

A decorative background element on the left side of the page, consisting of several concentric, irregular contour lines in a light green color, resembling a topographic map. The lines are more densely packed in some areas and more spread out in others, creating a sense of depth and terrain.

## **135 Badgerys Creek Road, Bradfield**

### **Riparian Assessment**

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Bradfield Corporation Pty Ltd

## Document Tracking

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## Abbreviations

Abbreviation	Description
CAA	Controlled Activity Approval
CEMP	Construction Environmental Management Plan
DCCEEW – Water Group	<i>NSW Department of Climate Change, Energy, the Environment and Water</i>
DCP	Development Control Plan
ELA	Eco Logical Australia Pty Ltd
FM Act	<i>Fisheries Management Act 1994</i>
KFH	Key Fish Habitat
RC	Riparian corridor (VRZ plus channel width)
SEPP	State Environmental Planning Policy
SSDA	State Significant Development Application
VMP	Vegetation Management Plan
VRZ	Vegetated riparian zone (measured from top of bank)
WEMP	Weed Eradication Management Plan
WM Act	<i>Water Management Act 2000</i>
WM Regulation	<i>Water Management (General) Regulation 2025</i>

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# 1. Introduction

## 1.1. Scope and aims of report

Eco Logical Australia (ELA) was engaged by Bradfield Corporation Pty Ltd (the Applicant) to provide a desktop and field-validated riparian assessment to support their State Significant Development Application (SSDA 7458970) on land at 135 Badgerys Creek Road, Bradfield (Figure 1, the site). An impact assessment is applied against the development footprint for the site (Figure 2).

The site shares a western frontage with Badgerys Creek Road. The eastern boundary of the site adjoins the State government-led Bradfield City Centre which is set to be a vibrant 24/7 global city, driving advancements in industry and will support 10,000 more homes and 20,000 new jobs in Western Sydney.

As defined by the Aerotropolis Precinct Plan, the site is located within the Aerotropolis Core Precinct which is envisioned as an attractive place for workers, residents and visitors. The Aerotropolis Core Precinct will leverage the positive economic impact of the adjacent Western Sydney Airport and Bradfield City Centre. It will attract business hubs, research and development, professional services and creative industries in addition to providing residential development within walking distance of the Bradfield Metro station and proximity to blue and green infrastructure.

This report provides the following information on the site:

- Riparian impacts relevant to state legislation, planning instruments and guidelines such as the NSW *Water Management Act 2000*, State Environmental Planning Policy (Precincts – Western Parkland City) 2021, State Environmental Planning Policy (Biodiversity and Conservation) 2021, and NSW DCCEEW *Controlled activities – Guidelines for riparian corridors on waterfront land* (DCCEEW 2025)
- Riparian and aquatic development controls under the Western Sydney Aerotropolis Phase 2 Development Control Plan 2022 and the Western Sydney Aerotropolis Precinct Plan 2024
- Aquatic impacts to threatened species, populations and communities relevant to the NSW *Fisheries Management Act 1994* (FM Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- Measures to mitigate potential impacts to the riparian and aquatic habitat during construction and operation

## 1.2. Proposed development

The proposed development will seek consent for the redevelopment of the site, comprising:

- Enabling works including vegetation removal and earthworks;
- The construction of three buildings, comprising:
  - Residential use, including approximately 400 apartment units;
  - Hotel use, including approximately 450 hotel rooms;
  - Commercial use, including supermarket, food and drink and other commercial uses;
  - Medical centre use;
  - Childcare centre use;

- Construction of two basement structures, including approximately 800 carparking spaces;
- Public domain upgrades, including:
  - Construction of an internal road;
  - A public plaza;
- Rehabilitation and augmentation of the existing riparian corridor;
- Landscaping embellishments on the ground level and within the built form; and
- Services augmentation as required.

Refer to the Environmental Impact Statement for a detailed summary of the proposed development and Appendix A for the Landscape Masterplan and riparian section.

### 1.3. Secretary’s Environmental Assessment Requirements

In accordance with section 4.39 of the *Environmental Planning & Assessment Act 1979* (EP&A Act), Secretary’s Environmental Assessment Requirements (SEARs) for SSD 77458970 were issued on 30 January 2025. This report has been prepared to respond to the relevant issued Secretary’s Environmental Assessment Requirements (SEARS) and relevant agency requirements, as set out in Table 1 below.

**Table 1: SEARs and agency requirements addressed in this report**

Requirement	Response/Location in report
<b>Secretary’s Environmental Assessment Requirements</b>	
<u>13. Ground and Water Conditions</u>	
<ul style="list-style-type: none"> <li>• Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site, including soil erosion, salinity and acid sulfate soils.</li> <li>• Provide a Surface and Groundwater Impact Assessment that assesses potential impacts on                             <ul style="list-style-type: none"> <li>○ surface water resources (quality and quantity) including related infrastructure, hydrology, dependent ecosystems, drainage lines, downstream assets and watercourses.</li> <li>○ groundwater resources in accordance with the Groundwater Guidelines.</li> </ul> </li> <li>• Address the requirements listed in SEARs advice Water NSW dated 17 December 2024, by Water NSW.</li> </ul>	The impact assessment for riparian matters (Section 5) supports the Surface and Groundwater Impact Assessment (ELA 2025b).
<b>Liverpool City Council</b>	
<u>5. Flooding</u>	
<ul style="list-style-type: none"> <li>b. Two natural watercourses (Strahler Order 1 &amp; 2) run through the site. According to the Western Sydney Aerotropolis (WSA) Development Control Plan (DCP), waterways of Strahler Order 2 and higher need to be maintained in a natural state.</li> </ul>	Section 5 of this report for riparian matters.
<b>DCCEEW Biodiversity, Conservation and Science (BCS) Group</b>	
<u>Water and Soils</u>	
<ul style="list-style-type: none"> <li>• The EIS must map the following features relevant to water and soils including:                             <ul style="list-style-type: none"> <li>b. Rivers, streams, wetlands and estuaries</li> </ul> </li> <li>• The EIS must assess the impact of the development on hydrology, including:                             <ul style="list-style-type: none"> <li>a. Effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas</li> </ul> </li> </ul>	Section 5 of this report for riparian matters.

Requirement	Response/Location in report
<p><u>Waterway Health and Stormwater Management</u></p> <ul style="list-style-type: none"> <li>BCS recommends the applicant address the provisions of section 2.3 Stormwater, Water Sensitive Urban Design and Integrated Water Management and section 2.5.5 Erosion and Sediment Control within the Phase 2 Aerotropolis Development Control Plan and Section 4.5 Blue-Green Infrastructure framework of the Western Sydney Aerotropolis Precinct Plan. In addressing the above, the applicant will need to access the Technical guidance for achieving Wianamatta South Creek stormwater management targets (DPE, 2022) and associated MUSIC modelling toolkit.</li> </ul>	<p>Section 5.5 of this report addresses Section 4.5 Blue-Green Infrastructure framework of the Western Sydney Aerotropolis Precinct Plan.</p>
<p><b>WaterNSW</b></p> <ul style="list-style-type: none"> <li>WaterNSW notes that numerous watercourses traverse the site. Given the significant earthworks and potential impacts on overland waterflow paths, the Project EIS would need to include measures to address potential soil erosion, overland flow and water quality impacts within and surrounding the site. As this application is an SSD, any flood works or licensing approvals will be assessed by others</li> </ul>	<p>Section 5 of this report for riparian matters.</p>

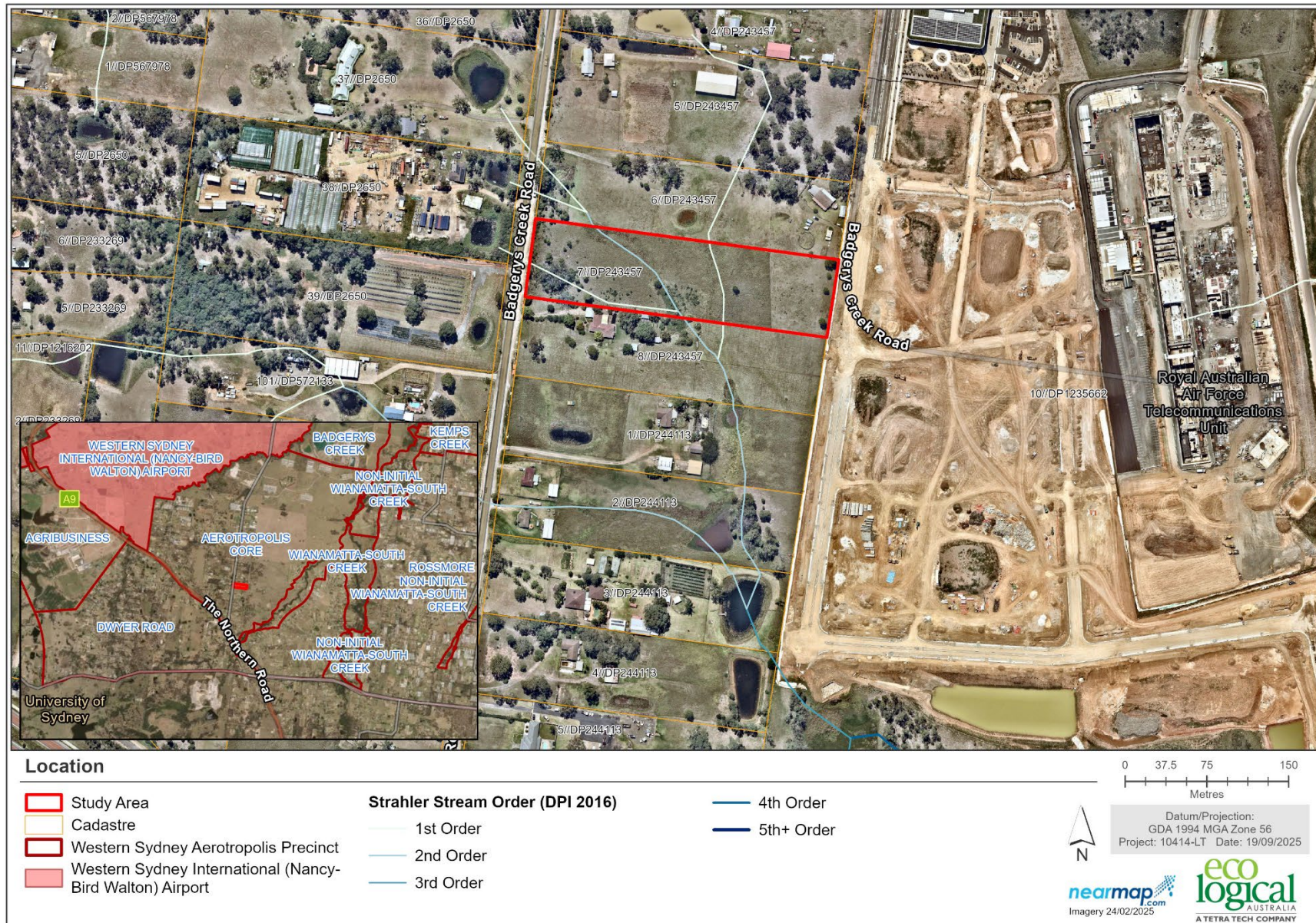
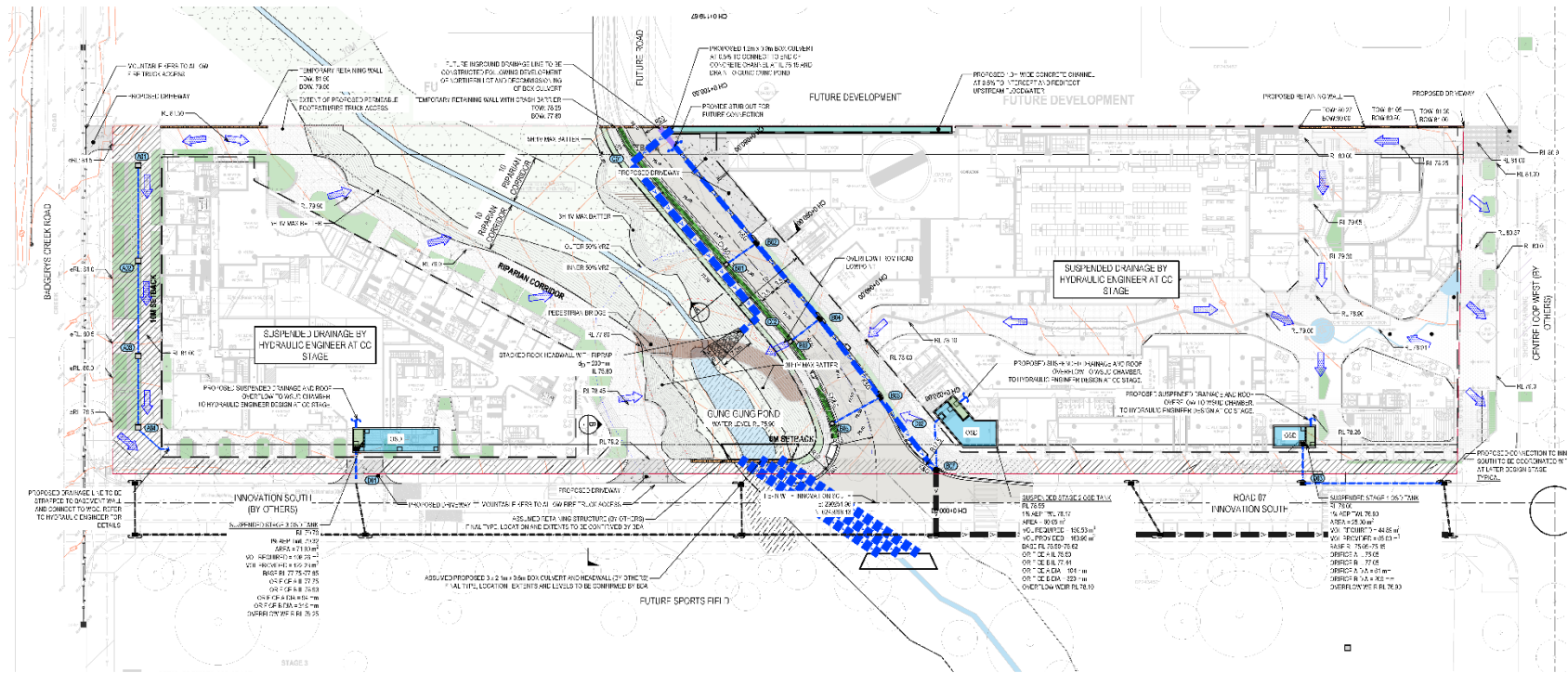


