Services	4	15	26	34	43	47
Newsagent and Chemist	8	27	46	60	76	83
Bottle-shop	5	20	33	44	55	60
Total	**106**	**387**	**662**	**886**	**1,140**	**1,265**

Source: MacroPlan Australia

The pool shows growth in expected retail expenditures from $106 million in 2011 to an expected $1.27 billion in 2036 in real terms. The composition of this pool will be driven by residential product mixes, population age, household structure and wealth which are difficult to predict more precisely at this time.

7.4.2 Sustainable floorspace

Subject to the retail expenditure pools calculated above for trade areas residents, MacroPlan has calculated estimates of the retail floorspace that is sustainable assuming no leakage of expenditure. In other words the table depicts the retail floorspace that could be built in Oran Park, Turner Road, Catherine Fields and Marylands if every $ of retail expenditure was captured in these precincts. The table below reveal these estimates.

Table 12. Sustainable floorspace Oran Park / Turner Road, Catherine Fields and Marylands

Sustainable Floorspace Estimate	Forecast					
	2011	2016	2021	2026	2031	2036
Catchment						
Supermarket	4,013	14,459	24,376	32,122	40,662	44,371
Catering (Restaurant and Café')	2,887	10,400	17,533	23,104	29,247	31,915
Clothing and Assessorires	2,493	8,983	15,144	19,956	25,262	27,566
Furniture and Whitegoods	2,534	9,730	17,486	24,562	33,144	38,553
Electrical	711	2,732	4,909	6,896	9,305	10,824
Houseware and Softgoods	1,512	5,806	10,434	14,657	19,777	23,005
Hardware	3,299	12,668	22,765	31,978	43,150	50,191
Sports and Hobbies	1,109	3,997	6,738	8,879	11,239	12,264
Services	1,458	5,252	8,854	11,667	14,769	16,116
Newsagent and Chemist	1,043	3,759	6,337	8,351	10,572	11,536
Bottle-shop	433	1,560	2,630	3,466	4,387	4,788
Total	**21,492**	**79,345**	**137,205**	**185,638**	**241,514**	**271,127**

Source: MacroPlan Australia

Table 12 above reveals how the trade area's total estimated sustainable floorspace is expected to grow from 21,492m2 in 2011 to 271,127m2 in 2036. As discussed above, this includes expenditure from primary and secondary catchments – i.e. Oran Park, Turner Road, Catherine Fields and Marylands.

7.4.3 Development Potential

In reality not all retail expenditure of trade area residents will be captured in Oran Park. Many residents will spend money outside Oran Park in areas like Narellan, Campbelltown, Liverpool and the proposed Leppington town centre.

The estimates above assume no leakage of expenditure to retailers outside the catchment. MacroPlan has assessed benchmark rates of expenditure leakage based on other retail trade analysis work across Australia in order to estimate retention rates by retail category for both primary and secondary catchments.

Leakage of expenditure away from shopping centres close to residents occurs due to:

- A failure of the shopping centre to supply a full range of retail goods and services
- The loss of expenditure dollars as residents work and spend money in different locations
- Competition from other centres

As illustrated in Table 13 below, the results of the sustainable floorspace assessment for the Oran Park Trade Area, combined with potential levels of retention indicate that the trade area categories will generate demand for 58,156 m2 of retail floorspace by 2026 and 77,278m2 by 2036.

These estimates are premised on competing shopping centres being established at Leppington from 2020 and in Catherine Fields and Marylands as population is delivered in these precincts. If the delivery of Leppington is delayed, captured expenditure at the Oran Park Town Centre will be higher.

Table 13. Sustainable floorspace assuming expenditure leakage

Development Potential (retention based on escape exp)	Forecast 2011	2016	2021	2026	2031	2036
Regional						
Supermarket	2,194	7,989	12,143	14,101	16,241	17,438
Catering (Restaurant and Café')	1,347	4,900	7,528	8,668	10,336	11,121
Clothing and Assessorires	914	3,334	4,988	5,664	6,401	6,849
Furniture and Whitegoods	642	2,474	4,299	5,816	7,646	8,855
Electrical	180	695	1,207	1,633	2,147	2,486
Houseware and Softgoods	383	1,476	2,565	3,470	4,562	5,284
Hardware	836	3,221	5,597	7,571	9,954	11,529
Sports and Hobbies	222	799	1,348	1,776	2,248	2,453
Services	758	2,759	4,207	4,907	5,672	6,094
Newsagent and Chemist	494	1,803	2,669	2,984	3,327	3,551
Bottle-shop	228	833	1,228	1,366	1,516	1,616
Total	**8,199**	**30,283**	**47,779**	**58,156**	**70,048**	**77,278**

Source: MacroPlan Australia

7.5 Retail Assessment Outcome

The analysis detailed in this report identifies the need and sustainable justification for a retail town centre of between 45,000m2 and 55,000m2 in the Oran Park Precinct at the end of the development timeframe for the retail catchment. This is likely to incorporate two full line discount department stores, two supermarkets and approximately 100 specialty stores. This offering will provide extensive coverage of a broad range of retail needs and a wide range of shopper facilities and amenities.

There is also the potential for approximately 20,000m2 of retail floorspace within other areas of Oran Park and Turner Road. This would include two neighbourhood centres of around 5,000m2 west of the Northern Road and 10,000m2 at Turner Road. The demand for this floorspace would be partially driven by the secondary expenditure pool from Turner Road and Catherine Fields and Marylands (assuming they are delivered from 2015). Hence the floor areas proposed in the masterplan for Oran Park and the Turner Road precincts are broadly sufficient for the region.

The new town centre at Oran Park will have the capacity to capture expenditure from a wider catchment including areas within Camden and Marylands / Catherine Fields. Estimates of captured expenditure from Marylands and Catherine Fields have been included in this estimate for the Oran Park Town Centre.

Importantly, the timing of the delivery of retail floorspace is designed to limit the impact on the existing Camden and Narellan town centres. It does this by delaying the supply of floorspace at Oran Park and Turner until a suitable expenditure pool exists from the new residents in these precincts.

A more detailed explanation of the configuration and timing associated with the Oran Park Town Centre is provided below in part 7.6 of this report.

7.6 Oran Park Town Centre Configuration and Employment

A town centre with up to 50,000m2 of floorspace will have a significant function within the region as a service centre and employment generator.

An appropriate configuration for this floorspace would be around 40,000 to 45,000m2 of retail at the Oran Park Town Centre with up to 10,000m2 of bulky goods adjacent to the town centre. Around 5,000m2 of commercial floorspace would also be supplied.

Most white collar workers residing in Oran Park and Turner Road are likely to work in larger administrative centres including Campbelltown, Liverpool, Parramatta and the Sydney CBD. Leppington will also eventually have a role as an employment generator for white collar workers residing in Oran Park and Turner Road.

Likely employment yields at the town centre are as follows:

- Retail 50,000m2 – supporting 2,000 jobs at 1 position per 25m2
- Office and other administrative – supporting 250 jobs at 1 position per 20m2

7.7 Retail configuration outside Oran Park Town Centre

The table below provides a suggested overview of the release of retail floorspace at Oran Park and Turner Road. It reveals a suggested release of retail floorspace across all centres in the Oran Park and Turner Road precincts including:

- The Oran Park Town Centre is supplied with an initial stage of 5,000m2 in 2011(including a full line supermarket and speciality stores) with an additional 15,000m2 supplied in 2016 including one discount department store, a second supermarket and further speciality stores. The later stages from 2030 allow for the opportunity of additional supply of bulky goods retail adjoining the town centre.
- The McIntosh Land Northern local Centre is supplied from 2011 due to its further distance from the Oran Park Town Centre. The McIntosh Land Southern Centre is supplied in alternative stages. Both of these centres would supply around 5,000m2 of retail floorspace. A limit of 1,500m2 on supermarket floorspace would be appropriate to ensure that full line supermarkets operated in the Oran Park Town Centre are the primary 'retail anchors' in the region consolidating expenditure in this centre.
- Badgally Road retail would be supplied on employment land as 'lunchtime cafes / restaurants' for workers in the precinct.
- Golf Course retail at Turner Road could include restaurants / bistro / golf store etc as part of the golf course and could equate to around 3,000m2

In addition to the supply of a hardware store (that would be consistent with industrial uses in the area) an opportunity may exist to supply some bulky goods adjacent to Badgally Road and Camden Valley Way at Turner Road in the medium to longer term. This would have a limited impact on the Oran Park Town Centre under the following scenarios:

- Lots are released at Catherine Fields from 2015 at a rate of around 300 per year or more adding to the retail expenditure pool and providing impetus for the sustainability supply of additional retail
- Badgally Road is upgraded from 2012 - 2014 providing for a potentially wider retail catchment from Campbelltown
- Marylands is also co-ordinated and released with a rapid lot supply of up to 500 lots per annum from 2015 providing additional support for the Oran Park Town Centre, however this is unlikely given the supply of lots envisaged from Oran Park and the competition they would provide.

Table 14. Timing and staging of retail floorspace across Oran Park and Turner Road precincts

Development staging and timing Floorspace m2	2011	2016	2021	2026	2031	2036
Oran Park Town Centre	5,000	15,000	5,000	15,000	5,000	5,000
McIntosh Land Northern Centre	2,500		2,500			
McIntosh Land Southern Centre		2,500		2,500		
Turner Road Town Centre	2,500	2,500	5,000			
Golf Course Retail		1,000		2,000		
Badgally Road Retail		500	1,500			
Additional Supply	10,000	21,500	14,000	19,500	5,000	5,000
Accumulated Supply	**10,000**	**31,500**	**45,500**	**65,000**	**70,000**	**75,000**

Source: MacroPlan Australia

8 Conclusion

8.1 Oran Park and other town centres

The role of the Oran Park Town Centre in the development of the Southern half of the South West Growth Centre will be influenced by a number of factors. However, one of the primary drivers of its growth as a retail and commercial centre will be the timing of Leppington.

It is currently assumed that Leppington (and surrounding populations) will begin delivery between 2016 and 2018. However this timing is contingent upon the Growth Centres Commission achieving a co-ordinated release of land.

MacroPlan recommends that the Growth Centres Commission takes a flexible position on the role of the Oran Park town centre in the future recognising that a delay in the delivery of Leppington will require the Oran Park town centre to have a more significant role, particularly as a commercial centre.

Further, if Leppington is delayed and if dwellings are delivered from 2016 in Marylands and Catherine Fields, the Oran Park Town Centre will have a more important regional role as a town centre and will need to be developed in a way that ensures that local business activity is captured and not leaked to other more established regions of Sydney.

8.2 Land Use at Turner Road

MacroPlan has noted that landowners in Turner Road have a preference for supplying bulky goods and retail showrooms on industrial land on Badgally Road and Camden Valley Way. MacroPlan would have concerns with this land use strategy for the following reasons:

- It will reduce the supply of land for industrial purposes in South West Sydney of which there is a current and emerging future shortfall
- It will impact on the timing of the supply of retail floorspace in and around the Oran Park Town Centre by competing with retail floorspace there
- It would increase the volume of private vehicle trips for the purpose of shopping as there would be limited public transport options at Turner Road relative to the Oran Park Town Centre
- The supply of bulky goods adjacent to the Oran Park Town Centre is a better option as it will increase retail trade and the absorption of floorspace there. This will make commercial and high density residential uses more attractive.

It is important for the Growth Centres Commission to recognise that the delivery of higher density living in the South West Growth Centre will be difficult to achieve in the context of the residential market. Apartments and townhouses in established centres within South West Sydney (including Liverpool and Campbelltown) are becoming difficult to sell.

Apartments sold in new development fronts such as Oran Park are unlikely to be offered at a discount to apartments in established town centres. This is because the land price discount for the developer is minimal relative to the overall cost of construction and delivery.

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It is therefore important to note that the supply of high density housing in new development fronts will need planning assistance in terms of the provision of job opportunities in the town centre (i.e. a wide spectrum of retail) and commercial floorspace. Buyers of medium and high density dwellings will only trade off dwelling size if a wide range of services are available on there doorstep.

MacroPlan has also noted that draft indicative layout plans for Turner Road included the supply of up to 30,000m2 of commercial floorspace. While we do not believe this volume of commercial floorspace is appropriate at Turner Road, it could be logical to supply an additional 10,000 to 15,000m2 of commercial floorspace at the Oran Park Town Centre if Leppington is delayed. The logic behind this will be to achieve:

- Improved demand for high density dwellings at the Oran Park Town Centre
- Employment opportunities for white collar workers as the Oran Park precinct matures

In conclusion, MacroPlan re-iterates that this study has assessed retail, commercial and employment land requirements for the Oran Park and Turner Road precincts subject to current market conditions and the needs of residents as well as anticipated future needs and job requirements. However there are a number of unknown variables that are likely to influence the most appropriate land use strategy in the future including:

- The timing of residential land co-ordination in other precincts (including the management of small land holder price expectations)
- The timing of infrastructure supply and connections (including road and rail)
- Market acceptance of medium and high density dwellings in new development fronts

All of these factors have proven to be constraints on the delivery of residential land in Sydney in recent years and they are likely to continue to remain as constraints.

ORD05

Attachment 1

Planning Proposal to Amend Land Use Zones

Manooka Valley Stage 3, Lot 627 DP 1163903

YN294099

Prepared for
Wolin Investments and Landco Pty Ltd

13 July 2017

Cardno
Shaping the Future

Contact Information

Cardno NSW/ACT Pty Ltd
ABN 95 001 145 035

Level 9, The Fourm
203 Pacific Highway
St Leonards NSW 2065

Telephone: (02) 9496 7700
Facsimile: (02) 9439 5170

tracy.davey@cardno.com.au
www.cardno.com.au

Author(s):

Tracy Davey /
Senior Specialist Planner

Approved By: John O Grady
Planning Manager

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1	10.7.17	Draft	Tracy Davey	John O Grady
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1 Introduction

This Planning Proposal (PP) proposes amendments to the *Camden Local Environmental Plan, 2010* with respect to land described as lot 627 DP 1163903, Currans Hill (the Subject Site). It is proposed to partially rezone the Subject Site to R1 – General Residential, while partially maintaining the existing Environmental Zone E2 - Environmental Conservation, RU2 Rural Landscape and SP2 Infrastructure.

Cardno have prepared the PP on behalf of the landowners, being a joint venture between Landco (NSW) and Wolin Investments Pty Ltd. This PP has been prepared for the purpose of Section 55 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and is structured in accordance with the document '*A Guide to Preparing Planning Proposals*', (NSW Department of Planning & Infrastructure 2012). In particular, this PP addresses the following specific matters in the guidelines:

- Objectives and intended outcomes;
- Explanation of provisions;
- Justification;
    - Need for the PP;
    - Relationship to strategic planning framework;
    - Environmental, social and environmental impact;
    - State and Commonwealth interests; and
- Community consultation.

Cardno request that Council forward the PP to the Minister for Planning for a 'gateway determination' in accordance with Section 56 of the EP&A Act.

1.1 Site Background

The site is approximately 343,380 m^2 in extent and was historically used for cattle grazing. Currently, the site contains predominantly open space and is comprised of a grassy hill to the North, woodland areas and open land. A TransGrid electrical easement runs north-south along the western boundary within the site. The study area consists predominantly of grazing land which has undergone historical vegetation clearance. A portion of the site to the north is utilised by Sydney Water and contains a recently constructed water tank.

1.2 Previous Approvals

Numerous Development Applications (DA) have been lodged for the site. A DA was lodged with Camden Council in early 2007. Subsequently, development consent 300010/2002 was issued in August 2007. This consent was issued with deferred commencement subject to the approval of a Vegetation Management Plan for the Riparian Corridor and the Stage 3 re-vegetation area and a resolution to the Rural Bushfire Services requirements. Cardno addressed all requirements by December 2008, which made the consent operational in January 2009.

Due to TransGrid requirements, the decision was made to lodge a Section 96/SEPP1 application to remove a proposed road on the southern portion of Stage 3 and reduce the number of lots within the southern portion from four to two. The loss of two lots in the southern portion was compensated by increasing the number of lots in the northern portion from ten to twelve. In January 2009, Camden Council and the Department of Planning granted consent to the revised layout.

As a requirement of the State Environmental Planning Policy for Infrastructure, Cardno pursued approval from TransGrid for the revised layout of Stage 3 in March 2009. TransGrid provided written approval of the layout on 19 May 2009.

The detailed design for the site was put on hold, awaiting clarification on servicing lots above RL112m with potable water. Cardno carried out the initial feasibility investigations for a booster pumping station, which was

followed by negotiations with Sydney Water regarding the funding arrangements. All works completed on Stage 3 until 2009 were in accordance with Council requirements.

A subsequent DA for subdivision of the site DA 2014/597 was lodged in July 2014, with consent granted on the 27 th February 2015. The consent was for *"Staged subdivision of land to create 23 residential lots, 2 public reserve lots and 2 residue lots and the provision of drainage, landscaping and associated works"*.

A further DA for Stage 3 Bulk Earthworks (Early Works), DA 2014/597 *"Sediment basin, tree removal, sediment and erosion control measures and erection of temporary fences"* was approved by Council on the 24th May 2016.

As a result of the above approvals some minor drainage and associated works have been undertaken on the site.

2 Details of the Proposal

2.1 Subject Site

The site is located at 207B Turner Road, Currans Hill, and covers an area of approximately 343,380 m^2 (DP&E). The site has a legal description of Lot 627 DP 1163903 (see **Appendix A)**. The site adjoins the Eastern suburban fringe of low density residential development at Currans Hill. A small hill lies at the Northern end of the lot, with the gradient of the slopes rising up to the peak measuring an incline greater than 16% in certain areas. For the most part, the land gently rises from a low point of 105 metres above sea level at the South of the site to a high point of 145 metres at the north of the site. A TransGrid power line easement runs in a north – south direction just inside the Western perimeter of the study area. To the West of the site is Badgally Hill and undulating hills which form part of the "Scenic Hills". Refer to Site Plan overleaf. (**Figure 2-1**).

2.2 Site Context

The suburb of Currans Hill is located in Greater Sydney's south-west, approximately 60 km south-west of the Sydney Central Business District (CBD), 44 km from the Parramatta CBD, 42 km from Penrith, 26 km from Liverpool, 20 km south of the site of the proposed Western Sydney Airport at Badgerys Creek, and 6 km north-west of Campbelltown City Centre. The future South West Priority Growth Area regional centre of Leppington is approximately 8.5 km to the north-east.

The Subject Site is located within the Camden Local Government Area, just over one hours drive south west of Sydney city, which extends from Leppington in the north to the township of Camden in the south, including the rural village of Cobbitty, Ellis Lane, Grassmere and Bringelly and the residential suburbs of Currans Hill, Mount Annan and Narellan Vale. Camden covers an area of 201 km^2 and is bisected by the Nepean River

The suburb is home to a population of 72,256 people (ABS 2015) with a median age of 29. It is in close proximity to a number of other suburbs currently experiencing significant population increases and infrastructure development, such as Leppington, Camden, Gregory Hills, Oran Park and Catherine Field.

Currans Hill is connected to other areas of Sydney via existing major road networks. The site is 1.5 km north of Narellan Road, an arterial road connecting with the Hume Motorway to the south-east and Camden Valley Way to the north-west. The Hume Motorway then connects with the Westlink M7 Motorway and the M5 Motorway further north at the Sir Roden Cutler Interchange.

ORD05

Attachment 1

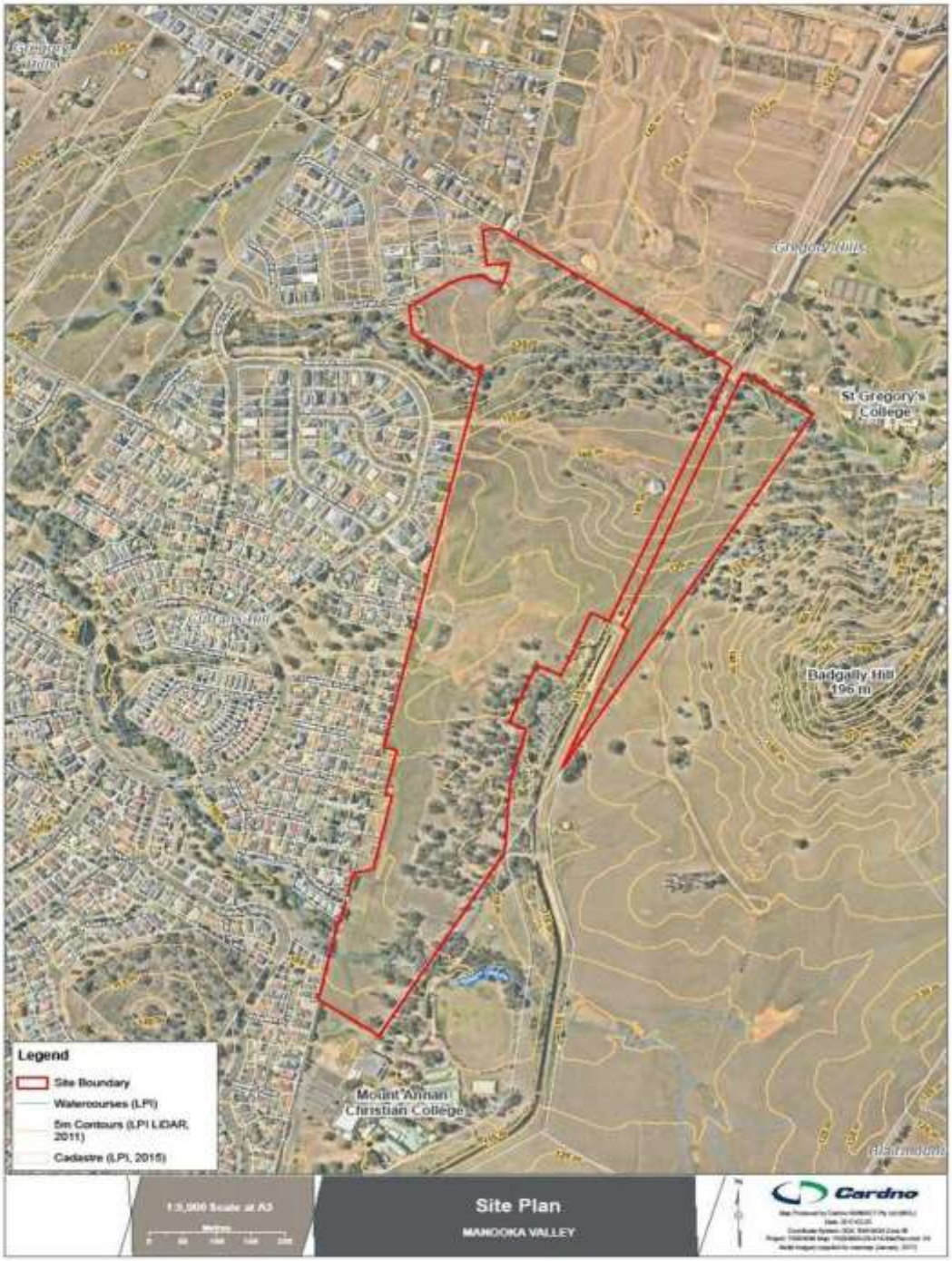


Figure 2-1 Subject Site

Source: Google Maps

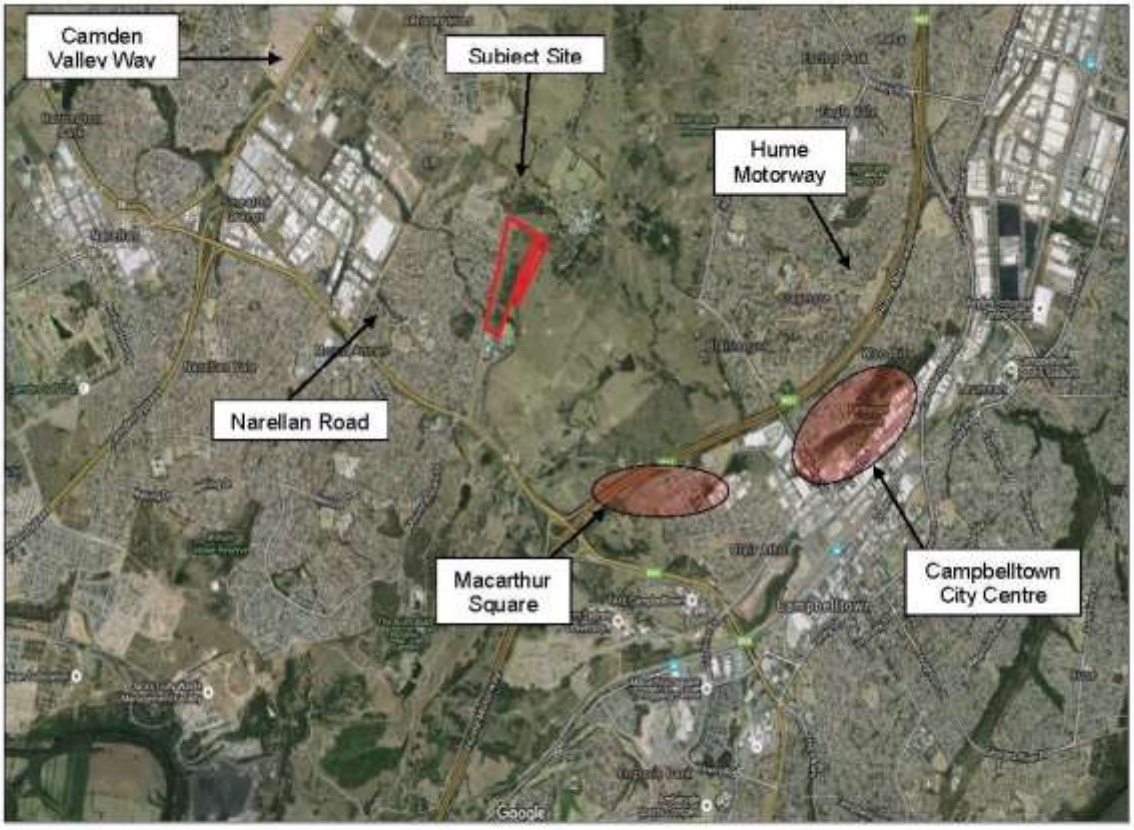


Figure 2-2 Subject Site in Context
Source: Google Maps

2.2.1 Landmarks and Community Services

The site is well supported by existing community infrastructure, as detailed below.

- Educational facilities:
  - Currans Hill Primary School – 10 Tramway Drive, Currans Hill;
  - Mount Annan Christian High School – 248 Welling Drive, Mount Annan;
  - Elizabeth Macarthur High School – 38 Waterworth Drive, Narellan Vale;
  - Western Sydney University Campbelltown Campus – Narellan Road, Campbelltown
  - TAFE Campbelltown – 181 Narellan Road, Campbelltown;
  - University of Sydney Cobbitty Campus – Nepean River Road, Cobbitty;
  - A range of private and religious educational institutions.
- Health facilities:
  - Campbelltown Hospital – Therry Road, Campbelltown;
  - Campbelltown Private Hospital – 42 Parkside Crescent, Campbelltown;
  - Camden Hospital – Menangle Road, Camden
- Infrastructure:
  - Camden Airport, Cobbitty
- Places of interest: Commercial/retail

- Macarthur Square Shopping Centre;
- Campbelltown City Centre;
- Narellan Town Centre;
- Camden Town Centre.

2.2.2 South West Priority Growth Area

The Subject Site is bordered by the southern boundary of the suburb of Gregory Hills. Gregory Hills forms part of the Turner Road Precinct, within Sydney's South West Priority Growth Area.

The South West Priority Growth Area is a region of approximately 17,000 hectares that includes parts of Liverpool, Camden and Campbelltown Local Government Areas. It comprises 18 precincts to streamline the supply of Greenfield land for urban development and coordinate the delivery of infrastructure. The precincts are being progressively released for planning and rezoned for future sustainable urban development. Thus far, seven of the precincts have been rezoned to allow for urban development. The area is planned to contain approximately 110,000 new dwellings for 300,000 residents. Refer to **Figure 2-3** below for the location of the Subject Site in relation to the Growth Area. **Figure 2-4** illustrates the location of the site adjacent to the Turner Road Precinct of the Growth Area.

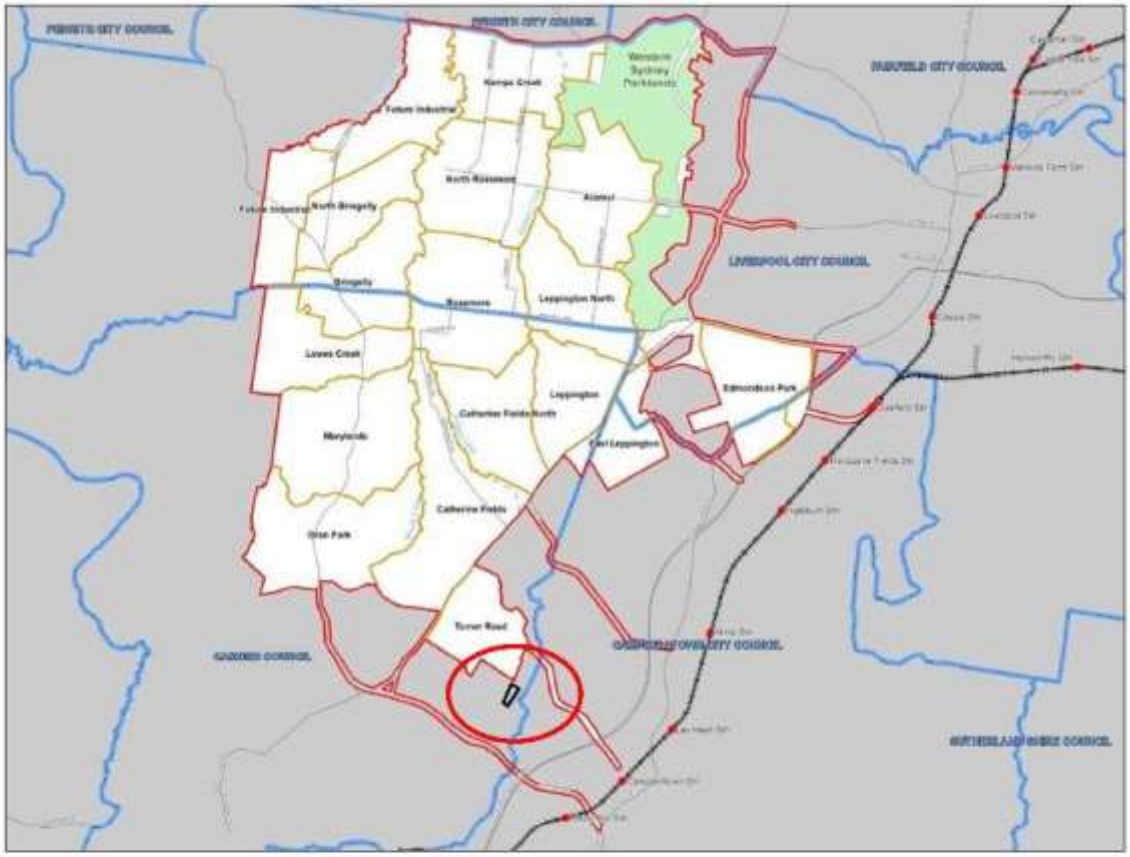


Figure 2-3 South West Growth Area

Source: Growth Centres DCP

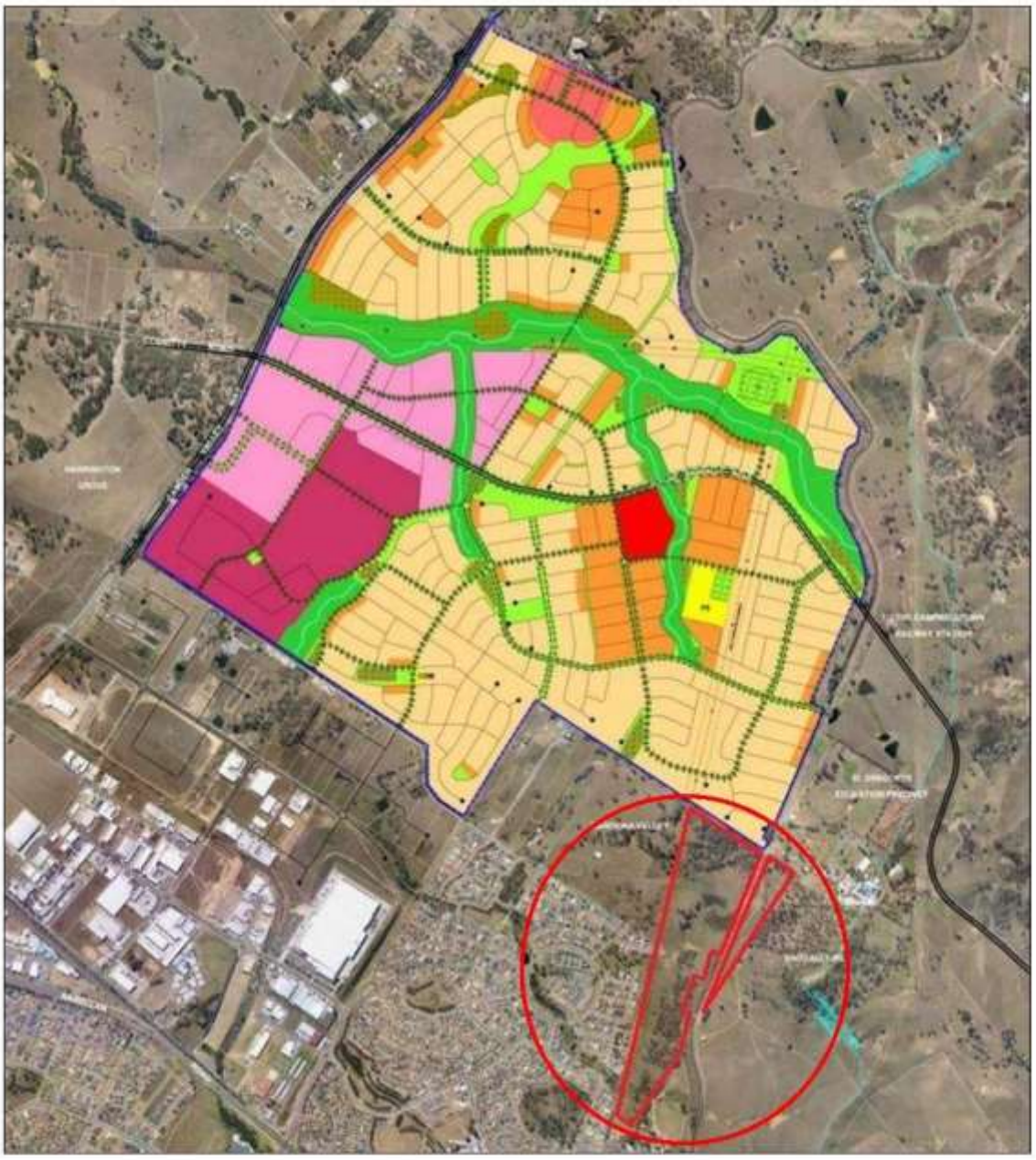


Figure 2-4 Subject Site Context – Turner Road Precinct

Source: Turner Road Precinct Indicative Layout Plan

2.2.3 Transport and Access

2.2.3.1 Car

Currans Hill is connected to other areas of Sydney via existing major road networks. The site is 1.5 km north of Narellan Road, an arterial road connecting with the Hume Motorway to the south-east and Camden Valley Way to the north-west. The Hume Motorway then connects with the Westlink M7 Motorway and the M5 Motorway further north at the Sir Roden Cutler Interchange.

Planning and building for the progressive upgrade of major arterial roads within the South West Priority Growth Area is under way. Major arterial roads to be upgraded include:

- Camden Valley Way;
- Narellan Road; and
- The Northern Road.

2.2.3.2 *Train*

The locality is connected with Greater Sydney and regional NSW via rail. The site is located approximately 6 km from both Campbelltown Station and Macarthur Station by car. The currently connected rail networks include:

- T2 Airport, Inner West and South Line, comprising three varying routes connecting Sydney CBD to Macarthur, Edmondson Park and Leppington;
- T5 Cumberland Line connecting to Schofields through the Western Suburbs of Sydney, including Parramatta and Blacktown, and
- Southern Highland Line, connecting Campbelltown with rural regional centres such as Bowral and Goulburn.

Furthermore, the future South West Rail Link Extension is proposed to run from the existing Leppington Station to a new station at Narellan, approximately 5 km from the site. This new line will have the potential to connect with the future Western Sydney Airport at Badgerys Creek.

Rail journeys to major centres within Sydney are generally under an hour; train journeys from Campbelltown Station to Sydney CBD, Parramatta CBD, and Sydney Airport can each be completed in less than an hour, whilst a journey to Liverpool Station is under 30 minutes.

2.2.3.3 *Bus*

A number of bus routes provide direct service to Currans Hill:

- 890 – Campbelltown to Harrington Park via Narellan;
- 891 – Mount Anna to Campbelltown via Currans Hill, and
- 896 – Campbelltown to Oran Park via Gregory Hills.

These routes each stop along Glenfield Drive, located in close proximity to the southern portion of the site. Bus stops located on Narellan Road, approximately 750 m south of the site, provide access to Camden, Campbelltown, Spring Farm, and Picton. Other bus routes from Campbelltown and Camden provide access to various regional areas of Sydney and NSW.

2.3 Current Planning Context

2.3.1 Draft Sydney South West District Plan (SWDP)

The Greater Sydney Commission has recently released the draft SWDP, a strategy to guide development in the Greater Sydney Western District over a 20 year timeframe. The draft SWDP identifies overarching priorities under the headings of Liveability, Productivity and Sustainability.

The South West District is Sydney's fastest growing District with plans for an estimated 31,450 additional residential dwellings to be provided by 2021 and 143,000 additional residential dwellings by 2036. The goal of the District Plans is to have well-coordinated, integrated and effective planning for land use, transport and infrastructure.

