

Submission to Western Sydney Aerotropolis  
for  
Langway Pty Ltd

13 March 2020

## 1. Introduction

This submission is prepared on behalf of our client, Langway Pty Ltd, the registered owner of land formally identified as [REDACTED] and more commonly known as [REDACTED] Elizabeth Drive, Badgerys Creek (**subject site**).

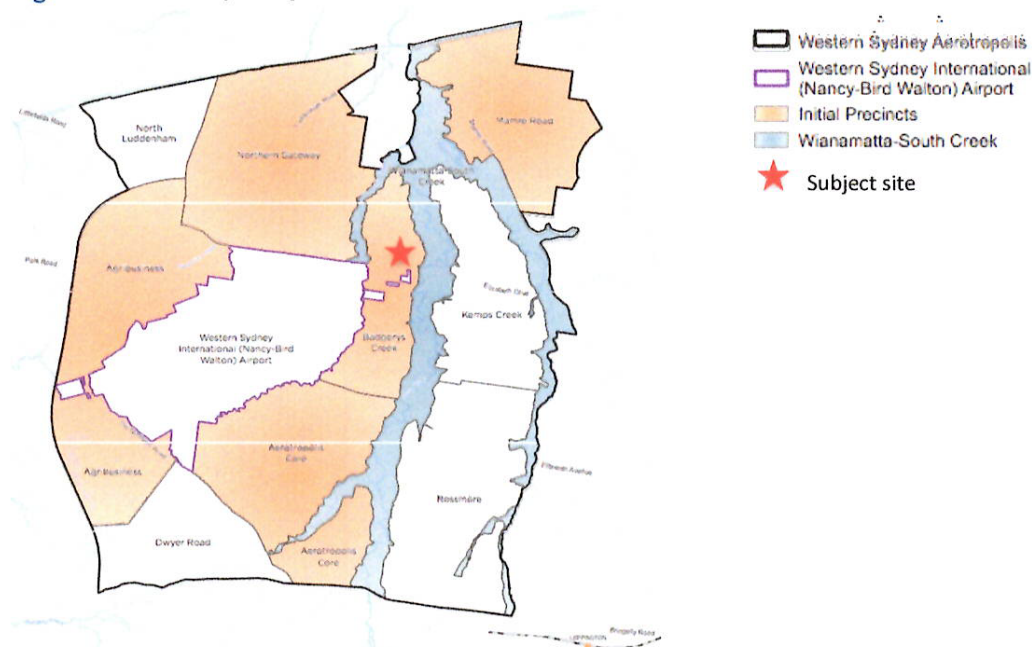
The subject site is located within the Badgerys Creek Precinct (refer [Figure 1](#)) that forms part of the Western Sydney Aerotropolis boundary as identified in the *Draft Western Sydney Aerotropolis Plan*.

This submission is complimentary to an earlier submission lodged with the Department of Planning, Industry and Environment by Gough Planning dated 11 February 2020.

The following documents have been referenced in the preparation of this submission:

- Draft Western Sydney Aerotropolis Plan
- Draft Western Sydney Aerotropolis Development Control Plan Phase 1
- Western Sydney Aerotropolis proposed SEPP Discussion Paper
- Penrith Local Environmental Plan 2010
- Environment and Recreation Zone Fact Sheet

**Figure 1: Aerotropolis precincts**



**Source:** Draft Western Sydney Aerotropolis Plan

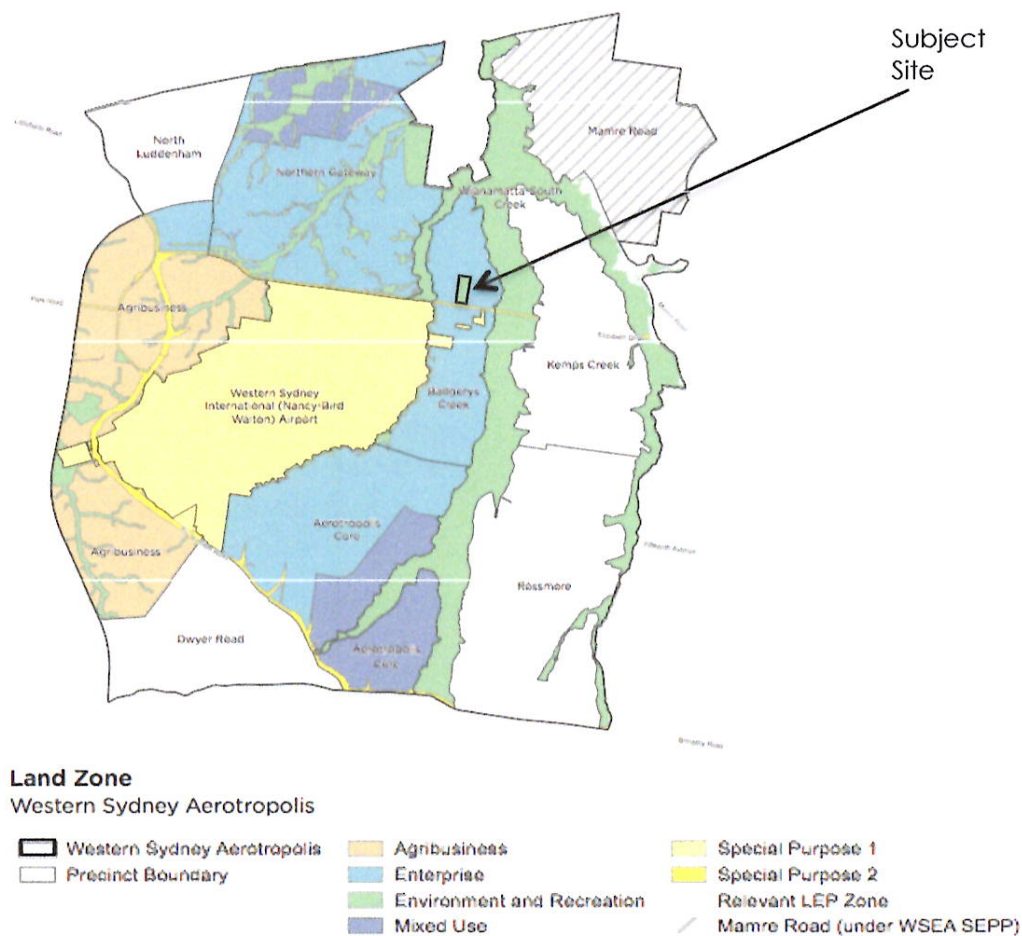
## 2. Summary of Submission

The *Draft Western Sydney Aerotropolis Plan (the Plan)* proposes to rezone the subject site, outlined in black in [Figure 2](#), from 'R2 Rural Landscape' pursuant to *Penrith Local Environmental Plan 2010* to 'Environment and Recreation'.

Following a detailed and comprehensive review of the key Western Sydney Aerotropolis documents that are currently on public exhibition we are of the opinion that:

1. there is insufficient justification for the rezoning of the subject site to *Environment and Recreation*; and
2. the subject site should instead be rezoned *Enterprise*, the same as the surrounding lands.