Figure 1: Location context



GENERAL ARRANGEMENT PLAN  
SCALE 1:400

LEGEND

- BPP BOUNDARY
- EXISTING CONDUIT (R.10M)
- PROPOSED 210 WATER PIPE
- PROPOSED 210 WATER PIPE
- STORMWATER PIPE BY OTHERS
- GRADED SURFACE (LET PIT)
- SCALE 1:10 PIT
- R.10M 1.5M BY OTHERS
- PROPOSED WERE MILE PIT
- STORMWATER PIPE
- MANHOLE
- COVER A OF W. DISPOSITION

PIT SCHEDULE				
PIT ID	PIT TYPE	COVER LEVEL (M+D)	PIT ID	DEPTH TOLL (M)
A01	REINFORCED CONCRETE	+1.41	A02	1.00
A02	REINFORCED CONCRETE	81.21	A03	1.00
A03	REINFORCED CONCRETE	66.85	A04	1.00
A04	REINFORCED CONCRETE	76.23	A05	1.00
A05	REINFORCED CONCRETE	77.88	A06	1.00
A06	REINFORCED CONCRETE	77.79	A07	2.02
A07	REINFORCED CONCRETE	77.91	A08	1.00
A08	REINFORCED CONCRETE	77.91	A09	1.00
A09	REINFORCED CONCRETE	77.91	A10	1.00
A10	REINFORCED CONCRETE	77.91	A11	1.00
A11	REINFORCED CONCRETE	77.91	A12	1.00
A12	REINFORCED CONCRETE	77.91	A13	1.00

M01	1.5m x 1.5m x 1.5m	77.67	76.85	1.83
M02	1.5m x 1.5m x 1.5m	77.68	76.69	2.02
M03	1.5m x 1.5m x 1.5m	78.67	78.63	2.02
M04	1.5m x 1.5m x 1.5m	78.63	78.40	2.23
M05	1.5m x 1.5m x 1.5m	78.66	78.38	1.62
M06	1.5m x 1.5m x 1.5m	77.62	76.88	1.77
M07	1.5m x 1.5m x 1.5m	77.62	77.63	1.83
M08	1.5m x 1.5m x 1.5m	78.46	78.63	2.06
M09	1.5m x 1.5m x 1.5m	77.66	74.39	2.67

Revision	Description
1	ISSUED FOR PERMIT
2	ISSUED FOR PERMIT
3	ISSUED FOR PERMIT
4	ISSUED FOR PERMIT
5	ISSUED FOR PERMIT
6	ISSUED FOR PERMIT

Rev	Date	By	Check
1	12/11/2024	ADP	CV
2	12/11/2024	ADP	CV
3	12/11/2024	ADP	CV
4	12/11/2024	ADP	CV
5	12/11/2024	ADP	CV
6	12/11/2024	ADP	CV

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Project: 135 BADGERS CREEK, BRADFIELD  
135 BADGERS CREEK, BRADFIELD

Working Title: CIVIL ENGINEERING SERVICES  
GENERAL ARRANGEMENT PLAN

NOTES

1. ALL 1.5m x 1.5m x 1.5m BOX CULVERTS TO BE CONSTRUCTED BY OTHERS.
2. ALL 1.5m x 1.5m x 1.5m BOX CULVERTS TO BE CONSTRUCTED BY OTHERS.
3. ALL 1.5m x 1.5m x 1.5m BOX CULVERTS TO BE CONSTRUCTED BY OTHERS.
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9. ALL 1.5m x 1.5m x 1.5m BOX CULVERTS TO BE CONSTRUCTED BY OTHERS.
10. ALL 1.5m x 1.5m x 1.5m BOX CULVERTS TO BE CONSTRUCTED BY OTHERS.

PRELIMINARY

Prepared	Design	Approved	Date	Scale	Sheet No.
AA	AA	AA	OCT 2025	NTS	@ A1

Job No.	Drawing Number	Status	North Point
SYD3120	CE100	H	

Figure 2: Civil General Arrangement Plan ADP Consulting, Drawing no. CE100, Revision H, Oct 2025)

## 2. Statutory Context

### 2.1. Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Under the EPBC Act, the Commonwealth Environment Minister needs to approve any development that is likely to have a significant impact on Matters of National Environmental Significance (MNES). Should such an impact, as defined in the EPBC Act Policy Statement 1.1 – Significant Impact Guidelines (Department of the Environment 2013), be likely, the preparation and submission of a Referral is required. MNES relevant to this study includes threatened ecological communities, flora and fauna species and migratory species that are listed under the Act. The proposed work would not cause a significant impact to aquatic species, and therefore a Referral is not recommended for impacts to aquatic species.

For terrestrial matters, refer to the Biodiversity Assessment Report (ELA 2025a).

### 2.2. NSW Environmental Planning and Assessment Act 1979 (EP&A Act)

All developments in NSW are assessed in accordance with the provisions of the EP&A Act and the *Environmental Planning and Assessment Regulation 2021*. The EP&A Act provides a system for environmental planning and assessment, including approvals and environmental impact assessment requirements for proposed developments. Implementation of the EP&A Act is the responsibility of the Minister for Planning, statutory authorities and local councils.

### 2.3. NSW Biodiversity Conservation Act 2016 (BC Act)

Terrestrial biodiversity values, and flora and fauna listed under the BC Act are addressed in the Biodiversity Assessment Report (ELA 2025a).

### 2.4. NSW Wetlands Management Policy 2010

The NSW Wetlands Management Policy (DECCW 2010) aims to provide for the protection, ecologically sustainable use and management of NSW wetlands. Wetlands include lakes, lagoons, estuaries, rivers, floodplains, swamps, bogs, billabongs, marshes, coral reefs and seagrass beds. Wetlands within the site occur within the riparian corridor.

### 2.5. NSW Water Management Act 2000 (WM Act)

The WM Act aims to protect and use NSW water in a way that is sustainable and holistic, which will help present generations without harming the ability of future generations to satisfy their needs. The NSW Department of Climate Change, Energy, the Environmental and Water (DCCEEW) – Water Group administers licencing and approvals for controlled activities on ‘waterfront land’, which is defined as the land 40 m from the highest bank of a river, lake or estuary published on the Department’s website (*Water Management (General) Regulation Hydro Line spatial data*), known as the ‘hydroline’. Apart from the exceptions stated in Schedule 4, Part 6 of the *Water Management (General) Regulation 2025*, controlled activities are:

- The construction of buildings or carrying out of works
- The removal of material or vegetation from land by excavation or any other means

- The deposition of material on land by landfill or otherwise
- Any activity that affects the quality or flow of water in a water source.

Under s.4.41 of the EP&A Act, a controlled activity approval (CAA) is not required for State Significant Development. However, the principles and objectives of the WM Act still apply to the proposal.

The DCCEEW *Controlled activities – Guidelines for riparian corridors on waterfront land* (DCCEEW 2025) (DCCEEW riparian guidelines) outlines the need for a Vegetated Riparian Zone (VRZ) adjacent to the channel to provide a transition zone between the terrestrial environment and watercourse. This vegetated zone helps maintain and improve the ecological functions of a watercourse whilst providing habitat for terrestrial flora and fauna. The VRZ plus the channel (bed and banks of the watercourse to the highest bank) constitute the ‘riparian corridor’ (Figure 3). VRZ widths are applied to each stream order, using the Strahler system of ordering watercourses calculated from the published ‘hydroline’ (Table 2).