Following is an overview and commentary on the priorities in the Plan that are of direct relevance to the intent of this PP:

2.3.1.1 *Productivity*

With respect to improving productivity in the South West District, the draft Plan identifies the following priorities of relevance to this PP:

- *Creating a framework to deliver the Western City*
- ***Integrating land use and transport planning to drive economic activity***
- *Planning for job target ranges for strategic and district centres*
- *Growing and diversifying the economic opportunities of the District's strategic centres*
- *Growing jobs in the health and education sectors*
- ***Coordinating infrastructure planning with population growth – enhancing local access***
- *Strengthening the diversity of employment choice*

By releasing land that has been identified through detailed environmental assessment as suitable for residential development, this PP increases opportunities for sustainable growth in the District. Moreover, the PP would clearly increase local employment opportunities during consequent housing and infrastructure construction. The increase in housing supply within 2 kms of the Smeaton Grange employment lands and within approximately 15 kms from the site of the proposed Badgerys Creek airport would contribute directly to improved local access to job opportunities.

2.3.1.2 Liveability

Improving housing choice

The draft SWDP identifies a need for greater diversity and adaptability in new housing in the District in order to cater to the changing sizes and demographics of households. A requirement is identified for:

"diversity of housing types including small lot housing, terraces and apartments in a variety of configurations (one, two and three+ bedrooms) and more adaptable and accessible forms of housing for older people, people with disabilities and families." (draft SWDP, P.89)

The rezoning of sustainably developable portions of this land to R1 – General Residential will facilitate further opportunities for provision of a range of housing forms from low to medium density, all of which are permissible within the zone.

Improving housing affordability and liveability

The need for affordability and the need to live close to places of work is another identified priority in the draft Plan.

"a supply of diverse housing types in the private market that are more affordable to key workers and moderate income households." (draft SWDP, P.89)

By providing increased opportunities for a broad range of residential development on land that is an extension of an existing residential community this PP positively addresses the two priorities for housing choice and affordability in the draft SWDP. The proposed R1 – General Residential zoning will permit a diverse range of housing types on the rezoned land, providing a planning platform for a mixed community of housing forms and increased opportunities for affordable housing.

2.3.1.3 Sustainability

Amongst a range of sustainability priorities, of direct relevance to this PP is the stated objective to protect the qualities of the Scenic Hills landscape. The zoning in this PP has been carefully considered to ensure protection by environmental zonings of land that is visually or ecologically sensitive. To this end, the Visual Quality assessment that accompanies the PP has directly informed the location of future residential development.

Our conclusion is that by providing opportunities for sustainable development of diverse housing stock close to employment hubs, this PP would be entirely consistent with and would contribute positively to the priorities and objectives set by the strategic intentions of the draft SWDP.

Various actions pertaining to Productivity, Liveability and Sustainability are noted and addressed overleaf.

Table 2-1 SWDP Productivity Actions

Productivity Actions	Outcome	Planning Proposal Response
P1: Establish the Western Sydney City Deal	Increase in total jobs	The construction and maintenance of additional homes for future residents will generate employment opportunities in the local area.
P2: Develop and implement an economic development strategy for the Western City	Increase total jobs and proportion of health and education and knowledge and professional services jobs	As above.
P3:Develop and implement a centres framework for the District	Increased investment, increased jobs, reduced retail escape expenditure	As above.
P4: Review the role and staging of the Leppington town centre in the context of the Western Sydney Airport and Western Sydney City Deal	Investor certainty	N/A
P5: Develop and implement a Framework for the Enterprise corridor	Increased investment, increased jobs	The construction and maintenance of additional homes for future residents will generate employment opportunities in the local area.
P6: Identify transport improvements which deliver east west and north south connectivity	Improved transport connectivity	Additional road network development and improvements are occurring in the sub region which will support the proposed rezoning. For example, the Narellan Interchange is currently being upgraded.
P7: Build the Badgally transport connection, including an active transport link	Improved transport connectivity	Will contribute to providing improved infrastructure for future residents.
P8: Prioritise the planning of Spring Farm Parkway	Improved transport connectivity	N/A
P9: Develop a threshold for greenfield dwelling numbers based on transport provision	Development linked to infrastructure	The integration of residential land and transport infrastructure is essential to the long term sustainability of the site. The Traffic Report in ***Appendix H Section 6.1*** finds that the increase in traffic generated by the proposed development will have an insignificant impact to the average delay of the assessed intersections in the vicinity of the development during peak hour periods.
P10: Encourage and support the use of public transport	Increased public transport patronage	A local bus system is available. This could be extended to the Subject Site in order to service any new population. In addition, car share options are available and shared transport journeys which connect to the Campbelltown Station and Macarthur Stations will be encouraged.
P11: Develop specific guidelines to inform the planning of new communities in land release areas	Improved integrated land use, transport and environmental planning and improved productivity, liveability, and sustainability outcomes	Redevelopment of the site would integrate land use, transport and environmental planning, productivity, liveability and sustainability by unlocking land that has been demonstrated to be suitable for residential development and providing zoning protection for components of the subject site that have been identified as environmentally sensitive.

P12: Develop a South West Priority Growth Area land use and infrastructure plan	Improved infrastructure decision making and investor certainty	The provision of additional housing and a supported transport access approach would support the Priority Growth Area.
P13: Designate Liverpool as a Collaboration Area	Increase in total jobs and increase in total health and education and knowledge and professional services jobs	N/A
P14: Support the development and delivery for the Campbelltown–Macarthur strategic centre of a CBD transformation plan	Increase in total jobs and increase in total health and education and knowledge and professional services jobs	N/A
P15: Plan for the Liverpool health and education super precinct as part of the Liverpool Collaboration Area	Increase in health and education jobs	N/A
P16: Work with State agencies, especially Sydney Water, to enable the timely delivery of infrastructure for employment and urban services land	Timely land release / land development	Sydney Water has recently constructed a reservoir on the site and there is currently excellent communication between the landowners and Sydney Water regarding long term capability.
P17: Set parameters for the delivery of local jobs as a condition of approval for rezoning in new release areas	Increase in total local jobs	The construction and maintenance of additional homes for future residents would support employment opportunities in the area. New housing on the subject site would be in close proximity to local employment lands.
P18: Plan for and facilitate the attraction of new jobs in Wilton New Town	Increase in total local jobs	N/A
P19: Identify and plan for efficient movement of freight to, from and within the District, with least impact on residents' amenity	Improved freight transport connectivity	N/A
P20: Provide adequate access to and from the Moorebank Intermodal Terminal	Improved freight transport connectivity	N/A
P21: Leverage the South West District's potential as a visitor destination	Increased visitation	The site has an excellent view point adjacent to the Sydney Water tank towards the 'Scenic hills" and it will provide a further link in the walking/cycling corridor located beneath the transmission lines. These two elements will attract local visitors to the site. The scenic quality of the locality will be protected by restricting residential development to land which has been identified as capable of absorbing development and by protection and enhancement of existing vegetation tracts and creek lines on the site.
P22: Developing better understanding of the value and operation of employment and urban services land	Increase in total jobs	The development of additional homes for future residents would support the value and operation of employment and urban services land within Camden Council LGA.

Table 2-2 SWDP Livability Actions

Liveability Actions	Outcome	Planning Proposal Response
L1: Prepare local housing strategies	Increase in diversity of housing choice	The development of additional homes for future residents would support Camden Council's future housing strategies for the LGA.
L2: Identify the opportunities to create the capacity to deliver 20-year strategic housing supply targets	Creation of housing capacity	This portion of Manooka Valley provides an opportunity to assist Camden Council in its delivery of additional housing supply.
L3: Councils to increase housing capacity across the District	Creation of housing capacity and increase in diversity of housing choice	As above.
L4: Encourage housing diversity	Increase in diversity of housing choice	The PP provides for a general residential zone on the identified developable land in order to maximise opportunities for housing diversity.
L5: Independently assess need and viability	Increase in affordable rental housing	The PP would increase opportunities for supply of affordable rental housing through its proposed general residential zoning.
L6: Support councils to achieve additional affordable housing	Increase in affordable housing	As above.
L7: Provide guidance on Affordable Rental Housing Targets	Increase in affordable rental housing	As above.
L8: Undertake broad approaches to facilitate affordable housing	Increase in affordable housing	As above.
L9: Coordinate infrastructure planning and delivery for growing communities	Change in industry perceptions (surveyed)	The PP shall coordinate infrastructure planning and delivery for this new community.
L10: Provide data and projections on population and dwellings for local government areas across Greater Sydney	Contribute to more informed infrastructure investment decisions, strategic planning and plan making	The South West District is Sydney's fastest growing District and plans for an estimated 31,450 additional residential dwellings to be provided by 2021 and 143,000 additional residential dwellings by 2036. The Subject Site has the potential to deliver 180 - 200 additional lots.
L11: Provide design-led planning to support high quality urban design	Contribute to improved sustainability, productivity and liveability outcomes	The PP process has identified land with sustainable development capability on this site and it is proposed to rezone this to allow for a variety of residential development. It has also identified and set aside ecologically sensitive land and proposes to protect this via an E2-Environmental Conservation zoning. The result would be improved sustainability, productivity and liveability outcomes. Quality urban design can be readily achieved on the site which would afford access to high quality open space and the potential for living in the context of a protected bushland environment. Urban design outcomes could be further facilitated via future inclusions in Council's DCP and by the applicant at DA stage.
L12: Develop guidelines for safe and healthy built environments	Contribute to improved health outcomes and increased walking and cycling	The PP will provide for a safe and healthy built environment that encourages increased walking and cycling to improve the health and safety of future residents.

L13: Conserve and enhance environmental heritage including Aboriginal, European and natural	Identification and protection of heritage elements	The PP has identified and protected any environmental heritage, including Aboriginal, European and natural heritage. Refer to **Appendix F** for the Fauna and Flora Report.
L14: Develop a South West District sport and recreation participation strategy and sport and recreation facility plan	Contribute to informed decision making for sport and recreation infrastructure and increased participation	The increased numbers of residents would likely result in increased participation in sport and recreation infrastructure.
L15: Support planning for shared spaces	Increase in the provision of community facilities, including open space	The PP incorporates planning for open space areas. The subject will have approximately 58% open space as part of the overall development.
L16: Support planning for school facilities	Improved education infrastructure decision making	The increased numbers of residents would likely result in increased educational infrastructure requirements for future residents which are likely to be able to be supported by the local schools given the relatively low numbers of additional population.
L17: Support the provision of culturally appropriate services	Improved decision making with the aboriginal community	The PP shall incorporate consideration of any identified aboriginal cultural sensitivities.
L18: Support planning for emergency services	Contribute to improved decision making for emergency services operators	The PP shall include consultation with Emergency Services operators to ensure that their planning requirements are accommodated in the final subdivision design at the DA stage.
L19: Support planning for cemeteries and crematoria	Improved decision making for new cemeteries	N/A

Table 2-3 Sustainability Actions

Sustainability Actions	Outcome	Planning Proposal Response
S1: Protect the qualities of the Scenic Hills landscape	Protection through statutory controls	The PP has been designed to ensure that the qualities of the Scenic Hills landscape are not adversely affected by future development. Refer to the Visual Impact Assessment Report in ***Appendix I.***
S2: Review criteria for monitoring water quality and waterway health	Improved water quality and waterway health	The PP will ensure that water quality and waterway health are monitored and improved as analysed by the Flora and **Fauna Report in Appendix F** and future Conditions imposed by Council.
S3: Protect the South Creek environment and development approaches to achieve excellent environment performance	Improved water quality and waterway health, and integration of South Creek into land use planning	The PP will ensure that water quality and waterway health of South Creek are monitored and improved, as it effects the Subject Site.
S4: Improve the management of waterways in Priority Growth Areas	Improved water quality and waterway health	The PP will ensure that water waterways are monitored and improved as analysed by the **Flora and Fauna Report in Appendix F** and future Conditions imposed by Council.
S5: Monitor water levels and water quality in Thirlmere Lakes	Improve water quality and waterway health	N/A to the Subject Site per se.

S6: Develop a Strategic Conservation Plan for Western Sydney	Protection and management of areas of high environmental value	The PP associated with the Subject Site proposes statutory protection of identified environmentally sensitive lands via rezoning to E2 – Environmental Conservation. Strategic Conservation Plans, as determined by Council, would be likely to be included as conditions of any consequent development application pertaining to the land.
S7: Update information on areas of high environmental value	Protection and management of areas of high environmental value	Detailed assessment work has been undertaken by independent Consultants pertaining to Flora and Fauna, **Appendix F** and Bushfire Protection, **Appendix G.** A key outcome of the Planning Proposal is unlocking of land capable for residential development and statutory protection of environmentally sensitive lands.
S8: Use funding priorities to deliver the South West District Green Grid priorities	Delivery of the green grid priorities	N/A
S9: Develop support tools and methodologies for local open space planning	Improved utilisation of open space and increased provision of open space	The PP incorporates significant planning for open space areas, which are currently not available to the public, therefore it contributes additional amenity to the area.
S10: Update the Urban Green Cover in NSW Technical Guidelines to respond to solar access to roofs	Protection of solar access to roofs	The PP shall incorporate measures to protect solar access to roofs which can be addressed at the DA stage.
S11: Identify land for future waste reuse and recycling	Identification of land for waste management	N/A to the Subject Site per se.
S12: Embed the NSW Climate Change Policy Framework into local planning decisions	Contribute to energy efficiency, reduced emissions and improve environmental performance	The PP shall incorporate measures to contribute to energy efficiency, reduced emissions and improve environmental performance, as detailed in the DA stage of the process..
S13: Support the development of initiatives for a sustainable low carbon future	Contribute to energy efficiency, reduced emissions and improve environmental performance	The PP shall incorporate measures to contribute to energy efficiency, reduced emissions and improve environmental performance at the DA stage.
S14: Support the development of environmental performance targets and benchmarks	Contribute to improved environmental performance	Specific detailed measures to contribute to improved environmental performance will be fully addressed at the DA stage, once the land use has been established.
S15: Incorporate the mitigation the of urban heat island effect into planning for urban renewal projects and Priority Growth Areas	Contribute to reductions in ambient temperatures	The PP shall incorporate measures to contribute to reductions in ambient temperature at the DA stage, once the land use has been established.
S16: Review the guidelines for air quality and noise measures for development near rail corridors and busy roads	Improved land use and transport decision making	N/A
S17: Identify and map potential high impact areas for noise and air pollution	Improved land use and transport decision making	N/A

S18: Address flood risk issues in the Hawkesbury-Nepean Valley	Protection of life and property	N/A

It is clear from the above assessment that the proposed PP will fundamentally assist in meeting the strategic objectives of the SWDP and is an opportunity to contribute to the long term development of the area.

2.3.2 Zoning

The land use zoning of the site in its current form permits a combination of E2 – Environmental Conservation zone, E4 – Environmental Living zone, and RU2 – Rural Landscape purposes, as shown in Figure 2-5 below. The land use objectives of each zone and assessed in Tables 2-4 to 2-6

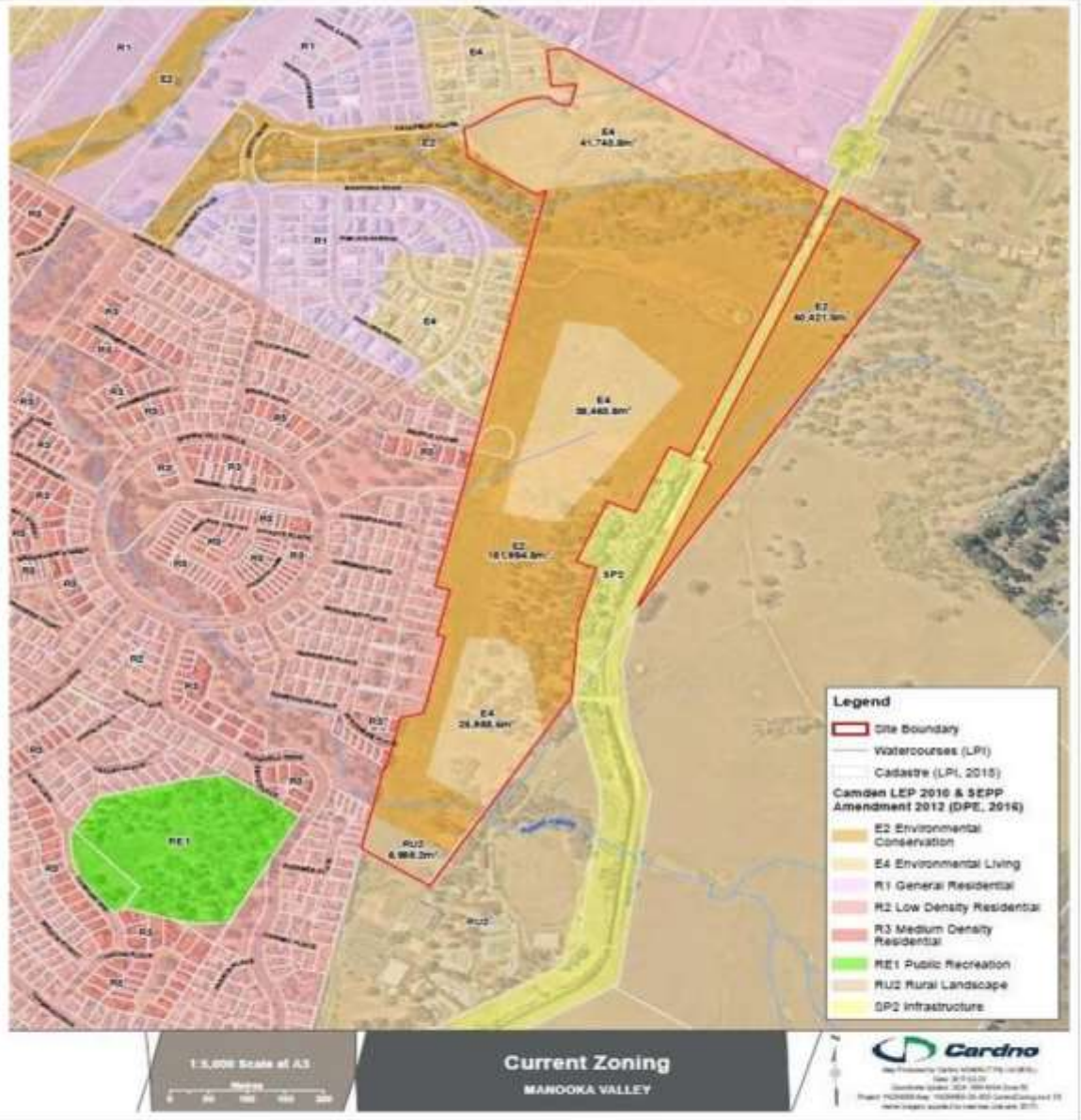


Figure 2-5 Camden LEP Zoning Map
Source: Camden LEP 2010

Table 2-4 Zone E2 – Environmental Conservation

Zone E2 – Environmental Conservation	
1 Objectives of zone	• To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values. • To prevent development that could destroy, damage or otherwise have an adverse effect on those values. • To protect and enhance the ecology, hydrology and scenic views of waterways, riparian land, groundwater resources and dependent ecosystems.
2 Permitted without consent	Nil
3 Permitted with consent	Environmental protection works; Flood mitigation works; Recreation areas; Roads; Water reticulation systems
4 Prohibited	Business premises; Hotel or motel accommodation; Industries; Multi dwelling housing; Recreation facilities (major); Residential flat buildings; Restricted premises; Retail premises; Seniors housing; Service stations; Warehouse or distribution centres; Any other development not specified in item 2 or 3

Table 2-5 Zone E4 – Environmental Living

Zone E4 – Environmental Living	
1 Objectives of zone	• To provide for low-impact residential development in areas with special ecological, scientific or aesthetic values. • To ensure that residential development does not have an adverse effect on those values.
2 Permitted without consent	Home occupations
3 Permitted with consent	Dwelling houses; Environmental facilities; Environmental protection works; Exhibition homes; Exhibition villages; Flood mitigation works; Home-based child care; Home businesses; Home industries; Recreation areas; Roads; Signage; Water recycling facilities; Water supply systems
4 Prohibited	Advertising structures; Industries; Service stations; Warehouse or distribution centres; Any other development not specified in item 2 or 3

Table 2-6 Zone RU2 – Rural Landscape

Zone RU2 – Rural Landscape	
1 Objectives of zone	• To encourage sustainable primary industry production by maintaining and enhancing the natural resource base. • To maintain the rural landscape character of the land. • To provide for a range of compatible land uses, including extensive agriculture. • To protect and enhance areas of scenic value by minimising development and providing visual contrast to nearby urban development. • To maintain the visual amenity of prominent ridgelines. • To permit non-agricultural uses which support the primary production purposes of the zone.
2 Permitted without consent	Extensive agriculture; Home occupations
3 Permitted with consent	Agricultural produce industries; Aquaculture; Bed and breakfast accommodation; Cellar door premises; Dual occupancies (attached); Dwelling houses; Environmental protection works; Farm buildings; Farm stay accommodation; Home-based child care; Home businesses; Home industries; Intensive plant agriculture; Roads; Rural workers' dwellings; Sawmill or log processing industries; Secondary dwellings; Any other development not specified in item 2 or 4
4 Prohibited	Advertising structures; Agriculture; Air transport facilities; Amusement centres; Camping grounds; Car parks; Caravan parks; Commercial premises; Correctional centres; Crematoria; Eco-tourist facilities; Entertainment facilities; Exhibition

Zone RU2 – Rural Landscape	
	homes; Extractive industries; Freight transport facilities; Function centres; Health services facilities; Heavy industrial storage establishments; Home occupations (sex services); Industrial retail outlets; Industries; Information and education facilities; Mortuaries; Port facilities; Recreation facilities (indoor); Recreation facilities (major); Residential accommodation; Restricted premises; Rural industries; Service stations; Sex services premises; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Warehouse or distribution centres; Wharf or boating facilities; Wholesale supplies

2.3.3 Surrounding Planning Context

The Subject Site is bounded by land to the north and west that is zoned to permit residential development. The land to the south is zoned for educational purposes and to the east is zoned for predominantly rural scenic uses.

2.3.3.1 Surrounding land to the North and West

Immediately adjacent the northern and western boundary of the Subject Site is land that falls within the South West Priority Growth Area and is zoned R1 – General Residential. This land is part of the suburb of Gregory Hills.

The zones that apply to the surrounding areas to the north and west of the site include:

- R1 – General Residential zone;
- R2 – Low Density Residential zone;
- R3 – Medium Density Residential zone, and
- E4 – Environmental Living zone.

Zoning controls that apply to the residential areas surrounding the site allow for a mix of types of residential development, including low and medium densities. These areas currently feature a mix of residential housing densities or are currently undergoing development for residential purposes. Residential development on the Subject Site will complement the current, existing and developing areas located to the north and west.

Figure 2-6 Surrounding Zoning Context (north and west)
Source: SEPP (Sydney Region Growth Centres) 2006

2.3.3.2 Surrounding land to the east and south

The land adjoining the site to the south and east is predominantly zoned for rural purposes. Specifically, the zones include:

- RU2 – Rural Landscape;
- E3 – Environmental Management (Campbelltown City LGA), and
- 7 d (1) – Environmental Protection (Scenic) (Campbelltown City LGA).

The objectives and controls for these zones focus primarily on maintaining the rural and scenic aspects of the land, in particular the ecological and aesthetic values.

Figure 2-7 Surrounding Zoning Context (east)
Source: NSW Department of Planning & Environment Property Details

Figure 2-8 Surrounding Zoning Context
Source: Campbelltown LEP 2015 – Deferred Area Zoning

2.3.4 Heritage

Heritage Item I122 under Camden LEP 2010 is the 'Upper Canal', a heritage item of State significance. The canal transects the site running north-south. It is an early water supply canal that has been in use since 1888 and is still in use today, providing water tunnelling for 62 km from Pheasants Nest to Prospect Reservoir. Uniquely, the canal feeds water to the reservoir entirely by gravity. The canal remains in good condition.

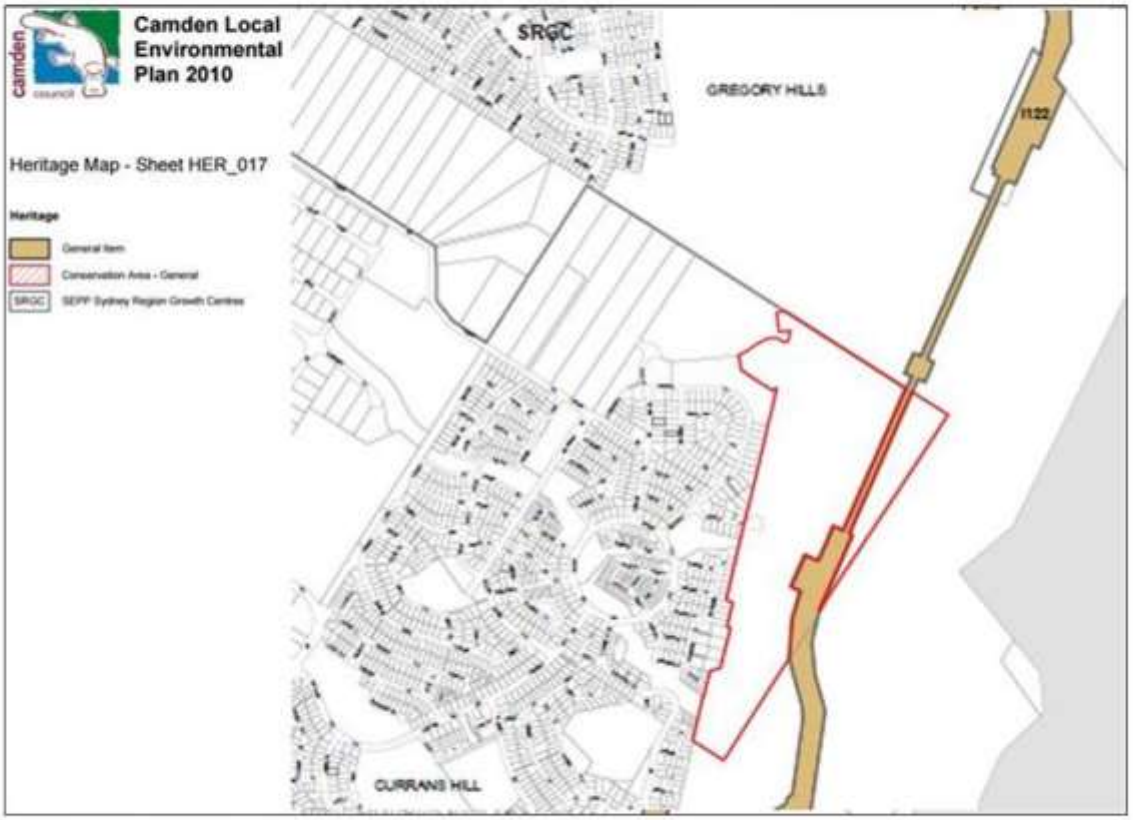


Figure 2-9 Camden LEP Heritage Map
Source: Camden LEP 2010

The heritage listed areas are located outside of the boundaries of the Subject Site. Thus, this Planning Proposal does not envisage any encroachment or adverse impact upon the canal.

2.4 Planning Proposal Details

This PP seeks the Minister's consent to rezone the Subject Site from a combination of:

- E2 – Environmental Conservation,
- E4 – Environmental Living, and
- RU2 – Rural Landscape

To a combination of:

- R1 – General Residential,
- E2 – Environmental Conservation.

2.4.1 R1 – General Residential zone

It is proposed to introduce the R1 – General Residential zone. Objectives of this zone and permissible / prohibited uses are described below.

Table 2-7 Zone R1 – General Residential

Zone R1 – General Residential	
1 Objectives of zone	• *To provide for the housing needs of the community.* • *To provide for a variety of housing types and densities.* • *To enable other land uses that provide facilities or services to meet the day to day needs of residents.* • *To allow for educational, recreational, community and religious activities that support the wellbeing of the community.* • *To minimise conflict between land uses within the zone and land uses within adjoining zones.*
2 Permitted without consent	*Home occupations*
3 Permitted with consent	*Attached dwellings; Bed and breakfast accommodation; Boarding houses; Child care centres; Community facilities; Dwelling houses; Exhibition homes; Group homes; Home-based child care; Home businesses; Home industries; Hostels; Kiosks; Multi dwelling housing; Neighbourhood shops; Places of public worship; Residential flat buildings; Respite day care centres; Roads; Semi-detached dwellings; Seniors housing; Shop top housing; Any other development not specified in item 2 or 4*
4 Prohibited	*Agriculture; Air transport facilities; Amusement centres; Animal boarding or training establishments; Boat building and repair facilities; Boat sheds; Camping grounds; Car parks; Caravan parks; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Electricity generating works; Entertainment facilities; Extractive industries; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Home occupations (sex services); Industries; Mortuaries; Public administration buildings; Recreation facilities (major); Research stations; Restricted premises; Rural industries; Rural workers' dwellings; Service stations; Sewerage systems; Sex services premises; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Warehouse or distribution centres; Waste or resource management facilities; Wharf or boating facilities; Wholesale supplies*

2.5 Indicative Zoning Plan

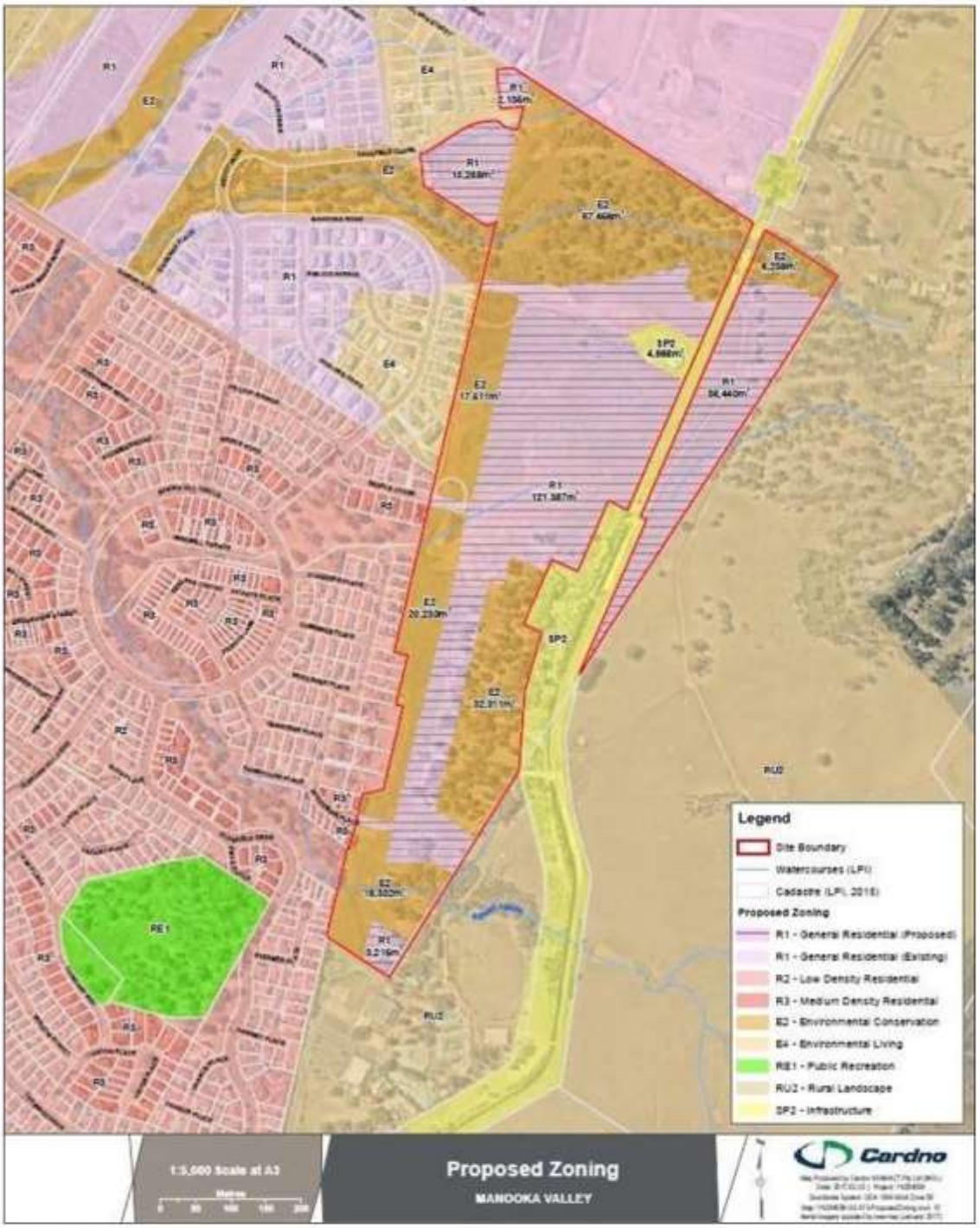


Figure 2-10 Proposed Zoning Plan
Source: Cardno

3 Objectives or Intended Outcomes

The purpose of the PP is to respond to demand for housing in the area. According to research undertaken by id.community (demographic resources) the demand for dwellings in Camden Council is forecast to grow from 19,588 in 2011 to 54,208 in 2026, with the average household size falling from 3.05 to 3.02 by 2026. In addition, the Draft SWDP states that the Camden Council area is required to provide an additional 11,800 dwelling within the next five years and the Manooka Valley area is specifically identified as being suitable for infill residential development (page 98 and 103). These issues will be addressed in more detail in Chapter 5.

The objective or intended outcomes will achieve the following:

- Encourage the development of vacant land located in a region experiencing significant population growth;
- Respond to demand for housing as identified in numerous strategic planning initiatives for the South West region;
- Encourage the provision of housing types and densities that are compatible to the surrounding area;
- Provide a transitional area between the medium/low density residential areas to the east and north and the rural areas located to the south and west.
- Protect and enhance areas of ecological significance within the site; and
- Provide public recreational spaces to the surrounding community, which are currently unavailable as the land is held in private ownership and fenced.

4 Explanation of the Provisions

The objectives of this PP are to be achieved by amending the Camden LEP 2010 Land Zoning Map as depicted below, and accompanying this proposal at **Appendix C.**

Amendment to the following Camden LEP Zoning Map:

Land Zoning Map – Sheet LZN_017

Figure 4-1 Current Camden LEP Zoning Map
Source: Camden LEP 2010

Figure 4-2 Proposed Camden LEP Zoning Map
Source: Cardno

5 Justification

5.1 Need for a Planning Proposal

5.1.1 Is the PP a result of any strategic study or report?

The PP has not been prepared as a direct result of a strategic study for the Subject Site, but has been informed by numerous strategic state-wide and Sydney Metropolitan strategies.

5.1.1.1 Draft South West District Plan (SWDP)

The Draft SWDP was prepared by the Greater Sydney Commission and released for exhibition in November 2016. The Greater Sydney Commission is aiming to connect local planning with longer-term planning for Greater Sydney to better coordinate State and local government planning. Six Greater Sydney Districts were created following consultation with local Councils. Camden Council LGA is located within the 'South West' Sydney District, which also includes Campbelltown, Fairfield, Liverpool and Wollondilly Local Government Areas (LGAs).

The Greater Sydney Commission's Fact Sheet for Sydney's South West District states the following:

> *"The South West District is a mix of productive rural areas, precious bushland and historic towns, interspersed with growing urban centres. It's the fastest growing district in Sydney. For some years, the South West Priority Growth Centre – new land releases around Oran Park, Leppington and Bringelly – has brought new housing to the market. The South West Rail Link now connects Leppington to the Sydney rail network, and a new town centre is emerging at Oran Park."*

The District Plan anticipates that the population in the south west region will increase from the 2016 estimate of 715,200 to 1,088,000 in 2036 (p.83). Camden LGA in particular is expected to experience the most significant growth, with a projected population increase of 143,700 people over that 20-year period (p.84). To accommodate this population influx, a significant increase in dwellings is required across Camden. The District Plan provides a target of 11,800 new dwellings over the 5 years to 2021, and notes that Manooka Valley is one of the precincts identified by the Department of Planning & Environment as able to generate significant capacity for housing supply (p.97).

The PP responds directly to the projections and targets that have been identified by the Greater Sydney Commission. The proposal aims to increase the residential zoned area of Camden Council, thus facilitating an increase in the potential developable land in the area.

Further to this, the confirmed location and future development of the proposed Western Sydney Airport at Badgerys Creek is anticipated to be the most significant driver of economic change in Sydney over the coming decades, a "game changer" for Greater Sydney (p.25). The new airport will create a hub for between 29,000 and 34,000 jobs while also spurring on construction and major new transport infrastructure (p.54). Manooka Valley is located approximately 20 minutes south of the proposed Western Sydney Airport site by car, and will therefore be seen as a suitable residential location for potential airport employees and will help ensure the attractiveness of the area as a place to live. Refer to 2.3.1 above for additional information.

5.1.1.2 NSW State Priorities – Making It Happen (Sep 2015)

NSW: Making it Happen is the most recent strategic vision released by the NSW Government, outlining 30 key reforms for the State.

- Relevant strategic priorities:
  - Creating Jobs

    The NSW Government aims to create 150,000 new jobs by 2019. New housing options are necessary in regions of job creation to accommodate and support workers.
  - Infrastructure

    Increasing housing supply across NSW is a major goal of the State Government. Their aim is to deliver more than 50,000 approvals every year to allow for the creation of 664,000 new homes

over the next 20 years. In the 12 months to July 2015, there were 61,057 building approvals in NSW, the highest result in more than 41 years and 64.5% above the decade average. The Government is supporting future growth by establishing housing targets across NSW, and providing record allocations to the Housing Acceleration Fund to build the infrastructure to support this growth.

The proposed rezoning of land at the Manooka Valley site will allow for significant residential development that will help to achieve the long-term housing goals set by the NSW Government.

5.1.1.3 A Plan for Growing Sydney (Dec 2014)

- Goal 2 – A city of housing choice, with homes that meet our needs and lifestyles
  - Direction 2.1 – Accelerate housing supply across Sydney
  - Direction 2.2 – Accelerate urban renewal across Sydney to ensure more jobs closer to home
  - Direction 2.3 – Improve housing choice to suit different needs and lifestyles
  - Direction 2.4 – Deliver timely and well planned greenfield precincts and housing

'A Plan for Growing Sydney' is the State Government's proposed strategy to ensure Sydney remains Australia's premier city and is able to respond appropriately to the growth it will experience over the next 20 years.