**Figure 2:** Proposed zoning of subject site



**Source:** Draft Western Sydney Aerotropolis Plan

### 3. Subject site

The subject site, outlined in red in [Figure 3](#), is located on the northern side of Elizabeth Drive, Badgerys Creek on the corner of an unnamed access road. The site is rectangular in shape with an approximate 180 metre frontage to Elizabeth Drive and approximate area of 10.19 ha.

To the north, the subject site is adjoined by the SUEZ Kemps Creek Resource Recovery Park that deals with waste types such as:

- Biosolids
- Contaminated waste
- Mixed putrescibles
- Non putrescibles

To the south, east and west the subject site is adjoined by rural/residential land uses.

It is understood that the subject site is currently occupied by:

- Crush and Haul Resource Recovery Facility; and
- BRM Recycling.

In addition, substantial work has commenced on the construction of a *poultry abattoir and processing facility* that was granted approval by Penrith Council. This approval also permits the removal of trees that currently exist on the subject site.

It is important to note that because of these existing and proposed land uses, the subject site has been substantially cleared of any significant vegetation as shown in [Figure 3](#) and [Figure 4](#) and will be cleared of more vegetation as a result of approved poultry abattoir and processing facility.

Pursuant to *Penrith Local Environmental Plan 2010* (LEP) the subject site is zoned R2 *Rural Landscape* with a primary objective "to encourage sustainable primary industry production". In providing a mechanism and planning framework for the management, orderly and economic development, and conservation of land in Penrith, the LEP:

- Does not identify the subject site as environmentally sensitive land;
- Does not identify the subject site as containing terrestrial biodiversity;
- Does not identify the subject site as being affected by the 1% AEP flood event; and
- Does not identify the subject site as containing endangered ecological communities or having high biodiversity value.

In addition, the subject site is not mapped on the Biodiversity Values (BV) Map



prepared by the Department of Planning, Industry and Environment (DPIE) under Part 7 of the *Biodiversity Conservation Act 2016 (BC Act)*. The DPIE website notes the BV Map “identifies land with high biodiversity value that is particularly sensitive to impacts from development and clearing”.

**Figure 3:** Aerial view of subject site



**Source:** Google Maps

Figure 4: Images of subject site



## 4. Submission

The Plan proposes to rezone the subject site from *R2 Rural Landscape* pursuant to *Penrith Local Environmental Plan 2010 to Environment and Recreation*.

Following a detailed and comprehensive review of the key Western Sydney Aerotropolis documents that are currently on public exhibition we are of the opinion that there is insufficient justification for the rezoning of the subject site to *Environment and Recreation*.

This opinion has been formed based on;

1. A review of the existing development approvals on the subject site and how they may impact on the proposed rezoning;
2. An assessment of the elements associated with the Blue-Green Grid in the Plan; and
3. An assessment of the purpose and location of the *Environment and Recreation* zone having regard to the *Environment and Recreation Fact Sheet* prepared by Western Sydney Planning Partnership (WSPP).

The opinions expressed in this submission are also supported by an assessment of the ecological values present within the subject site undertaken by EcoPlanning. A copy of the assessment is attached to this submission.

### 1. Review of existing development approvals

As detailed in the attached EcoPlanning report, some clearing of native vegetation and grassland across the subject site commenced in 1997 in accordance with a development approval for a poultry abattoir. The clearing footprint that is currently evident on site commenced in 2018 as a result of additional development approvals that are currently active on site. While some native vegetation has been retained, it is considered to be too small and not sustainable.

### 2. Assessment of the elements associated with the Blue-Green Grid

Having due regard to the elements of the Blue-Green Grid described in the Plan the subject site is considered not well suited to being zoned *Environment and Recreation* because;

- It is not located within the setting of the Wianamatta-South Creek corridor that is embraced in the Plan as the central element of the urban design and water management of the Western Parkland.
- It is not located along any ridgeline that may help frame the Western Parkland City setting and reduce the visual dominance of urban areas across the vast expanse of the Aerotropolis.



- It is not located alongside infrastructure corridors and minor creeks that offer quality local open spaces for walking and cycling connections as well as recreation.
- It is located within the 3km wildlife buffer identified in the Plan and raises serious safety concerns regarding impacts of birds and other wildlife on aircraft, particularly during take-off and landing. The Plan discourages the planting of vegetation that can attract wildlife, particular for land such as the subject site that is in very close proximity to the end of the runway where planes come in for landing and/or take off.

There is no apparent justification for rezoning this parcel of land for conservation and/or recreational purposes given:

- The relatively small size of two (2) separate areas identified as having native vegetation communities; and
- The subject site is an isolated parcel of proposed conservation/recreation land in a 'sea' of land zoned for enterprise purposes with no opportunity for creating any linkages with green corridors to the east or west.

### 3. Assessment of the purpose and location of the *Environment and Recreation zone*

The *Environment and Recreation Fact Sheet* prepared by WSPP provides invaluable direction as to:

**What is the purpose of the Environment and Recreation zone? and**

**Where is the Environment and Recreation zone?**

In relation to purpose, the fact sheet states:

*The Environment and Recreation Zone identifies land under the Structure Plans for purposes including regional parks, biodiversity conservation and flood management/mitigation.*

and

*The aims of the Environment and Recreation Zone are:*

- *to protect, manage and restore areas of ecological, scientific, cultural or aesthetic values*
- *to encourage leisure, cultural and recreation facilities and support service to provide activation, and access, and enable areas for cafes, events, community celebrations and education/interpretative facilities*
- *to prevent development that could destroy, damage or otherwise have an adverse effect on those values*
- *to provide a range of recreational settings and activities and compatible land uses.*



In assessing the ecological values of the subject site, EcoPlanning has determined that:

- the study area has been the subject of considerable recent disturbance;
- most native vegetation has been cleared from the site; and
- remaining vegetation is not sustainable in the long term.

Having due consideration to the findings of the ecological assessment, it is fair and reasonable to conclude the subject site;

- is not suitable for the purpose of a regional park or for biodiversity conservation; and
- does not have the ecological values needed to justify applying the aims of the *Environment and Recreation* zone.

The subject site is also not well located to existing water bodies, flood plains etc to be considered suitable for flood management/mitigation use.

In relation to where, the fact sheet identifies three (3) pre-conditions for locating the *Environment and Recreation* zone. The zone is to apply specifically to:

- *all land affected by the 1:100 chance per year flood;*

and also apply to:

- *land covered by the Strategic Assessment and Biodiversity Certification for the Growth Centres; and*
- *land covered by the Cumberland Plain Conservation Plan (CPCP). The CPCP will address impacts on high value biodiversity from urban growth through a conservation program.*

The only exception is being made to along Thompsons Creek, within the Aerotropolis Core Precinct, where the South Precinct Boundary is to be extended beyond the 1:100 chance per year flood extent to create additional opportunities for green space and recreation.

The following addresses the stated preconditions for where the *Environment and Recreation* zone should be located:

**Precondition 1 - All land affected by the 1:100 chance per year flood**

As identified in Penrith Council Flood Maps, the subject site is not affected by the 1:100 year flood. Compliance with this precondition is considered critical because the fact sheet is, in the first instance, specific about locating the *Environment and Recreation* zone in this area.

