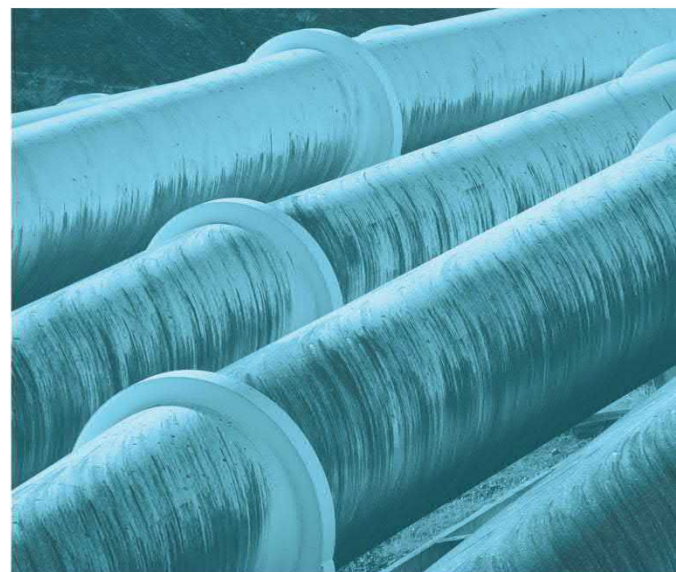




# 200 Aldington Road Industrial Estate Construction Environmental Management Plan

Prepared for Fife Kemps Creek Trust  
April 2022





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# 200 Aldington Road Industrial Estate

State Significant Development (SSD-10479)

## Construction Environmental Management Plan

Prepared for Fife Kemps Creek Trust  
April 2022

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# 200 Aldington Road Industrial Estate

## Construction Environmental Management Plan

### Report Number

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E210906 RP#1

### Client

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Fife Kemps Creek Trust

### Date

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7 April 2022

### Version

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v1 Final

### Prepared by

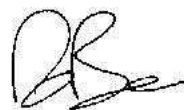
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**Lahnne Cooper**  
Associate Environmental Engineer  
7 April 2022

### Approved by

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**David Bone**  
Associate Director  
7 April 2022

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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# Abbreviations

Acronym	Description
BC Act	Biodiversity Conservation Act 2016
CM	Construction Manager
CEMP	Construction Environmental Management Plan
CCS	Community Communication Strategy
CNVMP	Construction Noise and Vibration Management Plan
CTMP	Construction Traffic Management Plan
DAWE	Department of Agriculture, Water and the Environment (Cth)
EIS	Environmental Impact Statement
ESCP	Erosion and Sediment Control Plan
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	Environmental Protection Agency
ER	Environmental Representative
FKC	Fife Kemps Creek Trust
GFA	Gross Floor Area
ha	hectare
km	kilometre
LGA	Local Government Area
m	metre
NSW	New South Wales
NRAR	Natural Resources Access Regulator
PCC	Penrith City Council
SS	Site Supervisor
UCP	Unexpected Contamination Protocol
WM Act	Water Management Act 2000
WHS Act	Work Health and Safety Act 2011

# 1 Introduction

This Construction Environmental Management Plan (CEMP) has been prepared for implementation by Fife Kemps Creek Trust (FKC) (and its contractors) for the construction of the 200 Aldington Road Industrial Estate (the Project). The Project is located in Kemps Creek, New South Wales 2178, within the Penrith Local Government Area (LGA).

The following documents have been reviewed and applicable information incorporated into this CEMP:

- Environmental Impact Statement (EIS) (including technical reports), prepared by Ethos Urban, dated 11 November 2020;
- SSDA-10479; and
- Mamre Road Precinct Development Control Plan 2021 (the DCP).

## 1.1 Project overview

### 1.1.1 Background / context

This CEMP forms a Request for Additional Information for the proposed Concept State Significant Development Application for a new industrial estate on land 106 – 228 Aldington Road, Kemps Creek.