The NSW Government's 2016 population projections suggest that the Camden LGA population is to grow from 80,900 residents in 2016 to 224,550 residents in 2036, a population increase of 143,650 residents. This signifies a 177.6% increase on 2016 population levels, the highest of any LGA in NSW by a significant distance. Similarly, the number of households in Camden LGA is expected to increase from 27,050 households in 2016 to 77,300 in 2036, an increase of 185.8%, in part due to the decreasing average household size.

The population and household data necessitates the utilisation of additional land in Camden LGA to allow for an increase in residential development. The proposed rezoning at Manooka Valley responds directly to both this data and the directions discussed in the strategy. It will allow for the region to more easily accommodate the high number of people moving to the area while promoting the delivery of a range of housing types in a desirable region of Sydney.

5.1.1.4 South West Priority Growth Area

The South West Growth Centre is approximately 17,000 hectares in size and includes parts of the Liverpool, Camden and Campbelltown local government areas. It is divided into 18 Precincts that are being progressively released for planning and rezoned for sustainable urban development. The South West Priority Growth Area will be supported by a Major Centre at Leppington and be serviced by the new South West Rail Link. It will contain about 110,000 new dwellings for some 300,000 residents.

To date, seven Precincts -- Oran Park, Turner Road, Edmondson Park, Austral, Leppington North, Catherine Field (partial) and East Leppington -- have been rezoned to allow urban development.

The Manooka Valley Subject Site borders the southern boundary of the suburb of Gregory Hills. Gregory Hills forms part of the South West Priority Growth Area Turner Road Precinct, as illustrated in the South West Priority Growth Centre Structure Plan Explanatory Notes. This is part of the southernmost boundary of the South West Priority Growth Area. As such, although the Subject Site does not fall under the legislation governing the South West Priority Growth Area, its proximity to the Turner Road Precinct and to Campbelltown City Centre allows it to cater to development based on similar principles.

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

The modifications sought in this PP are the best means of achieving the objectives and intended outcomes. Given the proposed amendments relate to statutory land use mapping outcomes contained in the LEP, other available processes are not considered an appropriate means of achieving the objectives and intended outcomes promoted by this PP.

The PP seeks amendment to the current Camden LEP 2010, rather than seeking modification of the South West Priority Growth Area boundary to include the land. This is reflective of recent decisions by the Department of Planning & Environment and current rezoning proposals within the region adjoining the Growth Area.

5.2 Relationship to Strategic Planning Framework

5.2.1 Is the PP consistent with the objectives and actions contained within the applicable regional or sub-regional strategy (including the SMS and exhibited draft strategies?)

Yes, refer to Section 5.1.1 above.

5.2.2 Is the PP consistent with the Council's local strategy or other plan?

Camden Council's endorsed local strategic plan is '*Camden 2040 – Working Together to Achieve the Community's Vision for the Future*' (Camden 2040). Camden 2040 has a vision to effectively manage its growth whilst promoting a prosperous local economy, with thriving local businesses and local employment. Part of successfully managing growth is to overcome a key challenge of "Achieving a balance between large population increases and keeping the valued characteristics of Camden as it is now will be an ongoing tension and challenge over the coming decades."

The specific key challenges for growing the Camden Area which relate to the Proposal include:

- Creating good quality, liveable urban environments with a greater density than is currently available in the Camden area, including providing a range of efficient, affordable and innovative housing styles and public urban and open spaces.
- The importance of building and maintaining certainty and investment confidence within the area through efficient and stable strategic planning and development control processes.

The key strategies to meet the above challenges include:

- Learning from and improving the urban planning process over time so that lessons learned from each precinct planning process, as well as industry best practice, are used in subsequent precincts to ensure improved outcomes over time
- Prioritising environmental outcomes through the planning and development process to maximise improvement and restoration opportunities and to minimise the ecological impacts of increased urban form, economic activity, and people and lifestyles.
- Ensuring greater choice and diversity in housing to meet a range of existing and future community needs.

This PP will be consistent with these key strategies through ensuring that there is certainty and consistency in the delivery of urban growth areas within Camden and delivering further choice in housing diversity.

5.2.3. *Camden Local Environmental Plan (LEP)*

The key issue regarding the Camden LEP is the change in land use which is the purpose of this Report.

5.2.4 *Camden Development Control Plan (DCP)*

In discussion with Council, post the 2nd "Pre-DA" Meeting on the 26th April 2017 the relevant DCP controls at this stage of the planning process have been identified as Section C8.1, the Manooka Valley Planning Principles and Section B1.2 Earthworks Controls. Other DCP controls will apply to the Subject Site at the Development Application stage of the process.

Section C8.1 of the DCP identifies Planning Principles applicable to the Manooka Valley generally, which are responded to overleaf.

Table 5-1 Manooka Valley Planning Principles

Manooka Valley Planning Principles	Response
1. *"Manooka Valley will provide a physical and visual transition between rural/scenic protection areas and Currans Hill. The residential zone will be characterised by a range of lot sizes. Lot size and building character within residential precincts will reflect their relationship to adjacent amenities and the provision of housing diversity. Other lots will provide a low key and visually sensitive transition to surrounding rural and scenic protection land".*	The Subject Site is located within the Manooka Valley. The natural landscape and environmental importance of portions of the site is reflected in the proposed rezoning plan. Approximately 54% of the site will be retained and protected via an E2 – Environmental Conservation zoning. This land comprises the most visually prominent parts of the site and is largely vegetated with indigenous vegetation communities. The protected environmental lands will provide a visual and physical buffer and transition the developed suburban precinct of Currans Hill and the rural/scenic protection areas located to the east of the Subject Site.
2. *"The visual impact of development on Manooka Valley's landscape setting will be minimised. A high level of scenic quality will be achieved by protecting significant watercourses, significant trees, ridgetops and steep slopes from any adverse effects of development. The design of roads, landscaping, open spaces, water cycle management systems, houses and other elements of the urban landscape, will positively respond to these aims. The public open space design and water cycle management system will be environmentally sensitive, will contribute to the maintenance of downstream water quality and will recognise the importance of revegetated riparian corridors in the locality".*	As detailed in the Visual Impact Study that accompanies this PP, it is proposed to protect ridges, vegetation and watercourses on the site within the E2 – Environmental Conservation zone. This facilitates detailed planning for the site post rezoning that would be fully consistent with the environmental imperatives set by this Planning Principle. A detailed independent Fauna and Flora Consultant Report has been prepared by Biosis and is enclosed in the Appendices, which clearly identifies significant environmental features. The proposed rezoning plan has been developed with respect to these elements to ensure the long term environmental integrity of the precinct.
3. *"A variety of publicly accessible open space areas, suitable for a range of passive recreation opportunities will be available to residents. Pedestrians and cyclists will have convenient access throughout the precinct and connections to surrounding precincts".*	Two areas of the Subject Site are to be dedicated for passive recreational use. One of which is the access to the viewpoint located adjacent to the water tower to the north of the site and the second area, is the proposed walking and cycling track located to the west of the site, within the electrical easement.
4. *"A significant area of endangered Cumberland Plain Woodland has been set aside for restoration and revegetation. A Village Common will be created within an attractive and functional creek line. An integrated stormwater management system will help make Manooka Valley an attractive, environmentally sustainable neighbourhood"*	As mentioned in No.2 above a detailed independent Fauna and Flora Consultant Report has been prepared by Biosis and is enclosed in the Appendices. This report clearly identifies and proposes the long term management of the endangered Cumberland Plan Woodlands. The proposal allows for protection and rehabilitation of the Kenny Creek riparian corridor, consistent with the principle to create a village common along creek lines.
5. *"The detailed design of the public domain in Manooka Valley, and its seamless integration with the private domain of each dwelling, is critical to achieving this vision. For this reason, control of the neighbourhood's streets and open spaces is rigorous. It has been planned and designed to respond to the natural features of the site, and to integrate innovative integrated water cycle management techniques. The combination of a thoughtful public domain"*	The detailed planning of the public domain aspects of the Subject Site are reflected in the proposed zoning plan and referenced in No. 2 above.

Section B1.2 Earthworks Controls and C9.8 Sloping Land and Retaining Walls of the DCP are applicable to the development of the Subject Site. These Sections of the DCP applies specifically to the development of steeper topography of the site. A small portion of the Subject Site is greater than 16%. Refer to Appendix I, Visual Impact Assessment, Slope Constraints Map. Notwithstanding, all sites will be developed in accordance with the relevant DCP Controls. The critical controls are outlined below.

Table 5-2 Earthworks Controls

General Land Use Controls	Response
1. Subdivision and building work should be designed to respond to the natural topography of the site wherever possible, minimising the extent of cut and fill (i.e. for steep land houses will need to be of a 'split level' design or an appropriate alternative and economical solution.)	This is noted and will be designed at the Development Application (DA) process and will be fully assessed by Council.
2. Subdivision and building work shall be designed to ensure minimal cut and fill is required for its construction phase.	This is noted and will be designed at the Development Application (DA) process.
3. The maximum amount of cut shall not exceed 1m. The maximum amount of fill shall not exceed 1m.	This is noted and has been tested in the illustration below.
4. Fill within 2.0m of a property boundary shall be fully contained by the use of deepened (drop) edge beam construction with no fill permitted outside of this building footprint.	This is noted and will be complied with at the DA stage.
5. The use of a deepened edge beam shall not exceed 1m above natural ground level.	This is noted and will be complied with at the DA stage.
6. Where filling is required alongside a driveway, it shall be retained by a retaining wall.	This is noted and will be complied with at the DA stage.
7. Council will consider permitting greater cut for basement garages and split level designed development on steeply sloping sites.	This is noted and will be complied with at the DA stage.
8. All retaining walls proposed are to be identified in the development application. Excavations affecting adjoining properties are to be retained or shored immediately. All other approved retaining walls are to be in place prior to the issue of an occupation certificate.	This is noted and will be complied with at the DA and CC stage.
9. Where terraced retaining walls are proposed the minimum distance between each step is one metre.	Noted.
***10.** A variation to the retaining wall heights can be considered with supporting justification and concurrence of the adjoining neighbours.*	Noted.
***11.** Council will consider permitting greater cut for basement garages.*	Noted.
***12.** All retaining walls proposed are to be identified in the development application. Those affecting adjoining properties i.e. adjacent to property boundaries are to be available for inspection prior to the internal linings of the house being installed. All other approved retaining walls*	Noted.

are to be in place prior to the issue of an occupation certificate.	
***13.** All retaining walls and footings are to be wholly contained within the allotment.*	Noted.
***14.** A section 88B instrument is to create an easement for support on the subject lot and adjoining land.*	Noted.
***15.** All retaining walls that are proposed as part of a subdivision or building work shall be designed by a practicing Structural Engineer and be of masonry construction.*	Noted.
***16.** Retaining walls that front a public place are to be finished with anti-graffiti coating.*	Noted.
***17.** Retaining walls are to be designed and constructed to allow for installation of boundary fencing without impact on the structural soundness of the retaining wall and its footings.*	Noted.

General Land Use Controls	Response
1. Retaining walls at the subdivisional works stage of development are permitted to reduce the need for cut and fill at the dwelling construction stage.	This is noted and will be designed at the Development Application (DA) process and will be fully assessed by Council.
The maximum height of a retaining wall is 1.5 metres.	This is noted and sites will be designed in accordance with the maximum height proposed. This will be designed at the Development Application (DA) process.
3. In instances where a retaining wall greater than 1.5 metres in height is required, a second retaining wall is permitted providing the retaining wall structure incorporates a step of 1 metre in width, with the second retaining wall being limited to 1 metre in height (i.e. first wall a maximum of 1.5 metres and second retaining wall is a maximum of 1 metre).	This is noted.
4. Retaining walls are to be constructed of masonry materials.	This is noted and will be complied with at the DA stage.
5. Any wall with a height of 1.5m or greater requires lodgement of a Development Application.	Noted.

The land within the site that is proposed to be rezoned for general residential uses varies in gradient with maximum gradients in the order of 1 in 6 in the northern sector of the site (see slope analysis at Figure 5.1). Where sites are located on these moderate slopes they will be developed in accordance with Camden Councils DCP. There are numerous examples within Western Sydney where steep sites have been developed sympathetically and in accordance with the relevant Councils controls. Refer to images overleaf.

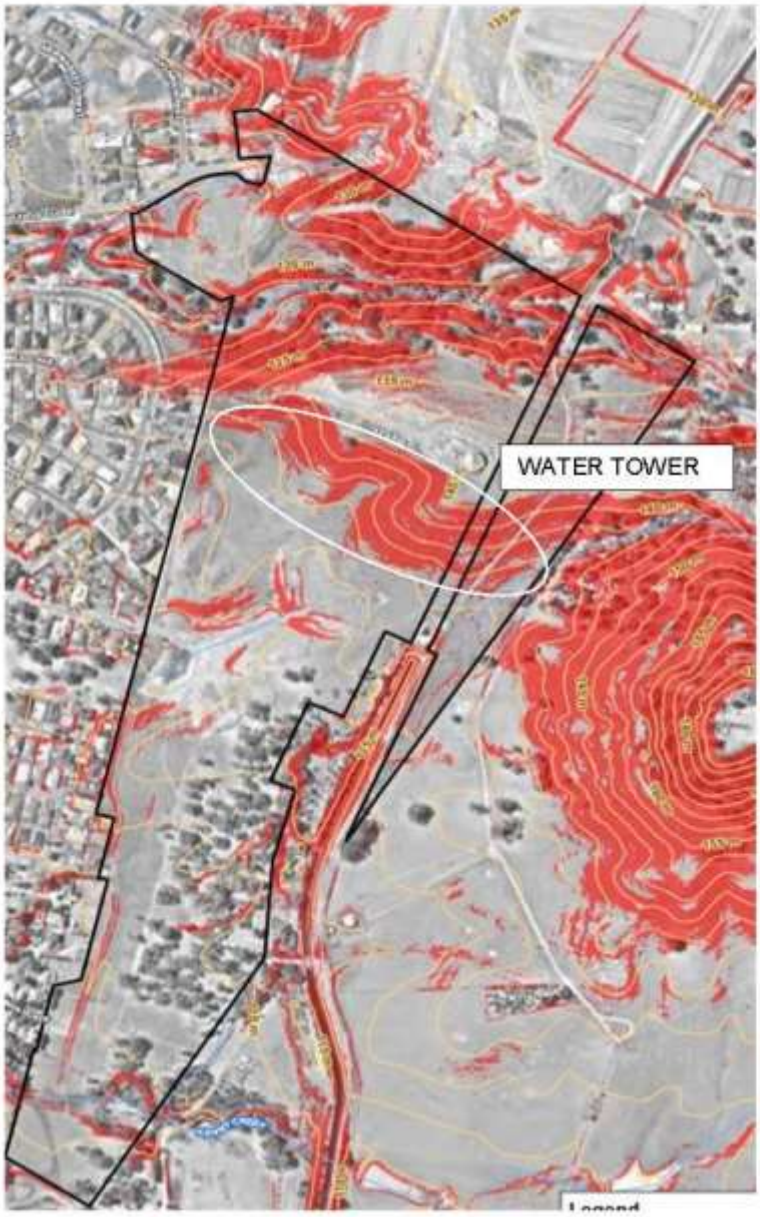


Figure 5-1 Slope Analysis
Cardno GIS

Photo 1, Muttong Street, Pemulwuy.

Photo 2, 28 Burran Road, Pemulwuy.

Photo 3, Corner of Daruga and Buriang Avenue, Pemulwuy

Photo 4, Middleton Grange

Photo 5, Middleton Grange

Photo 6, Middleton Grange

5.2.3 Is the PP consistent with applicable State Environmental Planning Policies?

It is considered that the proposal is compliant with the applicable SEPPs. The applicable SEPPs are identified in **Appendix D** of this Report.

5.2.4 Is the PP consistent with the applicable Ministerial directions (S.117 directions)?

It is considered that the PP is consistent with the relevant Directions issued under Section 117 of the EP&A Act by the Minister to Councils.

The proposal's compliance with the full set of Ministerial Directions is outlined in **Appendix E** of this report.

5.3 Environmental, Social and Economic Impacts

5.3.1 Is there any likelihood that critical habitat or threatened species will be adversely affected?

5.3.1.1 Ecology

Biosis Pty Ltd was commissioned to undertake a Flora and Fauna Assessment of the proposed Manooka Stage 3 rezoning in July 2015. A field assessment was undertaken on 1 December 2015. The field assessment determined that the key ecological values within the Study Area include:

- 13.24 ha of native vegetation:
    - 12.35 ha of Cumberland Plain Woodland split into:
        - 9.66 ha of Cumberland Plain Woodland (meeting EPBC Act criteria);
        - 2.24 ha of Cumberland Plain Woodland – Derived Shrubland (meeting TSC Act criteria), and
        - 0.45 ha of Cumberland Plain Woodland – Derived Grassland (meeting TSC Act criteria);
    - 0.85 ha of TSC Act listed River-flat Eucalypt Forest (EEC);
    - 0.04 ha of Native Sedgeland;
- 3 hollow-bearing trees;
- 12.35 ha of potential living, breeding and dispersal habitat for Cumberland Plain Land Snail (Endangered, TSC Act)
- 9.66 ha of potential habitat for Spiked Rive-flower (Endangered, EPBC Act and TSC Act);
- A population of Pink Bindweed, a Rare or Threatened Australian Plan species;
- Two ephemeral creeks, one unnamed creek in the north-east and the other, Kenny Creek to the southwest of the study area. A small dam is located in the north-west corner of the study area;
- Contribution to local habitat connectivity via patches of native vegetation in neighbouring properties and regional connectivity via Kenny Creek which connects to the Camden, Campbelltown, Liverpool, Penrith and Blue Mountains Local Government Areas (LGA) via the Narellan and Hawkesbury Nepean River riparian corridors.

Cumberland Plain Woodland and River-flat Eucalypt Forest are over cleared landscapes having been cleared of 90% and 95% respectively of their original distribution within the Hawkesbury-Nepean Catchment Management Area.

No threatened species listed under the EPBC Act or TSC Act were detected during the field assessment. It was determined that the Cumberland Plain Land Snail and Spiked Rice-flower have a moderate likelihood of occurrence within the Study Area.

Conclusions

The principal means to reduce impacts on biodiversity values within the study area will be to minimise removal of native vegetation and habitat. Ecological constraints can be protected through reducing the removal of the Cumberland Plain Woodland and River-flat Eucalypt Forest.

The revised rezoning proposal would however require the removal of 1.08 hectares of isolated patches and edge areas of disturbed Cumberland Plain Woodland (meeting TSC Act listing criteria) of which 0.71 hectares meets the EPBC Act listing criteria. The revised rezoning proposal will also result in the potential modification and indirect effects to 0.16 hectares of Cumberland Plain Woodland (EPBC Act) and 0.09 hectares of Cumberland Plain Woodland – Derived Grassland (TSC Act) which falls within the retained RU2 – Rural Landscape zone. Projected modification to these ecological communities based on the objectives of the RU2 – Rural Landscape zone comprise of activities associated with primary production such as cattle grazing, aquaculture, intensive plant agriculture, farm buildings, dwellings, home business, home industries and roads. This will result in the reduction of 0.71 hectares and modification of 0.16 hectares of potential habitat for the Spiked Rice Flower and reduction of 1.08 hectares and modification of 0.25 hectares of potential habitat for the Cumberland Plain Land Snail. The revised rezoning proposal will also entail the removal of one hollow-bearing tree, a Key Threatening Process listed under the EPBC Act.

The revised rezoning proposal seeks to mitigate these losses via the retention of 7.99 hectares of Cumberland Plain Woodland (EPBC), 0.68 hectares of Cumberland Plain Woodland - Derived Shrubland, 0.01 hectares of Cumberland Plain Woodland – Derived Grassland, 0.85 hectares of River-flat Eucalypt Forest and 0.04 hectares of Native Sedgeland under the E2 – Environmental Conservation zone category. In doing this, it is ensured the revised rezoning proposal does not directly impact on River-flat Eucalypt Forest or the two hollow-bearing trees which exist in the northern section of the study area.

Full details regarding biodiversity in the area can be found in the appended Flora and Fauna report prepared by Biosis Pty Ltd attached at ***Appendix F***, on balance the proposal can be supported as it ensures that the Cumberland Plain Woodlands are protected in perpetuity.

5.3.2 Are there any other likely environmental effects and how are they proposed to be managed?

5.3.2.1 Bushfire

A Bushfire Protection Assessment for the Subject Site has been prepared by Travers Bushfire & Ecology to accompany the proposal. The report identifies matters for consideration for the PP and to highlight the required bushfire protection measures for the site.

The assessment found that bushfire can potentially affect the site from the woodland vegetation located both within and external to the north-eastern and south-eastern site boundaries. Bushfire risk also exists from the riparian corridor in the north-west and to a lesser extent the grassland vegetation within the western portion of the site (electrical easement). A relevant excerpt from Camden Council's Bushfire Prone Land map is included below:

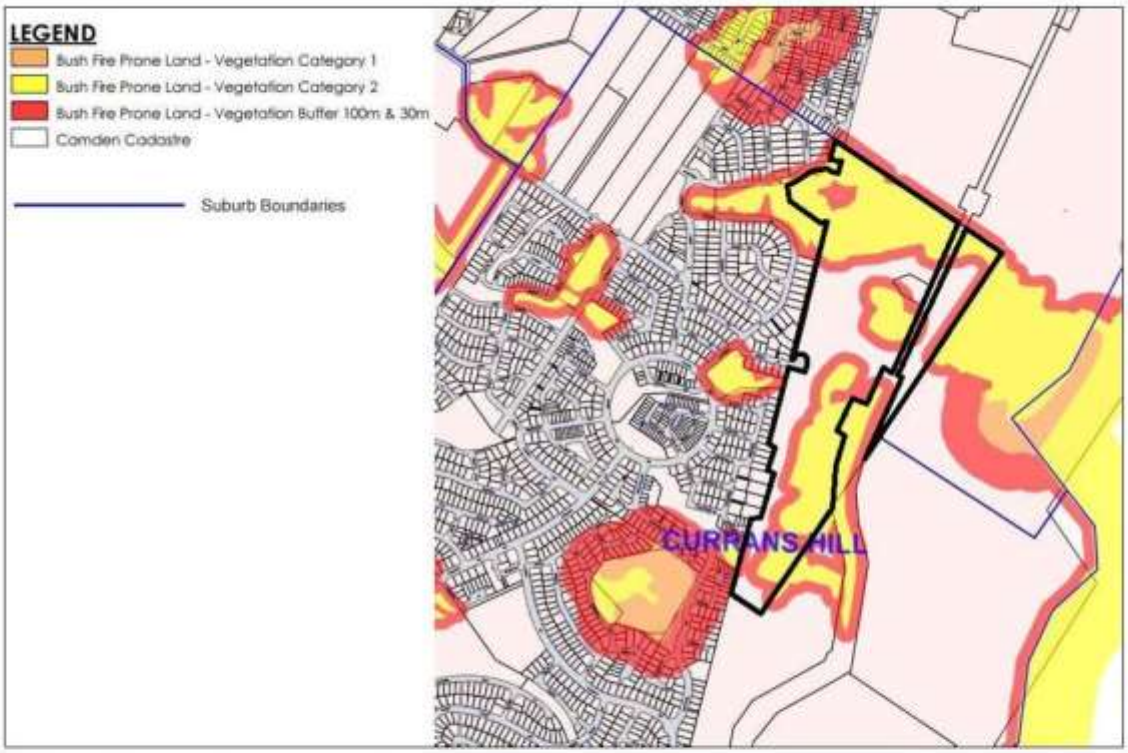


Figure 5-2 Camden Council Bushfire Prone Land Map
Source: Camden Council

Further details regarding bushfire risk on the site and the relevant planning principles that control the risk can be found in the appended Bushfire Protection Assessment.

It is considered by Travers that the bushfire risk posed to the site can be mitigated if appropriate bushfire protection measures, including Asset Protection Zones, are put in place and managed in perpetuity. Future development on the site is capable of complying with the planning principles set out in *Planning for Bushfire Protection 2006* and *Community Resilience Practice Note 2/12 – Planning Instruments and Policies*.

The full Bushfire Protection Assessment prepared by Travers Bushfire & Ecology accompanies this report at **Appendix G.**

5.3.3 Has the planning proposal adequately addressed any social and economic effects?

5.3.3.1 Social and economic benefits

The NSW Government's 2016 population predictions suggest that the Camden LGA population will grow from an estimated 80,900 residents in 2016 to 224,550 residents in 2036, a population increase of 143,650 residents. This signifies a 177.6% increase on 2016 population levels, the highest of any LGA in NSW by a significant amount.

Similarly, demand for housing in Camden LGA is anticipated to increase significantly over the period to 2036. The number of dwellings in Camden LGA is forecast to grow from 28,450 in 2016 to 81,250 in 2036, an increase of 185.6%. This is in part due to the decreasing average household size, which is expected to fall from 2.96 in 2016 to 2.86 in 2036 (NSW Govt., NSW LGA Household Projections and Implies Dwelling Requirements).

Such a significant population increase will require drastic action with regard to housing provision in Camden LGA. The proposed rezoning of the site at Manooka Valley will allow for a significant increase in land that is zoned for residential purposes to assist in the provision of essential housing in the region. Furthermore, a significant increase in housing supply will help to keep the cost of housing in the area low.

Manooka Valley is in close proximity to the proposed new Western Sydney Airport to be located at Badgerys Creek, located approximately 20 minutes south of the proposed airport site by car. The airport is proposed to become a new major centre within Sydney, and it is expected that the development of the airport will act as a catalyst in triggering the growth of major support industries in Western Sydney. The proposed zoning changes at Manooka Valley can help facilitate the provision of residential areas in the vicinity of the airport – one of Sydney's three planned major centres – encouraging the progression of Western Sydney as a major hub for commerce and industry.

The site acts as a transitional zone between the rural land located east of the site and the residential land to the west. As such, the proposed rezoning intends to retain approximately half of the site as protected open space to ensure that the site remains a transitional zone. Retaining a large portion of the land zoned E2 – Environmental Conservation zone – which prohibits any residential development – will help ensure the site continues to function as the transitional zone between rural and residential land in the region. The proposal retains approximately 47% of the site as open space, which will not be built upon. This ratio of undeveloped to developed land is significantly higher than surrounding suburbs such as Currans Hill and Gregory Hills, and reflects Camden Council's strategic intention to provide an interface area between suburban and rural landscapes

5.3.3.2 Traffic

A Traffic Impact Assessment (TIA) was carried out by Cardno to accompany the PP, assessing the short-term and long-term impact that the proposed rezoning could have on traffic in the area.

The assessment broadly covered >> issues with respect to traffic impacts of the Planning Proposal:

- Access to the site
- Trip generation and associated impacts on the function of local and regional roads
- Parking requirements.

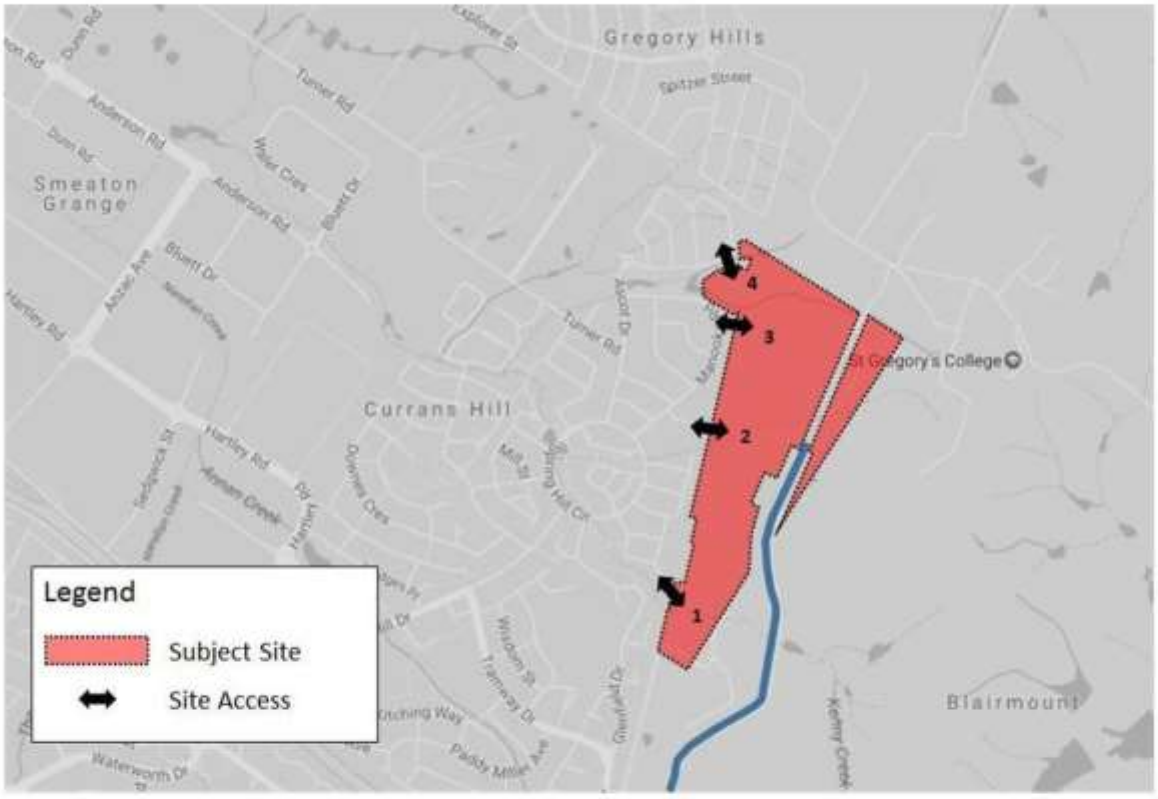
The outcomes of this assessment are summarized below and detailed in the Traffic report at Appendix>>

5.3.3.2.1 Access

Four potential locations for vehicular access are identified in the report (see Figure>>). These include:

- Horseman Place – access anticipated to be restricted to an extension of the existing cul-de-sac for a small number of dwellings;
- Saddle Close - to provide access to a limited number of dwellings at the central part of the site (not to function as the main access point to the overall development);
- New access off Manooka Road (just north of Pimlico Ave), anticipated to provide access to a substantial proportion of the total number of dwellings.
- Caulfield Close – anticipated to consist of converting the Oaklawn Street / Caulfield T intersection to a four-way intersection to allow access to small number of lots (cul-de sac)

Figure 5-3 Proposed Access Arrangement



The Traffic assessment recommends that access at locations 1 & 2 (Horseman Place and Saddle Close) should be restricted to extensions of the existing cul-de-sacs at those two roads into the development site, thus restricting through traffic access via the minor roads in Currans Hill and forcing most vehicles to use Manooka Road to access the greater part of the developed site. This would reduce traffic impacts on the minor road network in the adjacent development.

5.3.3.2.2 Impacts on the local / regional road network

The assessment finds that 70% of generated trips will head east on Narellan Road towards Campbelltown and Sydney CBD and 30 % of generated trips will head west towards Camden. It further finds that notwithstanding this, there will be a proportion of vehicles generated from the proposed precinct that may not contribute to a peak hour car trip to or from the Narellan Road and Tramway Drive intersection. These trips could be towards local employment lands and other attractions to the west and northwest including a supermarket, recreational facilities, educational facilities and the Smeaton Grange industrial area. Gregory Hills and Oran Park have mixed land uses including small retail and education facilities. Connections to Camden Valley Way from the proposed precinct may support trips made to these areas west and reduce the dependence on Narellan Road.

Improved public transport infrastructure (such as additional bus services and alternative bus routes) and improved walking and cycling facilities would help reduce reliance on private vehicle usage.

In summary, the traffic impact assessment described in this report consists of a conservative scenario which does not take in consideration the above factors.

The overall conclusions with regard to traffic generation and impacts on local roads are:

- Without the development that would result from the Planning Proposal:
    - In 2021 the intersections in the vicinity of the subject site will operate satisfactorily at LoS B or better, except Narellan Road / Hartley Road / Waterworth Drive which will operate at LoS F.

- In 2031 the intersections in the vicinity of the subject site will operate satisfactorily at LoS B or better, except Narellan Road / Hartley Road / Waterworth Drive and Narellan Road / Mount Annan Drive / Tramway Drive which will operate at LoS E and LoS F.

- The proposed development will have an insignificant impact to the average delay of the assessed intersections in the vicinity of the development during peak hour periods in opening year 2021 and future horizon year 2031
- It is notable that the poor performance of the Narellan Road intersection is the result of through traffic movements and its performance is not impacted by existing traffic from Currans Hill, nor would its performance deteriorate from the minimal amount of additional movements that would be generated by the development of the subject site as envisaged.
- Consultations with RMS are recommended to confirm if more detailed traffic modelling data for the Narellan Road corridor is available (which could show a different range of traffic volumes and therefore different results for the intersection operation)
- Parking requirements can be satisfied in accordance with the Camden DCP.

The full TIA prepared by Cardno can be found at **Appendix H.**

5.3.3.3 Visual Impact

5.3.3.3.1 Visual Catchment

The visual catchment for the Subject Site is reviewed in terms of a 4 km radius from the site, as views are generally not considered to be discernible at greater distances. This area is demonstrated in the image below:

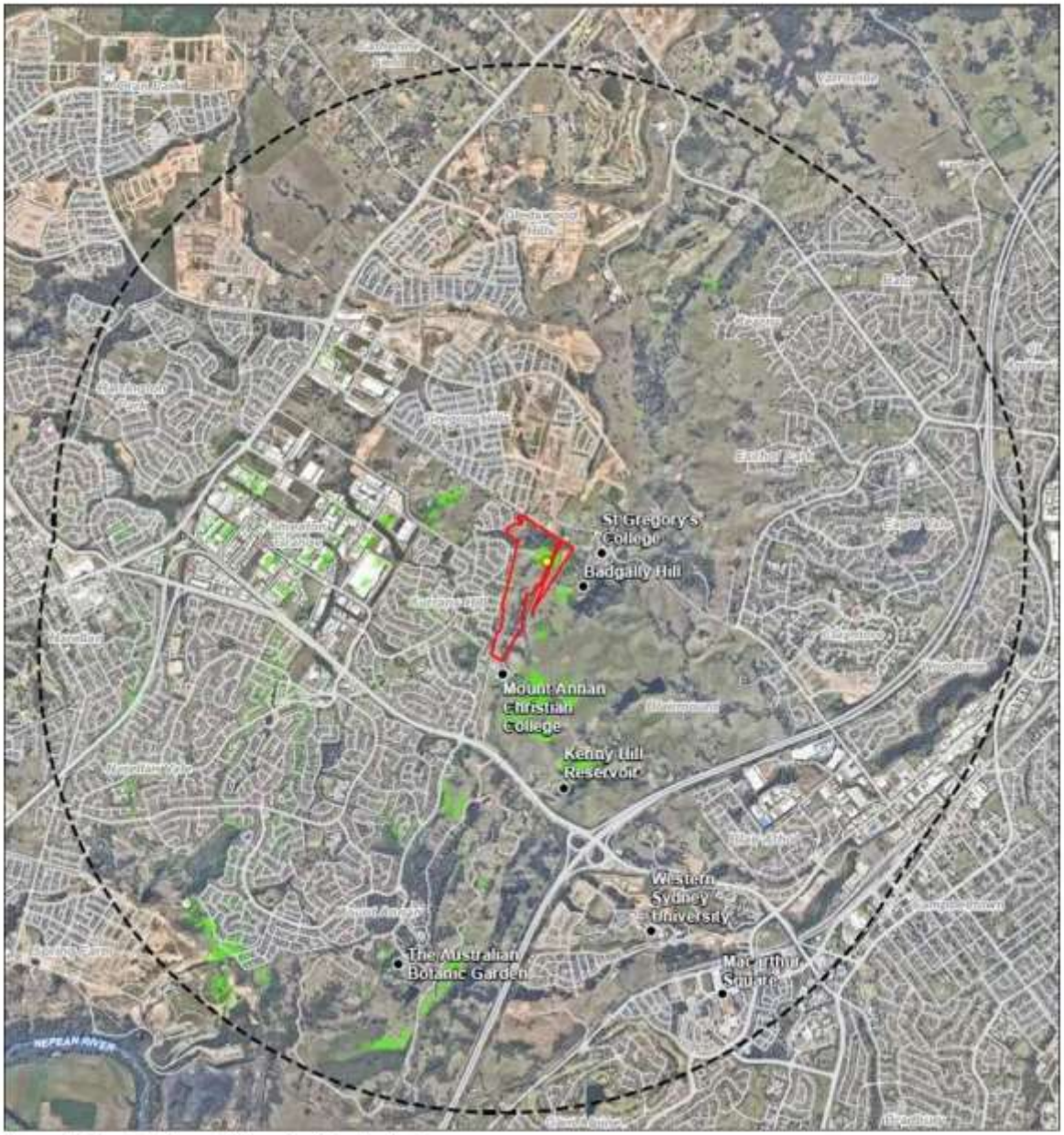


Figure 5-4 Catchment Viewshed Analysis Area
Source: Cardno

The key visual elements within that catchment area include the following:

- To the north of the site, the residential suburb of Gregory Hills, currently under construction. There are no outstanding landscape or visual features in this direction from the site. Gregory Hills will not be visible from the majority of the site.
- To the west, the residential suburb of Currans Hill. Ground levels here range from 105m to 125m, similar to the levels within the site. There are no outstanding topographic or visual features in this direction.
- To the east is Badgally Hill, with a ground level of 195m. Badgally Hill is considered an outstanding topographic feature in the region, being both visible from the site and having visibility of the site from the hill. The hill is an undeveloped natural feature of the landscape. To the far south of the site is Kenny Hill at 160m in extent and in between the two is an unnamed hill located at 150m Between the

hills the area typified by open bushland identified as the Blairmont area, which is traversed by Kenny Creek. Further east is the Hume Highway and Campbelltown City Centre.

- To the south of the site is Mount Annan Christian College, as well as open bushland which meets the Hume Highway. Further south is the Western Sydney University Campbelltown Campus.

5.3.3.3.2 Key Views and Visual Impacts

Photographic analysis and site visits have identified the following key view lines:

Views to the site:

- View line from Saddle Close and the existing residences toward Badgally Hill;
- From Windmill Parade, Currans Hill towards the site, with Badgally Hills in the distance.
- The view from the rear of the existing residences towards the site.