**Precondition 2 - Land covered by the Strategic Assessment and Biodiversity Certification for the Growth Centres**

The subject site is outside any Growth Centre boundaries.

**Precondition 3 - Land covered by the Cumberland Plain Conservation Plan (CPCP)**

It is understood the *draft Cumberland Plain Conservation Plan* (DCPCP) will be publicly exhibited later in 2020, and community and stakeholders will have an opportunity to have their say on the Plan. The field surveys and biodiversity assessments that have been referenced in the Western Sydney Aerotropolis exhibition documents are currently not publicly available and are expected to be made available as part of the public exhibition of the DCPCP. In the absence of any detailed background biodiversity assessments, the attached ecological assessment undertaken by EcoPlanning is a site specific assessment that provides detail of the ecological values present within the subject site.

While the subject site is located within the study area for the CPCP this precondition relates directly to how the CPCP will address the impact of urban growth on areas identified as being high value biodiversity. The ecological assessment undertaken by EcoPlanning confirms the subject site is not an area that can be considered as being high value biodiversity.

The subject site does not meet any of the preconditions for locating the *Environment and Recreation* zone and is not located within the only area specifically identified as being exempt from these preconditions.

## 5. Conclusion

1. A detailed analysis of the purpose and aims of the *Environment and Recreation* zone, as defined in WSPP's fact sheet, has been undertaken in relation to the proposed rezoning of the subject site and forms part of this submission.
2. As can be seen from this analysis, the subject site:
  - Is not considered suitable for a regional park, biodiversity conservation or flood management/mitigation;
  - Does not have the ecological values needed to justify applying the aims of the *Environment and Recreation* zone;
  - Does not meet the specified pre-conditions for where the *Environment and Recreation* zone should be located; and
3. The subject site is located in close proximity to the end of the proposed airport runway and raises serious safety concerns regarding impacts of birds and other wildlife on aircraft, particularly during take-off and landing.
4. The subject site is currently operating as a resource recovery facility and recycling facility and substantial works have also commenced on a Penrith Council approval for *poultry abattoir and processing facility*. This approval also permits the removal of trees that currently exist on the subject site.
5. In our opinion, there is insufficient justification for rezoning the subject site *Environment and Recreation* as proposed in the *Draft Western Sydney Aerotropolis Plan*. Subsequently, the subject site should be rezoned *Enterprise* in accordance with the surrounding lands in the Badgerys Creek precinct.

PPD Planning Consultants



Tony Polvere (BA Planning)  
13 March 2020



Mannie Caruana  
Langway Pty Ltd  
186 Hume Hwy  
Lansvale NSW 2166  
*Supplied by email*

13 March 2020

**Re: Ecological Assessment, [REDACTED] Elizabeth Drive, Badgerys Creek, NSW, 2555**

Dear Mannie,

This letter provides a description of the ecological values identified at [REDACTED] Badgerys Creek. For the purposes of this report, 1725-1743 Elizabeth Drive, Badgerys Creek is referred to as the 'study area' (Figure 1).

#### Background and purpose of report

The study area has been identified by the State Government to be rezoned 'Environment and Recreation' in the Draft Western Sydney Aerotropolis Plan. One of the main aims of the rezoning is to prevent development that could damage ecological values. This report assesses the ecological values present within the study area and identifies development approvals relevant to the study area that may affect future planning decisions.

#### General description of the study area

The study area is located within the City of Penrith Local Government Area (LGA) and covers approximately 10.19 ha. Currently the site is composed of cleared land and native vegetation. Cleared land is used to crush and store gravel, sand and plant equipment. Site offices and sheds are also located on cleared land. Native vegetation is not mapped on the Biodiversity Values Map (BVM) (DPIE 2020), nor is it mapped on council's Terrestrial Biodiversity layer under the Penrith Local Environment Plan 2010.

#### Methods

A site-specific literature and database review were undertaken prior to the field survey and the preparation of this report. This included desktop analysis of aerial photography and review of regional scale information from the following sources:

- NSW Planning Viewer (NSW Dept. of Planning and Environment 2020)
- BioNet Atlas (NSW Office of Environment and Heritage (OEH) 2020a)
- Biodiversity Values Map (Department of Planning, Industry and Environment 2020)



- SIX Maps (LPI 2020)
- NearMap (2020)
- The Native Vegetation of the Sydney Metropolitan Area (V3) (OEH 2016)
- Lesryk Environmental (2017). Flora and Fauna Survey and Assessment, 1725-1743 Elizabeth Drive, Badgerys Creek, NSW, September 2017. Prepared for National Integrated Creative Solutions on behalf of Crush and Haul Pty Ltd.

Threatened species, populations and migratory species recorded within 5 km of the study area (the locality) in a search of the BioNet Atlas (OEH 2020a) were consolidated and their likelihood of occurrence was assessed by:

- review of location and date of recent (<5 years) and historical (5-20 years) records
- review of available habitat within the study area and surrounding areas
- review of the scientific literature pertaining to each species and population
- applying expert knowledge of each species

Following a review of available habitat within the study area, the potential for each threatened species, populations and/or migratory species to occur was considered. The potential for species to use the study area and to be affected directly or indirectly by the proposed action was identified as either:

- “Recent record” = species has been recorded in the study area within the past 5 years
- “High” = species has previously been recorded in the study area (>5 years ago) or in proximity (for mobile species), and/or habitat is present that is likely to be used by a local population
- “Moderate” = suitable habitat for a species is present onsite but no evidence of a species detected and relatively high number of recent records (5-20 years) in the local area or species is highly mobile
- “Low” = suitable habitat for a species is present onsite but limited or highly degraded, no evidence of a species detected and relatively low number of recent records in the local area
- “Not present” – suitable habitat for the species is not present onsite or adequate survey has determined species does not occur in the study area

#### Field survey

A field survey was conducted by Bruce Mullins (Principal Ecologist) and Benjamin Brown (Ecologist) on 10 March 2020 over approximately 4.5 person hours during which the study area was traversed. The purpose of the site inspection was to validate regional vegetation mapping for the study area, determine the presence of threatened flora species, compile a list of visible flora and to assess the potential for threatened fauna species, listed under the *Biodiversity Conservation Act 2016* (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), to inhabit the study area.

Survey transects were recorded on a hand-held GPS (Garmin GPSMap 64) and in Avenza Maps.

### Approved DAs and historic aerial images

The Lot and DP for the study area was searched in DA tracker<sup>1</sup> to identify relevant, approved DAs. Additional information relating to approved DAs not contained within DA Tracker was provided by the landowner.

## Results

### Vegetation communities

A review of vegetation mapping by OEH (2015) identified two native vegetation communities within the study area, *Broad-leaved Ironbark - Grey Box - Melaleuca decora grassy open forest on clay/gravel soils of the Cumberland Plain, Sydney Basin Bioregion* (PCT 724) and *Broad-leaved Ironbark - Melaleuca decora shrubby open forest on clay soils of the Cumberland Plain, Sydney Basin Bioregion* (PCT 725) (**Figure 2**). Lesryk Environmental (2017) identified native vegetation as Shale-Gravel Transition Forest.