The EIS for the project was placed on public exhibition between 18 November 2020 and 15 December 2020. During this period, a total of 18 submissions were received. These submissions were addressed and subsequent amendments to the project were made, as outlined in the Response to Submissions Report (dated 23 March 2021) prepared by Ethos Urban.

In written correspondence dated 28 April 2021, it was requested that FKC provide a further response to additional commentary raised by DPE, as well as additional comments raised by public authorities in their review of the first Response to Submissions Report. This was responded to via a second a Response to Submissions Report outlined by Ethos Urban (dated 22 September 2021).

Additional correspondence was received from DPE dated 15 November 2021 which has necessitated updates and additional information, as contained within this report.

### 1.1.2 Summary of the project for which development consent is now sought

Consent is sought for the following development. It represents minor amendments and does not represent a significant material change to what was previously proposed under the second RTS Report (22 September 2021)

- A concept masterplan with an indicative total building area of 342,865 sqm, comprising:
  - 325,865 sqm of warehouse gross floor area (GFA);
  - 17,010 sqm of ancillary office GFA;
  - 13 individual development lots for warehouse buildings with associated hardstand areas and two lots for water management infrastructure purposes (each including a bio retention basin);
  - Roads, including:
    - Internal road layouts;



- Southern road connection to Aldington Road;
- Northern boundary road (half road corridor) connecting to Aldington Road;
- Road connections to adjoining landholdings to the north and east;
- Provision for 1,516 car parking spaces; and
- Associated concept site landscaping.
- Detailed consent for progressive delivery of site preparation, earthworks and infrastructure works (i.e., Stage 1 works) on the site, including:
  - Demolition and clearing of all existing built form structures;
  - Drainage and infill of existing farm dams and any ground dewatering;
  - Clearing of existing vegetation;
  - Subdivision of the site into 15 individual lots;
  - Construction of a warehouse building with a total of 50,300 sqm of GFA, including:
    - 47,800 sqm of warehouse GFA; 2,500 sqm of ancillary office GFA; and
    - 221 car parking spaces.
  - Bulk earthworks including 'cut and fill' to create level development platforms for the warehouse buildings, and site stabilisation works (if required);
  - Roadworks and access infrastructure, including an interim access road and a temporary junction with Aldington Road;
  - Stormwater works including stormwater basins, diversion of stormwater;
  - Utilities services including sewer and potable water reticulation; and
  - Road and boundary retaining walls.

## 1.2 Construction Environmental Management Plan

### 1.2.1 Scope

The scope of this CEMP includes activities for Stage 1 works of the Project. A number of environmental management sub-plans have been prepared to support this CEMP and include the requirements of the conditions of consent and mitigation measures identified in the EIS documentation. A list of construction environmental sub-plans is provided in Table 1.1.

**Table 1.1 Construction environmental sub-plans**

Element	Plan	Reference
Social	Community Consultation Strategy (CCS) including Complaints Response Handling Procedure	Appendix A
Air quality	Construction Air Quality Management Plan (incorporating Dust Management Plan)	Appendix B
Noise and vibration	Construction Noise and Vibration Management Plan (CNVMP)	Appendix C
Ecology	Flora and Fauna Management Plan (includes a Vegetation Management Plan)	Appendix D
Heritage	Aboriginal Cultural Heritage Management Plan	Appendix E
	Unexpected Finds Protocol (UFP) – Archaeological Items	Appendix E
Soil	Erosion and Sediment Control Plan	Appendix F
Contamination	Unexpected Contamination Protocol (UCP)	Appendix G
Traffic	Construction Traffic Management Plan (CTMP)	Appendix H