Views from the site:

- Views from the north of the site are largely obscured by topography and dense vegetation.
- To the west, the suburb of Currans Hill is visible, with views of the rear of existing residential dwellings. From the Sydney Water Reservoir at the northern end of the site, it is possible to view rooftops and street trees across Currans Hill and Smeaton Grange.
- Views in a southerly direction from the Hill, which provide visual and scenic amenity over the site towards the "Scenic Hills", Campbelltown Town Centre and Currans Hill.
- East of the site is Badgally Hill, with an elevation of 195 m. It is a natural undeveloped feature of the region. Surrounding Badgally Hill is Blairmont, typified by open pastoral lands. Further east is the Hume Highway and Campbelltown City Centre.

A full Visual Impact Assessment (VIA) has been prepared by Cardno to analyse the visual impact that any proposed development might have on the surrounding area. The full VIA considers that the proposed rezoning within the site is appropriate and will not have a significant adverse effect on views either from or toward the site.

The full VIA is attached to this report at Appendix I.

5.4 State and Commonwealth Interests

5.4.1 Is there adequate public infrastructure for the planning proposal?

The Subject Site is adjacent to a major urban growth area of South West Sydney. A comprehensive assessment on infrastructure needs was undertaken at the Precinct Planning stages of planning for the Turner Road Precinct and public infrastructure needs to accommodate the demands of an increased urban development have been determined.

The PP seeks to allow for the facilitation of general residential development in the region. It will result in a very minor increase in comparison with the total dwelling yield of the adjacent Turner Road Precinct, which is planned to contain approximately 4,400 dwellings.

As such, the proposal will not create any additional needs for public infrastructure for the locality.

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

At this first iteration of this PP, the relevant State and Commonwealth public authorities have not yet been identified, and the Gateway Determination is yet to be issued by the Minister for Planning and Environment.

6 Mapping

The specific amendments to the LEP maps are attached to this report at **Appendix C.** .A summary of the maps to be amended under this proposal are outlined below:

1. **Amendment to the following Camden LEP Zoning Map:**

   Land Zoning Map – Sheet LZN_017

7 Consultation

7.1 Camden Council

The applicant met with Camden Council on the 7th November 2016 to discuss the proposal. The Council staff raised a number of issues that need to be addressed prior to the lodgement of a PP to Council. A copy of the Meeting Minutes is attached at **Appendix J.** The key issues are summarised below.

Table 7-1 Camden Council Pre-Lodgement Meeting 1 Summary

Issues Raised	Response
Visual Impact 1. Manooka Valley has been set aside as an area to provide a physical & visual transition between rural / scenic protection areas and Currans Hill.	A Visual Impact Assessment has been prepared by Cardno detailing the visual impact that may arise as a result of the PP, along with mitigation measures that have been proposed to offset any potential adverse visual impacts that might arise from future development.
Ecological Constraints 2. A significant portion of the site is zoned E2 – Environmental Conservation, which is considered to have "environmental sensitive areas". Camden DCP 2011 reinforces the planning principle for Manooka Valley to set aside a significant area for the restoration and revegetation of the Cumberland Plain Woodland. The PP requires an Ecological Report to assess the significance of the existing vegetation. 3. Liaise with NSW Office of Environment and Heritage (OEH) for their comments on the PP.	An ecological report has been prepared by Biosis as supporting documentation and is appended to this report. The NSW Office of Environment and Heritage advised that they are not interested in consultation regarding the project at this stage of the application process. Further discussions will be held as appropriate.
Traffic 4. Road access to the site is limited. A Traffic Impact Assessment (TIA) is required.	A TIA has been prepared by Cardno and is appended to this report.
Other Development Constraints 5. Additional considerations should be given to areas identified as bushfire prone; 6. Additional considerations should be given to areas within close proximity to the TransGrid electrical easement; 7. Additional considerations should be given to areas within close proximity to the Upper Water Canal.	A Bushfire Protection Assessment has been prepared by Travers Bushfire and Ecology and is appended to this report. The report finds that the bushfire risk posed to the site can be mitigated if appropriate bushfire protection measures, including Asset Protection Zones, are put in place and managed in perpetuity. Subdivision layout and proximity to the TransGrid easement will be further detailed as part of a future application process. Subdivision layout and proximity to the Upper Water Canal will be further detailed as part of a future application process.
District Plans 8. The PP is to address the "Draft SWDP" and its requirements as applicable to Camden LGA.	Section 5.1.1 of this report addresses the Draft SWDP in relation to the PP.

The applicant met with Camden Council on the 31 March 2017 to discuss the proposal in response to a submission of the following documents to Council:

- Visual Impact Assessment (VIA) prepared by Cardno, dated February 2017;
- Flora and Fauna Assessment prepared by Biosis dated 27 February 2017;
- Bushfire Assessment Protection prepared by Travers Bushfire & Ecology dated March 2017; and
- Traffic Impact Assessment prepared by Cardno, dated 27 February 2017.

The Council staff raised a number of issues that need to be included into the final PP lodgement. A copy of the Meeting Minutes is attached at **Appendix J.** The key issues are summarised below.

Table 7-2 Camden Council Pre-Lodgement Meeting 2 Summary

Issues Raised	Response
Visual Impact Council requested that the VIA refer to the Camden (DCP) 2011.	In discussion with Council on the 21 June 2017 it was confirmed that the DCP referenced Manooka Valley Planning Principles only, which are addressed in Section 5.2.4 of this Report. Further the VIA acknowledges the, Plan of Management (PoM) 2003 prepared by Conacher Travers, for the Manooka Valley Release Area Currans Hill. The principles of this document are addressed in the **VIA in Section 3.2.**
Ecological Constraints Council requested that additional consideration be given to offset the loss of the Cumberland Plant Woodland (CPW) via on on-site Biobank and/or Biodiversity Certification agreement.	An ecological report has been prepared by Biosis which directly addresses this point in detail and is enclosed in **Appendix F.** Biosis have reaffirmed that the Flora and Fauna Assessment has adequately addressed the CPW and other threatened biota in accordance with current legislation (EP&A Act, EPBC Act and TSC Act) and that there is no further requirement for offset (via BioBank or Biocertification) under the current legislation. Biosis also informed Council that a NSW Assessment of Significance (to assess the 1.38 hectares of CPW planned for removal) determined that there is not likely to be a significant impact to this community, hence no further action is required. This vegetation removal however, looks to remove the isolated, poor quality patches within the site, whilst retaining through rezoning the highest quality patches within the site, whilst retaining through rezoning the highest quality patches. Biosis also noted that the pending NSW Biodiversity Conservation Act 2016 officially commences August 25 2017 and that beyond that time (for all new lodged proposed development) there will be broader requirements to offset native vegetation likely to be in line with the area of clearing to trigger offset under the NSW Biodiversity Conservation Regulation 2017currently on exhibition. It is likely that the area of clearing is be below the threshold so the offset would not be required.
Traffic Council noted that the signalised intersection of Narellan Road/Mount Annan Drive. Road access to the site is limited. A Traffic Impact Assessment is required.	An amendment to the TIA has been prepared by Cardno and is enclosed in ***Appendix H.*** With regard to the Narellan Intersection it is currently being upgraded to improve the transport infrastructure in the area.

	It is proposed to provide 3 and possibly 4 access points to the site. The access points include Manooka Road, Saddle Close and Farmhouse Place.
Bushfire Protection Assessment Council noted that details of the proposed road widths are not provided. Requirements pertaining to the "Guidelines for Riparian Corridors on Waterfront Land" need to be addressed.	At the PP stage detailed road design is not provided, until the land use via the rezoning process is established. The issue of access to residential lots in close proximity to the Cumberland Woodland Forest has been addressed in the Report, and sufficient distance has been provided, which is enclosed in ***Appendix G. Table E1.*** "*Guidelines for Riparian Corridors on Waterfront Land*" have been included in the Bushfire Report as enclosed in ***Appendix G Table E1.***
Other Planning Issues Council stated that residential development is to be discouraged on steeper sites.	As this is a rezoning proposal detailed design work has not been undertaken until the land use is established. Notwithstanding details are provided of where the site is greater than 1.6 and examples of how steeper sites have been developed within the Western Sydney region. Further any future sites will be developed in accordance with the relevant sections of Camdens DCP. ***Refer to Section 5.2.2 in this Report.***
District Plans 8. The PP is to address the "Draft SWDP" and its requirements as applicable to Camden LGA.	Section 5.1.1 of this report addresses the Draft SWDP in relation to the PP.

7.2 Other Agencies

7.2.1 Rural Fire Service

A meeting was held between Travers Bushfire & Ecology and NSW Rural Fire Service (RFS) on 10 February 2017 to discuss the proposed rezoning of the site. The primary conclusions from the meeting are summarised in the table below. The official minutes from the meeting are attached at **Appendix K.**

Issues Raised	Response
1. Provision of landscaping and maintenance of the electricity transmission easement	The 60 metre wide TransGrid electrical easement currently consists predominantly of grassland vegetation. The grassland easement will not pose a bushfire threat to the PP. Landscaping and management of the easement will be outlined in a Plan of Management to be prepared as part of future development on the site.
2. Access for fire-fighting operations	It was determined that the proposed future access to the site will not meet the acceptable standards. However, RFS have provided agreement that the performance criteria can be met and are therefore generally in support of the proposal.

7.2.2 NSW Office of Environment and Heritage

Cardno attempted to initiate a meeting with OEH, but were told that consultation at this stage of the application process is considered unnecessary. It was recommended that Cardno liaise with OEH once the Gateway Determination has been received.

7.3 Community Consultation

The community will be notified of the commencement of the exhibition period via a notice in a local newspaper and via a notice on Camden Council's website. The notice will:

- Give a brief description of the objectives or intended outcomes of the PP;
- Indicate the land affected by the PP;
- State where and when the PP can be inspected;
- Give the name and address of the RPA for the receipt of any submissions; and
- Indicate the last date for submissions.

During the exhibition period, the following material will be made available for inspection: -

- The PP, in the form approved for community consultation by the Secretary of Planning and Environment;
- The Gateway determination; and
- Any studies relied upon by the PP.

A letter will also be sent to all adjoining land owners.

8 Project Timeline

The timeframe for the completion of the PP will depend on the complexity of the matters, the nature of any additional information that may be required and the need for agency and community consultation. The key milestones are outlined below.

Table 8-1 Project Timeline

Task	Timeline
Commencement date (date of Gateway determination)	
Anticipated timeframe for the completion of required technical information	
Timeframe for government agency consultation (pre and post exhibition as required by Gateway determination)	
Commencement and completion dates for public exhibition period	
Dates for public hearing (if required)	
Timeframe for consideration of submissions	
Timeframe for the consideration of a proposal post exhibition	
Date of submission to the department to finalise the LEP	
Anticipated date RPA will make the plan (if delegated)	
Anticipated date RPA will forward to the department for notification	

9 Conclusion

The Planning Proposal (PP), prepared by Cardno on behalf of Wolin Investments, seeks to amend the land use controls and zoning mapping under the Camden Local Environmental Plan 2010, to be generally consistent with those in the adjoining residential lands which constitute the Turner Road Precinct. The rezoning is predicated on minimum lot size of 450 square metres is proposed, which will result in a built form that is compatible with the adjacent residential development.

The PP indicates consistency of the proposal with all relevant State and Local government planning strategies, policies and controls. It will allow for additional housing in a variety of forms that will go towards the identified local and regional need for housing choice in close proximity to employment opportunities. Additionally, the PP identifies ecologically and visually sensitive lands within the subject site and protects these via appropriate environmental zonings. It has also been illustrated that the subject site can be accessed in an orderly fashion without further impacting on local or regional roads.

An amendment to the Camden LEP Maps is the most appropriate method to affect the intended outcome of this proposal. In addition, the proposal will have a positive community benefit outcomes and is supported by Section 117 Directions and State Environmental Planning Policies.

Accordingly, progression of the proposal to public exhibition is sought.

ORD05

Attachment 2

Manooka Valley Stage 3, Lot 627 DP 1163903

APPENDIX

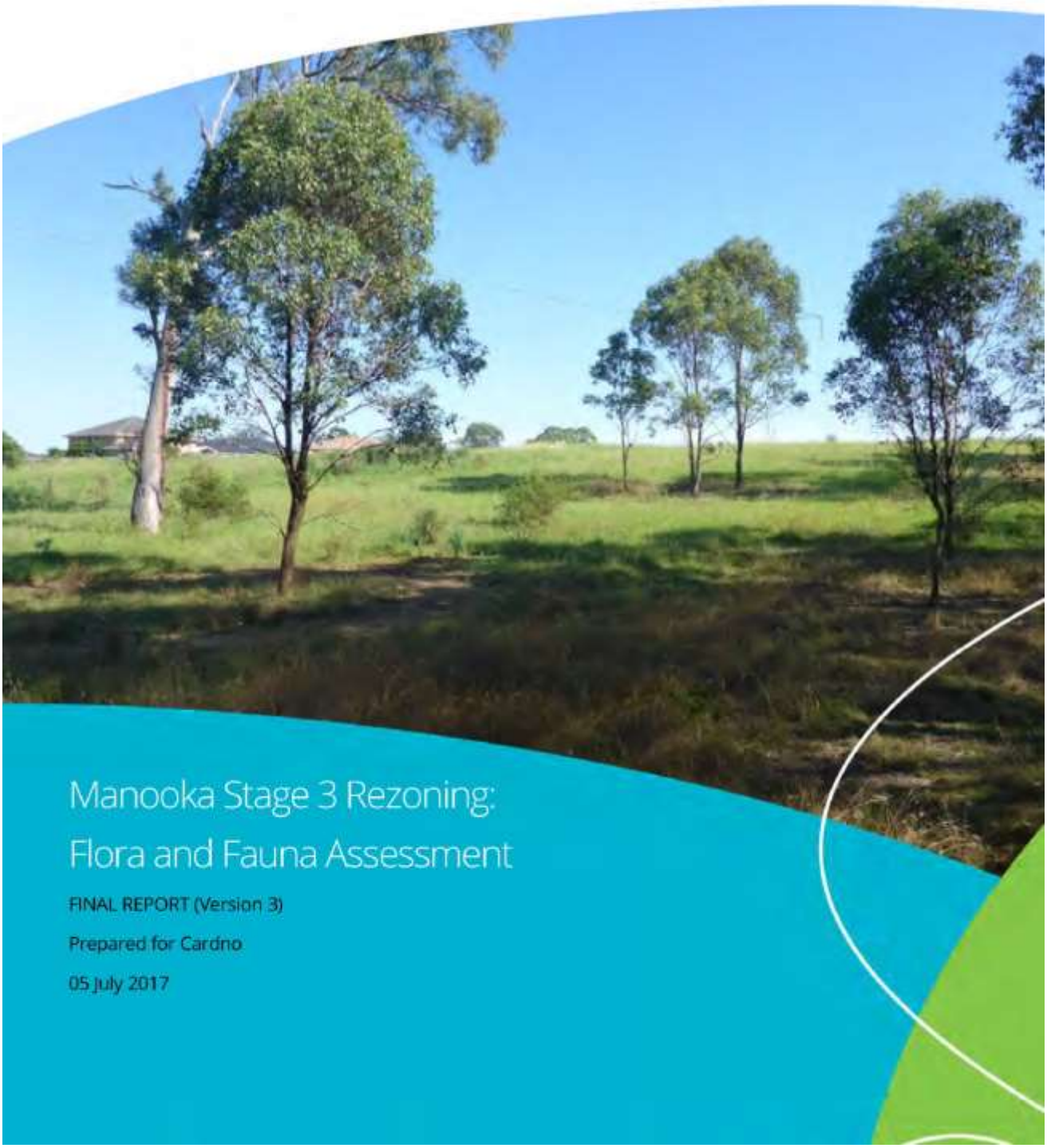
F

FLORA AND FAUNA ASSESSMENT

Cardno
Shaping the Future

ORD05

Attachment 2



Manooka Stage 3 Rezoning: Flora and Fauna Assessment

FINAL REPORT (Version 3)

Prepared for Cardno

05 July 2017

Biosis offices

AUSTRALIAN CAPITAL TERRITORY

Canberra
Floor 1, Unit 3, 38 Essington Street
Mitchell ACT 2911

Phone: (02) 6102 1200
Email: canberra@biosis.com.au

NEW SOUTH WALES

Newcastle
39 Platt Street
Waratah NSW 2298

Phone: (02) 4911 4040
Email: newcastle@biosis.com.au

Sydney
Unit 14 17-27 Power Avenue
Alexandria NSW 2015

Phone: (02) 9101 8700
Email: sydney@biosis.com.au

Wollongong
8 Tate Street
Wollongong NSW 2500

Phone: (02) 4201 1090
Email: wollongong@biosis.com.au

QUEENSLAND

Brisbane
Suite 4 First Floor, 72 Wickham Street
Fortitude Valley QLD 4006

Phone: (07) 3014 1110
Email: brisbane@biosis.com.au

VICTORIA

Ballarat
506 Macarthur Street
Ballarat VIC 3350

Phone: (03) 5304 4250
Email: ballarat@biosis.com.au

Melbourne (Head Office)
38 Bertie Street
Port Melbourne VIC 3207

Phone: (03) 8686 4800
Fax: (03) 9646 9242
Email: melbourne@biosis.com.au

Wangaratta
16 Templeton Street
Wangaratta VIC 3677

Phone: (03) 5718 6500
Email: wangaratta@biosis.com.au

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Prepared by:	Nicola Trulock
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- Cardno: Kevin Roberts, Cassie Lowry and Tracy Davey.
- Department of Primary Industries for access to the Protected and Threatened Species Viewer.
- NSW Office of Environment and Heritage for access to the BioNet Atlas of NSW Wildlife.
- NSW Department of Primary Industries for access to the Weedwise Declared Weeds Database – records viewer.
- BirdLife Australia for access to the New Atlas of Australian Birds 1998-2013.

Biosis staff members involved in this project were: Ed Cooper (field assessment), Nicola Trulock (field assessment, report writing), Chantel Benbow (background research, report writing) and Lauren Harley (mapping).

Contents

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biosis.

Glossary

AoS	Assessment of Significance
BBAM	BioBanking Assessment Methodology
BCAM	Biodiversity Certification Assessment Methodology
CBD	Central Business District
CEEC	Critically Endangered Ecological Community
CMA	Catchment Management Area
DBH	Diameter at Breast Height
DoE	Department of Environment
DP&E	NSW Department of Planning and Environment
DPI	Department of Primary Industries
EEC	Endangered Ecological Community
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
FM Act	*Fisheries Management Act 1994*
GIS	Geographic Information System
KTP	Key Threatening Process
LEP	Local Environment Plan
LGA	Local Government Area
locality	The broader area (within 5 kilometres) of Currans Hill in which the study area is located
NES	National Environmental Significance
NSW	New South Wales
NV Act	*Native Vegetation Act 2003*
NW Act	*Noxious Weed Act 1993*
OEH	Office of Environment and Heritage
PVP	Property Vegetation Plan
RoTAP	Rare or Threatened Australian Plant
SEPP	State Environmental Planning Policy
SIC	Significant Impact Criteria

SIS	Species Impact Statement
SIX	Spatial Information eXchange
SSDP	Sensitive Species Data Policy
study area	The area of impact for the proposed works
TSC Act	*Threatened Species Conservation Act 1995*
VIS	Vegetation Information System

Summary

Biosis Pty Ltd was commissioned by Cardno to undertake a terrestrial flora and fauna assessment of the proposed Manooka Stage 3 rezoning located on Manooka Road, Currans Hill, NSW (the Project).

Cardno are in the process of preparing a rezoning application for the subdivision of an approximately 34.37 hectare parcel of land comprising lot 627 DP 1163903, Currans Hill (the study area), for the purposes of permitting future residential development. The study area is currently zoned *E2 – Environmental Conservation, E4 – Environmental Living* and *RU2 – Rural Landscape* in the Camden Local Environment Plan (Camden LEP 2010). Three rezoning options have been created by Cardno, each seeking to introduce different sized areas zoned as *R1 – General Residential* and *SP2 - Infrastructure* (Appendix 1). Cardno wish to better understand the legislative implications of the ecological constraints identified within the study area in order to advance with their current planning proposal application. Identified constraints will be used to guide detailed design, with an emphasis on avoiding impacts where feasible.

The study area is situated in Currans Hill, approximately 45 kilometres south west of the Sydney central business district (CBD). The study area consists predominantly of agricultural land which has undergone historical vegetation clearance and is currently stocked with cattle. Previous ecological assessments completed by Lesryk Environmental Consultants (2001 and 2015a) on this property have identified various ecological constraints, including *Cumberland Plain Shale Woodlands and Shale – Gravel Transition Forest*, a Critically Endangered Ecological Community (CEEC) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the NSW *Threatened Species Conservation Act 1995* (TSC Act).

A BioBanking assessment was subsequently undertaken by Lesryk Environmental Consulting in July 2015 (Lesryk Environmental Consulting 2015b). The assessment concluded that the study area would not meet the requirements of BioBanking as the 21.14 hectares of Cumberland Plain Woodland recorded in the study area during their BioBanking assessment was of moderate to good condition and is equal to or greater than four hectares in patch size.

The initial field assessment of the Manooka Stage 3 Development Site was undertaken on 1 December 2015 by Ed Cooper (Consultant Ecologist) and Nicola Trulock (Botanist) of Biosis. The initial field assessment determined that the study area contains 12.45 hectares of native vegetation of which 2.89 hectares was within areas to be rezoned as R1 – General residential and the remaining 9.56 hectares of native vegetation was to be zoned under, E2 – Environmental Conservation. Furthermore, the field assessment determined that one listed CEEC and one Endangered Ecological Community (EEC) exist within the study area:

- PCT: 850 BVT:HN529 *Cumberland Plain Woodlands on shale of the southern Cumberland Plain, Sydney Basin Bioregion* (synonymous with *Cumberland Plain Shale Woodlands and Shale - Gravel Transition Forest* (Critically Endangered, EPBC Act and TSC Act).
- PCT: 835 BVT: HN526 *River-flat Eucalypt Forest on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion* (synonymous with *River - Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* (Endangered, TSC Act).

Cumberland Plain Woodlands on shale of the southern Cumberland Plain, Sydney Basin Bioregion (here after referred to as Cumberland Plain Woodland) and *River-flat Eucalypt Forest on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion* (henceforth referred to as River-flat Eucalypt Forest) are over cleared landscapes having been cleared of 90% and 95% respectively of their original distribution within the Hawkesbury - Nepean Catchment Management Area (CMA) (OEH 2015b).

No threatened species listed under the EPBC or TSC Act were detected during the field assessment however it was determined that the Cumberland Plain Land Snail *Meridolum corneovirens* and Spiked Rice-flower *Pimelea spicata* have a moderate likelihood of occurrence within the study area.

A subsequent field assessment was conducted on 10 December 2016 by Nicola Trulock. This field assessment aimed to define the rezoning boundaries, relative to vegetation and extent of vegetation clearance undertaken under previous Development Application (DA) No. 597/2014 approved on 27 February 2015. Furthermore, the assessment aimed to map the area covered by the recent construction of Sydney Water Drinking Water Infrastructure. The resulting data has been used to refine the draft maps and update land use zone and vegetation community area values within this report. This secondary field assessment determined that under the revised rezoning plans and excluding the DA approved area (5.74 hectares), 12.08 hectares of the remaining study area is proposed to be rezoned as R1 – General residential, 16.10 hectares to be zoned under E2 – Environmental Conservation and 0.49 hectares is proposed to be zoned SP2 Infrastructure.

Ecological values

Key ecological values identified within the study area according to data derived from the field assessment of 10 December 2016 include:

- 10.94 hectares of native vegetation including:
  - 10.04 hectares of Cumberland Plain Woodland split into the following categories:
    - 8.85 hectares of Cumberland Plain Woodland (meeting EPBC Act criteria).
    - 0.76 hectares of Cumberland Plain Woodland - Derived Shrubland (meeting TSC Act criteria).
    - 0.43 hectares of Cumberland Plain Woodland - Derived Grassland (meeting TSC Act criteria).
  - 0.85 hectares of the TSC Act listed Endangered Ecological Community (EEC), River-flat Eucalypt Forest.
  - 0.04 hectares of Native Sedgeland.
- Three hollow-bearing trees.
- 10.04 hectares of potential living, breeding and dispersal habitat for Cumberland Plain Land Snail *Meridolum corneovirens* (Endangered, TSC Act).
- 8.85 hectares of potential habitat for Spiked Rice-flower *Pimelea spicata* (Endangered, EPBC Act and TSC Act).
- A population of Pink Bindweed *Convolvulus erubescens*, a Rare or Threatened Australian Plant (RoTAP) species.
- Two ephemeral creeks, one unnamed creek in the north-east and the other, Kenny Creek to the southwest of the study area. A small dam is located in the north-west corner of the study area.
- Contribution to local habitat connectivity via patches of native vegetation in neighbouring properties and regional connectivity via Kenny Creek which connects to the Camden, Campbelltown, Liverpool, Penrith and Blue Mountains Local Government Areas (LGA) via the Narellan and Hawkesbury Nepean River riparian corridors.

Government legislation and policy

An assessment of the Project against key biodiversity legislation and policy is provided and summarised in Table 1 below.

Table 1 Legislation relevant to the Manooka Stage 3 terrestrial flora and fauna assessment

Legislation / Policy	Relevant ecological feature on site	Permit / Approval required
Environment Protection and Biodiversity Conservation Act 1999	One CEEC, Cumberland Plain Woodland, occurs within the study area. The study area contains 8.85 hectares of potential habitat for the threatened Spiked Rice-flower *Pimelea spicata* (0.89 hectares to be removed).	Significant Impact Criteria assessments have been undertaken for the CEEC, Cumberland Plain Woodland, as well as the threatened flora species, Spiked Rice-flower (Appendix 5).
Threatened Species Conservation Act 1995	Two TECs, Cumberland Plain Woodland and River-flat Eucalypt Forest occur within the study area. The study area contains 10.04 hectares of potential habitat for the threatened species, Cumberland Plain Land Snail (1.38 to be removed). The study area contains 8.85 hectares of potential habitat for the threatened species Spiked Rice-flower (0.89 hectares to be removed).	Assessments of Significant under Section 5A of the EP&A Act for the: • Cumberland Plain Shale Hills Woodland • River-flat Eucalypt Forest • Cumberland Plain Land Snail • Spiked Rice-flower Refer to Table 3 for rationale. The AoS are provided in Appendix 4.
Environmental Planning & Assessment Act 1979	Two threatened ecological communities, Cumberland Plain Woodland and River-flat Eucalypt Forest occur within the study area. The study area contains 10.04 hectares of habitat for the threatened species, Cumberland Plain Land Snail (1.38 to be removed). The study area contains 8.85 hectares of habitat for the threatened species, Spiked Rice-flower (0.89 hectares to be removed).	Assessments of Significance under Section 5A of the EP&A Act for the: • Cumberland Plain Shale Hills Woodland • River-flat Eucalypt Forest • Cumberland Plain Land Snail • Spiked Rice-flower Impacts to the threatened species and communities present or likely to occur within the study area must be assessed through undertaking an Assessment of Significance. These are provided in Appendix 4.
State Environmental Planning Policy	SEPP19 applies to the Project as the	As with all other SEPPs, it is legally

Legislation / Policy	Relevant ecological feature on site	Permit / Approval required
No 19: Bushland in Urban Areas	study area is located within the Camden Council LGA which is listed in Schedule 1 – Areas and part areas to which the Policy applies. The study area also contains native vegetation which is similar to the original vegetation community, fitting the definition of bushland provided in Clause 4.1 of the Act.	enforceable.
Native Vegetation Act 2003	The Project does not fall under the aegis of the *Native Vegetation Act 2003* as Camden LGA is listed within Schedule 1 – land excluded from operation of the Act.	No permits or approvals are required.
Noxious Weeds Act 1993	The following 10 NSW Department of Primary Industry (DPI) listed noxious weeds for the Camden LGA are present within the study area: • African Boxthorn • Blackberry • Chilean Needle Grass • Fireweed • Lantana • Mexican Poppy • Moth Vine • Small-leaved Privet • St. Johns Wort • Sweet Briar	All of these noxious weeds are listed as Class 4 with the exception of Mexican Poppy which is a Class 5 weed. Class 4 refers to Locally Controlled Weeds, meaning that: *"The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction and the plant must not be sold, propagated or knowingly distributed".* Class 5 weeds are Restricted Plants, meaning that: *"The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with".* Land owners within the study area have an obligation under the *Noxious Weeds Act 1993* to control all noxious weeds on their land according to the specified control class.

Recommendations

The principal means to reduce impacts on ecological values within the study area will be to minimise removal of native vegetation and habitat. Through applying a rezoning proposal created by Biosis in collaboration with Cardno, ecological constraints can be protected through reducing the removal of the ecological communities Cumberland Plain Woodland and River-flat Eucalypt Forest. The revised rezoning proposal would however require the removal of 1.38 hectares of isolated patches and edge areas of disturbed Cumberland Plain Woodland (meeting TSC Act listing criteria) of which 0.89 hectares meets the EPBC Act listing criteria. In

addition, the area proposed for rezoning under SP2 – Infrastructure has already resulted in removal of 0.45 hectares of Exotic Grassland resulting from the construction of Sydney Water Drinking Water Infrastructure. Whilst Cardno are seeking an SP2 – Infrastructure zone for the Sydney Water Drinking Water Infrastructure, the vegetation (both cleared and extant) within this zone does not form part of this assessment. This will result in the reduction of 0.94 hectares of potential habitat for the Spiked Rice Flower and reduction of 1.38 hectares of potential habitat for the Cumberland Plain Land Snail. The revised rezoning proposal will also entail the removal of one hollow-bearing tree, a Key Threatening Process listed under the EPBC Act.

The revised rezoning proposal seeks to mitigate these losses via the retention of 7.95 hectares of Cumberland Plain Woodland (EPB0.60C), 0.59 hectares of Cumberland Plain Woodland - Derived Shrubland, 0.11 hectares of Cumberland Plain Woodland – Derived Grassland, 0.85 hectares of River-flat Eucalypt Forest and 0.04 hectares of Native Sedgeland under the E2 – Environmental Conservation zone category. In doing this, Cardno have ensured the revised rezoning proposal does not directly impact on River-flat Eucalypt Forest or the two hollow-bearing trees which exist in the northern section of the study area.

Projected impacts (comprising the removal of 0.89 hectares of Cumberland Plain Woodland (EPBC Act)) under the revised rezoning proposal are less than 1 hectare, therefore not likely to require further assessment under the EPBC Act. Furthermore, potential indirect impacts resulting from the establishment and maintenance of APZs are not likely to result in significant impacts to these EECs. Therefore, based on the findings of this terrestrial flora and fauna assessment, as well as the NSW Assessment of Significance (Appendix 4) and Significant Impact Criteria assessment (Appendix 5) no further assessment under the EPBC Act or TSC Act is required.

If the revised rezoning proposal is not amenable to Key stakeholders and/or governing authorities, Federal, State or Local Government, then Biosis recommends proceeding with Biodiversity Certification as the optimal alternative approval pathway which through recertification of the lands, would allow for long term positive environmental outcomes for the retention of biodiversity including threatened species, populations and ecological communities within the study area. Biodiversity Certification when applied to a proposed development in the design stage, can allow impacts to ecological values from development to be offset through the application of conservation measures in areas which have been identified for biodiversity protection (OEH, 2016). Biodiversity Certification does require a fair amount of time to prepare, consult, approve and implement which is mitigated somewhat by removing the need for other approval mechanisms such as a an application for a Section 91 licence and accompanying Species Impact Statement (SIS) if the Biodiversity Certification is approved.

Other alternative pathways include a Section 91 licence with accompanying SIS which will provide dispensation for the rezoning with conditional approval but will not ensure the same long term positive environmental outcomes as Biodiversity Certification. The last option would be to design a rezoning proposal which avoids all impacts to patches of Cumberland Plain Woodland which will negate the need for negotiating the approval pathways mentioned above.

Additional recommendations endorsed by Biosis which aim to minimise impacts highlighted in section 5.1 can be found in the Conclusions section of this report.

1 Introduction

1.1 Project background

Cardno are in the process of preparing a rezoning application for the subdivision of an approximately 34.37 hectare parcel of land comprising lot 627 DP 1163903, Currans Hill (the study area), for the purposes of permitting future residential development of Manooka Stage 3 located on Manooka Road, Currans Hill, NSW (the Project). The land upon which the Manooka Stage 3 development is proposed to take place is currently zoned *E2 – Environmental Conservation*, *E4 – Environmental Living* and *RU2 – Rural Landscape* in the Camden Local Environment Plan (Camden LEP 2010).

Previous ecological assessments completed by Lesryk Environmental Consultants (2001 and 2015a) on this property have identified various ecological constraints, including *Cumberland Plain Shale Woodlands and Shale – Gravel Transition Forest*, a CEEC listed under the EPBC Act and the NSW TSC Act. Further to this assessment a BioBanking Assessment of the proposed rezoning application was undertaken in July 2015 by Lesryk Environmental Consulting (Lesryk Environmental Consulting, 2015b). The report concluded that the study area would not meet the requirements of BioBanking as the vegetation communities located within the site were of moderate to good condition and equal to or greater than 4 hectares in patch size, therefore meaning that BioBanking as an offset mechanism is not permissible (OEH 2014a).

As a result, Cardno wish to explore alternative development approval pathways which allow the proposed Manooka Stage 3 development to go ahead without significantly impacting on the threatened ecological communities and ecological constraints present in the study area. Prior to ecological investigation, three rezoning options have been proposed, seeking to introduce different sized areas zoned as *R1 – General Residential* and *SP2 - Infrastructure* (Appendix 1). Following initial plans, Cardno sought to better understand the legislative implications of the ecological constraints identified within the study area in order to advance with their current planning proposal application. Therefore, a further flora and fauna assessment of the proposed Manooka Stage 3 development site has been undertaken (the subject of this report) to determine the ecological features of the study area, to identify biodiversity constraints and determine the best rezoning layout so to avoid ecological impacts. Identified constraints have been used to guide detailed design, with an emphasis on avoiding impacts where feasible through the development of a proposed rezoning option. This report does not include the area of land which is subject to Development Application DA 597/2014 and has received approval from Camden Council on 27 February 2015.

1.2 Scope of assessment

The objectives of this terrestrial flora and fauna assessment are to:

- Describe the vascular flora and vertebrate fauna present in the study area.
- Map ecological values and constraints (e.g. threatened flora presence, large infestations of noxious weeds, hollow-bearing trees, rock outcrops etc.).
- Determine vegetation condition under the BioBanking Assessment Methodology (BBAM).
- Review the implications of relevant biodiversity legislation and policy.
- Identify potential implications of the proposed development and provide recommendations to assist with development design.

- Provide recommendations for the Project, including justification for further assessment (if required) and mitigation measures (if any) required for the works to proceed, developed in accordance with best practice and the Project requirements.
- Undertake NSW Assessment of Significance (AoS) or Commonwealth Significant Impact Criteria (SIC) assessments for threatened biota likely to be present or potentially impacted by works.
- Provide advice regarding viable alternative approval pathways.

1.3 Location of the study area

The study area is located in Currans Hill approximately 45 kilometres south west of the Sydney CBD (Figure 1). The study area comprises a 34.37 hectare parcel of private land known as Lot 627 DP1163903 and the adjacent road reserve associated with Saddle Close and the proposed road, Caulfield Close. The land comprising the study area is currently zoned *E2 – Environmental Conservation*, *E4 – Environmental Living* and *RU2 – Rural Landscape* under the Camden Local Environment Plan (Camden LEP 2010).

The study area is within the:

- Sydney Basin Bioregion.
- Hawkesbury-Nepean River Basin (Hawkesbury-Nepean Catchment).
- Greater Sydney Local Land Services.
- Camden Council LGA.

The study area presents with a south-west facing aspect and is relatively flat throughout the southern half becoming mildly undulating as the land rises in elevation towards the north. The study area consists predominantly of agricultural land which has undergone historical vegetation clearance and is currently stocked with cattle. Vegetation within the study area includes 10.94 hectares of native vegetation, 17.54 hectares of pasture dominated by exotic grasses and 0.15 hectares of cleared vegetation. A TransGrid powerline easement runs in a north – south direction just inside the western perimeter of the study area (Figure 1).

There are no significant natural water bodies within or in close proximity to the study area. The Sydney Water Supply Channel bisects the study area, running in a north-south direction until it reaches Badgally tunnel which diverts the channel flow beneath the study area. One ephemeral drainage channel traverses the site, situated in a slight gully between two low hills in the northern end of the study area and Kenny Creek traverses the southern section of the study area. The northern channel was observed to be completely dry at the time of the survey whereas Kenny Creek was observed to be filled with still water. The northern channel enters the study area from the adjoining property along the north-east perimeter and runs for approximately 300 metres before dissipating. Kenny Creek enters the study area from the south - east, runs for 146 metres in an east/west direction before exiting along the south-west perimeter where it drains into a modified channel which runs the length of the Currans Hill development until merging with Narellan Creek.

No National Parks or reserves exist within or in close proximity to the study area, the closest being Bents Basin State Conservation Area and Gulguer Nature Reserve approximately 18 kilometres to the north-east. Broughton Reserve, managed by Camden Council, abuts the south-west perimeter of the study area. Other Council Reserves containing native vegetation existing in close proximity to the study area include Elizabeth Throsby Reserve, Charles Throsby Reserve, Downes Reserve, George Caley Reserve and William Howe Reserve. Mount Annan Botanic Gardens is located approximately 950 metres to the south.

Soils throughout the majority of the study area comprise of the *Blacktown residual soil landscape* (Bannerman and Hazelton 1990) which intergrades with the *Luddenham erosional soil landscape* towards the north-east limits of the study area. The Blacktown residual soil landscape occurs extensively throughout the Cumberland lowlands on gently undulating rises and broad rounded crests and ridges with gently inclined slopes. The Blacktown residual soil landscape is influenced by the underlying geology of Wianamatta Group shales giving rise to shallow or moderately deep hardsetting soils ranging from red and brown clay loams on crests to grey - yellow plastic clays on lower slopes and drainage lines. Blacktown residual soils present with low soil fertility, poor drainage and are fairly resistant to erosion, experiencing mild sheet or gully erosion when surface vegetation is absent. The Luddenham erosional soil landscape occurs towards the south and west of the Cumberland lowlands on undulating to rolling low hills, narrow ridges, hillcrests and valleys. The Luddenham erosional soil landscape is influenced by the underlying geology of Wianamatta Group shales in association with Minchinbury Sandstone giving rise to shallow brown or red clay loams on crests, moderately deep red strongly pedal clays on upper slopes and moderately deep yellow plastic clays on lower slopes and drainage lines. Luddenham erosional soils present a high risk of erosion, displaying minor gully erosion on unpaved roads, moderate sheet erosion in disturbed areas and severe sheet erosion in heavily grazed paddocks.