Parallel transects were applied to survey remnant vegetation on the study area (**Figure 3**). The survey identified 80 native species (including one non-endemic native, *Grevillea robusta*) and 23 exotic species.

Field survey determined that native vegetation within the study area was equivalent to PCT 724 (**Figure 4**). The total area of native vegetation is estimated to be 1.85 ha, with the larger southern patch comprising an area of 1.42 ha. The vegetation was characterised by a canopy dominated by *Eucalyptus fibrosa* and *Melaleuca decora*. Other canopy species included *Eucalyptus eugenioides* and *Allocasuarina littoralis*. The mid canopy was dominated by shrubs such as *Bursaria spinosa*, *Lissanthe strigosa*, *Ozothamnus diosmifolius* and *Daviesia ulicifolia*. The ground cover was dominated mainly by herbs such as *Brunoniella australis*, *Cheilanthes sieberi*, *Plectranthus parviflorus* and *Lobelia purpurascens*. Common weeds were *Eragrostis curvula*, *Setaria parviflora* and *Sida rhombifolia*.

According to the landowner, the larger patch of native vegetation to the south has been subject to historic disturbance and livestock grazing. Considering this, the patch exhibits a high degree of resilience with a relatively low cover of weeds (**Figures 6 and 7**). The margins of cleared areas are in variable condition; some areas dominated by weeds, while others have a higher cover of natives. A list of the flora identified during the survey is in **Appendix A**.

PCT 724 is equivalent to *Shale Gravel Transition Forest in the Sydney Basin Bioregion*, which is listed as an endangered ecological community (EEC) under the BC Act. It is a component of the critically endangered ecological community (CEEC) Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest listed under the EPBC Act.

The Conservation Advice (including listing advice) for Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest under the EPBC Act provides condition thresholds for when a patch retains sufficient conservation value to be considered as a Matter of National Environmental Significance (MNES), which is outlined in **Table 1**. A review of the approved

<sup>1</sup> Accessed at <https://www.penrithcity.nsw.gov.au/building-development/development/application-tracking>



Conservation Advice concluded that the larger southern patch within the study area was  $\geq 0.5$  ha and  $\geq 50\%$  of the perennial understorey vegetation cover is made up of native species and, therefore, forms part of the CEEC listed under the EPBC Act. Isolated area of native vegetation that are less than 0.5 ha in the study area do not conform to the condition criteria and, therefore, are not the CEEC.

A majority of the site is covered in crushed gravel, sand and clay from current land use and clearing activities (**Figures 5, 8 and 9**).

**Table 1: EPBC Act condition categories, rationale and thresholds for Shale Gravel Transition Forest in the Sydney Basin Bioregion**

Category and Rationale	Thresholds
A. Core thresholds that apply under most circumstances: patches with an understorey dominated by natives and a minimum size that is functional and consistent with the minimum mapping unit size applied in NSW.	Minimum patch <sup>3</sup> size is $\geq 0.5$ ha; AND $\geq 50\%$ of the perennial understorey vegetation cover <sup>4</sup> is made up of native species.
OR B. Larger patches which are inherently valuable due to their rarity.	The patch size is $\geq 5$ ha; AND $\geq 30\%$ of the perennial understorey vegetation cover is made up of native species.
OR C. Patches with connectivity to other large native vegetation remnants in the landscape.	The patch size is $\geq 0.5$ ha; AND $\geq 30\%$ of the perennial understorey vegetation cover is made up of native species; AND The patch is contiguous <sup>5</sup> with a native vegetation remnant (any native vegetation where cover in each layer present is dominated by native species) that is $\geq 5$ ha in area.
OR D. Patches that have large mature trees or trees with hollows (habitat) that are very scarce on the Cumberland Plain.	The patch size is $\geq 0.5$ ha in size; AND $\geq 30\%$ of the perennial understorey vegetation cover is made up of native species; AND The patch has at least one tree with hollows per hectare or at least one large tree ( $\geq 80$ cm dbh) per hectare from the upper tree layer species outlined in the Description and Appendix A.

### Threatened species

A search of the BioNet Atlas (OEH 2020a) identified that 26 threatened species have been previously recorded within a 5 km radius of the study area (**Figure 10**). This consists of 20 fauna and six flora species. Of the 20 fauna species previously recorded, 12 are birds, one is a gastropod and seven are mammals (six microchiropteran bats and one megachiropteran bat).

Of these species, two species have been recorded on the study area: *Dillwynia tenuifolia* and Cumberland Plain Land Snail (CPLS) (*Meridolum corneovirens*) (Lesryk Environmental 2017). *Dillwynia tenuifolia* is a vulnerable species listed under the BC Act; it is not listed under the EPBC Act. CPLS is listed as an endangered species under the BC Act. Lesryk Environmental (2017) identified a single *Dillwynia tenuifolia* individual and two CPLS in the northern third of the lot.

This survey identified 12 *Dillwynia tenuifolia* in proximity to the record by Lesryk Environmental (2017) (**Figure 3 and 12**). This included three mature plants approximately 30 cm high, with the remainder immature and <20 cm high. The area in which the plants were found was fenced and marked “no go area”. No other threatened species were found during the survey

Field survey determined that the likelihood of any other threatened flora species occurring in the study area is ‘low’ (**Appendix A**).

### Approved Development Applications and land use

A review of NearMap imagery identified native vegetation and grassland across the site in 2010, with a potential trotting track evident in the southern half of the study area. It is understood that some clearing had occurred on site in accordance with DA 960082 in 1997, however, the clearing footprint that is currently evident on site commenced in August 2018. Vegetation clearing commenced in the northern third of the site and progressed south with the current disturbance footprint finalised in October 2018 (**Figure 5**).

Approved DAs for the study area are listed in **Table 2**.

**Table 2: History of DAs and approvals for the study area.**

DA	Date	Description
DA16/0722	Determination date: 15/7/2018	Resource Recovery Facility. Located in the north of the site.
DA960082	28/8/1996	Consent Notice for a Poultry abattoir and processing facility. Includes buildings, evaporation ponds, sediment basins and irrigation areas ( <b>Figure 11</b> ).
	11/2/1998	Building Permit for a Poultry abattoir and processing facility.
	22/1/2008	Letter from Penrith City Council concluding “substantial commencement” of the project.



## Summary and future management

The study area has been subject to considerable recent disturbance that is understood to relate DA960082 and DA16/0722. This has resulted in most native vegetation being cleared from the site with native vegetation being retained surrounding 12 *Dillwynia tenuifolia* and in the southern third of the study area.

The retained native vegetation aligns with PCT 724, which is equivalent to the EEC Shale-Gravel Transition Forest under the BC Act and the CEEC Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest under the EPBC Act, in part.

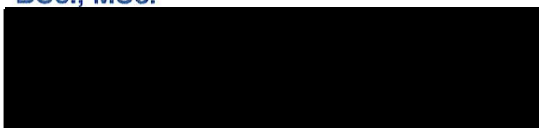
Native vegetation is in moderate to good condition, despite a history of livestock grazing, agricultural practices and recent activity, with a relatively low cover of weeds and an apparent high degree of resilience.