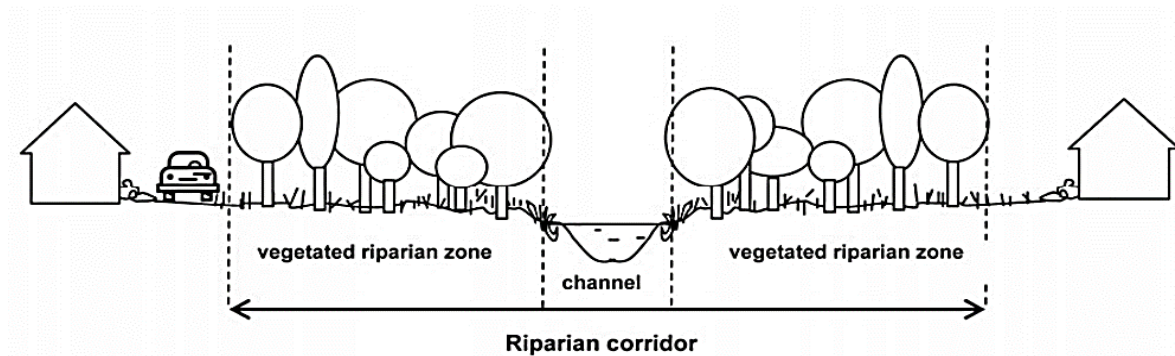


Figure 3: Vegetated riparian zone and watercourse channel comprising the riparian corridor (DCCEEW 2025)

Table 2: Recommended riparian corridor widths relative to Strahler stream order (DCCEEW 2025)

Watercourse type	VRZ width (each side of watercourse)	Total riparian corridor width
1 <sup>st</sup> order	10 m	20 m + channel width
2 <sup>nd</sup> order	20 m	40 m + channel width
3 <sup>rd</sup> order	30 m	60 m + channel width
4 <sup>th</sup> order and greater (includes estuaries, wetlands and any parts of rivers influenced by tidal waters)	40 m	80 m + channel width

Certain works are permissible within the riparian zone if specific design criteria are met (Table 3 and key below). Non-riparian uses in the outer 50% of the VRZ are permitted as long as compensation (1:1 offset) is achieved within the site using the ‘averaging rule’ (Figure 4).

**Table 3: Riparian corridor (RC) matrix of permissible use (DCCEEW 2025)**

Stream order	Vegetated Riparian Zone (VRZ)	RC offsetting for non RC uses	Cycleways and paths	Detention basins		Stormwater outlet structures and essential services	Stream realignment	Road crossings		
				Only within 50% outer VRZ	Online			Any	Culvert	Bridge
1 <sup>st</sup>	10 m	●	●	●	●	●	●	●		
2 <sup>nd</sup>	20 m	●	●	●	●	●		●		
3 <sup>rd</sup>	30 m	●	●	●		●			●	●
4 <sup>th+</sup>	40 m	●	●	●		●			●	●

Key to riparian corridor matrix

**Stream order:** The watercourse order as classified under the Strahler system based on Hydro Line Spatial Data published on the Department’s website<sup>1</sup> when zoomed in at 1:25,000, 1:50,000 or 1:100,000, whichever is the smallest scale available. A stream may separate and then converge—this is called a ‘braided stream’. A braided stream retains the same stream order throughout the braid, as though it were a single stream. For the riparian guidelines, stream order is fixed and is not to be altered if an upstream hydroline is not considered waterfront land.

**Vegetated riparian zone (VRZ):** The required width of the VRZ measured from the top of the high bank on each side of the watercourse.

**Riparian corridor (RC) off-setting for non RC uses:** Non-riparian uses, such as bushfire Asset Protection Zones, roads and urban development are allowed within the outer 50% of the VRZ, so long as offsets are provided in accordance with the averaging rule as seen in Figure 4.

**Cycleways and paths:** Cycleways or paths no wider than four metres total disturbance footprint can be built in the outer 50% of the VRZ.

**Detention basins:** Detention basins can be built in the outer 50% of the VRZ or online where indicated. Offline detention basins do not need to be offset so long as there is an equivalent VRZ for the corresponding watercourse and they are built in compliance with the department’s Guidelines for outlet structures and Guidelines for in-stream works. If a proposed basin will not have an equivalent VRZ for the corresponding watercourse, it may still be built in the outer 50% of the VRZ but must be offset. Online basins must:

- be dry and vegetated
- be for temporary flood detention only with no permanent water holding
- have an equivalent VRZ for the corresponding watercourse order
- not be used for water quality treatment purposes.

**Stormwater outlet structures and essential services:** Stormwater outlets or essential services are allowed in the RC. Works for essential services on a fourth order or greater stream are to be undertaken by directional drilling or tied to existing crossings.

**Stream realignment:** Indicates that a watercourse may be realigned.

**Road crossings:** Indicates permitted road crossing methods. Refer to the Department’s guidelines for watercourse crossings and DPI Fisheries policy and guidelines for fish friendly waterway crossings (Fairfull 2013, discussed below in section 2.6).

<sup>1</sup> <https://trade.maps.arcgis.com/apps/webappviewer/index.html?id=07b967fd0bdc4b0099fc5be45b6d1392>

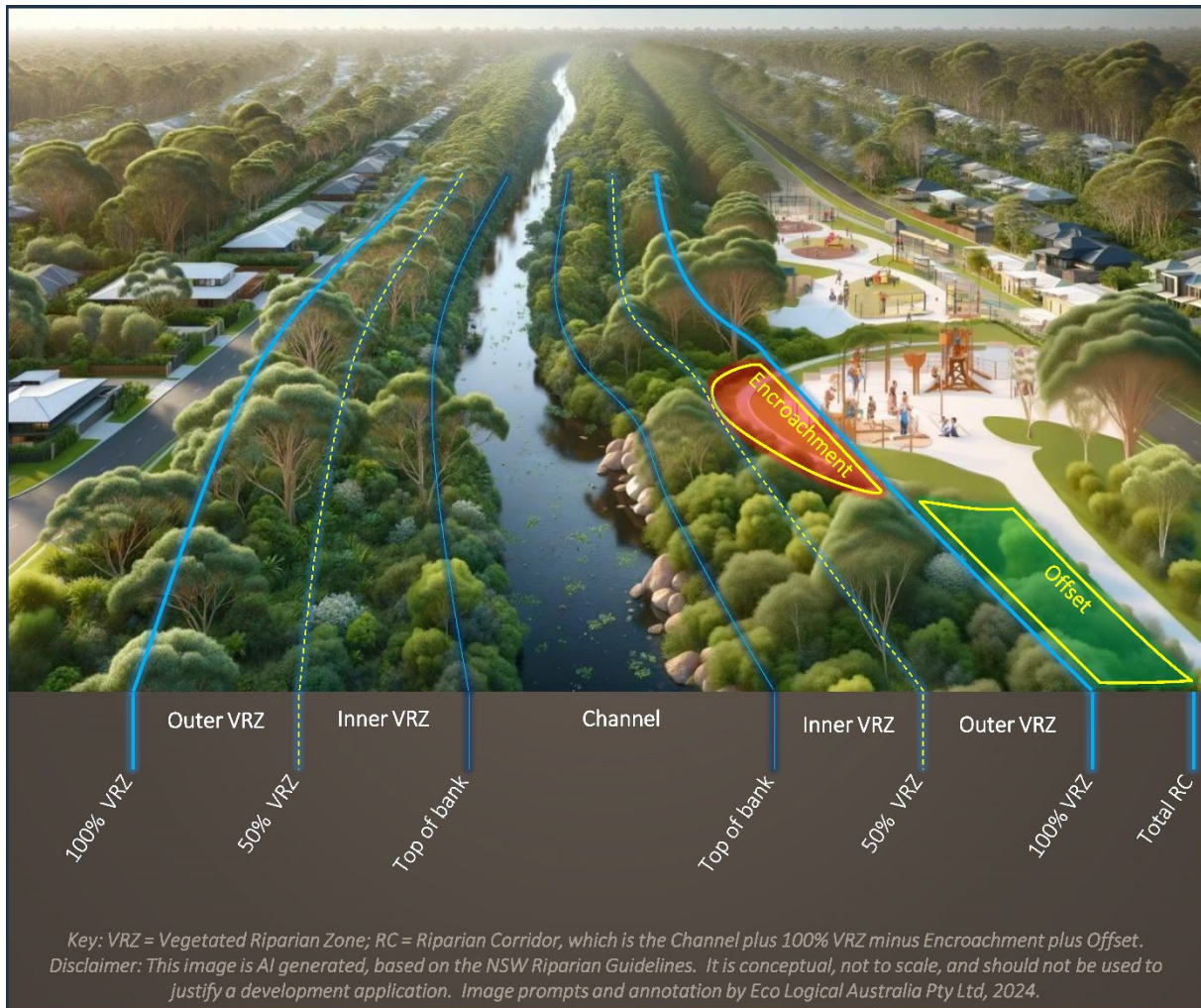


Figure 4: Riparian 'averaging rule' for offsetting encroachment into the outer 50% of the VRZ (adapted from DCCEE 2025)

## 2.6. NSW Fisheries Management Act 1994 (FM Act) and Policy and guidelines for fish habitat conservation and management

The FM Act is the principal piece of legislation protecting aquatic habitat in NSW. The act aims to conserve fish stocks, key fish habitat, aquatic vegetation, and threatened species, populations and communities. Threatened aquatic species, populations and communities are listed under Schedules 4, 4A and 5 of the FM Act, while key threatening processes are listed under Schedule 6. If works involve harm to aquatic habitat, then the proponent is required to demonstrate how the design and works have attempted to avoid, minimise and mitigate direct and indirect harm, plus apply the DPI Fisheries' offset policy to ensure there is no net loss of key fish habitat (KFH), as described in Section 3.3.3 of the *Policy and Guidelines for Fish Habitat Conservation and Management* (Fairfull 2013) ('DPI Fisheries guidelines').

The site does not contain KFH as defined in the DPI Fisheries guidelines (Strahler order 3 or greater, or threatened species habitat), therefore the guidelines do not apply to the proposal. However, the recommendations in Section 6 should be implemented to avoid potential indirect impact to KFH downstream.

## **2.7. NSW Coastal Management Act 2016 (CM Act) and State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP)**

The objectives of the CM Act are to manage the coastal environment of NSW in a manner consistent with the principles of ecologically sustainable development for the social, cultural and economic well-being of the people of the State. Part 2 of the CM Act identifies objectives related to four coastal management areas of the 'coastal zone'. The site is not mapped within the coastal zone, therefore the controls on development under Part 2 of the CM Act do not apply to the proposal.

## **2.8. State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP)**

The development site is located within the Hawkesbury Nepean Catchment in accordance with Chapter 6 of the State Environmental Planning Policy (Biodiversity and Conservation) 2021. Therefore, general development controls under Division 2 (clauses 6.6 – 6.10) apply:

- Water quality and quantity – the effect on the quality of water entering a natural waterbody will be as close as possible to neutral or beneficial, and, the impact on water flow in a natural waterbody will be minimised.
- Aquatic ecology – the development is to have minimal impacts, whether direct, indirect or cumulative, to adjacent and downstream waterbodies and wetlands.
- Flooding – the development, if flooded, is not to release pollutants or obstruct natural flows to nearby wetlands and riverine ecosystems.
- Recreation and public access – foreshore access is not to cause an adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation.
- Total catchment management – the consenting authority must consult with downstream Councils before granting development consent.