ORD05

Attachment 2

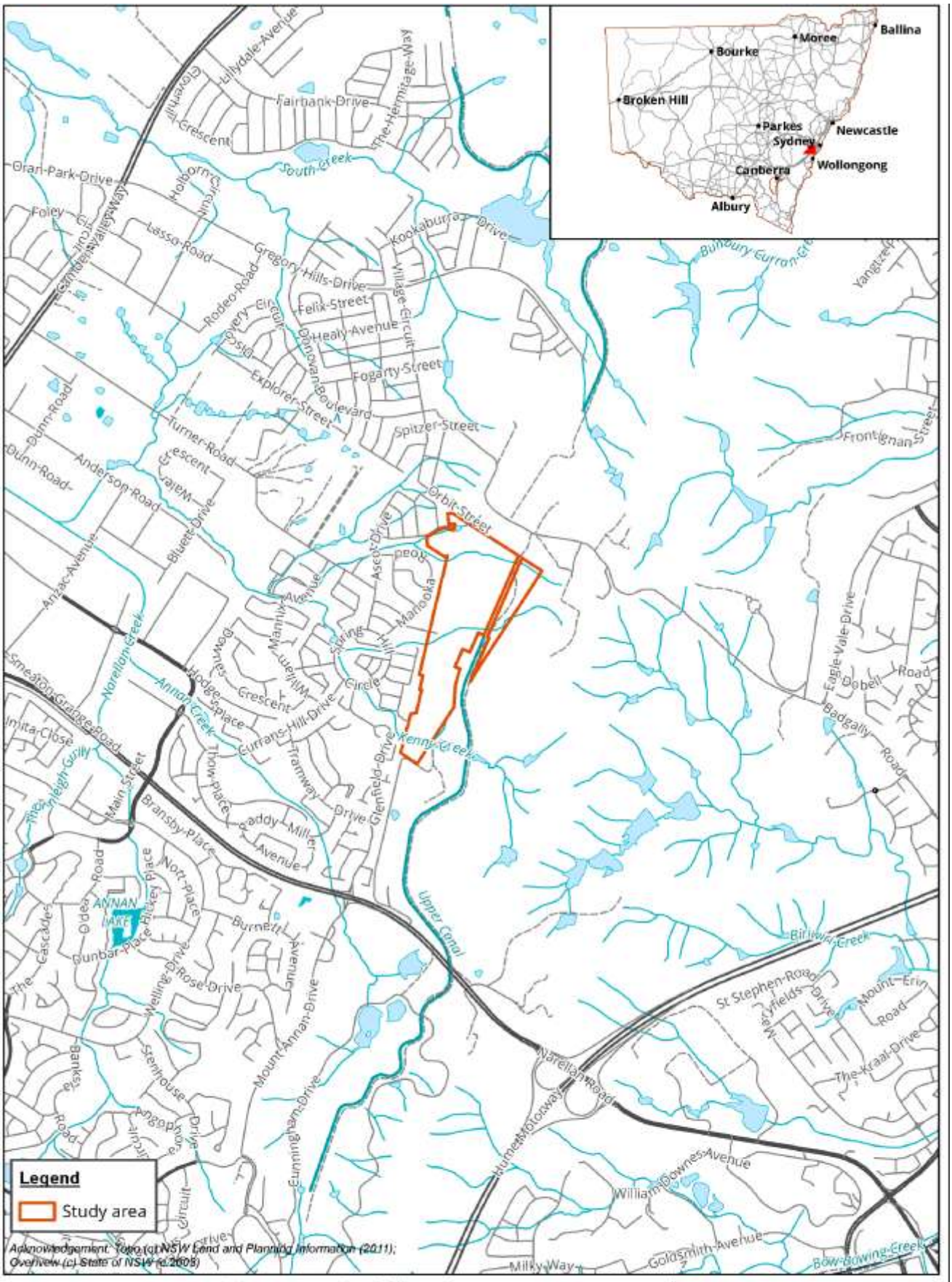

Figure 1: Location of the study area

biosis

Biosis Pty Ltd
Ballarat, Brisbane, Canberra, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Matter: 21307]
Date: 27 February 2017,
Checked by: NRT, Drawn by: LH, Last edited by: lharley
Location:P:\21300s\21307\Mapping\

2 Methods

2.1 Literature and database review

In order to provide a context for the study area, information about flora and fauna from within 5 kilometres (the 'locality') was obtained from relevant public databases. Records from the following databases were collated and reviewed:

- Department of Primary Industries (DPI) Threatened and Protected Species Viewer for matters protected by the EPBC Act.
- Office of Environment and Heritage (OEH) BioNet Atlas of NSW Wildlife for TSC Act listed threatened biota (OEH 2015a).
- PlantNET (RBGDT 2015) for Rare or Threatened Australian Plants (RoTAP).

Other sources of biodiversity information:

- Relevant vegetation mapping from OEH Vegetation Information System (VIS) Mapping through the Spatial Information eXchange (SIX) Vegetation Map Viewer, including:
  - *The Native Vegetation of the Cumberland Plain, western Sydney: systematic classification and field identification of communities* (Tozer 2003).
- NSW Scientific Committee final determinations for threatened biodiversity.

The following reports were also reviewed:

- *Flora and fauna impact assessment Manooka Valley Stage 3 residential subdivision* (Lesryk Environmental Consultants 2015a).
- *BioBanking Assessment Manooka Valley Stage 3 residential subdivision* (Lesryk Environmental Consultants 2015b).
- *Plan of Management for Environmental Protection Zones within Manooka Valley Release Area Currans Hill* (Conacher Travers 2003).
- *Bushfire Protection Assessment: Rezoning Application, Stage 3 – Manooka Valley* (Conacher Travers 2016).
- *Cumberland Plain Recovery Plan* (DECCW 2010).
- *Pimelea spicata R. Br. Recovery Plan*, (DEC 2005).

2.2 Site investigation

2.2.1 Flora assessment

The flora assessment was undertaken on 1 December 2015 by Ed Cooper (Consultant Ecologist) and Nicola Trulock (Botanist) of Biosis. Vegetation within the study area was surveyed using a combination of the random meander technique (Cropper 1993) and the BioBanking Assessment Methodology (BBAM) (OEH 2014a) over sixteen person hours. Specific objectives of the flora assessment were to assess the ecological values of the study area, determine the vegetation types present, detect the presence of threatened species and determine the nature and extent of impacts associated with the Project.

A subsequent field assessment was conducted on 10 December 2016 by Nicola Trulock over five person hours to define the extent of vegetation clearance undertaken under Development Application (DA) No. 597/2014 approved on 27 February 2015. The assessment also mapped the area covered by the recent construction of Sydney Water Drinking Water Infrastructure which is proposed for the SP2 – Infrastructure land use zone albeit the extant vegetation within this zone is not the subject of this assessment. The resulting data has been used to refine the draft maps and land use zone and/or vegetation community area values within this report.

General classification of native vegetation in NSW used in this report is based on the classification system in Keith (2004) which uses three groupings of vegetation: vegetation formation, vegetation class and vegetation type, with vegetation type the finest grouping. The grouping referred to in this report is vegetation type. Vegetation community definition used for this report is based on the classification system in Tozer (2003) which categorises vegetation into communities based on species composition and presence of indicative species, soil and geological characteristics, climate and landscape position. The finest scale classification system used in this report is the NSW Plant Community Type (PCT) which was developed in 2011 as a standardised system for use in vegetation mapping programs, decisions under the BioMetric system and for planning programs. The PCT system is based on two pre-existing classification systems, both at the scale of the vegetation community being:

- The NSW Vegetation Classification and Assessment database (Benson 2006 & 2008; Benson et al. 2006 & 2010).
- The BioMetric Vegetation Types database used in NSW regulatory processes including property vegetation planning and BioBanking.

A list of flora species was compiled for each vegetation type. Records of threatened flora species will be submitted to OEH for incorporation into the BioNet Wildlife Atlas.

The general condition of native vegetation was observed as well as the effects of current seasonal conditions. Notes were made on specific issues such as noxious weed infestations, evidence of management works, current grazing impacts and the regeneration capacity of the vegetation. The location of all hollow-bearing trees detected in the study area were recorded using a handheld GPS and attributes such as species, DBH, habitat value and health recorded in field data sheets.

2.2.2 Fauna assessment

The fauna assessment was undertaken on 1 December 2015 by Ed Cooper (Consultant Ecologist) and Nicola Trulock (Botanist) of Biosis over sixteen person hours. The fauna assessment aimed to determine the presence of fauna through direct and indirect observation as well as identification of habitat and resource availability. Fauna presence was determined primarily on the basis of the types and qualities of habitat(s) present. All species of fauna observed during the assessment were noted and limited active searching for fauna was undertaken. This included direct observation, searching under rocks, logs, inter-tussock spaces and around the bases of trees, examination of tracks and scats and identifying calls. Particular attention was given to searching for threatened biota and their habitats in particular the Cumberland Plain Land Snail *Meridolum corneovirens*. Fauna species were recorded with a view to characterising the values of the study area and the investigation was not intended to provide a comprehensive survey of all fauna that has potential to utilise the site over time.

Fauna records will be submitted to OEH for incorporation into the NSW BioNet Wildlife Atlas.

2.2.3 Permits and Licences

The terrestrial flora and fauna assessment was conducted under the terms of Biosis' Scientific Licence issued by the Office of Environment and Heritage under the *National Parks and Wildlife Act 1974* (SL100758, expiry

date 31 March 2017). Fauna survey was conducted under approval 11/355 from the NSW Animal Care and Ethics Committee (expiry date 31 January 2016).

2.3 Limitations

Ecological surveys provide a sampling of terrestrial flora and fauna at a given time and season. There are a number of reasons why not all species will be detected at a site during survey, such as species dormancy, seasonal conditions and migration and breeding behaviours of some fauna. In many cases these factors do not present a significant limitation to assessing the overall ecological values of a site.

The current terrestrial flora and fauna assessment was conducted at the start of summer, which is an optimal time for survey as the majority of flora species are in flower and readily identifiable and herpetofauna, avifauna and vertebrate mammals are not in torpor and are more likely to be active. The flora and fauna assessment site visit was conducted on a warm day inclement weather at a time when resident species are more likely to be active. The initial survey effort of sixteen hours expended on the study area combined with five hours of additional survey in December 2016 is determined to be more than adequate to determine the presence of flora and fauna species including the majority of threatened species with the exception of the Cumberland Plain Land Snail, non-calling amphibian species and microbat species. These species require a targeted survey using specialised techniques at specific times of day or specific seasons and are outside the scope of this assessment.

Database searches, and associated conclusions on the likelihood of species to occur within the study area and associated locality, are reliant upon external data sources and information managed by third parties.

Sydney Water Supply Channel bisects the study area and Kenny Creek crosses the southern end of the site, in an east/west direction. A second drainage channel exists at the bottom of a shallow gully located between undulating hills to the northern end of the study area, this one ephemeral. A thorough survey for aquatic fauna was not conducted on these channels as assessment of the aquatic ecological values was beyond the scope of this assessment. A search of the DPI Viewer determined that there were no records of threatened fish species, populations or ecosystems within the Camden LGA. The implications of relevant biodiversity legislation (e.g. EPBC / FM Act) cannot be fully assessed without an assessment of aquatic habitat and fauna. However, mitigation measures have been recommended that would be applicable to the prevention of impacts to this waterway and its associated ecological values.

Database searches and associated conclusions on the likelihood of species to occur within the study area are reliant upon external data sources and information managed by third parties.

2.4 Mapping

Aerial photography and the following site plans were supplied by Cardno:

- Development Constraints Manooka Valley (YN294099-GS-001-Constraints.mxd 03_25 September 2015) (Appendix 1).
- Proposed Zoning Manooka Valley (22 February 2017) (Appendix 1).
- Current Zoning Manooka Valley (22 February 2017) (Appendix 1).
- Proposed Zoning Option 1 Manooka Valley (YN294099-GS-003-ProposedZoningOne.mxd 01_7 October 2015) (Appendix 1).
- Proposed Zoning Option 2 Manooka Valley (YN294099-GS-004-ProposedZoningTwo.mxd 01_7 October 2015) (Appendix 1).

Mapping data was collected from the study area with a Samsung Tablet using ArcGIS Collector (uncorrected) (GDA94) uploaded with an aerial photo of the site produced by NearMap (2016). The accuracy of this mapping is therefore subject to the accuracy of the GPS units (generally ± 7 metres) and dependent on the limitations of aerial photo rectification and registration.

Mapping has been produced using a Geographic Information System (GIS). Electronic GIS files containing the relevant flora and fauna spatial data are available to incorporate into design concept plans. However this mapping may not be sufficiently precise for detailed design purposes.

3 Legislative context

This section provides an overview of key biodiversity legislation and government policy considered in this assessment. Where available, links to further information are provided. This section does not describe the legislation and policy in detail and guidance provided here does not constitute legal advice.

3.1 Commonwealth

3.1.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act is the Australian Government's key piece of environmental legislation. The EPBC Act applies to developments and associated activities that have the potential to significantly impact on Matters of National Environmental Significance (NES) protected under the Act.

Matters of NES identified under the EPBC Act relevant to biodiversity and the Project include:

- Wetlands of international importance (also known as 'Ramsar' wetlands).
- Nationally threatened species and ecological communities.
- Migratory species.

Under the EPBC Act, activities that have potential to result in significant impacts on Matters of NES must be referred to the Commonwealth Minister for the Environment for assessment.

One CEEC, Cumberland Plain Woodland and one threatened species, Cumberland Plain Land Snail have been detected within the study area during prior surveys (Lesryk Environmental Consultants, 2015a; 2015b). Threatened species and ecological communities detected during this flora and fauna assessment that are protection by the EPBC Act are outlined in Section 4.5. An assessment of potential impacts to all Matters of NES under the provisions of the EPBC Act is provided in Section 5 with, Significant Impact Criteria (SIC) assessments provided in Appendix 4.

3.2 State

3.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act was enacted to encourage the proper consideration and management of impacts of proposed development or land-use changes on the environment (both natural and built) and the community. The EP&A Act is administered by the NSW Department of Planning and Environment (DPE).

The EP&A Act provides the overarching structure for planning in NSW and is supported by other statutory environmental planning instruments. Sections of the EP&A Act of primary relevance to the natural environment are outlined further below.

Assessment of Significance (Part 1, Section 5A)

Section 5A of the EP&A Act is an integral part of environmental impact assessment and requires proponents and consent authorities to consider if a development will have a significant effect on threatened species, populations or communities listed under the TSC Act and FM Act. The objective of the Assessment of Significance (AoS) (formally known as the "7-part test") is to improve the standard of, and make transparent, the considerations given to threatened species, populations and ecological communities, and their habitats, and Section 5A (and Section 94 of the TSC Act) outlines seven factors that must be taken into account.

Typically, where any AoS determines that a development will result in a significant effect to a threatened species, population or community, a Species Impact Statement (SIS) is required.

Threatened species, populations and communities (biota) listed under the TSC Act are discussed in Section 4.5. An assessment of whether the Project will result in a significant effect to such threatened biota is summarised in Section 6, with an AoS for threatened biota relevant to the Project provided in Appendix 4.

State Environmental Planning Policies (Part 3, Division 2)

State Environmental Planning Policies (SEPPs) are environmental planning instruments under the EP&A Act that outline policy objectives relevant to State or regional environmental planning issues. There are over 65 SEPPs; however, only those relevant to the proposed development have been considered and are detailed below.

SEPP No. 19 – Bushland in Urban Areas

SEPP No. 19 aims to protect and preserve bushland within urban areas primarily to protect the remnants of vegetation communities whilst also protecting its recreational, educational and scenic amenity values. It applies to land located in the Council LGAs listed in Schedule 1 of the SEPP which contain areas of native vegetation which retain a species composition and structural formation similar or identical to the original vegetation community.

The study area is located within the Camden Council LGA, a Schedule 1 listed Council and contains native vegetation which is similar to the original vegetation community. Therefore SEPP No. 19 – Bushland in Urban Areas, is relevant to the current assessment and impacts relevant to this SEPP are discussed further in Section 5.1.

Local Environment Plans (Part 3, Division 4)

Local Environment Plans (LEP) are created by Councils in consultation with their community and guide planning decisions for LGAs. They apply either to the whole or part of a LGA and make provision for the protection or utilisation of the environment through zoning of land and development controls.

The study area is subject to the Camden LEP 2010 and is zoned E2 Environmental Conservation, E4 Environmental Living and RU2 – Rural Landscape. The objectives of E2 zoning are to:

- *To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values.*
- *To prevent development that could destroy, damage or otherwise have an adverse affect on those values.*
- *To protect and enhance the ecology, hydrology and scenic views of waterways, riparian land, groundwater resources and dependent ecosystems.*

The objectives of E4 zoning are to:

- *To provide for low-impact residential development in areas with special ecological, scientific or aesthetic values.*
- *To ensure that residential development does not have an adverse effect on those values.*

The objectives of RU2 zoning are to:

- *To maintain the rural landscape character of the land.*
- *To protect and enhance areas of scenic value by minimising development and providing visual contrast to nearby urban development.*

- *To provide for a range of compatible land uses, including extensive agriculture.*

3.2.2 Threatened Species Conservation Act 1995

The TSC Act is the key piece of legislation providing for the protection and conservation of biodiversity in NSW through the listing of threatened biota, key threatening processes and critical habitat for threatened biota. Impacts to threatened biota are assessed under Section 5A of the EP&A Act (see above).

The potential for threatened biota to occur within and be impacted by the proposed subdivision is assessed in Section 4.5. An assessment of whether the Project will result in a significant effect to threatened biota is summarised in Section 6. In addition, an AoS for threatened species, populations or communities relevant to the Project are provided in Appendix 4.

3.2.3 Native Vegetation Act 2003

The NV Act provides for, encourages and promotes the management of native vegetation on a regional basis and regulates the clearing of native vegetation on land in NSW. Under the NV Act no clearing of native vegetation is allowed except in accordance with prior development consent from the relevant Council or under a Property Vegetation Plan (PVP) approved by the relevant Catchment Management Authority.

The NV Act does not apply to this Project as the Camden Council LGA is listed within Part 3 of Schedule 1- land excluded from operation of the Act.

3.2.4 Noxious Weeds Act 1993

The NW Act was enacted to provide for the identification, classification and control of noxious weeds. The NW Act aims to reduce the negative impact of weeds on the economy, community and environment of NSW by:

- *Establishing control mechanists to prevent the establishment of significant weeds in NSW.*
- *Preventing, eliminating or restricting the spread of particular significant weeds in NSW.*
- *Effectively managing widespread significant weeds in NSW.*

Plants declared as noxious weeds are currently listed under *Noxious Weeds (Weed Control) Order 2014* published in the NSW Government Gazette No. 23. The NW Act is supported by a number of regulations and is administered by the NSW Department of Primary Industries (DPI).

Noxious weeds are discussed further in Section 4.3 with recommendations for adhering to the NW Act provided in Table 8

4 Results

The ecological features of the study area are described below and mapped in Figure 2.

4.1 Landscape context

The study area contains five large patches of native vegetation comprising of Grassy Woodland (identified as Cumberland Plain Woodland in this assessment as well as previous assessments [Lesryk 2015b]) and derived grassland and shrubland communities. These patches of vegetation are set within a matrix of pastoral land dominated by exotic grassland which has been cleared of vegetation and is currently used for cattle grazing. Surrounding land uses include public open space, medium density residential, road infrastructure and agricultural land.

The dominant geology within the study area was found to comprise Wianamatta Group Shales of the Blacktown and Luddenham Soil Landscape (Bannerman and Hazelton 1990), with soils characteristically shallow to moderately deep, dense and ranging from clay loams on crests and slopes to heavy plastic clays along drainage lines and depressions. Soils within the gully located to the north of the study area display a tendency to waterlogging, demonstrated by the presence of mesic species which will tolerate poorly drained soils. Mild sheet and rill erosion was evident in disturbed areas and evidence of soil compaction resulting from cattle was evident throughout high traffic areas of the study area, most notably in the vicinity of the northern and southern drainage channels.

The ephemeral creek and associated sedgelands located to the south of the study area was observed to be directly linked to the bushland fringing Kennys Creek, a modified creek channel which runs through the Currans Hill Development Area. This linkage provides connectivity to Charles Throsby Reserve and Downes Reserve both located approximately 800 metres to the north-west. The modified channel connects the study area to the Camden, Campbelltown, Liverpool, Penrith and Blue Mountains LGAs via the Narellan and Hawkesbury Nepean River riparian corridors, facilitating the movement of fauna throughout the landscape.

The subsequent field investigation to define clearing under DA 597/2014 ascertained that three sections of the study area (Figure 5), totalling 0.15 hectares, have undergone recent vegetation clearance including removal of all layers of vegetation. In addition, Sydney Water was observed to be in the process of constructing the Drinking Water Infrastructure which has resulted in the recent clearance of all vegetation in the area of the access road and reservoir.

4.2 Flora and fauna

Species recorded during the flora assessment are listed in Table A.1 of Appendix 2 (flora). Unless of particular note, these species are not discussed further. A list of threatened flora recorded or predicted to occur in the local area is also provided in those appendices, along with an assessment of the likelihood of the species occurring within the study area.

Out of the seventeen RoTAPs identified through desktop research (30 November 2015), only Blushing Bindweed and Spiked Rice-flower were considered likely to occur. Only one RoTAP was found during the field assessment, Blushing Bindweed *Convolvulus erubescens*.

Three hollow-bearing trees were detected in the study area during the assessment (Table 4). The hollow-bearing tree located towards the south end of the study area, a Forest Red Gum *Eucalyptus tereticornis* was observed to be occupied by a pair of Galahs *Eolophus roseicapilla* during the field assessment. In addition to

the three hollow-bearing trees a stag containing hollows was also recorded in the western side of the northern patch of Cumberland Plain Woodland.

During the site investigation ten noxious weeds as defined by DPI for the Camden Council LGA were recorded. These noxious weeds are outlined in Table 2 below.

Species recorded during the fauna assessment are listed in Table A.3 of Appendix 3 (fauna). Unless of particular note, these species are not discussed further. A list of threatened fauna recorded or predicted to occur in the local area is also provided in those appendices, along with an assessment of the likelihood of the species occurring within the study area.

Habitat features conducive to fauna presence were observed to be present on site consisting of roosting, resource, foraging and nesting habitat. Ample roosting habitat is provided by canopy trees situated throughout the three patches of Cumberland Plain Woodland and one patch of River-flat Eucalypt Forest associated with the drainage line to the north of the study area. Resource habitat in the form of exposed rock surfaces, hollow-bearing trees and a single dam was present towards the southern and northern extents of the study area, forming high quality habitat for reptile, avian and amphibian species within the locality.

Foraging habitat in the form of nectar producing trees and shrubs (Eucalyptus, Callistemon and Melaleuca spp.) present throughout the site may provide habitat for local avian and vertebrate mammal species such as honeyeaters, possums and the threatened Grey Headed Flying Fox. The dense Cumberland Plain Woodland - Derived Shrubland community throughout the middle of the study area provides optimal nesting habitat as well as refuge from interspecific competition for small insectivorous birds. The sedgelands lining the creek located to the south of the study area forms habitat for amphibian species, some of which were detected audibly during the field assessment such as the Common Eastern Brown Frog *Crinia signifera* and the Bleating Tree Frog *Litoria dentata*.

4.3 Noxious weeds

The following NSW DPI listed noxious weeds for the Camden LGA are present within the study area (Table 2), including their legal class and management requirements. All of these noxious weeds are listed by DPI as Class 4 noxious weeds with the exception of Mexican Poppy which is a Class 5 weed.

Table 2 Noxious weed species recorded in the study area

Scientific name	Common name	Class	Management
Lycium ferocissimum	African Boxthorn	4	*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed.*
***Rubus fruticosus* sp. agg.**	Blackberry	4	*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed.*
Nassella neesiana	Chilean Needle Grass	4	*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed.*
Senecio madagascariensis	Fireweed	4	*The plant must not be sold, propagated or knowingly distributed.*
Lantana camara	Lantana	4	*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread*

Scientific name	Common name	Class	Management
Argemone mexicana	Mexican Poppy	5	*The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with.*
Araujia sericifera	Moth Vine	4	*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed.*
Ligustrum sinense	Small-leaved Privet	4	*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread.*
Hypericum perforatum	St. Johns Wort	4	*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed.*
Rosa rubiginosa	Sweet Briar	4	*The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread.*

4.4 Vegetation communities and fauna habitat

The vegetation and fauna habitat throughout the majority of the study area has been modified by past and current disturbances which have included vegetation clearance, cattle grazing and associated pasture improvement, and adjacent residential development. Further historical disturbance has occurred in association with the construction and maintenance of the TransGrid powerline easement as well as the construction of the Sydney Water Supply Channel. Recent disturbance noted during the field investigation (10 December 2016) within areas of land adjacent to the study area, also included vegetation clearance within the area of land subject to DA 597/2014 in addition to vegetation clearance associated with the construction of the Sydney Water Drinking Water Infrastructure.

The field assessment determined that one listed CEEC and one EEC exist within the study area:

- PCT: 850 BVT:HN529 *Cumberland Plain Woodlands on shale of the southern Cumberland Plain, Sydney Basin Bioregion* (synonymous with *Cumberland Plain Shale Woodlands and Shale - Gravel Transition Forest* (Critically Endangered, EPBC Act and TSC Act) – Cumberland Plain Woodland.
- PCT: 835 BVT: HN526 *River-flat Eucalypt Forest on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion* (synonymous with *River - Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* (Endangered, TSC Act) - River-flat Eucalypt Forest.

Both Cumberland Plain Woodland and River-flat Eucalypt Forest are classed as over cleared landscapes having been cleared of 90% and 95% respectively of their original distribution within the Hawkesbury - Nepean Catchment Management Area (CMA).

The Cumberland Plain Woodland community in the study area includes two sub-communities, Cumberland Plain Woodland – Derived Shrubland and Cumberland Plain Woodland – Derived Grassland. Both of these sub-communities meet the criteria for listing under the TSC Act only.

The ecological features of the study area are outlined below (Table 3), divided by the vegetation communities they occur in (refer also to Figure 2).

Table 3 Vegetation communities of the study area

PCT: 850 Cumberland Plain Woodland	
Extent within study area	8.85 hectares of Cumberland Plain Woodland CEEC was recorded within the study area predominantly as small to medium patches ranging from 0.07 to 3.88 hectares in size, interspersed throughout a matrix of Exotic Grassland. The majority of the patches of Cumberland Plain Woodland throughout the site were contiguous with one another with some isolated patches and in varying condition. The woodland occupies the slightly higher elevations located in the eastern and northern halves of the study area.
Description	The structural formation of the community consists of three well defined strata, a canopy layer of woodland trees between up to 15 metres tall, a patchy midstorey layer of small trees and shrubs and an understorey layer comprising of herbs and grasses. The canopy layer is dominated by Forest Red Gum *Eucalyptus tereticornis* and Grey Box *E. moluccana* in association with subdominant species Narrow-leaved Ironbark *E. crebra* and Rough-barked Apple *Angophora floribunda*. Species present in the patchy and somewhat disjunct midstorey include Hickory Wattle *Acacia implexa*, Parramatta Wattle *Acacia parramattensis*, Native Blackthorn *Bursaria spinosa* and a single Hairy Clerodendrum *Clerodendrum tomentosum* located in the southern patch of Cumberland Plain Woodland in close proximity to the adjacent Native Sedgeland community. The understorey consists of a diverse array of native herbs and grasses including Weeping Grass *Microlaena stipoides*, Kangaroo Grass *Themeda australis*, Paddock Lovegrass *Eragrostis leptostachya*, Berry Saltbush *Einadia hastata*, Forest Nightshade *Solanum prinophyllum* and Early Spring Grass *Eriochloa pseudoacrotricha*. Common paddock weeds have integrated substantially into many of the patches identified as the Cumberland Plain Woodland as their small patch sizes increases the impact of edge effects. Exotic species most prevalent within the community are predominantly bird and wind dispersed including African Olive *Olea europaea* subsp. *cuspidata*, African Boxthorn *Lycium ferocissimum*, Moth Vine *Araujia sericifera*, Fireweed *Senecio madagascariensis*, Paddy's Lucerne *Sida rhombifolia*, Black-berry Nightshade *Solanum nigrum* and Purpletop *Verbena bonariensis*.
Condition	The larger patches of Cumberland Plain Woodland are in relatively good condition whereas the smaller patches are in moderate condition. Both large and small patches of Cumberland Plain Woodland contain low to moderate ingress of exotic species due to the surrounding agricultural land use and associated edge impacts. The historical removal of canopy species in conjunction with a long history of cattle grazing has led to increased recruitment of exotic species, particularly within the midstorey and understorey strata.
Associated soils, rainfall and landscape position	The Cumberland Plain Woodland community is found on higher elevations located in the northern and eastern sections of the study area. Soils associated with Cumberland Plain Woodland throughout the site consists of the Blacktown residual soil landscape. The Currans Hill area experiences an annual average rainfall of 742 millimetres (BoM 2016).
Threatened ecological community	Commonwealth EPBC Act: Critically Endangered (8.85 hectares of Cumberland Plain Woodland) NSW TSC Act: Critically Endangered (10.04 hectares of Cumberland Plain Woodland inclusive of 8.85 hectares of Cumberland Plain Woodland (EPBC Act Listed) combined with 0.76 hectares of Cumberland Plain Woodland - Derived Shrubland and 0.43 hectares of Cumberland Plain Woodland - Derived Grassland). TSC Act Justification: 10.04 hectares of the Cumberland Plain Woodland found throughout the study area is consistent with the definition under the NSW TSC Act based on the presence of diagnostic species (26 species including the presence of three characteristic canopy tree species), soil characteristics (clay soils derived from Wianamatta Shale group geology or alluvial substrates), and structural characteristics (canopy overtopping a midstorey of small trees and shrubs and an understorey of grasses, herbs and forbs) (NSW Scientific Committee 2011). EPBC Act Justification: 8.85 hectares of the Cumberland Plain Woodland within the study

PCT: 850 Cumberland Plain Woodland	
	area is consistent with the definition under the EPBC Act based on its location within the Sydney Basin Bioregion, the presence of clay soils derived from Wianamatta shale or alluvial substrates, the structural composition (canopy overtopping a midstorey of small trees and shrubs and an understorey containing grasses, herbs and forbs), the presence of the indicative canopy species, Grey Box and Forest Red Gum, a midstorey layer containing Blackthorn and Hickory Wattle and a groundcover layer dominated by indicative grasses, herbs and forbs. In addition the Cumberland Plain Woodland existing within the study area amounts to a contiguous patch of over two hectares with over 50% of the perennial understorey vegetation comprising of native species. This places the Cumberland Plain Woodland within the study area under the definition of A. High Condition Class under the EPBC Act (TSSC 2008a).
Threatened species / fauna habitat	Cumberland Plain Woodland within the study area is considered to provide moderate quality habitat for the threatened Spiked Rice-flower however this species was not detected during the site assessment. Cumberland Plain Woodland contains a variety of ecological features which forms habitat for threatened species within the locality including roosting, nesting and foraging habitat. In particular, there is high quality habitat present for the Cumberland Plain Land Snail in the form of drainage lines and depressions, tussock grasses and large woody debris. Two hollow-bearing trees exist within the northern extent of this community (Figure 2), one being a stag containing one large hollow and the other a Grey Box containing five small hollows.

Plate 1 Cumberland Plain Woodland in the study area

Cumberland Plain Woodland – Derived Shrubland	
Extent within study area	Approximately 0.76 hectares of Cumberland Plain Woodland – Derived Shrubland was recorded within the study area in five small patches.
Description	The structural formation of the community consists of two strata, a midstorey layer of dense shrubs up to 4 metres tall and a well-developed understorey comprising of a sparsely distributed array of native grasses and herbs in competition with exotic pasture grasses. The midstorey layer is dominated by Blackthorn. Native species present in the patchy and somewhat disjunct understorey include Weeping Grass, Kangaroo Grass, Red Grass *Bothriochloa macra*, and *Plectranthus parviflorus*. A small number of native species

Cumberland Plain Woodland – Derived Shrubland	
	were present in this community in low numbers whereas they are rare or absent from other communities in the study area, including Small St John's Wort *Hypericum gramineum*, Slender Stackhousia *Stackhousia viminea* and *Epilobium billardiereanum* subsp. *Cinereum*. Common paddock weeds have integrated substantially into many of the patches identified as the Cumberland Plain Woodland – Derived Shrubland community as the small patch size combined with a history of sporadic disturbance increase the impact of edge effects. Exotic species most prevalent within the community are predominantly animal and wind dispersed including African Love Grass *Eragrostis curviflora*, Cocksfoot *Dactylis glomerata*, Fireweed, Sweet Briar *Rosa rubiginosa*, African Olive *Olea europaea* subsp. *cuspidata*, Paddy's Lucerne and Purpletop *Verbena bonariensis*.
Condition	The patches of Cumberland Plain Woodland – Derived Shrubland are in quite poor condition, consisting of a monoculture of shrub species, namely Blackthorn and an understorey with a low native species diversity and low cover abundance. The Cumberland Plain Woodland – Derived Shrubland community contains a moderate level of exotic species incursion due to the surrounding agricultural land use and associated edge impacts. The historical removal of canopy species in conjunction with sporadic disturbance resulting from cattle grazing has led to increased recruitment of Blackthorn and exotic species.
Associated soils, rainfall and landscape position	The Cumberland Plain Woodland – Derived Shrubland community is found on higher elevations located in the northern and middle sections of the study area. Soils associated with Cumberland Plain Woodland – Derived Shrubland throughout the study area consists of the Blacktown residual soil landscape. The Currans Hill area experiences an annual average rainfall of 742 millimetres (BoM 2016).
Threatened ecological community	Commonwealth EPBC Act: Does not meet listing criteria. NSW TSC Act: Critically Endangered Justification: Cumberland Plain Woodland – Derived Shrubland found throughout the study area is consistent with the definition under the NSW TSC Act based on the presence of diagnostic species (16 species including the presence of one characteristic midstorey shrub species, Blackthorn), soil characteristics (clay soils derived from Wianamatta Shale group geology), and structural characteristics (a midstorey of shrubs overtopping an understorey of grasses, herbs and forbs) (NSW Scientific Committee 2011). Cumberland Plain Woodland – Derived Shrubland within the study area does not meet the listing criteria as the patches are less than 5 hectares in size. Cumberland Plain Woodland – Derived Shrubland is required to be over 5 hectares in size, be congruent with a patch of Category A or B Cumberland Plain Woodland and contain a ≥30% native understorey before it can meet the listing criteria for this community (TSSC 2008a).
Threatened species / fauna habitat	Cumberland Plain Woodland – Derived Shrubland within the study area is considered to provide low quality habitat for the threatened Spiked Rice-flower however this species was not detected during the field assessment. Cumberland Plain Woodland – Derived Shrubland contains a variety of ecological features which forms habitat for threatened species within the locality including roosting, nesting and foraging habitat. In particular, this community is high quality habitat for small insectivorous birds as the dense shrub cover acts as a refuge from interspecific competition.

Cumberland Plain Woodland – Derived Shrubland


Plate 2 **Cumberland Plain Woodland – Derived Shrubland in the study area**

Cumberland Plain Woodland – Derived Grassland	
Extent within study area	Approximately 0.43 hectares of Cumberland Plain Woodland – Derived Grassland was recorded in five small patches across the study area.
Description	The structural formation of the community consists of one strata, an understorey layer comprising of herbs, sedges, ferns and grasses. Native species include Wallaby Grass *Rytidosperma racemosum*, Windmill Grass *Chloris truncata*, Common Couch *Cynodon dactylon*, Common Wheatgrass *Elymus scaber*, Blueberry Lily *Dianella longifolia*, Shorthair Plumegrass *Dichelachne micrantha*, Twining glycine *Glycine clandestina*, Wiry Spurge *Phyllanthus virgatus*, *Austrostipa rudis*, Slender Flat-sedge *Cyperus gracilis*, Red Grass *Bothriochloa macra* and Rock Fern *Cheilanthes sieberi*. Exotic species present include Browntop Bent *Agrostis capillaris*, Scarlet Pimpernel *Anagallis arvensis*, Shivery Grass *Briza minor*, Soft Lovegrass *Eragrostis pilosa*, Yorkshire Fog *Holcus lanatus*, St. Johns Wort *Hypericum perforatum*, Paspalum *Paspalum dilatatum*, Parramatta Grass *Sporobolus africanus*, Lamb's Tongue *Plantago lanceolata* and Creeping Oxalis *Oxalis corniculata*.
Condition	The patches of Cumberland Plain Woodland – Derived Grassland are in moderate to high condition with high species diversity and a cover abundance of over 65%. The historical removal of canopy and midstorey species in conjunction historic cattle grazing has led to the incursion of exotic species in this community.
Associated soils, rainfall and landscape position	The Cumberland Plain Woodland – Derived Grassland community is found on low to high elevations, fringing patches of remnant Cumberland Plain Woodland located in the middle and southern sections of the study area. Soils associated with Cumberland Plain Woodland – Derived Grassland throughout the site consist of the Blacktown residual soil landscape.
Threatened ecological community	Commonwealth EPBC Act: Does not meet listing criteria NSW TSC Act: Critically Endangered Justification: Cumberland Plain Woodland – Derived Grassland found throughout the study area is consistent with the definition under the NSW TSC Act based on the presence of diagnostic species (26 species including the presence of one characteristic midstorey shrub species, Hickory Wattle), soil characteristics (clay soils derived from Wianamatta Shale group geology), and structural characteristics (an understorey of grasses, herbs and forbs)

Cumberland Plain Woodland – Derived Grassland	
	(NSW Scientific Committee 2011). Cumberland Plain Woodland – Derived Grassland within the study area does not meet the listing criteria as the patches are less than 5 hectares in size. Cumberland Plain Woodland – Derived Grassland is required to be over 5 hectares in size, be congruent with a patch of Category A or B Cumberland Plain Woodland and contain a ≥30% native understorey before it can meet the listing criteria for this community (TSSC 2008a).
Threatened species / fauna habitat	Cumberland Plain Woodland – Derived Grassland contains a variety of ecological features which forms habitat for threatened species within the locality including nesting and foraging habitat. In particular, there is high quality habitat present for the Cumberland Plain Land Snail in the form of drainage lines and depressions, tussock grasses and large woody debris. A single hollow-bearing tree (Figure 2), a Forest Red Gum, contains one medium hollow which is currently occupied by a breeding pair of Galahs.