Despite a high degree of resilience, in the event that currently cleared areas may be biodiversity certified, the viability of a small patch of native vegetation should be considered in decision making. While small patches of vegetation may increase the species and genetic diversity present in the future precinct, management resources and costs will be high to maintain the remaining native vegetation in moderate to good condition. Given its size, the patch will not provide suitable long term habitat for CPLS.

If you would like to discuss any of the above comments and recommendations further, please do not hesitate to contact me.

Yours sincerely,

Bruce Mullins  
Director | Principal Ecologist | BAM Assessor (#17024)  
**BSc., MSc.**



## References

NSW Land and Property Information (LPI) (2020). *SIX Maps*. Accessed at: <https://maps.six.nsw.gov.au/>

NSW Department of Planning and Environment (2020). Biodiversity Values Map and Threshold Tool. Accessed at: <https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap>

NSW Office of Environment and Heritage (OEH) (2016). The native vegetation of the Sydney metropolitan area v3.0. Office of Environment and Heritage for the NSW Government, Sydney.

NSW Office of Environment and Heritage (OEH) (2019). Threatened Species Survey and Assessment Guidelines. Accessed at: <http://www.environment.nsw.gov.au/threatenedspecies/surveyassessmentgdlns.htm>.

NSW Office of Environment and Heritage (OEH) (2020a). BioNet Atlas of NSW Wildlife. Accessed at: [http://www.environment.nsw.gov.au/atlaspublicapp/UI\\_Modules/ATLAS /AtlasSearch.aspx](http://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS /AtlasSearch.aspx)

NSW Office of Environment and Heritage (OEH) (2020b). BioNET Vegetation Classification. Accessed at: <http://www.environment.nsw.gov.au/atlasapp/Default.aspx?a=1>





Figure 1: Study area.



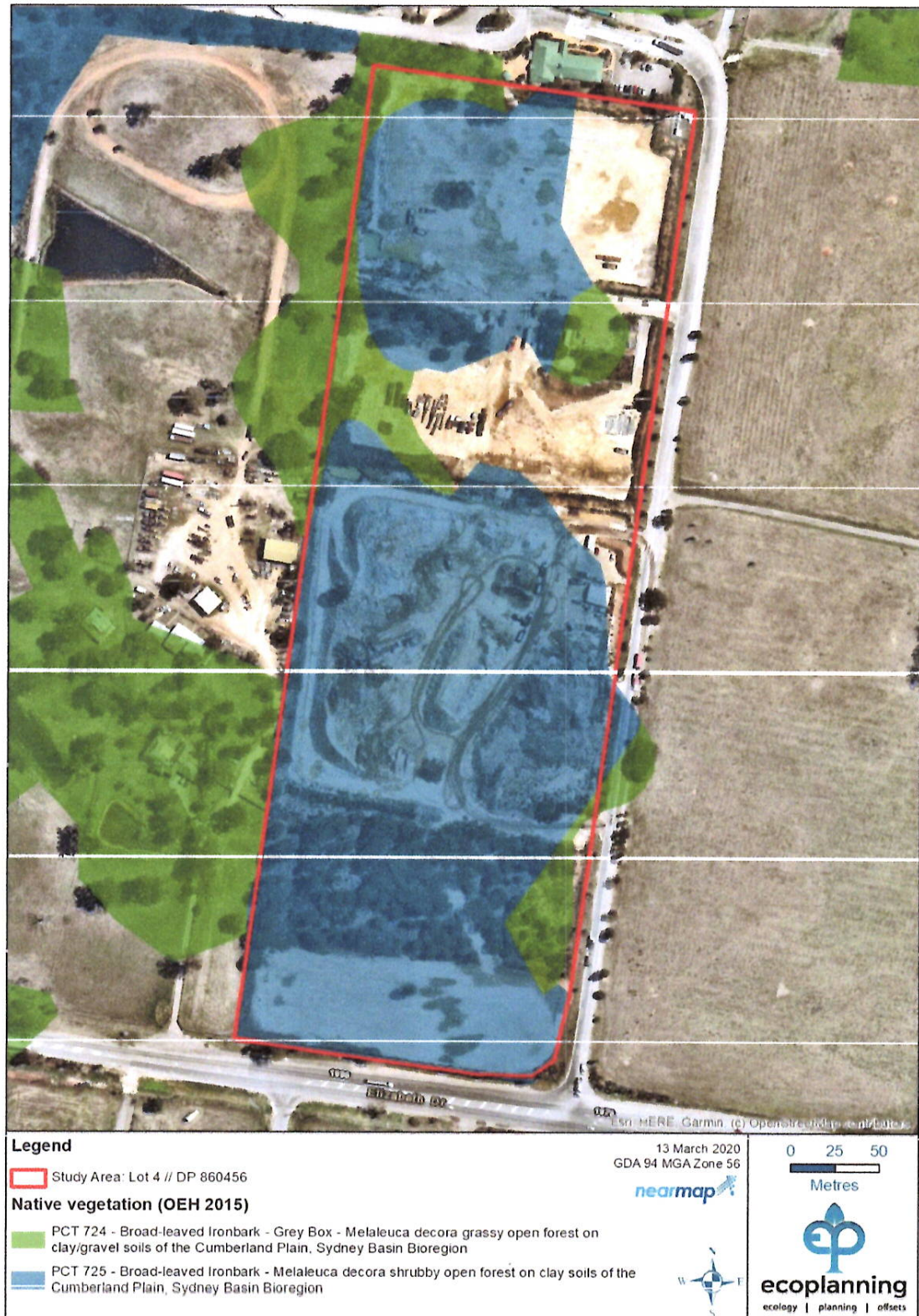


Figure 2: Regional vegetation mapping (OEH 2016).





Figure 3: Survey track and record of *Dillwynia tenuifolia*.





Figure 4: Validated vegetation mapping in the study area (Ecoplanning 2020).





Figure 5: Historic aerial photos showing clearing.