## **2.9. State Environmental Planning Policy (Precincts – Western Parkland City) 2021 (Western Parkland City SEPP) and Western Sydney Aerotropolis Precinct Plan 2024**

The Western Sydney Aerotropolis Precinct Plan (Precinct Plan) is in force under the provisions of State Environmental Planning Policy (Precincts – Western Parkland City) 2021 (Precincts SEPP), specifically Chapter 4 Western Sydney Aerotropolis. Section 4.5.2 of the Precinct Plan outlines objectives and requirements for the protection, restoration and maintenance of riparian corridors within Western Sydney Aerotropolis. Objectives include the protection, restoration and maintenance of vegetated riparian zones in accordance with state legislation and guidelines, management of impacts of development on waterways to meet and maintain waterway health targets, and the facilitation of safe water access for recreation and for urban cooling. Assessment of the proposal against the Section 4.5.2 requirements of the Precinct Plan is provided in Section 5.5 of this report.

## **2.10. Western Sydney Aerotropolis Phase 2 Development Control Plan (DCP) 2022**

Section 2.3.1 of the Western Sydney Aerotropolis Phase 2 Development Control Plan (Aerotropolis DCP) contains objectives, performance outcomes and benchmark solutions for waterway health and riparian corridors. The objectives of this section are to:

- O1: Protect and restore native and riparian vegetation to improve the connectivity, ecological condition, and function of ecosystems.
- O2: Ensure that development does not adversely affect aquatic fauna.
- O3: Effectively manage indirect and ongoing impacts of development adjacent to waterways to ensure vegetation in the riparian area, aquatic fauna, water quality and quantity is protected and maintained.
- O4: Reinststate more natural conditions in highly modified waterways and riparian land while not increasing flood risk.

Assessment of the proposal against the performance outcomes and benchmark solutions under Section 2.3.1 of the Aerotropolis DCP is presented in Section 5.6 of this report.

## 3. Methods

### 3.1. Desktop assessment

A review of the following data, background literature and relevant planning instruments and strategic documents was undertaken, with databases accessed on 1 September 2025, unless otherwise noted:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* – Protected Matters Search Tool (5 km radius)
- NSW *Fisheries Management Act 1994*; Fisheries NSW *Policy and Guidelines for Fish Habitat Conservation and Management* (2013 update) (Fairfull 2013); key fish habitat mapping; listed protected and threatened species and populations, including species profiles; ‘Primefact’ publications and expected distribution maps (Riches et al 2016)
- NSW *Water Management Act 2000* and DCCEEW *Controlled activities – Guidelines for riparian corridors on waterfront land* (DCCEEW 2025)
- *Water Management (General) Regulation Hydro Line spatial data*
- NSW Wetlands Management Policy 2010 (DECCW 2010)
- Online Zoological Collections of Australian Museums (OZCAM) and Atlas of Living Australia (ALA) – individual species searches to determine likelihood of occurrence of threatened species
- NSW River styles database (DPE 2023)
- Chapter 6 – Hawkesbury-Nepean River of the State Environmental Planning Policy (Biodiversity and Conservation SEPP) 2021
- State Environmental Planning Policy (Precincts – Western Parkland City) 2021 and Western Sydney Aerotropolis Precinct Plan 2024
- Western Sydney Aerotropolis Phase 2 Development Control Plan 2022
- Desktop top of bank mapping estimated in ArcGIS Pro using high resolution (7.5 cm) aerial imagery and 0.5 m surface contours derived from 1 m resolution LiDAR imagery.

### 3.2. Field survey

Two ELA aquatic ecologists undertook field work on 8 April 2025. The aim of the field work was to validate watercourses against the definition of a ‘river’ used in the WM Act and the DCCEEW riparian guidelines, and to ground-truth/adjust desktop top of bank mapping. A rapid assessment of aquatic and riparian condition was conducted to describe the value of validated watercourses.

#### 3.2.1. River validation

A ‘river’, as defined in the WM Act, is a watercourse shown on the state hydroline map and has a defined bed, bank and evidence of geomorphic processes (erosion and deposition). A river may generally have some aquatic habitat features, either ephemeral or permanent, and may be discontinuous along its length. A watercourse may have portions of its length that do not display evidence of a river but if there are defining features upstream of that reach, then it must be classed as a river for its full length (as measured down from the uppermost part that has defining characteristics). Under the DCCEEW riparian guidelines, should a watercourse not be defined as a river, then the

downstream Strahler stream order remains unchanged. That is, the Strahler stream order is a fixed calculation from the state hydroline map, regardless of whether the river exists, or has been engineered, or is proposed to be engineered (i.e. piped or filled for development). Watercourses in the site that were mapped on the state hydroline were visually observed for evidence of geomorphic processes and validated based on these criteria.

### **3.2.2. Top of bank mapping**

Top of bank of validated watercourses within the site were walked and mapped using a GPS-enabled tablet loaded with high-resolution (7.5 cm) aerial imagery, LiDAR-derived contours and desktop mapping. Linework was adjusted based on site observations, then corrected in ArcGIS Pro following field work.

### **3.2.3. Habitat assessment**

For reaches proposed to be removed or potentially realigned, notes on its condition were taken to describe geomorphic condition, riparian vegetation and aquatic habitat.

## **3.3. Riparian corridors**

Once linework was finalised, a riparian buffer (VRZ width) was applied to its corresponding stream order in accordance with the DCCEEW riparian guidelines (Table 2). Any encroachment to the outer 50% VRZ by non-permissible riparian uses (Table 3) was offset within the site to maintain the average VRZ width, as per the riparian averaging rule (Figure 4). Where possible, offset areas were positioned on existing cleared land to increase the vegetated area, and/or over remnant bushland to protect it from future clearing or provide habitat connectivity to other protected land.

## 4. Results

### 4.1. Desktop review

The site consists of two unnamed 1<sup>st</sup> order and one 2<sup>nd</sup> order watercourses (proposed to be named Gung Gung Creek), forming part of the Hawkesbury catchment and South Creek sub-catchment (Figure 5).

The nearest KFH (3<sup>rd</sup> order and greater or threatened species habitat) is located approximately 250 m downstream of the site within an online dam along Moore Gully, which is a tributary to Thompsons Creek (Figure 6). DPI Fisheries identify South Creek, ~3.7 km downstream of the site, as having 'fair' freshwater fish community status. The nearest aquatic reserve is Towra Point Aquatic Reserve, 40 km ESE of the site.

The River Style of Moore Gully is a laterally unconfined, discontinuous channel with chain of ponds geomorphic form and a gravel bed in moderate geomorphic condition, assessed March 2020 (DPE 2023). Approximately 250 m downstream of the site, where Reach 2A becomes a 3<sup>rd</sup> order tributary to Moore Gully; DPE (2023) assessed this reach in March 2020 as a laterally unconfined creek with a discontinuous channel, low sinuosity and a fine-grained bed.

The FM Act listed threatened species, populations or communities with an indicative distribution nearest to or within the site include *Archaeophya adamsi* (Adams emerald dragonfly), *Austrocordulia leonardi* (Sydney hawk dragonfly) and *Macquaria australasica* (Macquarie perch) (Riches et al. 2016). The MNES search tool identifies EPBC Act listed threatened species, Macquarie perch, *Persicaria elatior* (tall knotweed) and *Prototroctes maraena* (Australian grayling), as having potential habitat within the site. The ALA database indicates no aquatic FM Act or EPBC Act listed threatened species, populations or communities records exist within 5 km of the site. Nearest ALA records of the above species and the presence or likelihood of occurrence of FM Act and EPBC Act listed threatened species, populations or communities is presented in Appendix B.



Figure 5: Hydrological context

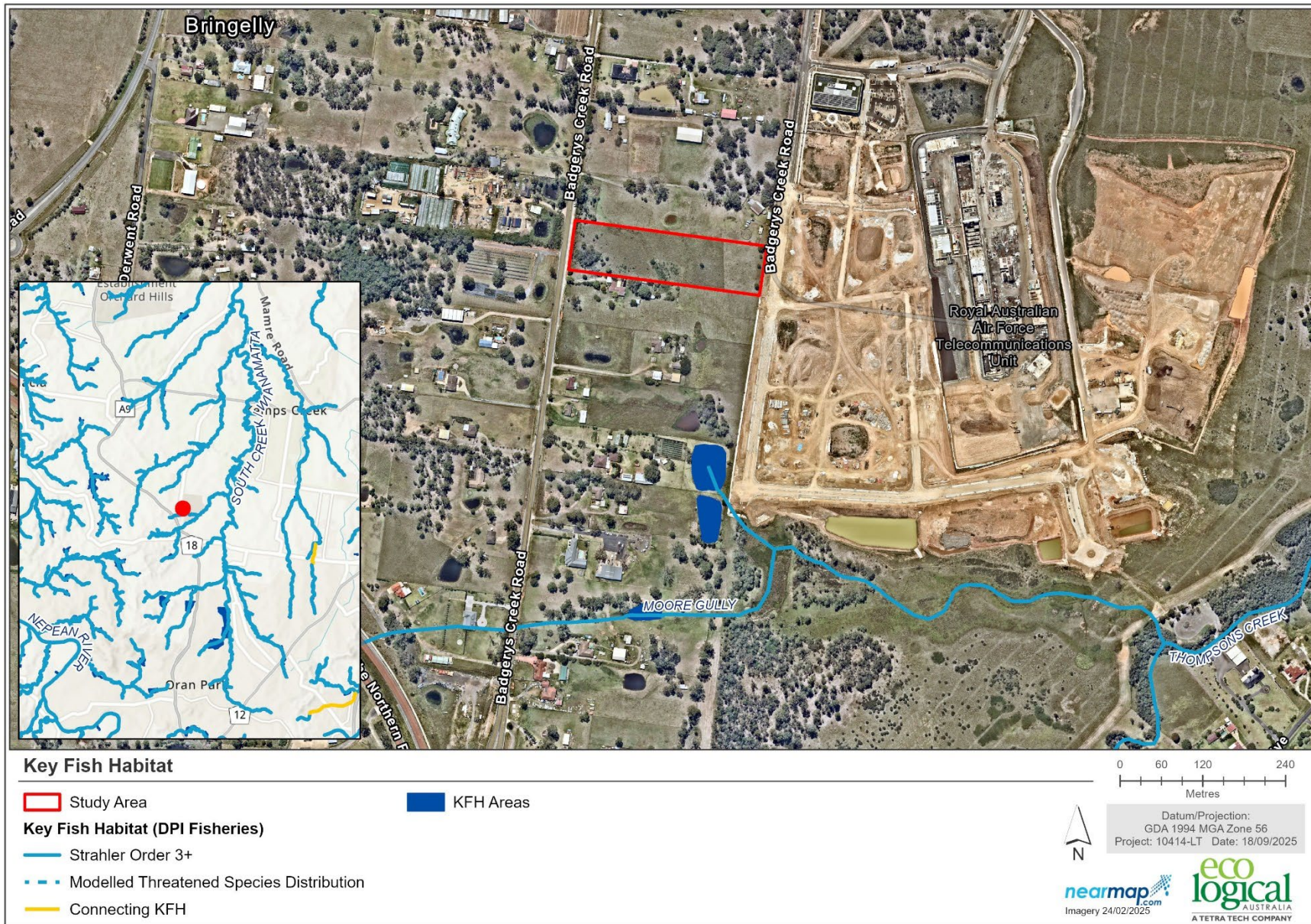


Figure 6: Key fish habitat

## 4.2. River validation and top of bank mapping

Findings from the field survey showed that Reaches 1A, 1B, 1C, 1D and the upstream ~85 m of Reach 2A were not considered 'rivers' under the WM Act, because they had no bed, banks or evidence of geomorphic processes (Figure 7). These do not trigger riparian offsets if they are removed. The downstream ~30 m of Reach 2A within the site qualified as a 'river' due to the presence of a bed, banks and instream aquatic vegetation, described in Section 4.3 below. Therefore, waterfront land only exists within 40 m of the top of bank of the lower quarter of Reach 2A, but not for the upstream three quarters. Therefore, the upper reach (not a 'river') is suitable for applying a new channel and riparian offsets to balance encroachment of the lower reach ('river'). As the works would be a controlled activity, the principles and objectives of the WM Act still apply to the proposal. As such, the proposal has been assessed against the DCCEEW riparian guidelines in Section 5.1.