Plate 3 Cumberland Plain Woodland –Derived Grassland in the study area

PCT: 835 River-flat Eucalypt Forest	
Extent within study area	Approximately 0.85 hectares of River-flat Eucalypt Forest EEC was recorded in one small patch lining the upper banks of the ephemeral drainage line located at the northern end of the study area.
Description	The structural formation of the community consists of three well defined strata, a canopy layer comprising of woodland trees up to 13 metres tall, a patchy midstorey layer of small trees and an understorey layer comprising of herbs and grasses. The canopy layer is dominated by Forest Red Gum *Eucalyptus tereticornis* and Rough-barked Apple *Angophora floribunda*. The midstorey consists of a dense layer of Prickly-leaved Paperbark *Melaleuca styphelioides*. The understorey consists of a diverse array of native herbs and grasses including Weeping Grass *Microlaena stipoides*, Hedgehog Grass *Echinopogon caespitosus*, Native Raspberry *Rubus parvifolius*, Forest Nightshade *Solanum prinophyllum* and Common Rush *Juncus usitatus*. There is a low level of weed ingress throughout the entire length of this community consisting of wind, animal and bird dispersed species such as Cobblers Pegs *Bidens pilosa*, Common Sowthistle *Sonchus oleraceus*, Lantana *Lantana camara*, Black-berry Nightshade *Solanum nigrum*, Fireweed *Senecio madagascariensis*, Inkweed *Phytolacca octandra* and African Olive *Olea europaea* subsp. *cuspidata*.
Condition	The patch of River-flat Eucalypt Forest is in moderate condition due to impacts associated with cattle grazing and the presence of edge effects. This community exhibits a low to

PCT: 835 River-flat Eucalypt Forest	
	moderate ingress of exotic species resulting from surrounding agricultural land use and the presence of frugivorous birds. Routine cattle grazing within the vicinity of the drainage line has resulted in soil compaction which has led to a reduction in vegetation cover in affected areas. The history of cattle grazing has facilitated the ingress of weeds via animal assisted dispersal and nutrient enrichment of the soil.
Associated soils, rainfall and landscape position	The River-flat Eucalypt Forest community fringes the drainage line and associated low gully which runs in an east/west direction in the northern section of the study area. Soils associated with River-flat Eucalypt Forest consist of soils from the Blacktown Soil landscape. The Currans Hill area experiences an annual average rainfall of 742 millimetres (BoM 2016).
Threatened ecological community	Commonwealth EPBC Act: Not listed NSW TSC Act: Endangered TSC Act Justification: River-flat Eucalypt Forest found throughout the study area is consistent with the definition under the NSW TSC Act based on the presence of diagnostic species (18 species including the presence of two characteristic canopy tree species), soil characteristics (clay soils derived from Wianamatta Shale group geology or alluvial substrates), and structural characteristics (canopy overtopping a midstorey of small trees and shrubs and an understorey of grasses, herbs and forbs) (NSW Scientific Committee 2011). Cumberland Plain Woodland within the study area is consistent with the definition under the EPBC Act based on its location within the Sydney Basin Bioregion, the presence of clay soils derived from Wianamatta shale or alluvial substrates, the structural composition (canopy overtopping a midstorey of small trees and shrubs and an understorey containing grasses, herbs and forbs), the presence of the indicative canopy species, Grey Box and Forest Red Gum, a midstorey layer containing Blackthorn and Hickory Wattle and a groundcover layer dominated by indicative grasses, herbs and forbs. The Cumberland Plain Woodland existing within the study area amounts to a contiguous patch of over two hectares with over 50% of the perennial understorey vegetation comprising of native species. This places the Cumberland Plain Woodland within the study area under the definition of A. High Condition Class under the EPBC Act (TSSC 2011).
Threatened species / fauna habitat	River-flat Eucalypt Forest within the study area is considered to provide moderate quality habitat for the threatened Spiked Rice-flower however this species was not detected during the site assessment. River-flat Eucalypt Forest contains a variety of ecological features which forms habitat for threatened species within the locality including roosting, nesting and foraging habitat. In particular, there is high quality habitat present for the Grey-headed Flying-fox, a transient visitor to the locality, in the form of dense stands of Prickly-leaved Paperbark.

PCT: 835 River-flat Eucalypt Forest

Plate 4 **River-flat Eucalypt Forest in the study area**

Native Sedgeland	
Extent within study area	Approximately 0.04 hectares of Native Sedgeland was recorded in one very small patch in the southern end of the study area.
Description	The structural formation of the community consists of one strata, an understorey layer comprised predominantly of sedges and grasses. Native species include Tall Sedge *Carex appressa*, Common Couch, Tall Spike Rush *Eleocharis sphacelata*, Common Fringe-sedge *Fimbristylis dichotoma*, *Juncus usitatus* and Water Pepper *Persicaria hydropiper*. Exotic species in this community include Umbrella Sedge *Cyperus eragrostis*, Perennial Ryegrass *Lolium perenne*, Vasey Grass *Paspalum urvillei*, Phalaris *Phalaris aquatica*, Broadleaf Dock *Rumex obtusifolius* and Dandelion *Taraxacum officinale*.
Condition	This community is in moderate condition displaying a minimal degree of weed incursion from aquatic weeds throughout the channel of Kenny Creek, only presenting with moderate weed ingress from terrestrial species within a metre of the waterway.
Associated soils, rainfall and landscape position	Sedgelands fringe Kennys Creek which runs in an east/west direction in the southern section of the study area. Soils associated with the sedgeland community consist of the Blacktown Soil Landscape.
Threatened ecological community	Commonwealth EPBC Act: Not listed NSW TSC Act: Not listed
Threatened species / fauna habitat	Native Sedgeland contains a variety of ecological features which forms habitat for threatened species within the locality including breeding, foraging and dispersal habitat. In particular, there is high quality habitat present for amphibian species and migratory wading birds in the form of riparian invertebrates, macro-invertebrates and sedges for refugia.

Native Sedgeland

Plate 5 **Native Sedgeland in the study area**

Exotic Grassland	
Extent within study area	Approximately 17.54 hectares of Exotic Grassland occupies the study area, forming a matrix surrounding patches of remnant vegetation.
Description	The structural formation of the community consists of one well defined understorey layer of exotic grasses and herbs reaching a maximum height of 0.5 metres tall combined with a midstorey consisting of a few scattered individual shrub species. The understorey layer is populated by sparsely scattered native species including Purple Wiregrass *Aristida ramosa*, Red Grass, Spike Centaury *Centaurium spicatum*, Shorthair Plumegrass *Dichelachne micrantha*, Kangaroo Grass, Weeping Grass and *Juncus usitatus*. A few individual natives rarely seen throughout the site were detected within this community including Small St John's Wort and Pink Bindweed. The midstorey layer consists of a few scattered Blackthorn individuals. Exotic species are most prevalent in this community comprising of wind, water and animal dispersed species including African Olive *Olea europaea* subsp. *cuspidata*, African Boxthorn *Lycium ferocissimum*, Moth Vine *Araujia sericifera*, Fireweed *Senecio madagascariensis*, Paddy's Lucerne *Sida rhombifolia*, Chilean Needle Grass *Nassella neesiana*, Phalaris *Phalaris aquatica* and Purpletop *Verbena bonariensis*.
Condition	The matrix of Exotic Grassland is in poor condition displaying low levels of native species diversity and resilience combined with a high abundance of exotic species. The historical removal of canopy species in conjunction with a long history of cattle grazing has led to increased recruitment of exotic species, particularly within the midstorey and understorey strata.
Associated soils, rainfall and landscape position	The Exotic Grassland community is found on all elevations of the study area, primarily along the perimeters, within the middle and towards the south. Soils associated with Exotic Grassland throughout the site consist of the Blacktown residual soil landscape. The Currans Hill area experiences an annual average rainfall of 742 millimetres (BoM 2016).
Threatened ecological community	Commonwealth EPBC Act: Not listed NSW TSC Act: Not listed

Exotic Grassland	
Threatened species / fauna habitat	Exotic Grassland within the study area is considered to provide marginal quality habitat for threatened flora including Spiked Rice-flower however this species was not detected during the site assessment. Exotic Grassland contains a limited range of ecological features which forms habitat for threatened species within the locality including nesting and foraging habitat. In particular, there is poor quality habitat present for the Cumberland Plain Land Snail in the form of drainage lines and depressions, tussock grasses and large woody debris.

Plate 6 Exotic Grassland in the study area

The following hollow-bearing trees were identified during the field investigation (Table 4 and Figure 2).

Table 4 Hollow-bearing trees in the study area

Hollow-bearing tree	Tree species	Number of hollows	Size of hollows	Fauna presence
1	Stag	1	Large	None noted during diurnal survey, December 2016
2	Grey Box *Eucalyptus molluccana*	5	Small	None noted during diurnal survey, December 2016
3	Forest Red Gum *Eucalyptus tereticornis*	1	Medium	Breeding Gallah's present December 2016

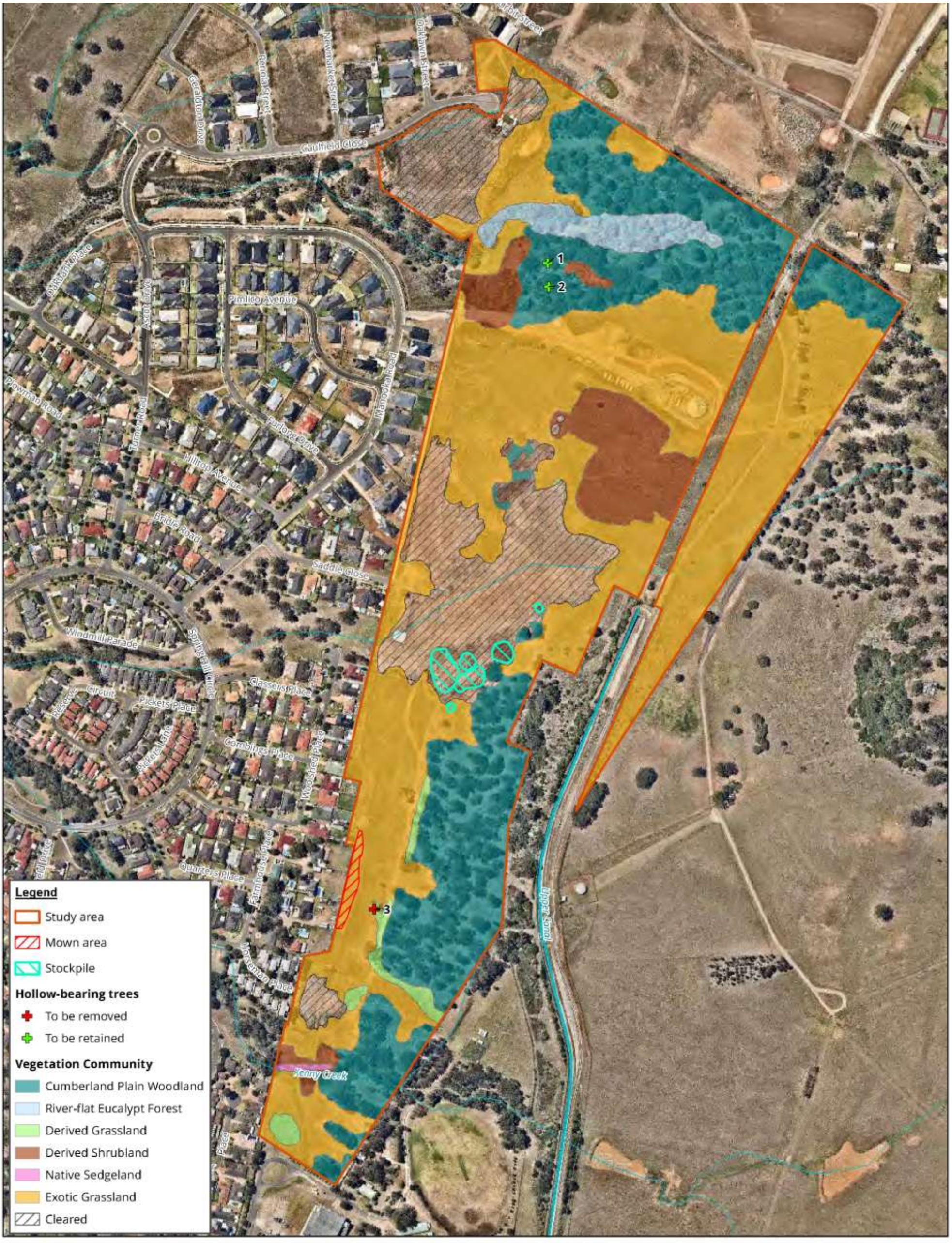

Figure 2: Ecological values of the study area

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Acknowledgements: Imagery (c) Nearmap 2015
Topo (c) NSW Land and Planning Information (2015)

Matter: 21307
Date: 27 February 2017,
Checked by: NRT, Drawn by: LH, Last edited by: lharley
Location:P:\21300s\21307\Mapping\

0 30 60 90 120 150
Metres
Scale 1:3,800 @ A3
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4.5 Threatened biota

Threatened biota includes all flora and fauna species, populations and ecological communities listed under the EPBC Act and TSC Act. Lists of threatened biota recorded or predicted to occur within 5 kilometres of the study area are provided in Appendix 2 (flora) and Appendix 3 (fauna). Previous records of threatened biota within the locality are shown in Figure 3 (flora) and Figure 4 (fauna). An assessment of the likelihood of these species occurring in the study area, and an indication of where within the study area (i.e. which habitats or features of relevance to the species), is included.

No areas of critical habitat for flora or fauna have been declared within the study area.

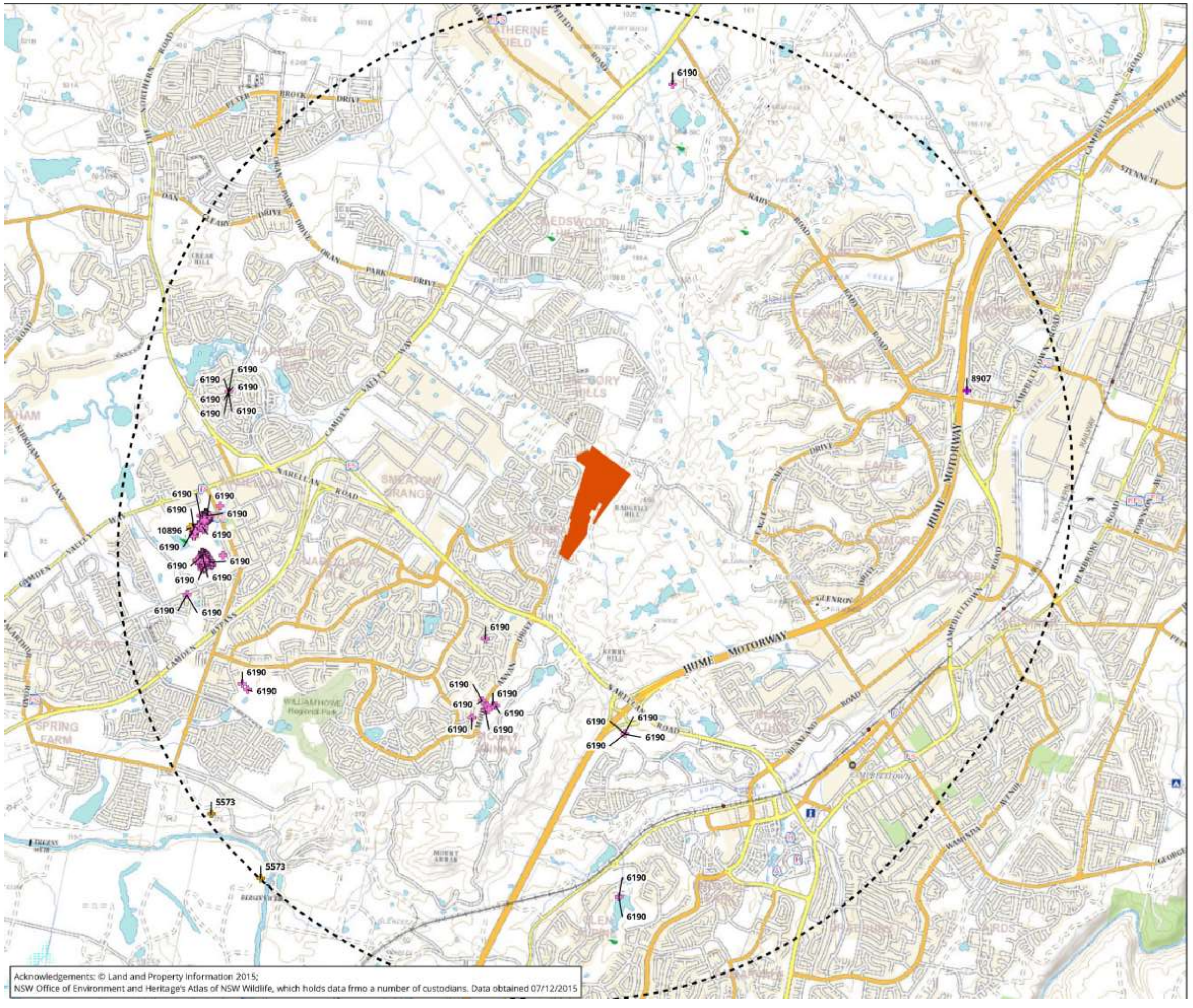
Two threatened ecological communities were recorded during the site investigation, being Cumberland Plain Woodland (Critically Endangered, EPBC Act and TSC Act) and River-flat Eucalypt Forest (Endangered, TSC Act).

No threatened flora or fauna species were recorded during the site investigation. A summary of all threatened flora and fauna species which have a medium or higher likelihood of occurring in the study area is provided in Table 5 below.

No migratory species were recorded during the site investigation. The following migratory species have a medium or higher likelihood of occurring in the study area but are transient and not expected to remain for long within the area. These species include Latham's Snipe *Gallinago hardwickii*, Eastern Great Egret *Ardea modesta*, Black Faced Monarch *Monarcha melanopsis* and Rufous Fantail *Rhipidura rufifrons*. As these species are transient and do not take up permanent residence within the study area, an SIC assessment will not be necessary and has not been prepared. Known habitats for these migratory species have been considered and are addressed in Appendix 3.

Table 5 Summary of threatened biota likely to occur in the study area

Species name	Area of value within the study area
EPBC Act listed biota	
Cumberland Plain Woodland	8.85 hectares of CEEC Cumberland Plain Woodland is present in the study area (Section 4.4). Although some weeds are present in the lower strata the Cumberland Plain Woodland is considered to be in good to moderate condition.
Spiked Rice-flower	A total of 8.85 hectares of potential Spiked Rice-flower habitat occurs within the study area.
TSC Act listed biota	
Cumberland Plain Woodland	10.04 hectares of CEEC Cumberland Plain Woodland is present in the study area inclusive of 8.85 hectares of Cumberland Plain Woodland (EPBC Act Listed) combined with 0.76 hectares of Cumberland Plain Woodland - Derived Shrubland and 0.43 hectares of Cumberland Plain Woodland - Derived Grassland
River-flat Eucalypt Forest	0.85 hectares of EEC River-flat Eucalypt Forest is present in the study area (Section 4.4). Although a sparse infestation of weeds are present in the lower strata the River-flat Eucalypt Forest is considered to be in moderate condition.
Cumberland Plain Land Snail	10.04 hectares of breeding and dispersal habitat for the Cumberland Plain Land Snail occurs throughout the study area. Habitat features for this species include tussock grasses, large woody debris, drainage lines and depressions and decorticated bark.


Legend
Study area
Search area
Threatened Flora
10896 - Marsdenia viridiflora subsp. viridiflora
5573 - Pomaderris brunnea
6190 - Pimelea spicata
8907 - Eucalyptus scoparia
4464 - Genoplesium baueri*
* Record is listed as sensitive under OEH's Sensitive Species Data Policy and cannot be shown at this scale
Figure 3: Threatened Flora within 5km of the study area
0 400 800 1,200 1,600 2,000
Metres
Scale: 1:40,000 @ A3
Coordinate System: GDA 1994 MGA Zone 55
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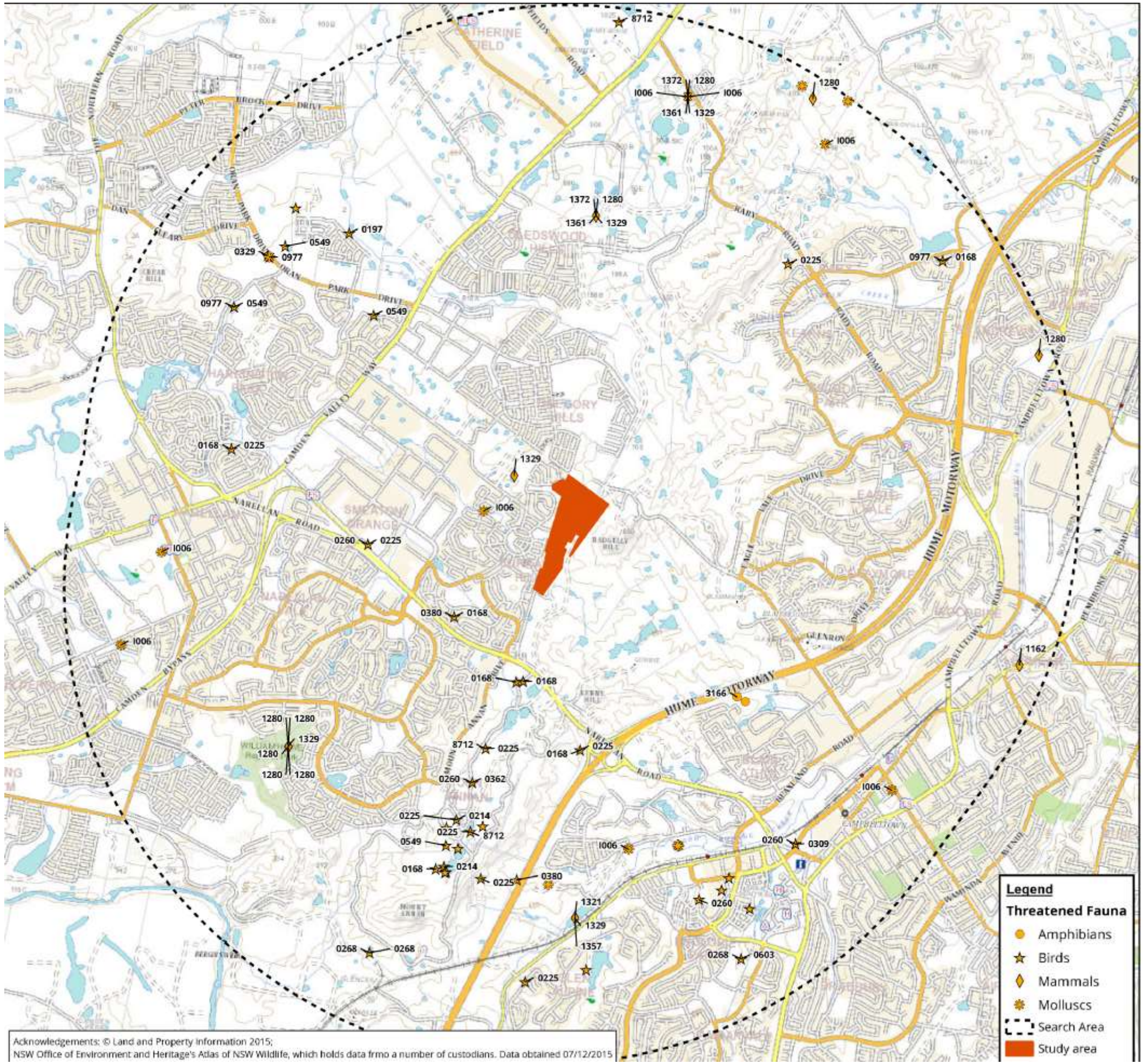
Acknowledgements: © Land and Property Information 2015;
NSW Office of Environment and Heritage's Atlas of NSW Wildlife, which holds data frmo a number of custodians. Data obtained 07/12/2015



Species list

Amphibians

3166 - Green and Golden Bell Frog

Birds

0197 - Australasian Bittern
0214 - Freckled Duck
0218 - Spotted Harrier
0225 - Little Eagle
0260 - Little Lorikeet
0265 - Glossy Black-Cockatoo
0265 - Glossy Black-Cockatoo*
0268 - Gang-gang Cockatoo
0268 - Gang-gang Cockatoo*
0302 - Turquoise Parrot
0302 - Turquoise Parrot*
0309 - Swift Parrot
0380 - Scarlet Robin
0549 - Varied Sittella
0603 - Regent Honeyeater

Mammals

1162 - Koala
1280 - Grey-headed Flying-fox
1321 - Yellow-bellied Sheathtail-bat
1329 - Eastern Freetail-bat
1357 - Southern Myotis
1361 - Greater Broad-nosed Bat
1372 - Eastern False Pipistrelle

Molluscs

I006 - Cumberland Plain Land Snail

* Record is listed as sensitive under OEH's Sensitive Species Data Policy and cannot be shown at this scale

Figure 4: Threatened Fauna within 5km of the study area

0 400 800 1,200 1,600 2,000

Metres
Scale: 1:40,000 @ A3
Coordinate System: GDA 1994 MGA Zone 55

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Date: 27 February 2017.
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5 Ecological impacts and recommendations

This section identifies the potential impacts of the Proposal on the ecological values of the study area and includes recommendations to assist Cardno to design a rezoning proposal which will minimise impacts on biodiversity.

5.1 Ecological impacts

The principal means to reduce impacts on ecological values within the study area will be to minimise removal of native vegetation and habitat. This aim is best accomplished during the design phase of development when flexibility is at a maximum. Under the initial rezoning proposals produced by Cardno, (Appendix 1) approximately 55% (Option 1) and 50% (Option 2) of Cumberland Plain Woodland and approximately10% of River-flat Eucalypt Forest was designated for removal. Both of these options would have impacted on over cleared vegetation types as defined by the VIS Classification Tool (OEH, 2015b) that are in moderate condition, making the approval pathway challenging and removing BioBanking as a viable offset mechanism.

Based on the above initial zoning issues a rezoning proposal has been created by Biosis (Figure 5) based upon the field investigation and client input. The rezoning proposal seeks to minimise the incidence and extent of impacts on the CEEC and EEC in the study area by ensuring that as much Cumberland Plain Woodland (EPBC Act) as possible is retained under the E2 – Environmental Conservation zone category. In particular, the revised rezoning proposal does not directly impact on River-flat Eucalypt Forest or the two hollow-bearing trees which exist in the northern section of the study area.

The rezoning proposal seeks to divide the study area into three zones with different associated land uses comprising of:

R1 – General residential which has the following land use objectives.

- *To provide for the housing needs of the community.*
- *To provide for a variety of housing types and densities.*
- *To allow for educational, recreational, community and religious activities that supports the wellbeing of the community.*

Under the revised rezoning proposal a total of 1.38 hectares of Cumberland Plain Woodland (meeting TSC Act criteria) comprising of; 0.89 hectares of Cumberland Plain Woodland (meeting EPBC Act criteria), 0.17 hectares of Cumberland Plain Woodland - Derived Shrubland (meeting TSC Act criteria) and 0.32 hectares of Cumberland Plain Woodland – Derived Grassland (meeting TSC Act criteria) is designated for removal in areas with a proposed rezoning of R1 – General residential.

E2 – Environmental Conservation which has the following land use objectives;

- *To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values. To prevent development that could destroy, damage or otherwise have an adverse affect on those values.*
- *To protect and enhance the ecology, hydrology and scenic views of waterways, riparian land, groundwater resources and dependent ecosystems.*

Under the revised rezoning proposal the land designated to be rezoned as E2 will result in the retention of 9.47 hectares of native vegetation including; 7.95 hectares of Cumberland Plain Woodland (EPBC), 0.59

hectares of Cumberland Plain Woodland - Derived Shrubland, 0.11 hectares of Cumberland Plain Woodland – Derived Grassland, 0.85 hectares of River-flat Eucalypt Forest and 0.04 hectares of Native Sedgeland.

SP2 – Infrastructure which has the following land use objectives:

- *To provide for infrastructure and related uses.*
- *To prevent development that is not compatible with or that may detract from the provision of infrastructure.*

Under the revised rezoning, the SP2 zoned land existing in the area covered by the recent construction of Sydney Water Drinking Water Infrastructure has resulted in removal of 0.45 hectares of Exotic Grassland. The remaining land is to be zoned as E2 – Environmental conservation and retained as intact native vegetation.

A recent bushfire protection assessment (Conacher Travers 2016) has concluded that bushfire can potentially affect the study area as a result of native vegetation retained in the proposed E2 zoning in addition to intact existing vegetation, external to the study area, adjacent to the north-eastern and south-eastern boundaries. Further bushfire risk was also identified within the riparian corridor in the north-west of the study area. Therefore, the bushfire protection assessment report advises that various bushfire protection measures are required including:

- *Provision of a perimeter road with two way access, delineating the entire extent of the proposed development.*
- *Establishment of Asset Protection Zones (APZ) to ensure the safety of future residents.*
- *Specifying minimum residential lot depth to accommodate APZ requirements for lots on perimeter roads.*

Suggested APZ locations and extent have been extrapolated from the bushfire protection assessment (Conacher Travers 2016) and are summarised in Table 6 below and displayed in Appendix 1. Management recommendations for vegetation within the proposed APZ areas include the following:

- Inner protection area:
  - Grasses to be no higher than 50-75 millimeters.
  - Shrubs to occur in small patches amidst open grassy areas for a total cover between 15-20%.
  - Trees are allowed except when within 5 metres of a dwelling.
  - Trees must not form a linking canopy or link with shrubs.
- Outer protection area:
  - All trees to remain.
  - Shrub layer and grass layer to be modified (thinned).
  - Regular removal of up to 85% of the litter layer.

Broader management actions recommended in the bushfire protection assessment include:

- Regular mowing of grasses.
- Raking or manual removal of fine fuels.
- Removal or pruning of trees, shrubs and understorey species.

With relevance to this flora and fauna assessment, all APZ are to be located within land proposed for R1 – General Residential zoning and will not result in removal of native vegetation proposed for the E2 – Environmental Conservation land use zone. Recommendations for managing APZ include ensuring the APZ is

contained within a perimeter road or in individual lot boundaries to ensure maintenance access or alternatively maintenance outside of lot boundaries via a "community title" subdivision.

Table 6 Suggested APZ requirements and projected ecological impacts

Lots Vegetation formation within 140 meters of development	Slope of land	Minimum APZ required	APZ provided (meters)	Projected ecological impacts
North-west of study area (adjacent to Caulfield Close)				
Woodland within riparian corridor	0-5°	N/A	21	No direct impacts to native vegetation, impacted vegetation consists of Exotic Grassland. Indirect impacts to native vegetation (including River-flat Eucalypt Forest) consist of increased edge effects and disrupted fire regime resulting in alterations to species composition and structural integrity.
Woodland within E2 zone (land to east)	Level to upslope	N/A	16	
North of study area (within E2 zoned land)				
Woodland	5-10°	N/A	26	Potential modification of River-flat Eucalypt Forest and Cumberland Plain Woodland – Derived Shrubland patch boundaries resulting in increased edge effects, disrupted fire regime, alterations to species composition and structural integrity.
	13°	32	32	
	0-5°	N/A	21	
East (external study area boundary)				
Woodland	Level to upslope	N/A	16	Potential modification of linear patch of River-flat Eucalypt Forest resulting in increased edge effects, disrupted fire regime, alterations to species composition and structural integrity.
	5-10°	N/A	26	
Grassland	Level to upslope	N/A	16	No direct impacts to native vegetation, impacted vegetation consists of Exotic Grassland.
	5-10°	N/A	26	
Remnant vegetation within SP2 zoned land	5-10°	N/A	14	No direct impacts to native vegetation, impacted vegetation consists of Exotic Grassland.
Eastern aspect (within E2 zoned land)				
Woodland	Level to upslope	N/A	16	Potential modification of Cumberland Plain Woodland (EPBC Act), Cumberland Plain Woodland – Derived Shrubland, Cumberland Plain Woodland – Derived Grassland and native sedgeland patch boundaries resulting in increased edge effects, disrupted fire regime, altered ecosystem function (native sedgeland) alterations to species composition and structural integrity.
	2°	19	19	

A summary of potential implications of development of the study area and recommendations to minimise impacts associated with the revised rezoning proposal is provided in Table 8 within Section 5.3.

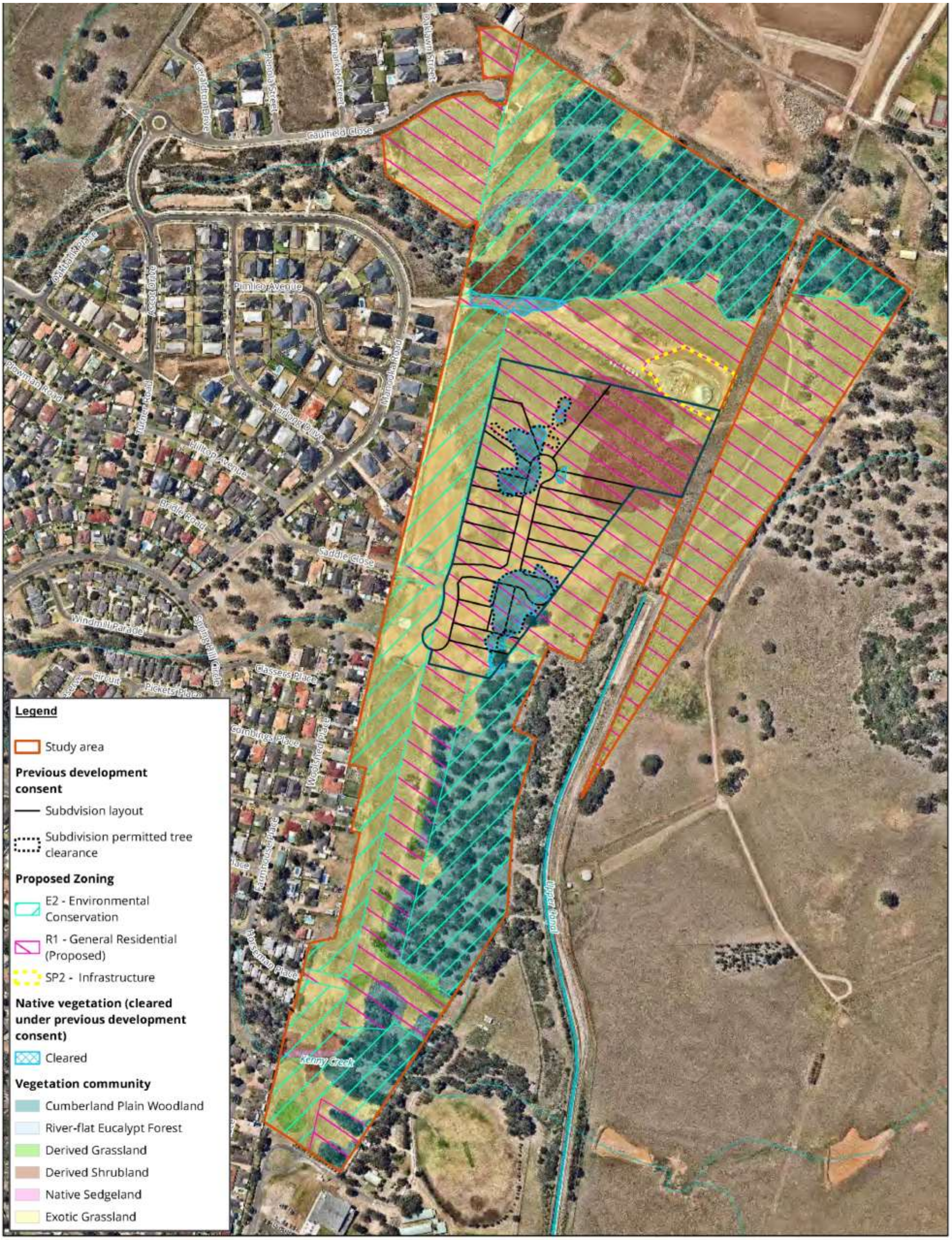

Figure 5: Potential rezoning options for the Manooka Stage 3 Development

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Acknowledgements: Imagery (c) Nearmap 2015
Topo (c) NSW Land and Planning Information (2015)

Matter: 21307
Date: 27 February 2017,
Checked by: NRT, Drawn by: LH, Last edited by: lharley
Location:P:\21300s\21307\Mapping\

0 30 60 90 120 150
Metres
Scale 1:3,800 @ A3
Coordinate System: GDA 1994 MGA Zone 56
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5.2 Legislative implications

The vegetation removal associated with this rezoning proposal is projected to impact directly and indirectly on the exotic grassland and areas of native vegetation that are either isolated patches or heavily edge impacted. Impacts to the native vegetation i.e. Cumberland Plain Woodland have triggered the requirement for the preparation of an AoS/SIC of these communities as well as Cumberland Plain Land Snail and Spiked Rice-flower to determine the presence of significant impacts. An AoS/SIC has been created for each of the threatened biota determined to have a moderate or higher likelihood of occurrence within the study area (Appendix 4). The results of the AoS/SIC assessments determined an absence of significant impacts associated with the revised rezoning proposal, therefore no Species Impact Statement (SIS) is required.