**Figure 6:** Shale-Gravel Transition Forest in the southern parts of the study area.



**Figure 7:** Shale-Gravel Transition Forest in the southern parts of the study area, near the western boundary.





**Figure 8:** Disturbance footprint adjacent to the southern boundary.



**Figure 9:** Disturbance footprint in the centre of the study area.



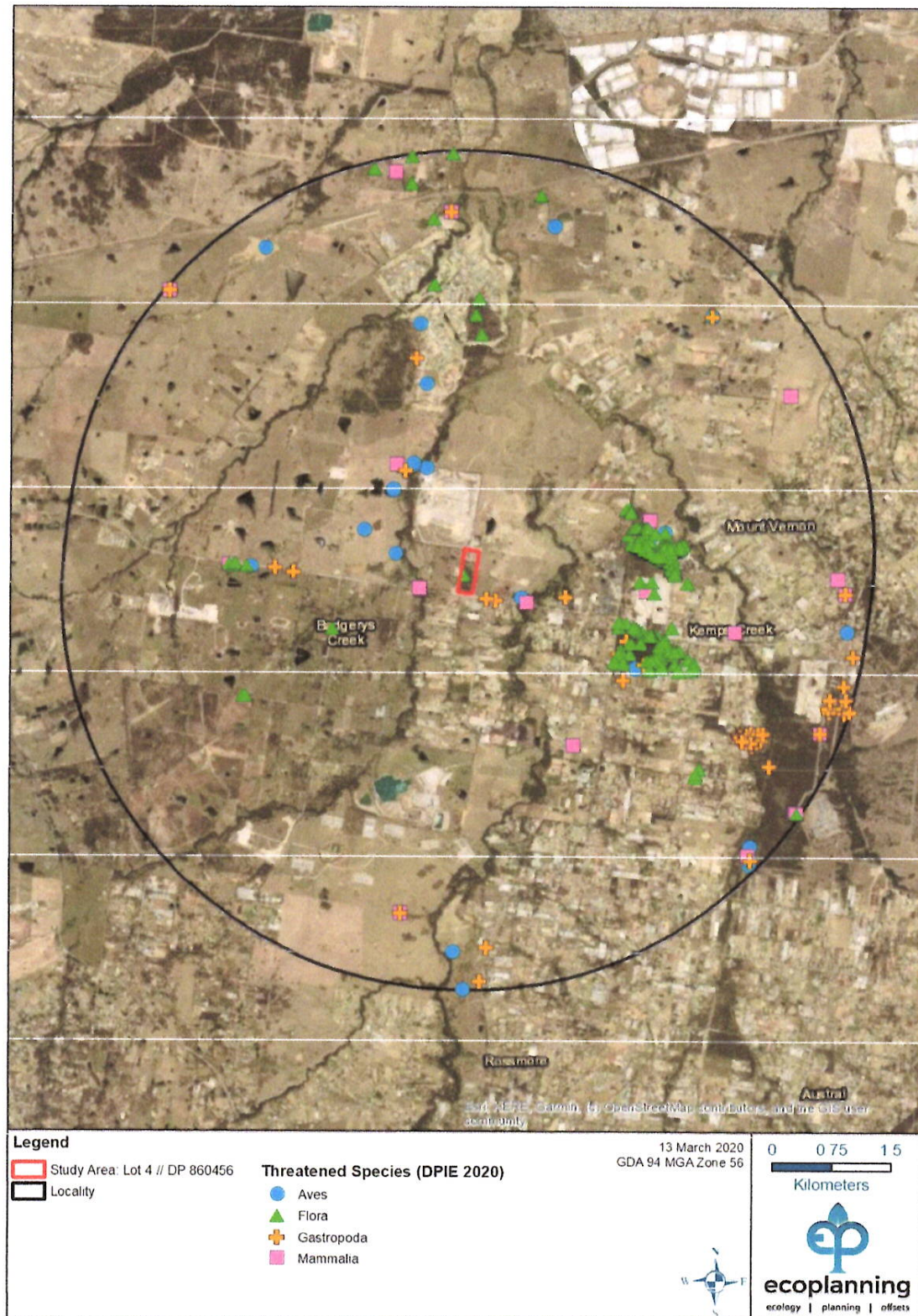


Figure 10: Threatened species within 5 km of the study area (OEH 2020).



Family	Scientific Name	Common name	Native/Exotic
Asteraceae	<i>Vittadinia cuneata</i>	Fuzzweed	Native
Campanulaceae	<i>Vahlenbergia gracilis</i>	Sprawling Bluebell	Native
Fabaceae (Faboideae)	<i>Zornia dyciocarpa</i>		Native

Family	Scientific Name	Common name	Native/Exotic
Asteraceae	<i>Ozothamnus diosmifolius</i>	White Dogwood	Native
Apocynaceae	<i>Parsonsia straminea</i>	Common Silkpod	Native
Poaceae	<i>Paspaliolum dilatatum</i>	Paspalum	Native
Polygonaceae	<i>Persicaria</i> spp.	Knotweed	Native
Phyllanthaceae	<i>Phyllanthus virgatus</i>	Wiry Spurge	Native
Plantaginaceae	<i>Plantago</i> spp.	Plantain	Native
Lamiaceae	<i>Plectranthus parviflorus</i>		Native
Portulacaceae	<i>Portulaca oleracea</i>	Pigweed	Native
Cyperaceae	<i>Ptilothrix deusta</i>		Native
Poaceae	<i>Rytidosperma</i> spp.		Native
Solanaceae	<i>Solanum prinophyllum</i>	Forest Nightshade	Native
Solanaceae	<i>Solanum</i> spp.		Native
Poaceae	<i>Sporobolus creber</i>	Slender Rat's Tail Grass	Native
Stackhousiaceae	<i>Stackhousia viminea</i>	Slender Stackhousia	Native
Aizoaceae	<i>Tetragonia tetragonioides</i>	New Zealand Spinach	Native
Poaceae	<i>Themeda triandra</i>		Native
Anthericaceae	<i>Tricoryne elatior</i>	Yellow Autumn-lily	Native

Family	Scientific Name	Common name	Native/Exotic
Amaranthaceae	<i>Gomphrena celosioides</i>	Gomphrena Weed	Native
Goodeniaceae	<i>Goodenia hederacea</i>	Ivy Goodenia	Native
Proteaceae	<i>Grevillea robusta</i>	Silky Oak	Native
Hypoxidaceae	<i>Hypoxis hygrometrica</i>	Golden Weather-grass	Native
Myrtaceae	<i>Kunzea ambigua</i>	Tick Bush	Native
Asteraceae	<i>Lagenifera stipitata</i>	Blue Bottle-daisy	Native
Asteraceae	<i>Leontodon saxatilis</i>		Native
Cyperaceae	<i>Lepidosperma laterale</i>		Native
Ericaceae	<i>Lissanthe strigosa</i>	Peach Heath	Native
Campanulaceae	<i>Lobelia purpurea scens</i>	whiteroot	Native
Lomandraceae	<i>Lomandra filiformis</i>	Wattle Matt-rush	Native
Lomandraceae	<i>Lomandra glauca</i>	Pale Mat-rush	Native
Lomandraceae	<i>Lomandra multiflora subsp. multiflora</i>	Many-flowered Mat-rush	Native
Myrtaceae	<i>Melaleuca decora</i>		Native
Myrtaceae	<i>Melaleuca nodosa</i>		Native
Poaceae	<i>Microlaena stipoides</i>	Weeping Grass	Native
Rubiaceae	<i>Opercularia diphylla</i>	Stinkweed	Native