Final field-validated top of bank mapping is shown in Figure 7. Mapping rules were applied for the whole site:

- All drainage lines/gullies not on the state hydroline map were excluded and clipped out at their confluence with a defined river.
- Portions of Reach 1B, 1C and 1D were assessed via high-resolution aerial imagery where access was limited.

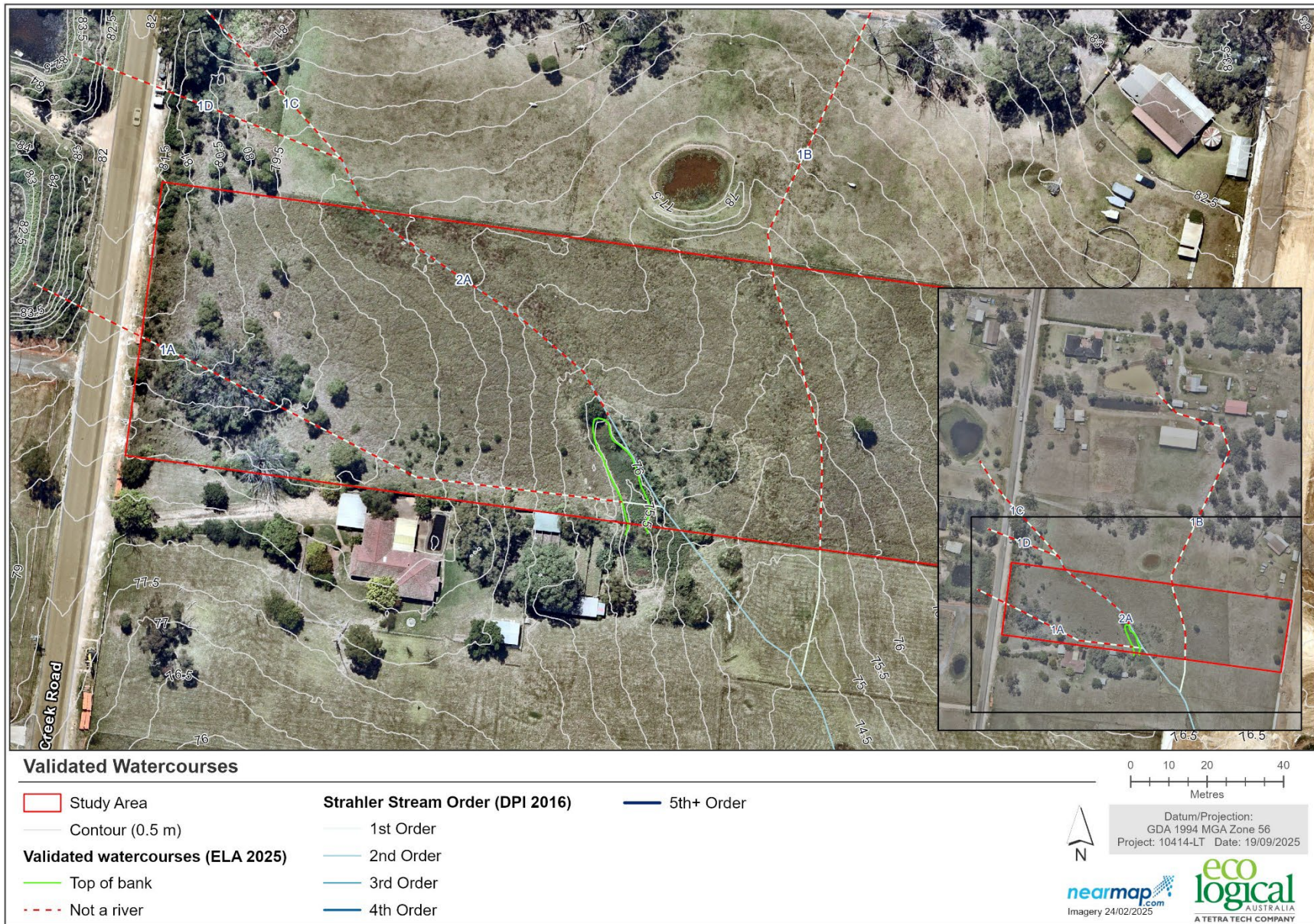


Figure 7: Validated watercourses

### 4.3. Riparian and aquatic condition

No threatened species of fish or aquatic plants are known to occur, or expected to occur in the site, or upstream of the site. An assessment of their likelihood of occurrence is provided in Appendix B.

Streams, or portions of streams that do not meet the definition of a river are documented in Table 4 and Figure 8 to Figure 11. These streams were grassy depressions, some with online dams. They lacked evidence of a bed, bank or geomorphic processes (erosion and deposition). These reaches do not need to be treated as waterfront land and are suitable for engineered alternatives if necessary.

Within the site, a portion of Reach 2A meets the definition of a 'river' and is in poor condition, as demonstrated by field observations and photographs in Table 4 and Figure 12. It provides low aquatic and riparian value in its current state.

Table 4: Riparian and aquatic condition assessed in field

Reach label (Figure 7)	Strahler stream order	WM Act status	Description
1A (Figure 8)	1 <sup>st</sup>	Not a river	<ul style="list-style-type: none"> <li>Upstream of the site, hydroline crosses Badgerys Creek Road with no culvert or evidence of geomorphic processes</li> <li>Within the site, this reach contains terrestrial grasses with no bed, banks or aquatic vegetation</li> <li>This reach may function as an overland flow path during periods of high rainfall</li> </ul>
1B (Figure 9)	1 <sup>st</sup>	Not a river	<ul style="list-style-type: none"> <li>No bed, banks or evidence of geomorphic processes observed</li> <li>This reach presents as a grassy swale dominated by terrestrial grasses with sporadic <i>Juncus</i> sp.</li> <li>No aquatic or riparian vegetation observed</li> <li>Viewed from the northern site boundary with the aid of high-resolution aerial imagery, the portion of the hydroline upstream of the site did not exhibit features characteristic of a 'river'</li> </ul>
1C (Figure 10)	1 <sup>st</sup>	Not a river	<ul style="list-style-type: none"> <li>Reach located upstream of the site with no access to lot to the north</li> <li>No defined bed, banks or signs of geomorphic processes observed from Badgerys Creek Road</li> <li>During periods of heavy rainfall, this reach likely functions as an overland flow path at its confluence with Reach 1D, with flow concentrated into a single-pipe culvert under Badgerys Creek Road</li> <li>Downstream of the pipe culvert, minor scouring/channelisation is present, which dissipates into the online dam through terrestrial grasses</li> <li>Online dam east of the road contains <i>Typha orientalis</i></li> </ul>
1D (Figure 11)	1 <sup>st</sup>	Not a river	<ul style="list-style-type: none"> <li>Reach located upstream of the site with no access to lot to the north</li> <li>No defined bed, banks or signs of geomorphic processes observed from Badgerys Creek Road</li> <li>During periods of heavy rainfall, this reach likely functions as an overland flow path at its confluence with Reach 1C</li> </ul>
2A (Figure 12)	2 <sup>nd</sup>	River (partial)	<p>Upstream portion (~85 m) – not a river</p> <ul style="list-style-type: none"> <li>No bed, banks or evidence of geomorphic processes observed</li> <li>This reach presents as a grassy swale dominated by terrestrial grasses with sporadic <i>Juncus</i> sp.</li> <li>No aquatic or riparian vegetation observed</li> </ul> <p>Downstream portion (~30 m) – river</p>

Reach label (Figure 7)	Strahler stream order	WM Act status	Description
			<ul style="list-style-type: none"> <li>• Poor condition</li> <li>• Shallow (~0.5 m deep), defined banks and ~4 – 7 m wide channel observed</li> <li>• Channel bed densely vegetated by native instream aquatic vegetation including <i>Persicaria decipiens</i> (slender knotweed), suggesting regular and/or consistent inundation</li> <li>• <i>Juncus</i> sp. and <i>Ludwigia peploides</i> subsp. <i>montevidensis</i> (water primrose) were also observed within the channel</li> <li>• Minimal to no riparian vegetation observed on western bank, with exotic species dominating the eastern bank, including <i>Cydonia oblonga</i> (quince), <i>Olea europaea</i> subsp. <i>cuspidata</i> (African olive), <i>Salix</i> sp. (willow) and <i>Robinia</i> sp.</li> </ul>



Reach 1A upstream of the site



Reach 1A within the site

Figure 8: Reach 1A facing upstream (left) and downstream (right)



Figure 9: Reach 1B facing upstream (left) and downstream (right)



Figure 10: Reach 1C (off site) facing upstream (left) and downstream (right) – roadside drainage



Figure 11: Reach 1D (off site) facing upstream (left) and downstream (right)



*Start of the 'river'*



*Mid-reach*

**Figure 12: Reach 2A facing upstream (left) and downstream (right)**

## 5. Impact assessment

### 5.1. Controlled activities – Guidelines for riparian corridors on waterfront land (WM Act)

Riparian averaging across the site is possible, as there is sufficient space to offset any non-permissible uses of the riparian corridor north of the validated river portion of Reach 2A. Offsets are to be 1:1 compensation for encroaching the VRZ, with the aim to provide an average width that meets the VRZ widths shown in Figure 4. The averaging rule was applied using hectares rounded to two decimal places.

Mapping rules were applied to meet the DCCEEW riparian guidelines as much as possible:

- Non-permissible impacts must stay outside of the 50% VRZ and avoid stands of native riparian vegetation.
- Offsets should be located on cleared areas, if possible, with the aim to restore previous disturbed riparian land, rather than offsetting overtop of vegetation protected for other purposes.
- Permissible impacts do not need offsetting, unless they do not meet the design criteria (e.g., footpaths with a total disturbance footprint >4 m).
- Watercourses not meeting the definition of a river do not need to be offset or treated as waterfront land.
- Road crossing should be minimised and avoid river bends.

A recommended indicative riparian corridor is shown in Figure 13, where non-permissible encroachment of the VRZ (0.08 ha, red shading) is offset elsewhere (0.16 ha, green shading) to adhere to the DCCEEW riparian averaging rule (Figure 4). The total area of the existing riparian corridor (VRZ plus channel width) area is 0.21 ha. The proposal seeks to provide for a total riparian corridor area of 0.27 ha, including construction of a riparian corridor where there is currently no defined river, exceeding the 1:1 offsetting requirement. As offsetting cannot be provided for along the validated portion of the watercourse, the proposal to apply offsets upstream is subject to a merit-based assessment by DCCEEW – Water Group.