The revised rezoning proposal has mitigated the projected loss of; 1.38 hectares of Cumberland Plain Woodland (meeting TSC Act criteria), 0.89 hectares of Cumberland Plain Woodland (meeting EPBC Act criteria), 0.17 hectares of Cumberland Plain Woodland – Derived Shrubland (meeting TSC Act criteria) and 0.32 hectares of Cumberland Plain Woodland – Derived Grassland (meeting TSC Act criteria). This loss has been mitigated via the retention of 7.95 hectares of Cumberland Plain Woodland (EPBC Act), 0.59 hectares of Cumberland Plain Woodland - Derived Shrubland, 0.11 hectares of Cumberland Plain Woodland – Derived Grassland, 0.85 hectares of River-flat Eucalypt Forest and 0.04 hectares of Native Sedgeland under the E2 – Environmental Conservation zone category. Through this retention, Cardno have ensured the revised rezoning proposal does not directly impact on River-flat Eucalypt Forest or the two hollow-bearing trees which exist in the northern section of the study area.

Projected impacts (comprising the removal of 0.89 hectares of Cumberland Plain Woodland (EPBC Act)) under the revised rezoning proposal is less than 1 hectare, therefore not likely to require further assessment under the EPBC Act. Therefore, based on the findings of this flora and fauna assessment, as well as the NSW Assessment of Significance (Appendix 4) and Significant Impact Criteria assessment (Appendix 5) no further assessment under the EPBC Act or TSC Act is required.

If key stakeholders do not find the revised rezoning proposal acceptable, or if further modifications are required that alter the aforementioned impacts, options are available to undertake the alternative approval pathways of applying for a section 91 licence with accompanying SIS, or alternatively to conserve areas of E2 – Environmental conservation under the NSW Biodiversity Certification scheme using the Biodiversity Certification Assessment Methodology (BCAM).

A section 91 licence is required for "*actions that are likely to result in harm to, or picking of, a threatened species, population or ecological community, or damage to a habitat of a threatened species, population or ecological community, including critical habitats*". The creation of the accompanying SIS will involve a thorough investigation of the nature and extent of the rezoning proposal and impacts associated with the resulting altered land uses. An SIS requires investigation of the effects on resident flora and fauna species on a local scale rather than just the effects the study area. An SIS will present feasible alternatives which reduce the scale and extent of impacts on threatened species, populations and ecological communities and will contain a list of approvals which are required before any actions can be undertaken. The benefits of an SIS is the requirement that the Chief Executive of the OEH must make a decision within 120 days of receiving a section 91 license application whereas no timeframes are required for a section 91 licence without an accompanying SIS.

An alternative approval pathway available for the Manooka Stage 3 development if Cardno wish to continue with the rezoning proposal is Biodiversity Certification. Biodiversity certification offers a range of options which enable offsetting for impacts on biodiversity. Biodiversity Certification takes place during the design phase of a project and identifies areas of high conservation value and areas suitable for development at the landscape scale. Areas of land which are deemed of high conservation value can be retained as an offset with the requirement that management actions to improve or maintain vegetation community condition such as

bush regeneration, weed control, pest control and fencing are undertaken on the offset. Biodiversity Certification can only be approved by the Minister if the projected effects of management actions associated with Biodiversity Certification can be shown to improve or maintain biodiversity outcomes for the offset. As the Cumberland Plain Woodland patches designated to be zoned E2 – Environmental conservation are in moderate condition, it is unlikely that Biodiversity Certification will be a viable option.

5.2.1 Camden Council Comments

The ensuing comments from Camden Council have been forwarded following the second Planning Proposal pre-lodgement meeting dated 31 March 2017 in the *Second Pre-lodgement meeting for planning proposal property: Lot 627 DP1163903 at 207B Turner Road, Currans Hill* (Camden Council 2017).

Camden Council have advised:

> *Where there is a loss of Cumberland Plain Woodland from the planning proposal that additional consideration be given to offset the loss of Cumberland Plain Woodland via an on-site Biobank and/or biodiversity certification agreement.*

Camden Council have also advised that the Project will be referred to NSW OEH for formal comments.

In response to Council comments from Cardno, Biosis contacted Rob Corby (Sustainability Officer) of Camden Council and reaffirmed that the Biosis Flora and Fauna Assessment report (Final Version 03, 2017) has adequately addressed Cumberland Plain Woodland and other threatened biota with a moderate or higher likelihood of occurrence within the study area in accordance with current legislation (EP&A Act, EPBC Act and TSC Act). Biosis further informed Camden Council that an NSW AoS (for removal of 1.38 hectares of Cumberland Plain Woodland [TSC Act]) and a Commonwealth SIC (for removal of 0.89 hectares of Cumberland Plain Woodland [meeting EPBC Act criteria]) have determined that there is not likely to be a significant impact to this community, hence no further action is required (under the current legislation). The Cumberland Plain Woodland proposed for removal consists of isolated small, poor quality patches whilst the majority of high quality patches of Cumberland Plain Woodland are to be retained within the study area through the rezoning. Biosis has further reaffirmed through communications with Camden Council that there are no further requirements for offsetting under the current legislation.

Biosis noted the timeframes for the change in NSW legislation (introduction of the pending *Biodiversity Conservation Act 2016*). At this stage the pending NSW *Biodiversity Conservation Act 2016* will officially commence on 25 August 2017. Any future development applications for the study area will be assessed under the requirements of this new Act. Where clearing of native vegetation exceeds the thresholds set out in Part 7.2 of the NSW *Biodiversity Conservation Regulation 2017* (Table 7; currently on exhibition) the biodiversity offsets scheme applies and impacts and offset requirements must be assessed in accordance with the Biodiversity Assessment method (BAM).

Table 7 Area of vegetation clearance to trigger offset under NSW Biodiversity Conservation regulation 2017

Minimum lot size of land	Area of clearing
Less than 1 hectare	0.25 hectare of 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

If the Manooka Rezoning DA, which involves clearing of native vegetation is lodged prior to 25 August 2017 offsets will not be required. If, however the DA is lodged it is likely that an offset will be required considering the site is proposed to be rezoned R1 General residential (minimum lot size of 450 square metres). In this circumstance it is important to note that the concept of 'serious and irreversible' consequences may apply. If the project results in serious and irreversible consequences the planning authority cannot approve the development application.

5.3 Recommendations

The principal means to reduce impacts on ecological values within the study area will be to minimise removal of native vegetation and habitat. The results of this flora and fauna assessment should therefore be used to inform the design of the development. The design phase of the Project is critical to determining specifics of how ecological values will be incorporated and managed within the development. The revised rezoning proposal created by Biosis in collaboration with Cardno aims to achieve this objective by increasing the area of Cumberland Plain Woodland protected under the E2 – Environmental Conservation zoning. In addition, Cardno proposes to protect the area of Native Sedgeland to the south of the study area by placing it under the E2 – Environmental conservation zoning. Indirect impacts to the E2 – Environmental Conservation zone can be avoided or minimised by following the recommendations listed within Table 8.

Should the proposed rezoning plan (Figure 5) be acceptable the following recommendations have been prepared (Table 8) to avoid, minimise and mitigate impact to the following ecological constraints (requiring removal under the proposed rezoning plan):

- Removal of 0.89 hectares of Cumberland Plain Woodland (meeting EPBC Act criteria).
- Removal of 1.38 hectares of Cumberland Plain Woodland inclusive of 0.89 hectares of Cumberland Plain Woodland (EPBC Act) combined with 0.17 hectares of Cumberland Plain Woodland – Derived Shrubland (TSC Act) and 0.32 hectares of Cumberland Plain Woodland – Derived Grassland (TSC Act).
- Reduction of 0.89 hectares of habitat for the Spiked Rice Flower (EPBC Act and TSC Act listed).
- Reduction of 1.38 hectares of habitat for the Cumberland Land Snail (TSC Act listed).
- Removal of one hollow-bearing tree (Key Threatening Process listed under the EPBC Act).

The minimisation, mitigation and avoidance of ecological impacts under the revised rezoning proposal combined with fulfilment of recommendations provided within this report will ensure that the majority of the ecological values of the study area are retained in perpetuity. In addition, the revised rezoning proposal has ensured that the loss of 0.89 hectares of Cumberland Plain Woodland (meeting EPBC Act criteria) is as minimal as possible, i.e. less than 1 hectare, therefore not likely to require further assessment under the EPBC Act. However, under the guise of the precautionary principle, a NSW Assessment of Significance (Appendix 4) and a Commonwealth Significant Impact Criteria assessment (Appendix 5) have concluded that there is an absence of significant impacts associated with the revised rezoning proposal. Based on these findings, it is our understanding that this flora and fauna assessment is adequate and no further assessment under the EPBC Act or TSC Act is required.

If the revised zoning proposal is not amenable to Federal, State or Local Government bodies as is, then Biosis recommends proceeding with Biodiversity Certification as the optimal alternative approval pathway which allows for long term positive environmental outcomes for the retention of biodiversity including threatened species, populations and ecological communities within the study area. Other alternative pathways include a Section 91 licence with accompanying SIS which will provide dispensation for the rezoning with conditional

approval but will not ensure the same long term positive environmental outcomes as Biodiversity Certification.

Table 8 Ecological values, impacts and recommendations

Ecological value (Figure 3)	Impacts	Recommendations		
		Avoid	Minimise and mitigate	Offset
Native vegetation including trees	1.38 hectares of native vegetation in total will be cleared as part of the revised rezoning proposal including the following TECs: • 0.89 hectares of Cumberland Plain Woodland (EPBC Act). • 0.17 hectares of the form of Cumberland Plain Woodland – Derived shrubland (TSC Act). • 0.32 hectares of Cumberland Plain Woodland – Derived Grassland (TSC Act).	Risk of impacts to the EEC Cumberland Plain Woodland can be managed by implementing appropriate safeguards to avoid, mitigate or offset projected impacts associated with alterations to land use resulting from rezoning, including: • Avoid clearing of Cumberland Plain Woodland if feasible. • Explore rezoning options which allow all patches of Cumberland Plain Woodland to be protected under an E2 – Environmental conservation zoning.	• Fence off patches of Cumberland Plain Woodland to be retained and mark as no-go zones. • Minimise the extent of clearing of Cumberland Plain Woodland as much as possible. • Minimise impacts from vegetation clearance and edge effects via revegetation using native species specific to Cumberland Plain Woodland of local provenance on the boundaries of all E2 – Environmental Conservation zoned areas as well as for street plantings, parklands and drainage line buffers within R1 – General residential areas.	• Undertake the Biodiversity Certification approval pathway using areas of Cumberland Plain Woodland to be zoned as E2 – Environmental Conservation as offsets.

Ecological value (Figure 3)	Impacts	Recommendations		
		Avoid	Minimise and mitigate	Offset
Threatened Species	1.38 hectares of Cumberland Plain Woodland is to be removed which decreases core habitat required for the Cumberland Plain Land Snail. 0.89 hectares of Cumberland Plain Woodland (EPBC Act) is to be removed which decreases core habitat required for the Spiked Rice-flower.	• Avoid clearing of Cumberland Plain Woodland if feasible. • Explore rezoning options which allow all patches of Cumberland Plain Woodland to be protected under an E2 – Environmental conservation zoning.	• Fence off patches of Cumberland Plain Woodland. • Minimise the extent of clearing of Cumberland Plain Woodland as much as possible. • Minimise impacts from vegetation clearance and edge effects via revegetation using native species specific to Cumberland Plain Woodland of local provenance on the edges of all E2 – Environmental Conservation zoned areas. • Relocate any individual populations of Spiked Rice-flower or Cumberland Plain Land Snail which are found within land rezoned as R1 – General residential and E2 – Environmental Conservation.	
Hollow-bearing tree removal	One hollow-bearing tree, a Forest Red Gum containing one medium sized hollow may potentially require removal under the revised rezoning proposal.	• Retain the hollow-bearing tree if possible by avoiding the need to clear vegetation by extending the E2-Environmental conservation to encompass it.	• If hollow-bearing tree removal cannot be avoided then removal must be done in the presence of a trained and qualified ecologist using the following procedure: • Tree must be knocked and then left at least 24 hours before each tree is removed and slowly lowered to the ground in stages. • Tree trunk containing the single hollow is to be cut and slowly lowered to the ground in stages. • Once on the ground, hollow tree limbs and/or the hollow within the trunk are to be inspected for resident fauna by the supervising ecologist before	N/A

Ecological value (Figure 3)	Impacts	Recommendations		
		Avoid	Minimise and mitigate	Offset
			being relocated to the E2 – Environmental Conservation zones for fauna habitat. • Any fauna found emerging from or within the tree hollow is to be given time to move off the site of its own free will or if unable to do so, Is to be assisted from the site by the supervising ecologist. • The impact of hollow-bearing tree removal is to be mitigated by the installation of a single nest box per hollow removed in the nearest tree.	
Waterways (creeks, dams, etc.)	Alterations to surface flow (increased sediment loads, increased velocity and volume of flow, increased erosion).	N/A	• Design rain gardens, detention basins, retention basins and vegetated drainage swales in any proposed residential development plan for land zoned R1 – General residential to ensure the maximum retention and diversion of stormwater. • Ensure appropriate sediment control measures are put in place so stormwater run-off does not result in indirect impacts to waterways and native plant communities, particularly EECs. • Creek banks and drainage areas to be revegetated with vegetation diagnostic of River-flat Eucalypt Forest associated species.	N/A
APZ	Potential modification of Cumberland Plain Woodland (EPBC Act), Cumberland Plain Woodland – Derived Shrubland (TSC Act), Cumberland Plain Woodland – Derived Grassland (TSC Act), River-	• Avoid clearing of native vegetation if feasible. • Ensure APZ remain within lot boundaries and do not extend into patches of native vegetation conserved within E2 – Environmental Conservation zones.	• Minimise the extent of clearing of native vegetation as much as possible. • Minimise impacts from vegetation clearance and edge effects via selective revegetation using fire resistant/fire retardant native species specific to Cumberland Plain Woodland of local provenance on the edges of all E2 – Environmental Conservation zoned areas.	N/A

Ecological value (Figure 3)	Impacts	Recommendations		
		Avoid	Minimise and mitigate	Offset
	flat Eucalypt Forest and native sedgeland patch boundaries resulting in increased edge effects, disrupted fire regime, altered ecosystem function (native sedgeland) alterations to species composition and structural integrity.	• Avoid placement of perimeter road within land zoned E2 – Environmental Conservation.		
Exotic species	Potential introduction of new exotic species and garden escapes into retained patches of Cumberland Plain Woodland.	• Ensure proposed future residential development is located as far away as possible from core sections of moderate quality Cumberland Plain Woodland to prevent garden escapes.	• Ensure future vegetation clearance associated with the R1 – General residential zoning does not facilitate an increase in exotic species by minimising the extent of disturbed ground in close proximity to Cumberland Plain Woodland and River-flat Eucalypt Forest. • Ensure all weed removal is based on manual control techniques in preference over chemical or mechanical control techniques as per Best Practice Guidelines.	• If land rezoned as E2 – Environmental conservation is retained as an offset under BCAM, ensure management activities in the form of weed control are conducted on a regular basis.
Noxious weeds	Potential increase in range, diversity and extent of noxious weeds declared by Camden Council LGA.	Ensure proposed future residential development is located as far away as possible from core sections of moderate quality Cumberland Plain Woodland to prevent the introduction of further noxious weeds.	• Control /dispose of noxious listed weeds as per Camden LGA and DPI requirements (Section 4.3). • Ensure future vegetation clearance associated with the R1 – General residential zoning does not facilitate an increase in noxious weed species by removing all noxious weed green waste to the nearest Green Waste Facility, SITA Spring Farm	• If land rezoned as E2 – Environmental conservation is retained as an offset under BCAM, ensure all noxious weeds are treated as per regulations

Ecological value (Figure 3)	Impacts	Recommendations		
		Avoid	Minimise and mitigate	Offset
			Resource Recovery Park (275 Richardson Road, Spring Farm, NSW, 2570).	within the *Noxious Weeds Act 1993*.

6 Conclusion

This report is an assessment of the potential impact of the revised rezoning proposal for future subdivision of lot 627 DP 1163903, Currans Hill with a view to permitting future development on the ecological values within the study area in accordance with the EP&A Act, the TSC Act and the EPBC Act.

The Proposed activities that will result in impacts to biodiversity including:

- Rezoning of land from E2 Environmental Conservation, E4 – Environmental Living and RU2 – Rural Landscape to R1 – General residential resulting in:
  - Removal of 0.89 hectares of Cumberland Plain Woodland (EPBC Act).
  - Removal of 0.49 hectares of Cumberland Plain Woodland (TSC Act) inclusive of 0.17 hectares of Cumberland Plain Woodland - Derived Shrubland and 0.32 hectares of Cumberland Plain Woodland – Derived Grassland.
  - Removal of 1.38 hectares of Cumberland Plain Land Snail habitat within the study area.
  - Removal of 0.89 hectares of Spiked Rice-flower habitat within the study area.
  - Removal of one hollow-bearing tree within the study area.
  - Altered surface flow resulting from increased area of impervious surfaces.
- Rezoning land from E4 – Environmental Living to SP2 – Infrastructure (0.45 hectares of Exotic Grassland not covered in this assessment).
- Potential indirect impacts to native vegetation retained in E2 – Environmental Conservation zones including: Cumberland Plain Woodland (EPBC Act), Cumberland Plain Woodland - Derived Shrubland (TSC Act), Cumberland Plain Woodland – Derived Grassland (TSC Act) and River-flat Eucalypt Forest (TSC Act) associated with establishment and maintenance of APZs.

No flora species or endangered populations listed under the EPBC Act or TSC Act were recorded during the field surveys.

For the reasons outlined in the Assessment of Significance, the revised rezoning proposal as currently designed is deemed to present no significant impact on the CEEC Cumberland Plain Woodland or the EEC River-flat Eucalypt Forest, this includes potential indirect impacts resulting from the establishment and maintenance of APZs. Were the proposal to go ahead a number of safeguards to avoid, minimize and mitigate the above impacts have been included in Table 8 of this report including detailed design recommendations, exclusion fencing and recommendations regarding weed control.

Subsequent to field investigations, the EPBC and TSC listed Spiked Rice-flower was determined to have a moderate likelihood of occurrence within the study area. No EPBC Act listed threatened fauna species were determined to have a moderate likelihood of occurrence within the study area, however, the Cumberland Plain Land Snail, listed under the TSC Act is considered to have a moderate likelihood of occurrence. Assessments of significance were carried out for the threatened flora and fauna species to which the proposal was considered likely to impact on limiting habitat resources. These assessments concluded the proposal is unlikely to have a significant impact on any TSC or EPBC Act listed flora or fauna species. Safeguards specific to the removal of threatened and general fauna species habitat have been included in Section 5 of this report, including supervision of habitat clearance (refer to Table 8 for full details regarding proposal safeguards).

In lieu of these findings, Biosis concludes that the revised rezoning proposal in its current state (14 December 2016) presents the most viable option for rezoning for future subdivision with a view towards permitting future development. This revised rezoning proposal allows for future residential development whilst ensuring that impacts to surrounding native biota are minimised as much as possible.

If the revised zoning proposal is not amenable to Federal, State or Local Government bodies as is, then Biosis recommends proceeding with Biodiversity Certification as the optimal alternative approval pathway which allows for long term positive environmental outcomes for the retention of biodiversity including threatened biota within the study area.

biosis

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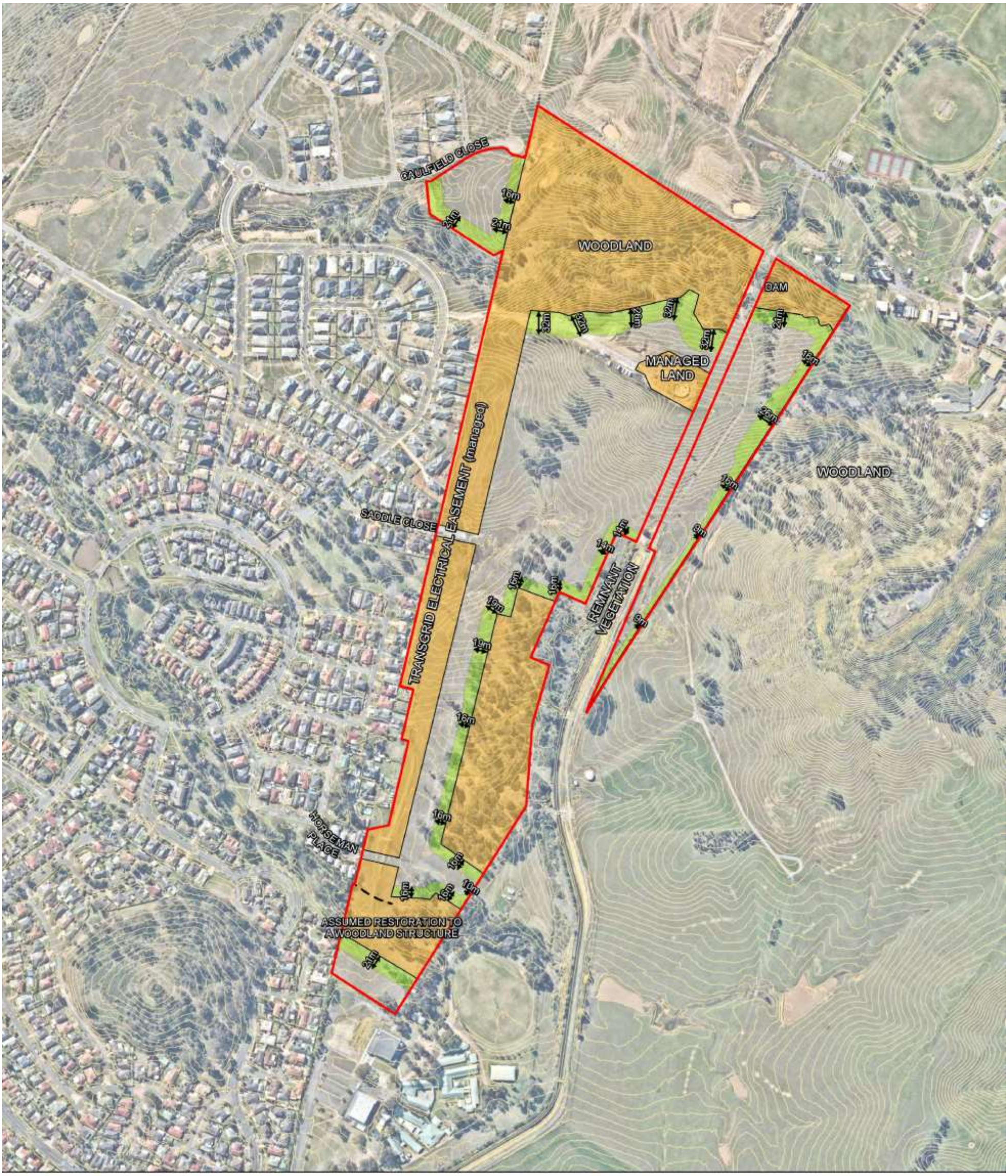
Appendices

Appendix 1 Figures: APZ plans, Proposed Zoning, Current Zoning and Proposed Layout 1 and 2



Legend

- Site boundary (source: LPI)
- Proposed rezoning - E2 Environmental Management
- Contours - 1m (source: LiDAR)
- Minimum Asset Protection Zone (APZ) (based on BAL29 construction)

Aerial source: Nearmap

Travers bushfire & ecology

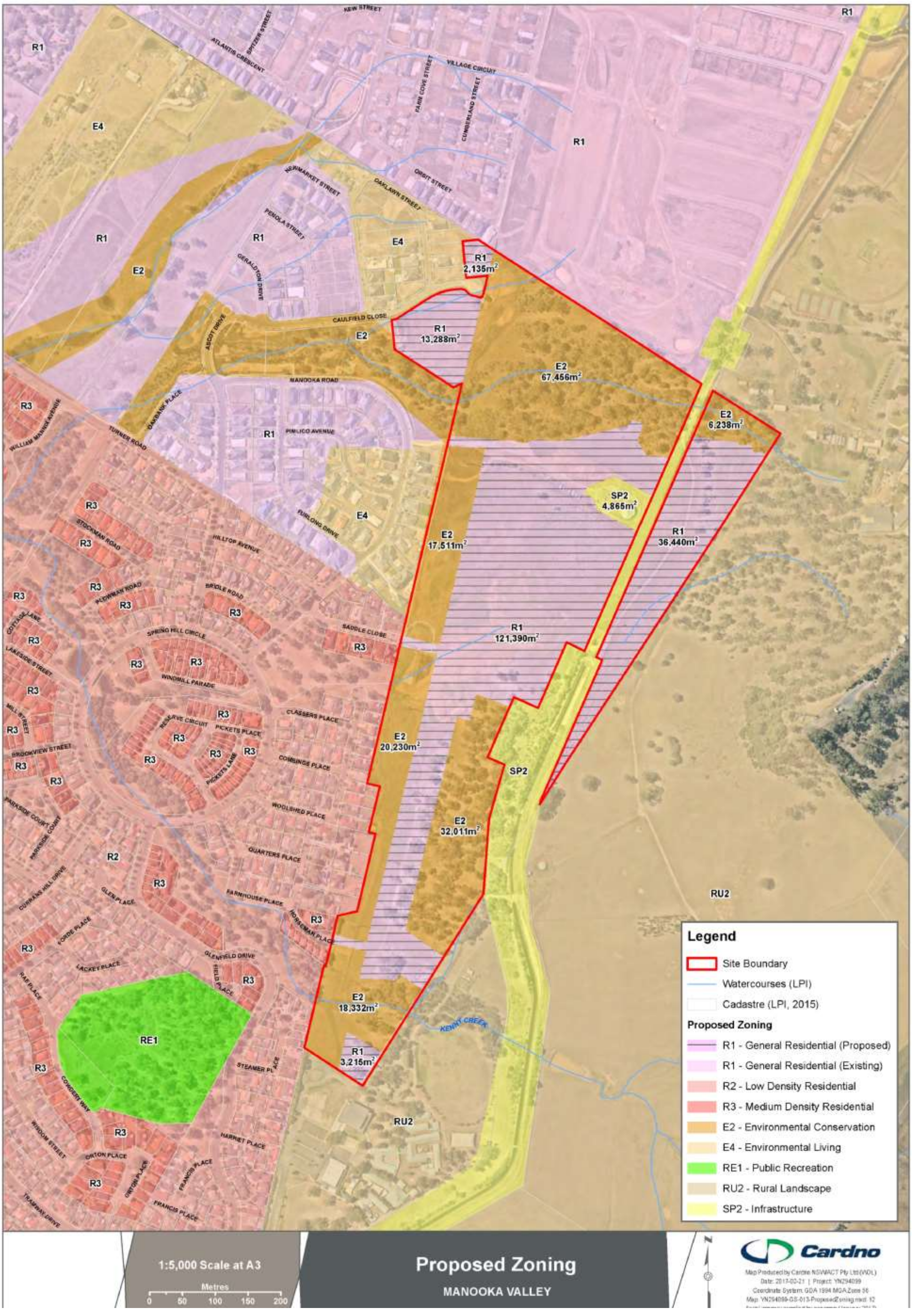
PROJECT & MXD REFERENCE	DATE & ISSUE NUMBER	SCALE & COORDINATE SYSTEM
Stage 3, Manooka Valley A16187_BF001	29/11/2016 Issue 1	1:5,000 @ A3 GDA 1994 MGA Zone 56

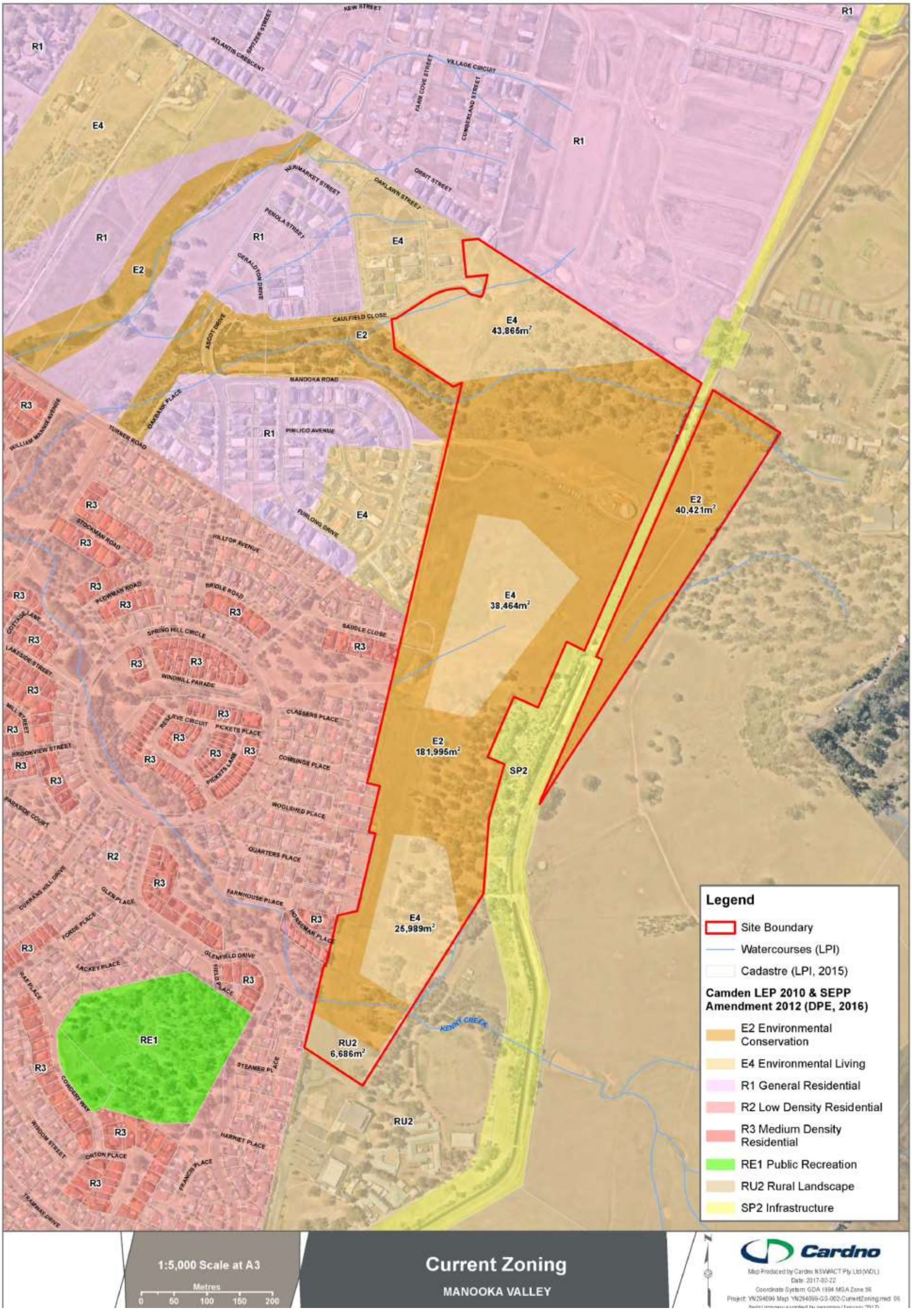
0 100 200 m

TITLE

Schedule 1 - Bushfire Protection Measures

Disclaimer: The mapping is indicative of available space and location of features which may prove critical in assessing the viability of the proposed works. Mapping has been produced on a map base with an inherent level of inaccuracy, the location of all mapped features are to be confirmed by a registered surveyor.


R1
E4
E2
R3
R2
RE1
RU2
SP2
R1 2,135m²
R1 13,288m²
E2 67,456m²
E2 6,238m²
SP2 4,865m²
E2 17,511m²
R1 36,440m²
R1 121,390m²
E2 20,230m²
E2 32,011m²
E2 18,332m²
R1 3,215m²
KEW STREET
ATLANTIS CRESCENT
SPITZER STREET
KAWI COVE STREET
VILLAGE CIRCUIT
CUMBERLAND STREET
NEWMARKET STREET
ORBIT STREET
OAKLAWN STREET
PENOLA STREET
GERALDTON DRIVE
CAULFIELD CLOSE
ASCOT DRIVE
MANOOKA ROAD
OAKBANK PLACE
WILLIAM MANNING AVENUE
TURNER ROAD
PIMLICO AVENUE
FURLONG DRIVE
STOCKMAN ROAD
HILLTOP AVENUE
PADDMAN ROAD
BRIDLE ROAD
SADDLE CLOSE
SPRING HILL CIRCLE
WINDMILL PARADE
COTTAGE LANE
LAKESIDE STREET
MILL STREET
BROOKVIEW STREET
PARKSIDE COURT
RESERVE CIRCUIT
PICKETS PLACE
PICKETS LANE
CLASSERS PLACE
COMBINGS PLACE
WOOLSHED PLACE
QUARTERS PLACE
FARMHOUSE PLACE
HORSEMAN PLACE
CURRANS HILL DRIVE
GLEN PLACE
FORDE PLACE
LACKEY PLACE
GLENFIELD DRIVE
FIELD PLACE
RAE PLACE
STEAMER PLACE
CONQUEST WAY
WISDOM STREET
ORTON PLACE
HARRIET PLACE
FRANCIS PLACE
TRAMWAY DRIVE
KENNY CREEK
Legend
Site Boundary
Watercourses (LPI)
Cadastre (LPI, 2015)
Proposed Zoning
R1 - General Residential (Proposed)
R1 - General Residential (Existing)
R2 - Low Density Residential
R3 - Medium Density Residential
E2 - Environmental Conservation
E4 - Environmental Living
RE1 - Public Recreation
RU2 - Rural Landscape
SP2 - Infrastructure
1:5,000 Scale at A3
Metres
0 50 100 150 200
Proposed Zoning
MANOOKA VALLEY
Cardno