Family	Scientific Name	Common name	Native/Exotic
Phormiaceae	<i>Dianella revoluta</i>	Blueberry Lily	Native
Convolvulaceae	<i>Dichondra repens</i>	Kidney Weed	Native
Fabaceae (Faboideae)	<i>Dillwynia sieberi</i>		Native
Fabaceae (Faboideae)	<i>Dillwynia tenuifolia</i>	Dillwynia tenuifolia	Native
Poaceae	<i>Echinopogon caespitosus</i>	Bushy Hedgehog-grass	Native
Chenopodiaceae	<i>Ei nadia hastata</i>	Berry Saltbush	Native
Chenopodiaceae	<i>Ei nadia nutans</i> subsp. <i>linifolia</i>	Climbing Saltbush	Native
Chenopodiaceae	<i>Ei nadia polygonoides</i>	Knotweed Goosefoot	Native
Chenopodiaceae	<i>Ei nadia trigonos</i>	Fishweed	Native
Poaceae	<i>Ei ntolasia marginata</i>	Bordered Panic	Native
Poaceae	<i>Ei ragrostis leptocarpa</i>	Drooping Lovegrass	Native
Myrtaceae	<i>Eucalyptus eugenioides</i>	Thin-leaved Stringybark	Native
Myrtaceae	<i>Eucalyptus fibrosa</i>	Red Ironbark	Native
Myrtaceae	<i>Eucalyptus tereticornis</i>	Forest Red Gum	Native
Cyperaceae	<i>Fimbristylis dichotoma</i>	Common Fringe-sedge	Native
Fabaceae (Faboideae)	<i>Glycine clandestina</i>	Twining glycine	Native
Fabaceae (Faboideae)	<i>Glycine tabacina</i>	Variable Glycine	Native

Family	Scientific Name	Common name	Native/Exotic
Asteraceae	<i>Asteraceae indeterminate</i>	Daisies	Native
Araliaceae	<i>Astroloma humifusum</i>		Native
Fabaceae (Faboideae)	<i>Bossiaea</i> spp.		Native
Acanthaceae	<i>Brunoniella australis</i>	Blue Trumpet	Native
Pittosporaceae	<i>Bursaria spinosa</i>	Native Blackthorn	Native
Anthericaceae	<i>Caesia parviflora</i>		Native
Apiaceae	<i>Centella asiatica</i>	Indian Pennywort	Native
Pteridaceae	<i>Cheilanthes sieberi</i>	Rock Fern	Native
Chenopodiaceae	<i>Chenopodium cristatum</i>	Crested Goosefoot	Native
Ranunculaceae	<i>Clematis glycinoides</i>	Headache Vine	Native
Commelinaceae	<i>Commelina cyanea</i>	Native Wandering Jew	Native
Convolvulaceae	<i>Convolvulus</i> spp.		Native
Rhamnaceae	<i>Cryptandra spinescens</i>		Native
Poaceae	<i>Cynodon dactylon</i>	Common Couch	Native
Cyperaceae	<i>Cyperus gracilis</i>	Slender Flat-sedge	Native
Fabaceae (Faboideae)	<i>Daviesia ulicifolia</i>	Goose Bitter Pea	Native
Fabaceae (Faboideae)	<i>Desmodium varians</i>	Slender Tick-trefoil	Native

Family	Scientific Name	Common name	Native/Exotic
Phytolaccaceae	<i>Phytolacca octandra</i>	Inkweed	Exotic
Rubiaceae	<i>Richardia</i> spp.		Exotic
Asteraceae	<i>Senecio madagascariensis</i>	Fireweed	Exotic
Poaceae	<i>Setaria parviflora</i>		Exotic
Malvaceae	<i>Sida rhombifolia</i>	Paddy's Lucerne	Exotic
Solanaceae	<i>Solanum nigrum</i>	Black-berry Nightshade	Exotic
Solanaceae	<i>Solanum sisymbriifolium</i>		Exotic
Asteraceae	<i>Sonchus oleraceus</i>	Common Sowthistle	Exotic
Fabaceae (Mimosoideae)	<i>Acacia decurrens</i>	Black Wattle	Native
Fabaceae (Mimosoideae)	<i>Acacia elongata</i>	Swamp Wattle	Native
Fabaceae (Mimosoideae)	<i>Acacia falcata</i>		Native
Fabaceae (Mimosoideae)	<i>Acacia ulicifolia</i>	Prickly Moses	Native
Casuarinaceae	<i>Allocasuarina littoralis</i>	Black She-Oak	Native
Amaranthaceae	<i>Alternanthera denticulata</i>		Native
Poaceae	<i>Aristida ramosa</i>	Purple Wiregrass	Native
Poaceae	<i>Aristida vagans</i>		Native
Anthericaceae	<i>Arthropodium milleflorum</i>	Pale Vanilla-lily	Native



## Flora

Family	Scientific Name	Common name	Native/Exotic
Oxalidaceae	<i>Oxalis</i> sp.		Native
Apocynaceae	<i>Araujia sericifera</i>	Moth Vine	Exotic
Asteraceae	<i>Bidens subalternans</i>	Greater Beggar's Ticks	Exotic
Poaceae	<i>Chloris gayana</i>	Rhodes Grass	Exotic
Asteraceae	<i>Cirsium vulgare</i>	Spear Thistle	Exotic
Asteraceae	<i>Conyza</i> spp.	A Fleabane	Exotic
Asteraceae	<i>Cyanthillium cinereum</i>	Iron Weed	Exotic
Cyperaceae	<i>Cyperus eragrostis</i>	Umbrella Sedge	Exotic
Poaceae	<i>Eleusine indica</i>	Crowsfoot Grass	Exotic
Poaceae	<i>Eragrostis cunvula</i>	African Lovegrass	Exotic
Euphorbiaceae	<i>Euphorbia drummondii</i>	Caustic Weeds	Exotic
Boraginaceae	<i>Heliotropium amplexicaule</i>	Blue Heliotrope	Exotic
Asteraceae	<i>Hypochoeris radicata</i>	Catsear	Exotic
Poaceae	<i>Melinis repens</i>	Red Natal Grass	Exotic
Oleaceae	<i>Olea europaea</i>	Common Olive	Exotic
Cactaceae	<i>Opuntia stricta</i>	Common Prickly Pear	Exotic

Scientific name (Common name)	Legal Status	Number of records	Most recent record	Closest record	Likelihood of occurrence – post survey
Cumberland Plain Land Snail			199 m	199 m	
Class: Mammalia					
<i>Micronomus norfolkensis</i> Eastern Coastal Free-tailed Bat	BC: Act: V	8	30/09/2018 485 m	30/09/2018 485 m	Low
<i>Miniopterus australis</i> Little Bent-winged Bat	BC: Act: V	1	30/09/2018 485 m	30/09/2018 485 m	Low
<i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat	BC: Act: V	1	30/09/2018 485 m	30/09/2018 485 m	Low
<i>Myotis macropus</i> Southern Myotis	BC: Act: V	11	30/09/2018 485 m	30/09/2018 485 m	Low
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox	BC: Act: V EPBC Act: V	8	30/09/2018 485 m	30/09/2018 485 m	Moderate
<i>Saccolaimus flaviventris</i> Yellow-bellied Sheath-tail Bat	BC: Act: V	1	30/09/2018 485 m	30/09/2018 485 m	Low
<i>Scoteanax rueppellii</i> Greater Broad-nosed Bat	BC: Act: V	5	30/09/2018 485 m	30/09/2018 485 m	Low