Encroachment of the proposed development footprint into the riparian corridor which must be offset according to the DCCEEW riparian guidelines includes the proposed new street to the east of Reach 2A and its associated verge and footpath and the paved areas to the west. The VRZ encroachment area includes 17.13 m<sup>2</sup> of inner 50% VRZ encroachment from a footpath at a road intersection, which does not align with riparian guidelines, however, its location near a crossing is unlikely to impact the proposed riparian corridor's riverine function. Another small area of inner 50% VRZ encroachment (1.75 m<sup>2</sup>) is on the western side, where a pedestrian viewing/gathering area has had to shift closer to the watercourse because of a bushfire protection access track. It is proposed that all batters within the riparian corridor will be vegetated and managed under a Vegetation Management Plan (VMP) (ELA 2025c), therefore they have not been considered an impact. Creek crossings, including road and pedestrian crossings, also do not need to be offset.

Encroachments are proposed to be offset upstream of the validated watercourse, and the total proposed riparian corridor is to be revegetated and rehabilitated under a VMP (ELA 2025c). An open channel is proposed to support the natural drainage pattern and ensure the offset area functions as a riparian corridor. See Appendix A for the Landscape Masterplan and riparian section. The

rehabilitation and revegetation of 0.27 ha of riparian corridor is anticipated to have a positive impact on riparian and aquatic habitat along Reach 2A relative to existing poor conditions (Table 4 and Figure 12).

Modification to the design, if required, may change the encroachment and offset areas.

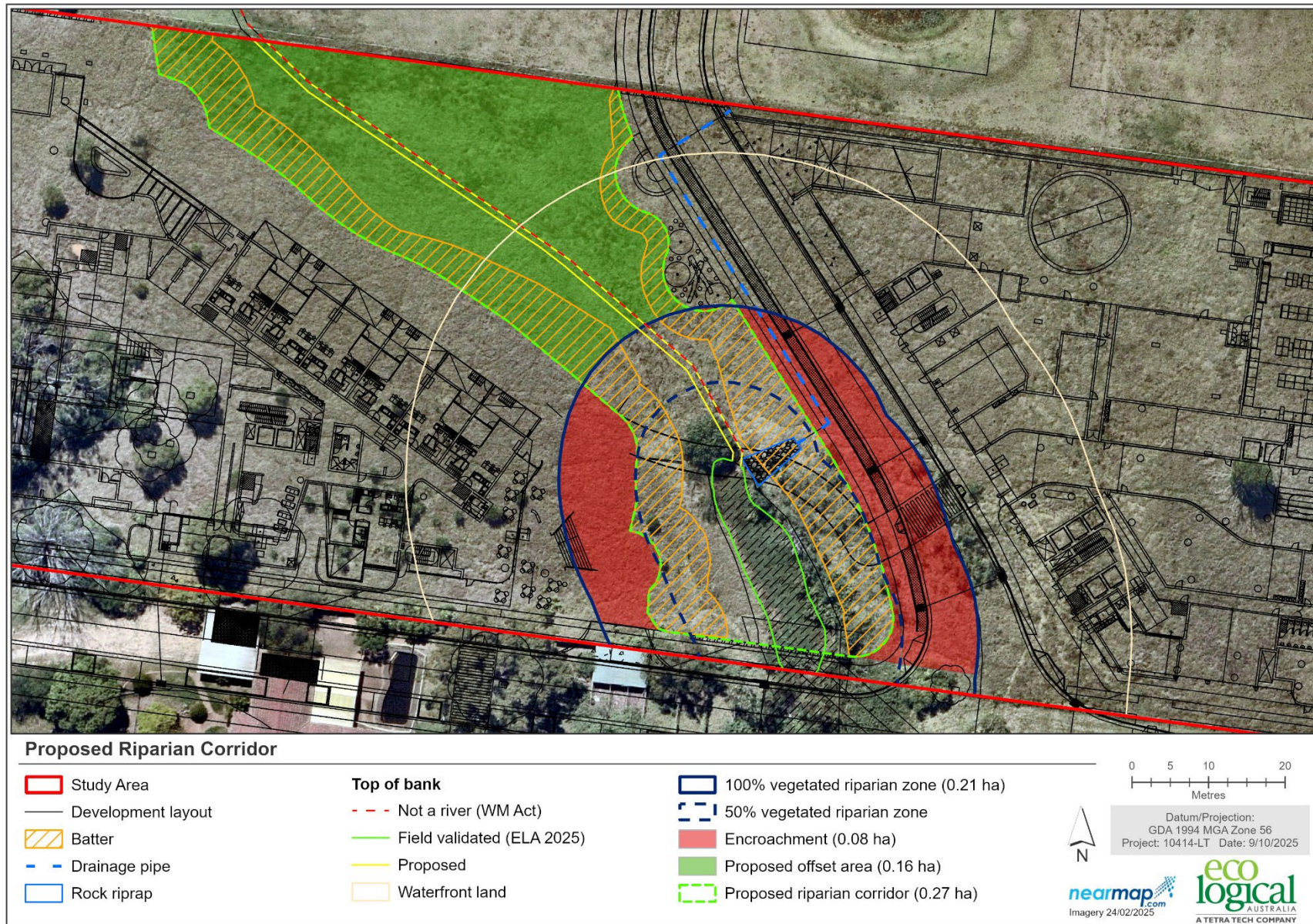


Figure 13: Recommended riparian corridor and averaging rule to meet the DCCEEW riparian guidelines

## 5.2. NSW Fisheries Management Act 1994

DPI Fisheries' Policy and Guidelines for Fish Habitat Conservation and Management (Fairfull 2013) outline requirements for assessing impact of waterfront development to ensure the sustainable management, and 'no net loss', of KFH in NSW. As no KFH exists within the site or immediately downstream of the site, Part 7 of the FM Act does not apply to the proposal.

No FM Act listed threatened species, populations or communities are anticipated to be directly or indirectly impacted by the proposed works. See Appendix B for their likelihood of occurrence within the site.

## 5.3. Matters of National Environmental Significance (MNES)

The following MNES (Table 5) were returned from the database search for a 5 km radius around the site.

**Table 5: Potential impacts to Matters of National Environmental Significance**

Matter of NES	Count	Comment	Impact Assessment
World Heritage Properties	0	None near site	No impact
National Heritage Places	0	None near site	No impact
Wetlands of International Importance (Ramsar Wetlands)	0	None near site	No impact
Great Barrier Reef Marine Park	0	Not near site	No impact
Commonwealth Marine Areas	0	None near site	No impact
Listed Threatened Ecological Communities	8	Terrestrial species excluded – see Biodiversity Assessment Report (ELA 2025a).	No impact (Appendix B).
Listed Threatened Species	53	Terrestrial species excluded – see Biodiversity Assessment Report (ELA 2025a).	No impact (Appendix B).
Listed Migratory Species	11	Terrestrial species excluded – see Biodiversity Assessment Report (ELA 2025a).	No impact (Appendix B).

## 5.4. Biodiversity and Conservation SEPP 2021

An assessment under the Biodiversity and Conservation SEPP are provided below for controls on development generally (Table 6).

**Table 6: Impact assessment for Part 6.2, Division 2 - Controls on development generally**

Item	Impact assessment
Clause 6.6 Water quality and quantity	<p>(2) Development consent must not be granted to development on land in a regulated catchment unless the consent authority is satisfied the development ensures—</p> <p>(a) the effect on the quality of water entering a natural waterbody will be as close as possible to neutral or beneficial.</p> <p>Implementation of a Construction Environmental Management Plan (CEMP) and adherence to the recommendations in Section 6 would ensure potential impacts of sedimentation of Reach 2A associated with construction activities would be mitigated. Implementation of a VMP (ELA 2025c) would increase the ability of riparian vegetation to improve water quality via filtration of runoff.</p> <p>(b) the impact on water flow in a natural waterbody will be minimised.</p>

Item	Impact assessment
	Overall impact on water surface flow hydrology is anticipated to be low with potential impacts unlikely to extend downstream (ELA 2025b)
Clause 6.7 Aquatic ecology	<p><i>(2) Development consent must not be granted to development on land in a regulated catchment unless the consent authority is satisfied of the following—</i></p> <p><i>(a) the direct, indirect or cumulative adverse impact on terrestrial, aquatic or migratory animals or vegetation will be kept to the minimum necessary for the carrying out of the development.</i></p> <p>The proposed design would improve aquatic habitat values relative to the current condition through rehabilitation of the VRZ under a VMP (ELA 2025c).</p> <p>Direct and indirect impacts to aquatic flora and fauna would be kept to a minimum through the implementation of a CEMP. Recommended mitigation strategies are presented in Section 6.</p> <p>Potential direct or indirect impacts to terrestrial flora or terrestrial or migratory fauna is assessed in the Biodiversity Assessment Report (ELA 2025a).</p> <p><i>(b) the development will not have a direct, indirect or cumulative adverse impact on aquatic reserves.</i></p> <p>The nearest aquatic reserve is Towra Point Aquatic Reserve, 40 km ESE of the site. Water flowing off the site is to meet relevant quality guidelines and is highly unlikely to adversely impact the reserve.</p> <p><i>(c) if a controlled activity approval under the Water Management Act 2000 or a permit under the Fisheries Management Act 1994 is required in relation to the clearing of riparian vegetation—the approval or permit has been obtained.</i></p> <p>A CAA is not required for SSDA under s.4.41 of the EP&amp;A Act. However, the project is to be assessed by DCCEEW – Water Group against their relevant guidelines, as the principles and objectives of the WM Act still apply to the proposal. Part 7 of the FM Act does not apply to the proposal; therefore, no permit is required.</p> <p><i>(d) the erosion of land abutting a natural waterbody or the sedimentation of a natural waterbody will be minimised.</i></p> <p>Potential erosion and sedimentation associated with construction activities would be minimised through the implementation of a CEMP. Post-construction, rehabilitation of the riparian corridor through the implementation of a VMP (ELA 2025c) would prevent future erosion and scouring through bank stabilisation.</p> <p><i>(e) the adverse impact on wetlands that are not in the coastal wetlands and littoral rainforests area will be minimised.</i></p> <p>The Biodiversity and Conservation SEPP does not provide a definition of a ‘wetland’. Under the NSW Wetlands Policy 2010 definition, the riparian corridor constitutes a wetland. The project intends to enhance the validated riparian areas through implementation of a VMP (ELA 2025c).</p>
Clause 6.8 Flooding	<p><i>(2) Development consent must not be granted to development on flood liable land in a regulated catchment unless the consent authority is satisfied the development will not—</i></p> <p><i>(a) if there is a flood, result in a release of pollutants that may have an adverse impact on the water quality of a natural waterbody.</i></p> <p>The Flood Risk Assessment (ADP 2025) shows that the 1% AEP Event Flood Hazard is generally limited to the riparian corridor. During such events, flooding extends to a small section of the road on the north-eastern side of the watercourse. Surface pollutants from this road would enter stormwater during non-flood events regardless.</p> <p><i>(b) have an adverse impact on the natural recession of floodwaters into wetlands and other riverine ecosystems.</i></p> <p>No impact would occur because the development is not located between a river and wetland or floodplain channel.</p>
Clause 6.9 Recreation and public access	<p><i>(2) Development consent must not be granted to development on land in a regulated catchment unless the consent authority is satisfied of the following—</i></p> <p><i>(a) the development will maintain or improve public access to and from natural waterbodies for recreational purposes, including fishing, swimming and boating, without adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation.</i></p> <p>Public access to Reach 2A would be improved relative to existing accessibility through construction of passive recreation facilities within the proposed riparian corridor such as a yarning circle, nature playground and footbridge. See Appendix A for the Landscape Masterplan and riparian section.</p>
6.10 Total catchment management	<p><i>In deciding whether to grant development consent to development on land in a regulated catchment, the consent authority must consult with the council of each adjacent or downstream local government area on which the development is likely to have an adverse environmental impact —</i></p>

Item	Impact assessment
	This is the responsibility of Council. The above items showcase how any potential impact downstream is no worse than existing.