KEW STREET
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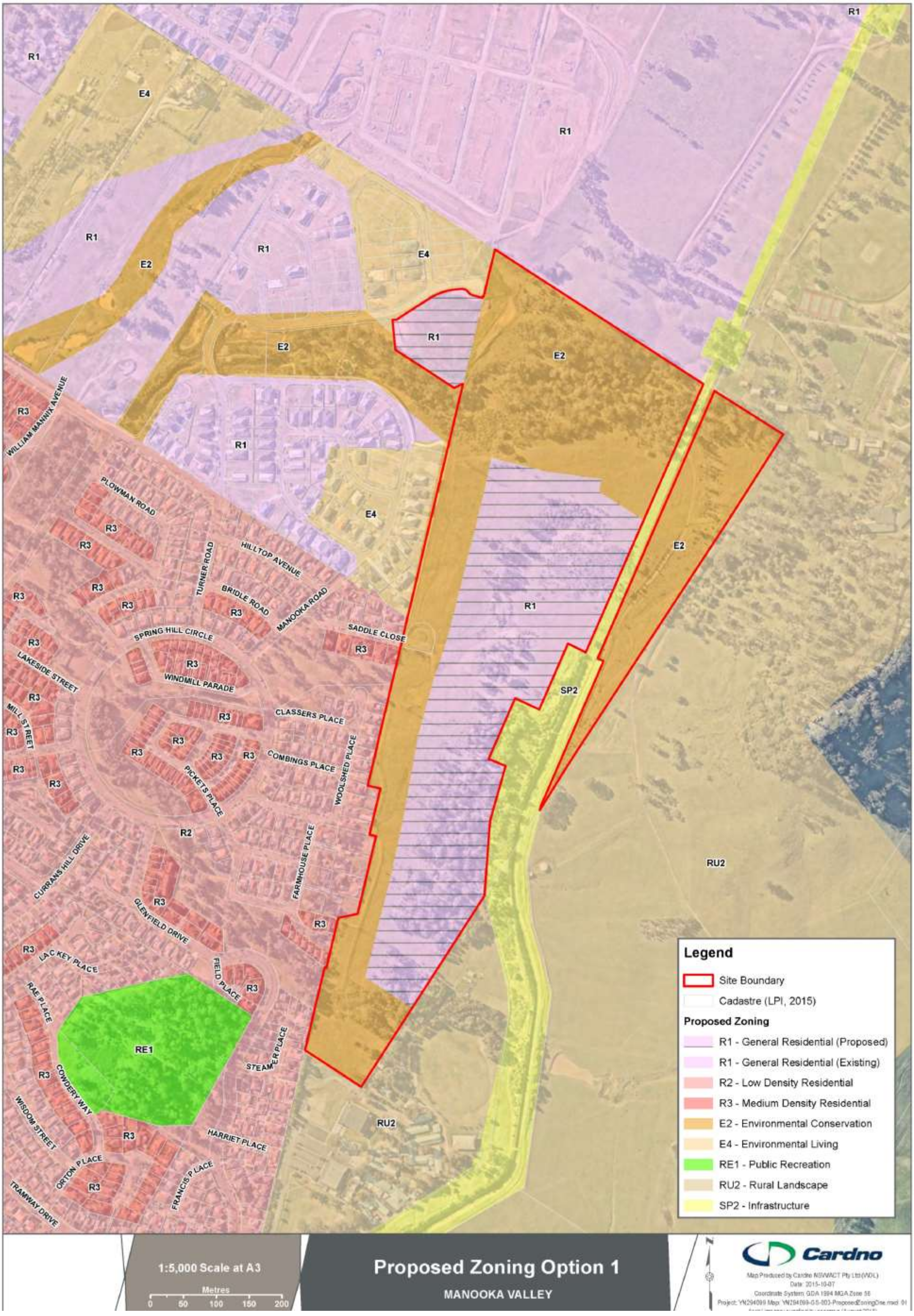
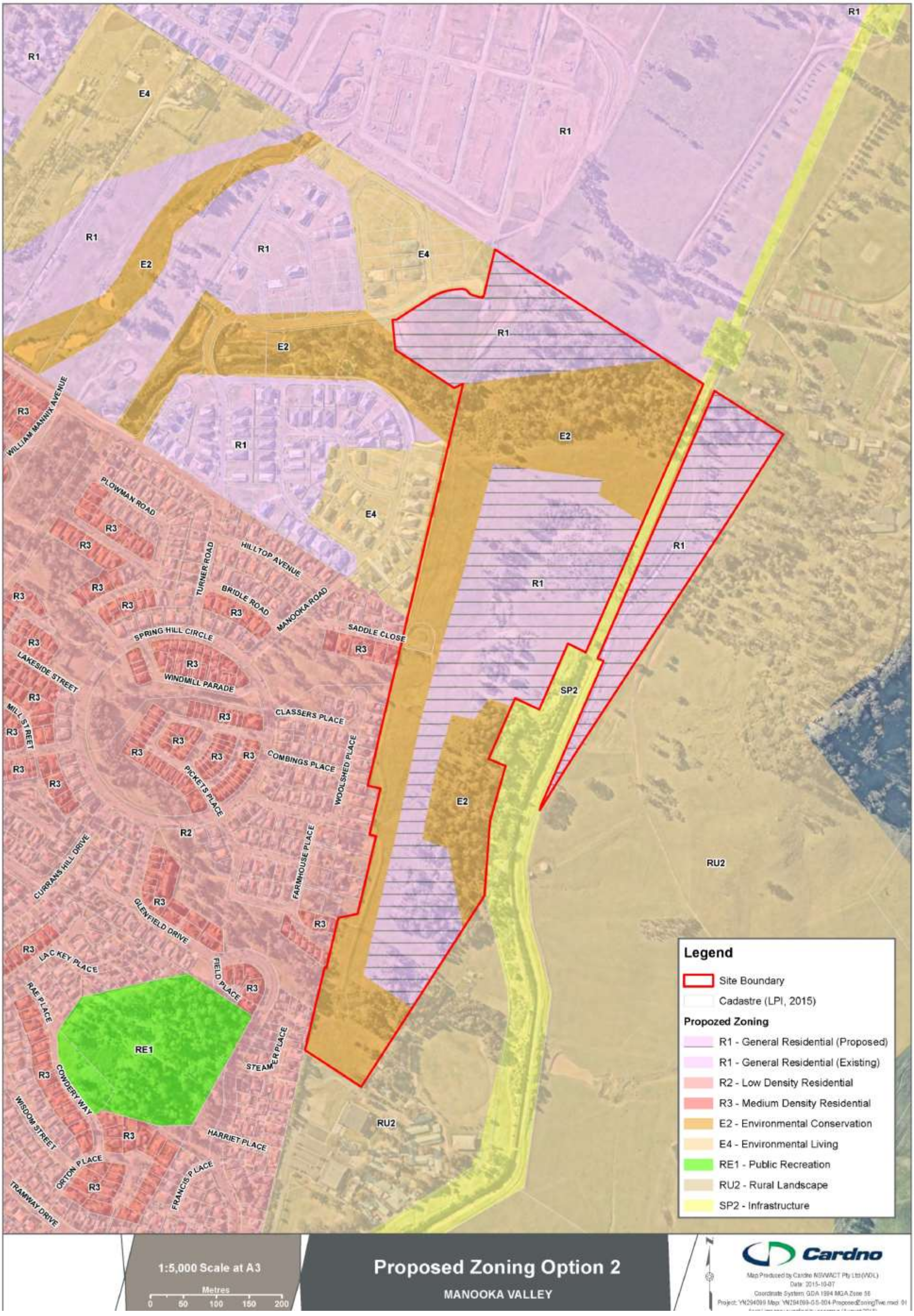
SPITZER STREET
PARK COVE STREET
VILLAGE CIRCUIT
CUMBERLAND STREET
NEWMARKET STREET
ORBIT STREET
OAKLAWN STREET
PENOLA STREET
GERALDTON DRIVE
CAULFIELD CLOSE
ASCOT DRIVE
MANOOKA ROAD
OAKBANK PLACE
PIMLICO AVENUE
FURLONG DRIVE
WILLIAM MANNIX AVENUE
TURNER ROAD
STOCKMAN ROAD
HILLTOP AVENUE
DRIOLE ROAD
SADDLE CLOSE
SPRING HILL CIRCLE
WINDMILL PARADE
COTTAGE LANE
LAKESIDE STREET
MILL STREET
BROOKVIEW STREET
PARKSIDE COURT
RESERVE CIRCUIT
PICKETS PLACE
PICKETS LANE
CLASSERS PLACE
COMBINGE PLACE
WOOLSHED PLACE
QUARTERS PLACE
CURRANS HILL DRIVE
GLEN PLACE
FARMHOUSE PLACE
HORSEMAN PLACE
PORDE PLACE
LACKEY PLACE
GLENFIELD DRIVE
FIELD PLACE
RAE PLACE
COWDERY WAY
STEAMER PLACE
WISDOM STREET
ORTON PLACE
HARRIET PLACE
FRANCIS PLACE
TRAMWAY DRIVE
KENNY CREEK
R1
R2
R3
E2
E4
RE1
RU2
SP2
E4
43,865m²
E2
40,421m²
E4
38,464m²
E2
181,995m²
E4
25,989m²
RU2
6,686m²
Legend
Site Boundary
Watercourses (LPI)
Cadastre (LPI, 2015)
Camden LEP 2010 & SEPP Amendment 2012 (DPE, 2016)
E2 Environmental Conservation
E4 Environmental Living
R1 General Residential
R2 Low Density Residential
R3 Medium Density Residential
RE1 Public Recreation
RU2 Rural Landscape
SP2 Infrastructure
1:5,000 Scale at A3
Metres
0 50 100 150 200
Current Zoning
MANOOKA VALLEY
Cardno
Map Produced by Cardno NSW/ACT Pty Ltd (MDL)
Date: 2017-02-22
Coordinate System: GDA 1994 MGA Zone 56

ORD05

Attachment 2




R1
E4
R1
R1
E2
R1
E4
R1
E2
R3
WILLIAM MANNIX AVENUE
R1
E2
E4
PLOWMAN ROAD
R3
R3
TURNER ROAD
HILLTOP AVENUE
R3
R3
BRIDLE ROAD
MANOOKA ROAD
R3
SADDLE CLOSE
SPRING HILL CIRCLE
R3
R3
LAKESIDE STREET
WINDMILL PARADE
R3
R3
CLASSERS PLACE
MILL STREET
R3
R3
R3
R3
COMBINGS PLACE
WOOLSHED PLACE
R3
R3
PICKETS PLACE
R2
CURRANS HILL DRIVE
FARMHOUSE PLACE
R3
GLENFIELD DRIVE
R3
R3
LACKEY PLACE
FIELD PLACE
R3
RAE PLACE
RE1
STEAMER PLACE
R3
COWDERY WAY
WISDOM STREET
R3
HARRIET PLACE
ORTON PLACE
R3
FRANCIS PLACE
TRAMWAY DRIVE
R1
R1
SP2
E2
RU2
RU2
Legend
Site Boundary
Cadastre (LPI, 2015)
Propozed Zoning
R1 - General Residential (Proposed)
R1 - General Residential (Existing)
R2 - Low Density Residential
R3 - Medium Density Residential
E2 - Environmental Conservation
E4 - Environmental Living
RE1 - Public Recreation
RU2 - Rural Landscape
SP2 - Infrastructure
1:5,000 Scale at A3
Metres
0 50 100 150 200
Proposed Zoning Option 2
MANOOKA VALLEY
Cardno
Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2015-10-07
Coordinate System: GDA 1994 MGA Zone 56

Appendix 2 Flora

A2.1 Flora species recorded from the study area

Notes to tables:

EPBC Act: EX - Extinct CR – Critically Endangered EN – Endangered VU – Vulnerable	**TSC Act:** E1 – endangered species (Part 1, Schedule 1) E2 – endangered population (Part 2, Schedule 1) E4 – presumed extinct (Part 4, Schedule 1) E4A – critically endangered V1 – vulnerable (Part 1, Schedule 2) *Codes identify the Legal Status of threatened biota within NSW under the TSC Act and the OEH Sensitive Species Data Policy (SSDP).*
Non-indigenous species # – native species outside natural range ** – noxious weed species declared under the Noxious Weeds Act	**Noxious weed status:** State prohibited species (Class 1) Regionally prohibited species (Class 2) Regionally controlled species (Class 3) Regionally restricted species (Class 4) Restricted plant (Class 5)

Table A.1 Flora species recorded from the study area

Status	Scientific Name	Common Name	Cumberland Plain Woodland	River-flat Eucalypt Forest	Derived Grassland	Derived Shrubland	Exotic Grass-land	Native Sedge-land
Native species								
	Abutilon oxycarpum	Straggly Lantern-bush	X					
	Acacia implexa	Hickory Wattle	X		X			
	Acacia parramattensis	Parramatta Wattle			X			
	Angophora floribunda	Rough-barked Apple	X					
	Aristida ramosa	Purple Wiregrass	X	X		X	X	
	Asperula conferta	Common Woodruff	X			X		
	Austrostipa ramosissima	Stout Bamboo Grass		X				
	Austrostipa rudis				X	X		

Status	Scientific Name	Common Name	Cumberland Plain Woodland	River-flat Eucalypt Forest	Derived Grassland	Derived Shrubland	Exotic Grass-land	Native Sedge-land
	Bothriochloa macra	Red Grass	X		X	X	X	
	Brunoniella australis	Blue Trumpet	X	X				
	Bursaria spinosa	Native Blackthorn	X		X	X	X	
	Carex appressa	Tall Sedge	X	X				X
	Centaurium spicatum	Spike Centaury	X	X	X	X	X	
	Cheilanthes sieberi	Rock Fern			X			
	Chloris truncata	Windmill Grass	X	X	X			
	Chloris ventricosa	Tall Chloris		X	X			
	Clematis glycinoides	Headache Vine	X	X				
	Clerodendrum tomentosum	Hairy Clerodendrum	X					
	Commelina cyanea	Native Wandering Jew	X	X				
	Convolvulus erubescens	Pink Bindweed				X	X	
	Cymbopogon refractus	Barbed Wire Grass	X					
#	*Cynodon dactylon*	Common Couch			X	X	X	X
	Cyperus gracilis	Slender Flat-sedge	X		X			
	Desmodium rhytidophyllum		X		X			
	Desmodium varians	Slender Tick-trefoil	X	X		X		
	Dianella longifolia	Blueberry Lily			X			

Status	Scientific Name	Common Name	Cumberland Plain Woodland	River-flat Eucalypt Forest	Derived Grassland	Derived Shrubland	Exotic Grass-land	Native Sedge-land
	Dichelachne micrantha	Shorthair Plumegrass	X		X	X	X	
	Dichondra repens	Kidney Weed		X		X		
	Echinopogon caespitosus	Bushy Hedgehog-grass	X	X		X		
	Einadia hastata	Berry Saltbush	X					
	Einadia nutans	Climbing Saltbush	X		X			
	Einadia polygonoides	Knotweed Goosefoot	X		X			
	Einadia trigonos	Fishweed	X		X			
	Eleocharis sphacelata	Tall Spike Rush						X
	Elymus scaber	Common Wheatgrass			X			
	Epilobium billardiereanum subsp. *cinereum*					X		
	Eragrostis leptostachya	Paddock Lovegrass	X		X			
	Eremophila debilis	Amulla			X			
	Eriochloa pseudoacrotricha	Early Spring Grass	X	X				
	Eucalyptus crebra	Narrow-leaved Ironbark	X					
	Eucalyptus moluccana	Grey Box	X	X	X			
	Eucalyptus tereticornis	Forest Red Gum	X					
	Euchiton sphaericus	Star Cudweed	X		X			
	Fimbristylis dichotoma	Common Fringe-sedge						X
	Geranium solanderi	Native Geranium				X		

Status	Scientific Name	Common Name	Cumberland Plain Woodland	River-flat Eucalypt Forest	Derived Grassland	Derived Shrubland	Exotic Grass-land	Native Sedge-land
	Glycine clandestina	Twining glycine		X	X			
	Glycine microphylla	Small-leaf Glycine	X	X	X	X		
	Glycine tabacina	Variable Glycine	X	X	X			
	Hypericum gramineum	Small St John's Wort				X	X	
	Juncus usitatus		X	X			X	X
	Kennedia rubicunda	Dusky Coral Pea		X				
	Melaleuca styphelioides	Prickly-leaved Tea Tree	X	X				
	Mentha diemenica	Slender Mint	X					
	Microlaena stipoides	Weeping Grass	X	X	X	X	X	
	Nyssanthes erecta			X				
	Oxalis perennans				X			
	Panicum simile	Two-colour Panic		X				
	Persicaria hydropiper	Water Pepper						X
	Phyllanthus virgatus	Wiry Spurge			X			
	Plectranthus parviflorus			X		X		
	Rubus parvifolius	Native Raspberry		X				
	Rumex brownii	Swamp Dock		X				
	Rytidosperma racemosum	Wallaby Grass	X	X	X	X		
	Sida corrugata	Corrugated Sida	X		X			
	Sigesbeckia orientalis subsp. *orientalis*	Indian Weed		X				

Status	Scientific Name	Common Name	Cumberland Plain Woodland	River-flat Eucalypt Forest	Derived Grassland	Derived Shrubland	Exotic Grass-land	Native Sedge-land
	Solanum campanulatum		X					
	Solanum prinophyllum	Forest Nightshade	X	X				
	Solanum pungetium	Eastern Nightshade	X		X			
	Stackhousia viminea	Slender Stackhousia				X		
	Themeda australis	Kangaroo Grass	X		X	X	X	
	Wahlenbergia gracilis	Sprawling Bluebell		X				
Exotic species								
	Agapanthus praecox	Agapanthus		X				
	Agrostis capillaris	Browntop Bent			X			
	Anagallis arvensis	Scarlet Pimpernel	X		X	X		
**	*Araujia sericifera*	Moth Vine	X	X				
**	*Argemone ochroleuca* subsp. *ochroleuca*	Mexican Poppy	X				X	
	Briza minor	Shivery Grass			X	X	X	
	Briza subaristata		X		X	X	X	
	Bromus catharticus	Prairie Grass		X			X	
	Chloris virgata	Feathertop Rhodes Grass	X					
	Cirsium vulgare	Spear Thistle	X	X			X	
	Conyza bonariensis	Fleabane	X	X				
	Cyclospermum leptophyllum	Slender Celery	X					
	Cyperus eragrostis	Umbrella	X					X

Status	Scientific Name	Common Name	Cumberland Plain Woodland	River-flat Eucalypt Forest	Derived Grassland	Derived Shrubland	Exotic Grass-land	Native Sedge-land
		Sedge						
	Dactylis glomerata	Cocksfoot	X	X	X	X	X	
	Ehrharta erecta	Panic Veldtgrass		X				
	Eragrostis pilosa	Soft Lovegrass			X			
	Euphorbia peplus	Petty Spurge		X				
	Foeniculum vulgare	Fennel						
	Gamochaeta americana	Cudweed			X		X	
	Gamochaeta calviceps	Cudweed		X				
	Holcus lanatus	Yorkshire Fog			X			
**	*Hypericum perforatum*	St. Johns Wort	X		X	X	X	
	Hypochaeris radicata	Catsear	X	X		X		
	Lactuca serriola	Prickly Lettuce		X				
**	*Lantana camara*	Lantana		X				
**	*Ligustrum sinense*	Small-leaved Privet		X				
	Linum trigynum	French Flax			X		X	
	Lolium perenne	Perennial Ryegrass		X			X	X
**	*Lycium ferocissimum*	African Boxthorn	X	X	X		X	
	Modiola caroliniana	Red-flowered Mallow	X	X			X	
**	*Nassella neesiana*	Chilean Needle Grass					X	
	Olea europaea subsp. *cuspidata*	African Olive	X	X	X	X	X	

Status	Scientific Name	Common Name	Cumberland Plain Woodland	River-flat Eucalypt Forest	Derived Grassland	Derived Shrubland	Exotic Grass-land	Native Sedge-land
	Oxalis corniculata	Creeping Oxalis	X		X			
	Paspalum dilatatum	Paspalum			X			
	Paspalum urvillei	Vasey Grass						X
	Passiflora caerulea	Blue Passionflower		X				
	Pennisetum clandestinum	Kikuyu Grass	X					
	Phalaris aquatica	Phalaris					X	X
	Phytolacca octandra	Inkweed		X				
	Plantago lanceolata	Lamb's Tongues		X	X	X	X	
	Poa spp.		X					
**	*Rosa rubiginosa*	Sweet Briar			X	X		
**	*Rubus fruticosus* sp. agg.	Blackberry complex		X				
	Rumex obtusifolius	Broadleaf Dock						X
	Schinus molle		X					
**	*Senecio madagascariensis*	Fireweed	X		X	X	X	
	Sida rhombifolia	Paddy's Lucerne	X	X		X	X	
	Solanum nigrum	Black-berry Nightshade			X			
	Sonchus oleraceus	Common Sowthistle	X		X			
	Sporobolus africanus	Parramatta Grass			X	X		
	Taraxacum officinale	Dandelion				X		X
	Trifolium	Hop Clover			X			

Status	Scientific Name	Common Name	Cumberland Plain Woodland	River-flat Eucalypt Forest	Derived Grassland	Derived Shrubland	Exotic Grass-land	Native Sedge-land
	campestre							
	Trifolium repens	White Clover	X	X			X	
	Verbena bonariensis	Purpletop	X	X	X	X	X	
	Verbena hispida	Rough Verbena	X		X	X	X	
	Polycarpon spp.	Four-leaved Allseed	X					

A2.2 Threatened flora species

The following table includes a list of the threatened flora species that have potential to occur within the study area and surrounding locality. The list of species is sourced from the NSW BioNet Wildlife Atlas and the Protected Matters Search Tool (DoE; accessed on 30/11/2015).

Examples of criteria for determining the likelihood of occurrence for threatened biota as a guide for writing the rationale for likelihood have been listed below.

Notes to table:

#	species predicted to occur by the DoE database (not recorded on other databases)
##	species predicted to occur based on natural distributional range and suitable habitat despite lack of records in the databases searched
Year	recorded on database listed above

Likelihood of occurrence	Potential criteria
High	• Species recorded in study area during current or previous assessment/s. • Aquatic species recorded from connected waterbodies in close proximity to the study area during current or previous assessment/s. • Sufficient good quality habitat is present in study area or in connected waterbodies in close proximity to the study area (aquatic species). • Study area is within species natural distributional range (if known). • Species has been recorded within 5 kilometres or from the relevant catchment/basin.
Medium	• Records of terrestrial biota within 5 kilometres of the study area or of aquatic species in the relevant basin/neighbouring basin. • Habitat limited in its capacity to support the species due to extent, quality, or isolation.
Low	• No records within 5 kilometres of the study area or for aquatic species, the relevant basin/neighbouring basin. • Marginal habitats present (low quality & extent). • Substantial loss of habitat since any previous record(s).
Negligible	• Habitat not present in study area. • Habitat for aquatic species not present in connected waterbodies in close proximity to the study area. • Habitat present but sufficient targeted survey has been conducted at an optimal time of year and species wasn't recorded.

Table A.2 Threatened flora species recorded, or predicted to occur, within 5 kilometres of the study area

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in subject site	Rationale for likelihood ranking	Habitat description*
		EPBC	TSC					
Allocasuarina glareicola		EN	E1	#		Low	Marginal habitat present in study area (low quality and extent) and no recent records.	Small, depauperate shrub restricted to a few populations in the Richmond district with an outlier population at Voyager Point in Liverpool. Grows in Castlereagh Woodlands, Cumberland Dry Sclerophyll Forest, Sydney Hinterland Dry Sclerophyll Forest, Sydney Sand Flats Dry Sclerophyll Forests. Grows in lateritic soil.
Cynanchum elegans	White-flowered Wax Plant	EN	E1	#		Negligible	Suitable habitat not present in study area and no recent records.	Climbing vine restricted to eastern NSW from Brunswick Heads to Gerroa in the Illawarra region. Grows in rainforest gully scrub and scree slope on the edge of dry rainforests in a variety of communities including Coastal Floodplain Wetlands, Maritime Grasslands, Coastal Valley Grassy Woodlands and Northern Hinterland Wet Sclerophyll Forests.
Eucalyptus scoparia	Wallangarra White Gum	VU	E1	2010		Negligible	Suitable habitat not present in study area.	Small tree restricted to three populations near Tenterfield including within Bald Rock National Park. Grows on rocky outcrops, hilltops and slopes in a variety of communities including New England Dry Sclerophyll Forests, Tableland Clay Grassy Woodlands, Northern Tableland Wet Sclerophyll Forests and Northern Escarpment Dry Sclerophyll Forests. Grows on granite or rhyolite substrates in well drained soils.
Genoplesium baueri	Bauer's Midge Orchid	EN	E1	1967#		Negligible	Suitable habitat not present in	Terrestrial orchid with 13 populations totalling 200 plants distributed between Ulladulla and Port Stephens. Grows on moss gardens in a variety of communities including

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in subject site	Rationale for likelihood ranking	Habitat description*
		EPBC	TSC					
							study area and no recent records.	Sydney Coastal Dry sclerophyll Forests, Sydney Coastal Heaths, Sydney Montane Heaths, Southern Lowland Wet Sclerophyll Forests and Sydney Hinterland Dry Sclerophyll Forests. Grows on sandstone substrates
Haloragis exalata* subsp. *exalata	Square Raspwort	VU	V	#		Low	Marginal habitat present in study area (low quality and extent) and no recent records.	Small to medium sized shrub found growing in four widely scattered locations in eastern NSW including the central coast, south coast and north western slopes. Grows in damp, protected and shaded areas in riparian zones in a variety of communities including South East Dry Sclerophyll Forests, Coastal Floodplain Wetlands, Montane Bogs and Fens and Northern Warm Temperate Rainforests.
Marsdenia viridiflora* subsp. *viridiflora	Native Pear		E2	2015		Low	Marginal habitat present in study area (low quality and extent).	Slender climber with twining stems with a scattered distribution within the Prospect, Bankstown, Smithfield, Cabramatta Creek, St Mary's and north from Razorback Range. Grows in vine thickets and open shale woodland in a variety of communities including Cumberland Dry Sclerophyll Forests, Coastal Floodplains Wetlands, Coastal Valley Grassy Woodlands and Dry Rainforests.
Pimelea spicata	Spiked Rice-flower	EN	E1	2015#		Moderate	Potential habitat present in study area. Habitat limited in its capacity to support the species due to extent, quality	Small erect or spreading shrub with populations occurring in two disjunct areas, one occurring on the Cumberland Plain from Marayong and Prospect Reservoir south to Narellan and Douglas Park, and the other occurring in the Illawarra from Landsdowne to Shellharbour and north Kiama. Grows in Maritime Grasslands and Coastal Valley Grassy Woodlands including Cumberland Plain Woodlands and Moist Shale Woodlands within the Cumberland Basin and in Coast Banksia Open Woodland Coastal Grasslands

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in subject site	Rationale for likelihood ranking	Habitat description*
		EPBC	TSC					
							and isolation.	in the Illawarra region. Grows on well structured clay soils.
Pomaderris brunnea	Brown Pomaderris	VU	E1	2007#		Low	Marginal habitat present in study area (low quality and extent).	Medium sized shrub with a distribution limited to the area around the Colo, Nepean and Hawkesbury Rivers including the Bargo area and near Camden. Grows on floodplains and creeklines in a variety of communities including Sydney Hinterland Dry Sclerophyll Forests, Central Gorge Dry Sclerophyll Forests, Coastal Floodplain Wetlands, Coastal Valley Grasslands and North Coast Wet Sclerophyll Forests. Grows in clay and alluvial soils.
Pterostylis saxicola	Sydney Plains Greenhood	EN	E1	#		Negligible	Suitable habitat not present in study area and no recent records.	Deciduous terrestrial orchid restricted to a few small populations located in Western Sydney between Freemans Reach in the north and Picton in the south including Georges River National Park. Found growing near streams in depression on sandstone rock shelves above cliff lines faces, moist, sheltered ridges and creek banks on mossy rocks in Temperate Montane Grasslands, Northern Warm Temperate Rainforests, Southern Warm Temperate Rainforests and Southern Tableland Wet Sclerophyll Forests. Grows in small pockets of shallow shale or shale/sandstone transition soils over sandstone substrates.
Thesium australe	Austral Toadflax	VU	V	#		Low	Marginal habitat present in study area (low quality and extent) and no recent records.	Small, straggling herb with a distribution comprising of small populations scattered along the coast of eastern NSW including the Northern and Southern Tablelands, Tasmania, Queensland and eastern Asia. A root parasite found growing on damp sites in grassland, Grassy Woodlands and coastal headlands often in association with Kangaroo Grass *Themeda triandra* in a variety of communities including New England Dry Sclerophyll

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in subject site	Rationale for likelihood ranking	Habitat description*
		EPBC	TSC					
								Forests, Western Slopes Grasslands, Northern Tableland Wet Sclerophyll Forests, Brigalow Clay Plain Woodlands, Subalpine Woodlands and Maritime Grasslands.

* - habitat descriptions have been adapted by qualified ecologists from the DEE Species Profile and Threats (SPRAT) Database, OEH Threatened Species online profiles and the NSW Scientific Committee final determinations for listed species, references within the above table are provided within the report reference list.

Appendix 3 Fauna

A3.1 Fauna species recorded from the study area

Notes to table:

EPBC Act:
EX - Extinct
CR - Critically Endangered
EN - Endangered
VU – Vulnerable
M - Migratory
CD - Conservation dependent

TSC Act:	**FM Act:**
C1 – critically endangered	C1 – critically endangered
E1 – endangered species (Part 1, Schedule 1)	E1 – endangered
E2 – endangered population (Part 2, Schedule 1)	E2 – endangered
E4 – presumed extinct (Part 4, Schedule 1)	E4 – presumed extinct
V1 – vulnerable (Part 1, Schedule 2)	V1 – vulnerable

* - introduced species

Table A.3 Vertebrate fauna recorded from the study area

Status	Scientific name	Common name
Birds		
	Corvus coronoides	Australian Raven
	Cracticus tibicen	Australian Magpie
	Manorina melanocephala	Noisy Miner
	Strepera graculina	Pied Currawong
*	*Cracticus tibicen*	Magpie
	Grallina cyanoleuca	Magpie Lark
	Corvus coronoides	Australian Raven
	Cacatua galerita	Sulphur-crested Cockatoo
	Eolophus roseicarpillus	Galah
	Trichoglossus haematodus	Rainbow Lorikeet
*	*Sturnus tristis*	Common Myna
	Manorina melanocephala	Noisy Miner
	Platycerus eximius	Eastern Rosella
	Falco cenchroides	Nankeen Kestrel

Status	Scientific name	Common name
*	*Streptopelia senegalensis*	Spotted Turtle Dove
	Macropus robustus	Common Wallaroo
	Anthochaera chrysoptera	Little Wattlebird
Mammals		
*	*Oryctolagus cuniculus*	European Rabbit
*	*Vulpes vulpes*	Fox
Amphibians		
	Limnodynastes peronii	Striped Marsh Frog
	Crinia signifera	Common Eastern Froglet
	Litoria dentata	Bleating Tree Frog

A3.2 Threatened fauna species

The following table includes a list of the significant fauna species that have potential to occur within the study area and surrounding locality. The list of species is sourced from the NSW BioNet Wildlife Atlas, BirdLife Australia data search and the Protected Matters Search Tool (DoE; accessed on 30/11/2015).

Notes to table:

#	species predicted to occur by the DoE database (not recorded on other databases)
##	species predicted to occur based on natural distributional range and suitable habitat despite lack of records in the databases searched
Year	recorded on databases listed above

Likelihood of occurrence	Potential criteria
High	• Species recorded in study area during current or previous assessment/s. • Aquatic species recorded from connected waterbodies in close proximity to the study area during current or previous assessment/s. • Sufficient good quality habitat is present in study area or in connected waterbodies in close proximity to the study area (aquatic species). • Study area is within species natural distributional range (if known). • Species has been recorded within 5 kilometres or from the relevant catchment/basin.
Medium	• Records of terrestrial species within 5 kilometres of the study area or of aquatic species in the relevant basin/neighbouring basin. • Habitat limited in its capacity to support the species due to extent, quality, or isolation.
Low	• No records within 5 kilometres of the study area or for aquatic species, the relevant basin/neighbouring basin. • Marginal habitats present (low quality & extent). • Substantial loss of habitat since any previous record(s).
Negligible	• Habitat not present in study area • Habitat for aquatic species not present in connected waterbodies in close proximity to the study area. • Habitat present but sufficient targeted survey has been conducted at an optimal time of year and species wasn't recorded.
Transient/ Nomadic	• Migratory or nomadic fauna species/individuals that may occur in the study area from time to time, but are not considered resident.

Table A.4 Threatened fauna species recorded, or predicted to occur, within 5 kilometres of the study area

Scientific name	Common name	Conservation status		Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	TSC				
Mammals							
Chalinolobus dwyeri	Large-eared Pied Bat	VU	V	#	Negligible	Suitable roosting habitat not present in study area and no recent records.	Occurs from the Queensland border to Ulladulla, with largest numbers from the sandstone escarpment country in the Sydney Basin and Hunter Valley. Primarily found in dry sclerophyll forests and woodlands, but also found in rainforest fringes and subalpine woodlands. Forages on small, flying insects below the forest canopy. Roosts in colonies of between three and 80 in caves, Fairy Martin nests and mines, and beneath rock overhangs, but usually less than 10 individuals. Likely that it hibernates during the cooler months. The only known existing maternity roost is in a sandstone cave near Coonabarabran.
Dasyurus maculatus	Spotted-tailed Quoll	EN	V	#	Low	Marginal habitat present in study area (low quality and extent) and no recent records.	Occurs along the east coast of Australia and the Great Dividing Range. Uses a range of habitats including sclerophyll forests and woodlands, coastal heathlands and rainforests. Occasional sightings have been made in open country, grazing lands, rocky outcrops and other treeless areas. Habitat requirements include suitable den sites, including hollow logs, rock crevices and caves, an abundance of food and an area of intact vegetation in which to forage.
Falsistrellus tasmaniensis	Eastern False Pipistrelle		V	2005	Low	Marginal habitat present in study area (low quality and extent).	Distribution extending east of the Great Dividing Range throughout the coastal regions of NSW, from the Queensland border to the Victorian border. Prefers wet high-altitude sclerophyll and coastal mallee habitat, preferring wet forests with a dense understorey but being found in open forests at lower altitudes. Roosts in tree hollows and sometimes in

Scientific name	Common name	Conservation status		Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	TSC				
							buildings in colonies of between 3 and 80 individuals. Often change roosts every night.
Mormopterus norfolkensis	Eastern Freetail-bat		V	2007	Low	Marginal habitat present in study area (low quality and extent).	Distribution extends east of the Great Dividing Range from southern Queensland to south of Sydney. Most records are from dry eucalypt forests and woodland. Individuals tend to forage in natural and artificial openings in forests, although it has also been caught foraging low over a rocky river within rainforest and wet sclerophyll forest habitats. The species generally roosts in hollow spouts of large mature eucalypts (including paddock trees), although individuals have been recorded roosting in the roof of a hut, in wall cavities, and under metal caps of telegraph poles. Foraging generally occurs within a few kilometres of roosting sites.
Myotis macropus	Southern Myotis		V	2005	Low	Marginal habitat present in study area (low quality and extent).	Scattered, mainly coastal distribution extending to South Australia along the Murray River. Roosts in caves, mines or tunnels, under bridges, in buildings, tree hollows, and even in dense foliage. Colonies occur close to water bodies, ranging from rainforest streams to large lakes and reservoirs. They catch aquatic insects and small fish with their large hind claws, and also catch flying insects.
Petrogale penicillata	Brush-tailed Rock-wallaby	VU	E1	#	Low	Marginal habitat present in study area (low quality and extent) and no recent records.	Occurs along the Great Dividing Range south to the Shoalhaven, and also occurs in the Warrumbungles and Mt Kaputar. Habitats range from rainforest to open woodland. It is found in areas with numerous ledges, caves and crevices, particularly where these have a northerly aspect. Individuals defend a specific rock shelter, emerging in the evening to forage on grasses and forbs, as well as browse in drier months.

Scientific name	Common name	Conservation status		Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	TSC				
Phascolarctos cinereus	Koala	VU	V	2002#	Low	Marginal habitat present in study area (low quality and extent).	In NSW the Koala mainly occurs on the central and north coasts with some populations in the western region. Koalas feed almost exclusively on eucalypt foliage, and their preferences vary regionally. Primary feed trees include *Eucalyptus robusta, E. tereticornis, E. punctata, E. haemostoma* and *E. signata*. They are solitary with varying home ranges.
Pseudomys novaehollandiae	New Holland Mouse	VU		#	Negligible	Suitable habitat not present in study area and no recent records.	The New Holland Mouse currently has a disjunct, fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Across the species' range the New Holland Mouse is known to inhabit open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes. The New Holland Mouse is a social animal, living predominantly in burrows shared with other individuals. The species is nocturnal and omnivorous, feeding on seeds, insects, leaves, flowers and fungi.
Pteropus poliocephalus	Grey-headed Flying-fox	VU	V	2007#	Transient	Suitable habitat for roosting not present in study area. Nomadic fauna species that may occur in the study area from time to time, but unlikely to be resident.	Occurs along the NSW coast, extending further inland in the north. This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Roosts in large colonies (camps), commonly in dense riparian vegetation. Bats commute daily to foraging areas, usually within 15 kilometres of the day roost although some individuals may travel up to 70 kilometres.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat		V	2005	Low	Marginal habitat present in study area (low quality and extent).	Found throughout NSW, they have been reported from southern Australia between January and June. Reported from a wide range of habitats throughout eastern and northern Australia, including wet and dry sclerophyll forest, open woodland, acacia shrubland, mallee, grasslands and desert.

Scientific name	Common name	Conservation status		Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	TSC				
							They roost in tree hollows in colonies of up to 30 (but more usually two to six) and have also been observed roosting in animal burrows, abandoned Sugar Glider nests, cracks in dry clay, hanging from buildings and under slabs of rock. It is high-flying, making it difficult to detect. It forages above the canopy of eucalypt forests, but comes lower to the ground in mallee or open country.
Scoteanax rueppellii	Greater Broad-nosed Bat		V	2005	Low	Marginal habitat present in study area (low quality and extent).	Occurs along the Great Dividing Range, generally at 500 metres but up to 1200 metres, and in coastal areas. Occurs in woodland and rainforest, but prefers open habitats or natural or human-made openings in wetter forests. Often hunts along creeks or river corridors. Flies slowly and directly at a height of 30 metres or so to catch beetles and other large, flying insects. Also known to eat other bats and spiders. Roosts in hollow tree trunks and branches.
Birds							
Anthochaera phrygia	Regent Honeyeater	CE	E4A	2012#	Transient	Suitable habitat for roosting not present in study area. Nomadic fauna species that may occur in the study area from time to time, but unlikely to be resident.	A semi-nomadic species occurring in temperate eucalypt woodlands and open forests. Most records are from box-ironbark eucalypt forest associations and wet lowland coastal forests. Key eucalypt species include Mugga Ironbark, Yellow Box, Blakely's Red Gum, White Box and Swamp Mahogany. Also utilises: *Eucalyptus microcarpa, E. punctata, E. polyanthemos, E. mollucana, Corymbia robusta, E. crebra, E. caleyi, C. maculata, E. mckieana, E. macrorhyncha, E. laevopinea* and *Angophora floribunda*. Nectar and fruit from the mistletoes *Amyema miquelii, A. pendula* and *A. cambagei* are also eaten during the breeding season. Regent Honeyeaters usually nest in horizontal branches or forks in tall mature

Scientific name	Common name	Conservation status		Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	TSC				
							eucalypts and sheoaks.
Botaurus poiciloptilus	Australasian Bittern	EN	E1	2011#	Negligible	Suitable habitat not present in study area and no recent records.	The Australasian Bittern is distributed across south-eastern Australia. Often found in terrestrial and estuarine wetlands, generally where there is permanent water with tall, dense vegetation including *Typha* spp. and *Eleocharis* spp.. Typically this bird forages at night on frogs, fish and invertebrates, and remains inconspicuous during the day. The breeding season extends from October to January with nests being built amongst dense vegetation on a flattened platform of reeds.
Callocephalon fimbriatum	Gang-gang Cockatoo		V	2012	Low	Marginal habitat present in study area (low quality and extent).	In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Also occur in subalpine Snow Gum woodland and occasionally in temperate or regenerating forest. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. It requires tree hollows in which to breed.
Calyptorhynchus lathami	Glossy Black-Cockatoo		V	2012	Low	Marginal habitat present in study area (low quality and extent).	Inhabits forest with low nutrients, characteristically with key *Allocasuarina* species. The species is uncommon although widespread throughout suitable forest and woodland habitats. Tends to prefer drier forest types. Often confined to remnant patches in hills and gullies. Breed in hollows stumps or limbs, either living or dead. Feeds almost exclusively on the seeds of several species of she-oak *Casuarina* and *Allocasuarina* species, shredding the cones with its massive bill.

Scientific name	Common name	Conservation status		Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	TSC				
Circus assimilis	Spotted Harrier		V	2000	Negligible	Suitable habitat not present in study area and no recent records.	The Spotted Harrier is found throughout Australia but rarely in densely forested and wooded habitat of the escarpment and coast. Preferred habitat consists of open and wooded country with grassland nearby for hunting. Habitat types include open grasslands, acacia and mallee remnants, spinifex, open shrublands, saltbush, very open woodlands, crops and similar low vegetation. The Spotted Harrier is more common in drier inland areas, nomadic part migratory and dispersive, with movements linked to the abundance of prey species.
Daphoenositta chrysoptera	Varied Sittella		V	2011	Low	Marginal habitat present in study area (low quality and extent).	The Varied Sittella is a sedentary species which inhabits a wide variety of dry eucalypt forests and woodlands, usually with either shrubby understorey or grassy ground cover or both, in all climatic zones of Australia. Usually inhabit areas with rough-barked trees, such as stringybarks or ironbarks, but also in mallee and acacia woodlands, paperbarks or mature Eucalypts. The Varied Sittella feeds on arthropods gleaned from bark, small branches and twigs. It builds a cup-shaped nest of plant fibres and cobweb in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.
Glossopsitta pusilla	Little Lorikeet		V	2014	Transient	Suitable habitat for roosting not present in study area. Nomadic fauna species that may occur in the study area	Distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range in NSW, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri. Mostly occur in dry, open eucalypt forests and woodlands. They feed primarily on nectar and pollen in the tree canopy. Nest hollows are located at heights of between 2 metres and 15 metres, mostly in living, smooth-barked