Scientific name (Common name)	Legal Status	Number of records	Most recent record	Closest record	Likelihood of occurrence – post survey
<i>Circus assimilis</i> Spotted Harrier	BC Act: V	1	19/09/2017 4.5 km	19/09/2017 4.5 km	Low
<i>Daphoenositta chrysoptera</i> Varied Sittella	BC Act: V	3	27/2/2015 621 m	27/2/2015 621 m	Moderate
<i>Gallinago hardwickii</i> Latham's Snipe	EPBC Act: C,J,K	4	25/10/2018 1.2 km	25/10/2018 1.2 km	Low
<i>Haliaeetus leucogaster</i> White-bellied Sea-eagle	BC Act: V EPBC Act: C	8	15/03/2019 485 m	15/03/2019 485 m	Low
<i>Hieraaetus morphnoides</i> Little Eagle	BC Act: V	2	22/2/2008 4.2 km	22/2/2008 4.2 km	Low
<i>Lathamus discolor</i> Swift Parrot	BC Act: E1 EPBC Act: CE	1	12/8/2013 4.8 km	12/8/2013 4.8 km	Low
<i>Petroica phoenicea</i> Flame Robin	BC Act: V	1	13/01/2004 4.9 km	13/01/2004 4.9 km	Low
<i>Stagonopleura guttata</i> Diamond Firetail	BC Act: V	1	27/03/2012 2.1 km	27/03/2012 2.1 km	
<i>Stictonetta naevosa</i> Freckled Duck	BC Act: V	1	25/10/2018 838 m	25/10/2018 838 m	Low
<i>Tringa nebularia</i> Common Greenshank	BC Act: V	1	21/04/2006 4.5 km	21/04/2006 4.5 km	Low
<b>Class: Gastropoda</b>					
<i>Meridolum corneovirens</i>	BC Act: E	54	25/10/2018	2018	Moderate





## Appendix A: Species likelihood of occurrence

Scientific name (Common name)	Legal Status	Number of records	Most recent record	Closest record	Likelihood of occurrence -- post survey
Flora					
<i>Dillwynia tenuifolia</i>	BC Act: V, EP	662	29/08/2018 0 km	29/08/2018 0 km	Present
<i>Grevillea juniperina</i> subsp. <i>juniperina</i> Juniper-leaved Grevillea	BC Act: V	7	30/04/2018 2.7 km	30/04/2018 2.7 km	Not present
<i>Grevillea parviflora</i> subsp. <i>parviflora</i> Small-flower Grevillea	BC Act: V EPBC Act: V	13	6/12/2018 2.4 km	6/12/2018 2.4 km	Not present
<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i> <i>Marsdenia viridiflora</i> R. Br. subsp. <i>viridiflora</i> population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas	BC Act: EP	6	22/05/2018 1.6 km	22/05/2018 1.6 km	Not present
<i>Persoonia nutans</i> Nodding Geebung	BC Act: E EPBC Act: E	5	9/11/2018 1.9 km	9/11/2018 1.9 km	Not present
<i>Pultenaea parviflora</i>	BC Act: E EPBC Act: V	89	9/11/2018 2.0 km	9/11/2018 2.0 km	Not present
Fauna					
Class: Aves					
<i>Calidris acuminata</i> Sharp-tailed Sandpiper	BC Act: V	1	25/10/2018 1.2 km	25/10/2018 1.2 km	Low

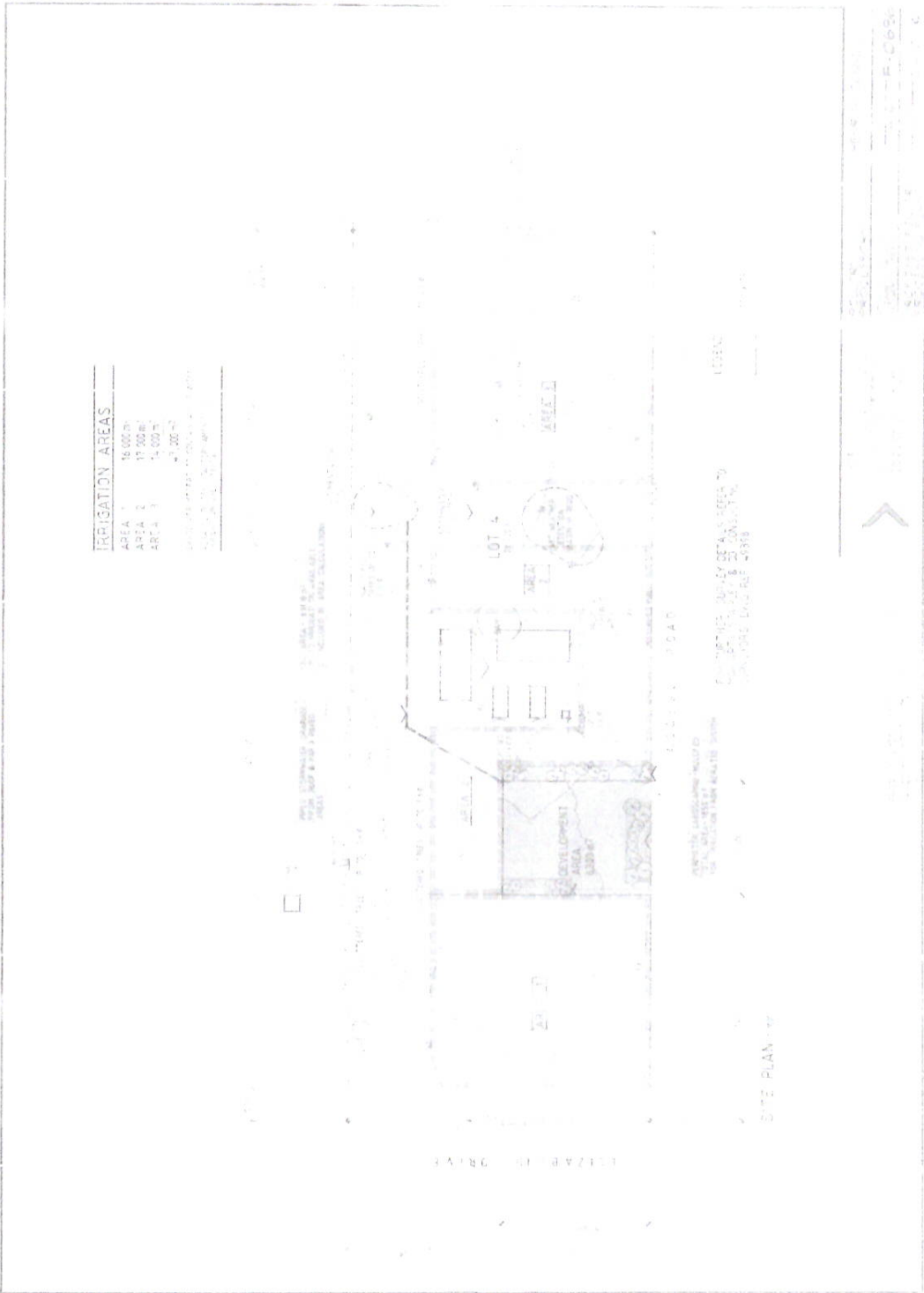


Figure 11: DA drawings for DA 960082