## 5.5. Western Parkland City SEPP and Western Sydney Aerotropolis Precinct Plan 2023

Assessment of the consistency of the proposal against the Section 4.5.2 riparian corridor requirements for development under the Western Sydney Aerotropolis Precinct Plan is provided in Table 7 below.

**Table 7: Requirements of development in relation to riparian corridors under the Precinct Plan**

Section 4.5.2 Precinct Plan requirement	Proposal consistency
<b>BG1.</b> Waterways and riparian corridors of Strahler Order 2 (refer to Figure 5) and higher are to be retained and rehabilitated to a natural state (unless minor realignment can be justified), in accordance with the requirements of the Guidelines for Riparian Corridors on Waterfront Land published by the Department of Primary Industries (Office of Water), or other relevant guidelines adopted and in operation at the time.	The 2 <sup>nd</sup> order watercourse (Reach 2A) is to be retained and rehabilitated under a VMP (ELA 2025c) for the portion of the reach which constitutes a 'river' under the WM Act.
<b>BG2.</b> Riparian Streets on Figure 5 are to be adjacent to riparian corridors. The design of Riparian Streets is to be integrated with the retention or naturalisation of the adjacent watercourse and associated riparian zone in accordance with the requirements of the Guidelines for Riparian Corridors on Waterfront Land published by the Department of Primary Industries (Office of Water), or other relevant guidelines adopted and in operation at the time.	Not applicable. No riparian streets are proposed within the site on Figure 5 of the Precinct Plan.
<b>BG3.</b> Consistency with DCP indicative cross-sections to guide the design of Riparian Streets and associated riparian zones.	Not applicable. No riparian streets are proposed within the site on Figure 5 of the Precinct Plan
<b>BG4.</b> The outer 50% of the Riparian Zone, as defined by the Guidelines for Riparian Corridors on Waterfront Land may contain paths, passive recreation facilities and other amenities subject to the appropriate consideration of flood impacts and safety	An alternative design proposes enhancing the riparian corridor's longitudinal function by offsetting VRZ encroachment upstream, in an area without a current channel. This approach increases riparian vegetation along future banks, rather than depending on one wider section for improvement.
<b>BG5.</b> Where a development application proposes the creation of a Riparian Street in association with a riparian corridor in accordance with Requirement BG2, and one or more lots for development, the area of land that comprises the riparian corridor is taken to be part of the minimum pervious area to be provided as part of the development under the DCP.	Not applicable. No riparian streets are proposed within the site.

## 5.6. Western Sydney Aerotropolis Phase 2 DCP 2022

The Aerotropolis DCP was adopted for the Aerotropolis in November 2022. Section 2.3.1 of the DCP provides objectives and controls for waterway health and riparian corridors. Consistency of the proposal with the relevant performance outcomes and benchmark solutions have been described in Table 8 below.

**Table 8: Proposal consistency with DCP performance outcomes and benchmark solutions**

Performance outcome	Benchmark Solution	Proposal consistency
<b>PO1:</b> Development retains and restores native vegetation and riparian corridors.	<ol style="list-style-type: none"> <li>1. Development maintains and protects waterways in accordance with the following guidelines:               <ol style="list-style-type: none"> <li>a. Strahler Order 1 watercourses with a catchment area of less than 15 hectares can be re-constructed and /or piped, providing stormwater modelling demonstrates the pipe and street network is capable of accommodating flows up to and including the 100 year AEP storm event.</li> <li>b. Naturalised trunk drainage paths are to be provided when the contributing catchment exceeds 15 hectares or when 1% AEP overland flows cannot be safely conveyed overland as described in Australian Rainfall and Runoff – 2019.</li> <li>c. Waterways of Strahler Order 2 and higher will be maintained in a natural state, including the maintenance and restoration of riparian areas and habitat, such as fallen debris.</li> <li>d. Where a development is associated with, or will affect, a waterway of Strahler Order 2 or higher, rehabilitation will occur to return that waterway to a natural state.</li> </ol> </li> <li>4. Retain areas of the Proteaceae shrubs for the Eastern Pygmy Possum (<i>Cercartetus nanus</i>) along or adjacent to riparian areas to improve and maintain habitat connectivity</li> <li>5. Weeds from creeks, streams and riparian areas are removed and replaced with appropriate native planting.</li> <li>6. Locate stormwater infrastructure including pipelines and detention basins wholly on certified-urban capable land consistent with the Plan’s biodiversity certification approvals. Stormwater infrastructure is not to be located within land identified as avoided or land managed as a reserve.</li> </ol>	<ol style="list-style-type: none"> <li>1. (a) Each 1<sup>st</sup> order watercourse within the site has a catchment area of &lt;15 ha and does not meet the definition of a ‘river’ under the WM Act.</li> <li>1. (b) Not applicable.</li> <li>1. (c) Reach 2A will be retained and rehabilitated under a VMP (ELA 2025c). Recommendations in Section 6 suggest avoiding removal of large woody debris from the watercourse.</li> <li>1. (d) As above.</li> <li>4. The site lacks Banksia or Acacia species, or midstorey with dense nectar producing vegetation, which is required by <i>Cercartetus nanus</i> (eastern pygmy possum) (ELA 2025a).</li> <li>5. Riparian zones will be restored under a VMP (ELA 2025b) and Weed Eradication Management Plan (WEMP) (ELA 2025d).</li> <li>6. No avoided land or land managed as a reserve exists within the study area.</li> </ol>
<b>PO2:</b> Protect key aquatic habitat where it occurs	<ol style="list-style-type: none"> <li>1. Where aquatic habitat exists, proposed development responds to Policy and Guidelines for Fish Habitat Conservation and Management by the Department of Primary Industries and other relevant guidelines.</li> </ol>	<ol style="list-style-type: none"> <li>1. The DPI Fisheries guidelines (Fairfull 2013) apply to KFH (i.e., 3<sup>rd</sup> order and higher, or any order with a known threatened fish species). No KFH exists within the site, therefore, the DPI Fisheries</li> </ol>

Performance outcome	Benchmark Solution	Proposal consistency
	<ol style="list-style-type: none"> <li>Aquatic fauna habitat is rehabilitated in streams of Strahler Order 2 and higher.</li> <li>Existing habitat, such as fallen debris, is retained in streams of Strahler Order 2 and higher.</li> </ol>	<p>guidelines do not apply to the proposal. However, aquatic habitat condition along Reach 2A would be improved through implementation of a VMP (ELA 2025c) within the proposed riparian corridor.</p> <ol style="list-style-type: none"> <li>Implementation of a VMP (ELA 2025c) within the proposed riparian corridor would improve riparian and aquatic condition relative to existing conditions.</li> <li>As above. Recommendations in Section 6 suggest avoiding removal of large woody debris from the watercourse.</li> </ol>
<b>PO3:</b> Development provides increased connectedness to high quality passive open space and the blue-green grid	<ol style="list-style-type: none"> <li>Road crossings across Strahler Order 2 or higher are to be designed to minimise impacts to vegetated riparian areas and species movements in accordance with NSW Department of Primary Industries' requirements to maintain fish passage.</li> </ol>	<ol style="list-style-type: none"> <li>No road crossings are proposed within the site. Any road crossing type is permitted for Innovation Road to the south of the site (off site) which crosses Reach 2A under the DCCEEW riparian guidelines (Table 3). However, the design should implement recommendations within the DCCEEW <i>Controlled activities – Guidelines for watercourse crossings on waterfront land</i> (DCCEEW 2024) (DCCEEW crossing guidelines) and the 'Design Considerations' section of Fairfull and Witheridge (2003).</li> </ol>
<b>PO4</b> Riparian streets shown on the Aerotropolis Precinct Plan are delivered as part of subdivision and civil works and riparian corridors are integrated with the public domain and active transport connections	<ol style="list-style-type: none"> <li>Riparian streets are to be designed generally in accordance with the indicative cross sections at Figure 2 and Figure 3 and Guidelines for Controlled Activities on Waterfront Land—Riparian Corridors Published by NSW Department of Industry in May 2018.</li> <li>The outer 50% of the riparian zone can accommodate pedestrian and cycle paths (or shared paths) street furniture (including lights and seating), landscaped verges and water sensitive urban design elements that are normally part of the street verge.</li> <li>On the side of the riparian corridor that is not adjacent to a public road, the outer 50% of the riparian corridor can form part of the front setback of development lots, provided the part of the setback that is within the riparian corridor is used for landscaped area and paths only (with permeable or semi-permeable surfaces).</li> <li>Despite any other provision of this DCP, for lots in the Mixed Use zone with development that includes active ground floor uses: <ol style="list-style-type: none"> <li>If fronting a riparian corridor or street, development may have a zero lot setback to the boundary fronting the riparian corridor or street; or</li> <li>If there is no street between the riparian corridor, the lot may encroach into the outer 50% of the riparian corridor. Buildings</li> </ol> </li> </ol>	Not applicable for this site, as no Riparian Streets are shown on Figure 5 of the Precinct Plan.

Performance outcome	Benchmark Solution	Proposal consistency
	<p>and hard surfaces on the lot must be outside the riparian corridor.</p> <ol style="list-style-type: none"> <li>5. Within the Enterprise zone, development that includes office, retail or other active uses that create an active façade with surveillance to the riparian corridor or street may have a zero lot setback to the boundary fronting the street or riparian corridor. Where there is no street between the riparian corridor and the lot boundary, the lot may encroach into the outer 50% of the riparian corridor providing buildings and hard surfaces are set back at least to the outer boundary of the riparian corridor.</li> <li>6. Vehicular access to lots that directly adjoin the riparian zone, or where there is a zero lot setback to the street is to be from the side or rear property boundary (i.e. opposite to the boundary fronting the riparian corridor).</li> <li>7. Maintenance access for the stormwater drainage manager must be accommodated in the design of riparian streets. Further details on access requirements for maintenance is provided in Section 2.3.3 of the DCP.</li> </ol>	

## 6. Recommendations and mitigation measures

The points in Table 9 are recommended for consideration during preparation of final designs, during construction and during operation. During construction, the mitigation measures should be implemented by the Site/Project Manager and all staff/contractors to reduce potential impacts on the watercourse (sedimentation, erosion, pollution and weed invasion).

**Table 9: Summary of recommendations and mitigation measures**

ID	Recommendation/mitigation measure
Construction management	
CM1	Prepare a CEMP to address measures to be adopted to minimise impacts on the environment as a result of the construction works, including type and location of sediment and erosion controls
CM2	A Sediment and Erosion Control Plan (within the CEMP) is to be prepared in accordance with The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom 2004) and implemented prior to works, with the aim of achieving an outcome of ‘no visible turbid plumes migrating through the waterway’
CM3	Inspect erosion controls regularly (daily during workdays) and after rainfall. Fix damaged controls immediately. Remove accumulated sediment or waste material from the sediment controls regularly and dispose of at a licensed waste facility
CM4	Monitor sedimentation down slope of excavated areas
CM5	Leave erosion and sediment controls in place until after the works are completed
CM6	Schedule the works outside of predicted heavy rain periods
CM7	Stop work during and following heavy rainfall to reduce risk of mobilising sediment
CM8	Spoil stockpiles should be wetted regularly to reduce opportunities for wind assisted sedimentation
CM9	Store all chemicals (e.g. fuel, oil) used for construction purposes away from the riparian zone. Chemicals should be stored in appropriate bunding/storage systems
CM10	Dedicated refuelling areas are to be established outside of the riparian area and away from other drainage and swales. These areas are to be bunded to ensure any spills do not enter the riparian areas or creek
CM11	Ensure appropriate spill kits are present onsite
CM12	Ensure all equipment is in good working order
CM13	Carry associated Safety Data Sheets (SDS) for all chemicals
CM14	Do not use any chemicals that are labelled as ‘harmful to marine life’ or ‘Class 9 Environmentally hazardous’ as part of the proposed activities
CM15	Stabilise and rehabilitate all disturbed areas including topsoiling, revegetation, weed control and maintenance in order to adequately restore and improve the integrity of the riparian corridor
CM16	Any concrete/cement slurry used in the construction must not leave the work area. Slurry must not enter the waterway
CM17	Wash all equipment, including, erosion and sediment control measures and trailers to prevent spread of exotic species. A visual check for vegetation and seeds on all vehicles, equipment and machinery to be used in the activities must be carried out before work commences
CM18	Remove priority weeds, if any, using best management practices (including appropriate controls to prevent impacts to threatened species) prior to removal of native vegetation
CM19	Bag and remove all weed propagules offsite, preferably the same day and dispose of at designated green waste facility
Design and operation	
D/O1	Minimise the number of temporary crossings and position to avoid native vegetation
D/O3	Footpaths must be <4 m wide (total disturbance footprint) and stay outside the 50% zone except for crossings
D/O4	Asset Protection Zones (APZ) must be outside the proposed riparian corridor, unless adequate offsets are applied
D/O5	Riparian planting is to meet the DCCEE requirements

ID	Recommendation/mitigation measure
D/O6	Avoid planting deciduous trees within 40 m of the watercourse, or in areas where excessive leaf drop cannot be contained from stormwater runoff. Seasonal leaf drop can have detrimental effects on the aquatic ecology, such as decreased dissolved oxygen due to leaf decomposition, and irregular food sources for detritivores (e.g. some waterbugs) that support the food web
D/O7	Avoid planting species that may become weeds in the adjacent riparian corridor
D/O8	Avoid removal of large woody debris within Reach 2A

## 7. References

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Eco Logical Australia (ELA) 2025d, *135 Badgerys Creek Road, Bradfield: Weed Eradication Management Plan*, Prepared for Bradfield Corporation Pty Ltd

Fairfull, S 2013, *Fisheries NSW Policy and Guidelines for Fish Habitat Conservation and Management (2013 update)*, available online: [http://www.dpi.nsw.gov.au/\\_data/assets/pdf\\_file/0005/634694/policy-and-guidelines-for-fish-habitat.pdf](http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0005/634694/policy-and-guidelines-for-fish-habitat.pdf)

Fairfull & Witheridge 2003, *Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings*, DPI Fisheries

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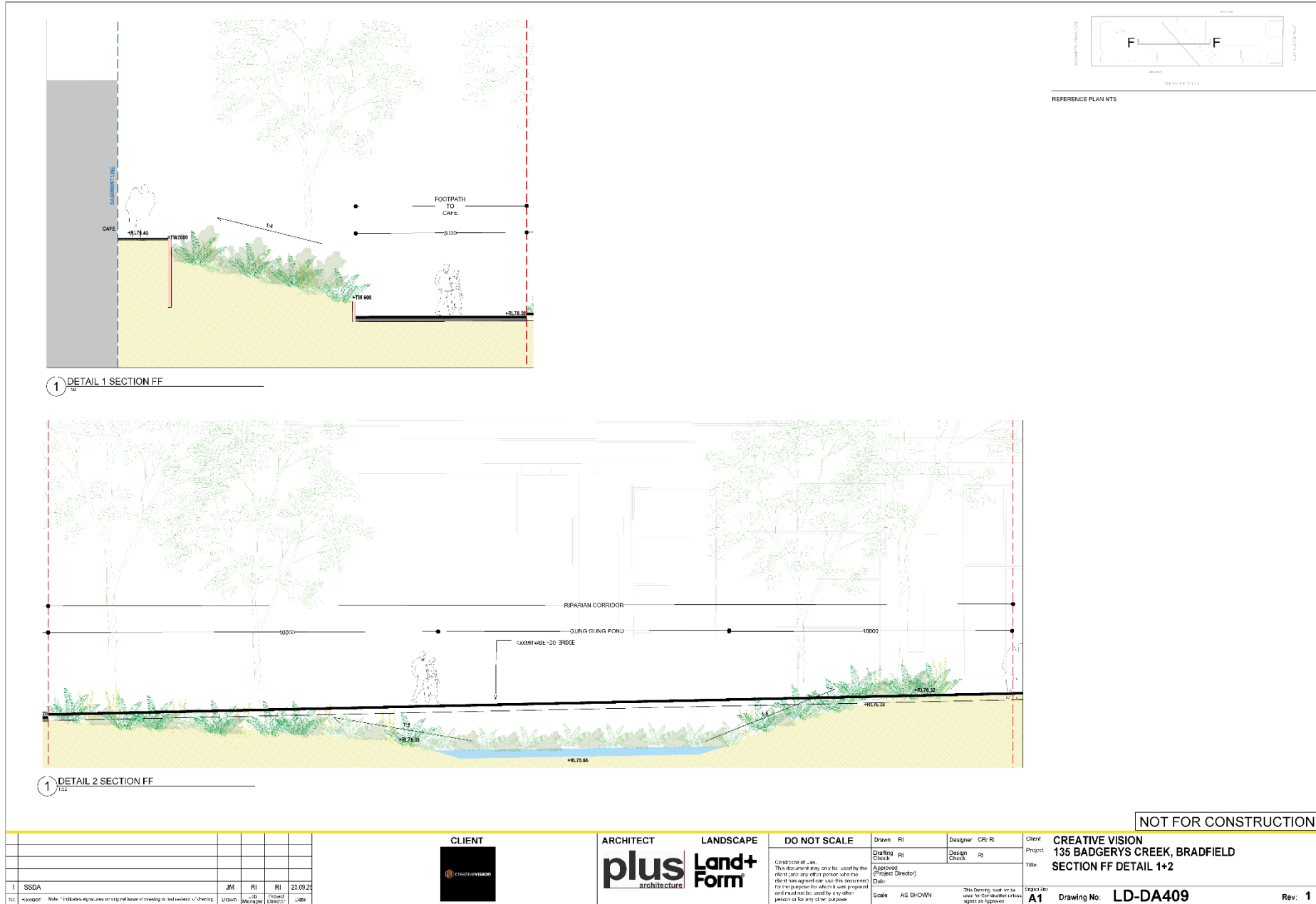
Riches, M, Gilligan, D, Danaher, K & Pursey, J 2016, *Fish Communities and Threatened Species Distributions of NSW*, NSW Department of Primary Industries

## Appendix A – Landscape Masterplan and riparian section (Land and Form 2025)



NOT FOR CONSTRUCTION

<p>1 SDDA</p>		<p>JM RI RI 23.09.25</p>		<p>3 5.0 7.5 10 12.5</p>		<p>CLIENT creative vision</p>		<p>ARCHITECT plus architecture</p>		<p>LANDSCAPE Land+Form</p>		<p>DO NOT SCALE</p>		<p>Drawn: JH Checked: RL Reviewed: RL Date: 23.09.25 Scale: AS 3:1000</p>		<p>Client: CREATIVE VISION 135 BADGERS CREEK, BRADFIELD GROUND FLOOR DETAILED LANDSCAPE PLAN 1 Title: A1 Drawing No: LD-DA101 Rev: 1</p>	
<p>Not for Construction</p>		<p>Client: Creative Vision 135 Badgers Creek Road, Bradfield Project: Ground Floor Detailed Landscape Plan 1 Date: 23.09.25 Scale: AS 3:1000</p>		<p>Scale: 1:1000 North</p>		<p>Client: Creative Vision 135 Badgers Creek Road, Bradfield Project: Ground Floor Detailed Landscape Plan 1 Date: 23.09.25 Scale: AS 3:1000</p>		<p>Architect: plus architecture Landscape: Land+Form</p>		<p>Do Not Scale</p>		<p>Drawn: JH Checked: RL Reviewed: RL Date: 23.09.25 Scale: AS 3:1000</p>		<p>Client: Creative Vision 135 Badgers Creek Road, Bradfield Project: Ground Floor Detailed Landscape Plan 1 Title: A1 Drawing No: LD-DA101 Rev: 1</p>			



## Appendix B – Presence or likelihood of threatened and protected species, populations and communities

Scientific name	Common name	FM Act	EPBC Act	Habitat associations	ALA records	Likelihood of occurrence and impact
<i>Archaeophya adamsi</i>	Adams Emerald Dragonfly	E	-	Aquatic larvae have been found in narrow, shaded riffle zones with moss and abundant riparian vegetation (often closed canopy) in small to moderate sized creeks with gravel or sandy bottoms.	0	No, no suitable habitat within the site. Nearest ALA record is 42 km NE, north of Hornsby. No further assessment of significance required.
<i>Austrocordulia leonardi</i>	Sydney Hawk Dragonfly	E	E	Aquatic larvae have been found under rocks in deep and shady riverine pools with cooler water.	0	No, no suitable habitat within the site. Nearest ALA record is 20 km SE of the site along Georges River near Freres Crossing Reserve. No further assessment of significance required.
<i>Macquaria australasica</i>	Macquarie Perch	E	E	Habitat for this species is bottom or mid-water in slow-flowing rivers with deep holes, typically in the upper reaches of forested catchments with intact riparian vegetation. Macquarie Perch also do well in some upper catchment lakes. In some parts of its range, the species is reduced to taking refuge in small pools which persist in midland-upland areas through the drier summer periods.	0	No, no suitable habitat within the site. Nearest recent ALA record is 13 km WNW near Warragamba Dam. No further assessment of significance required.
<i>Persicaria elatior</i>	Tall Knotweed	-	V	This species is found in damp locations, next to streams or bodies of still water. Its known distribution is somewhat fractured along the NSW and southern QLD coast.	0	Unlikely. Nearest ALA record is 30 km SSW and NE of the site near Picton and North Paramatta, respectively. None observed during field survey. No further assessment of significance required.
<i>Prototroctes maraena</i>	Australian Grayling	E	V	This species spends only part of its lifecycle in freshwater, mainly inhabiting clear, gravel-bottomed streams with alternating pools and riffles, and granite outcrops. Grayling migrates between freshwater streams and the ocean and as such it is generally accepted to be a diadromous species.	0	No, no suitable habitat. The nearest ALA records are south of Wollongong and north of Wyong. No further assessment of significance required.

\*KEY: ALA = Atlas of Living Australia records within 5 km, E = Endangered, V = Vulnerable