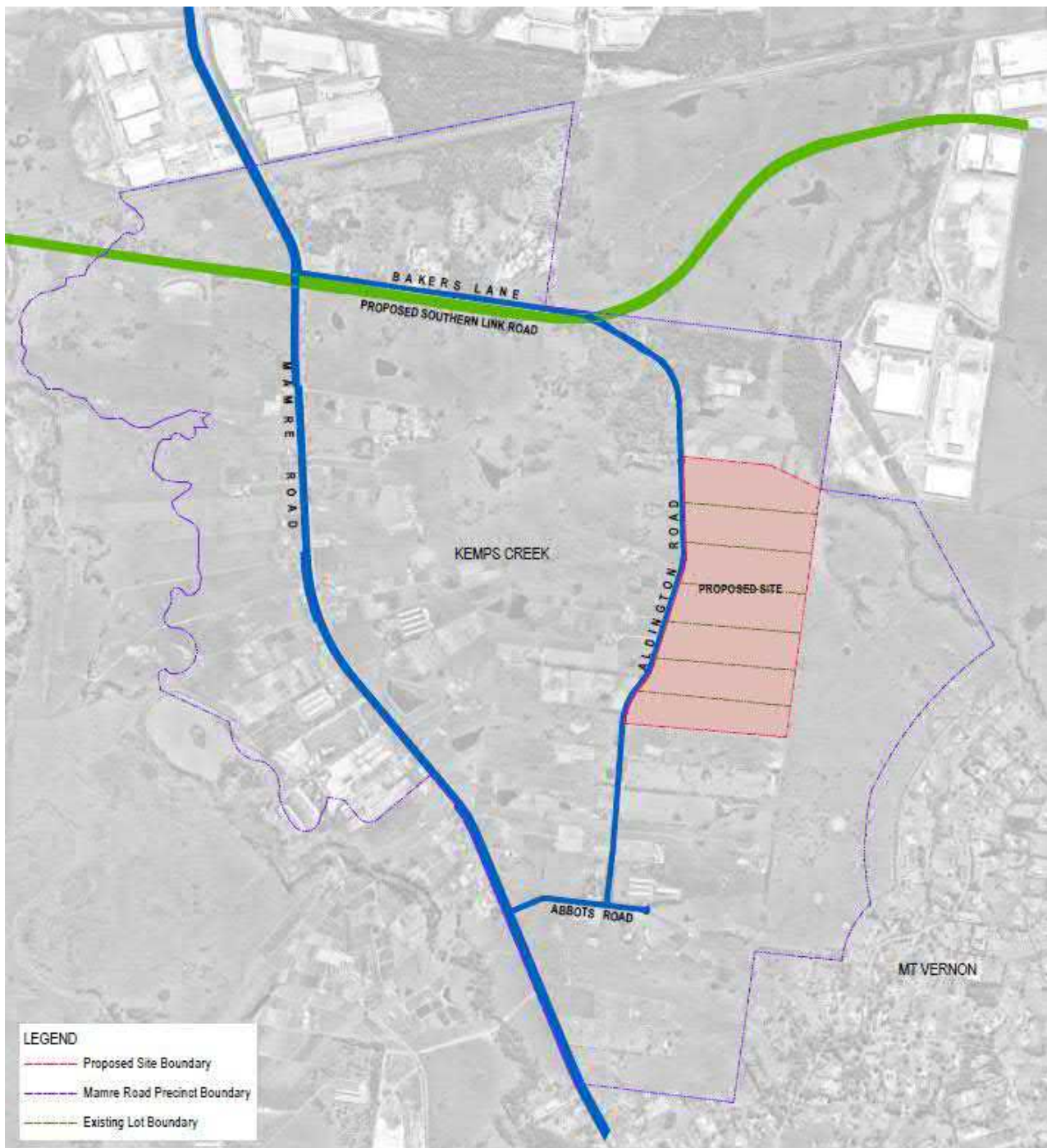
### 1.2.2 Objectives

The objectives of this CEMP are to:

- establish procedures to minimise the potential for environmental harm and/or environmental nuisance;
- assign responsibility for the implementation, management and review process and to ensure all Project Personnel understand individual roles and responsibilities;
- ensure Project personnel understand incident and emergency response procedures;
- provide a monitoring program to monitor the effective of controls as they are implemented during construction; and
- demonstrate that all statutory requirements and conditions of approval have been met.

#### i Mamre Road Precinct Development Control Plan 2021

The Project site is in the Mamre Road Precinct, and therefore the relevant controls of the DCP must be considered in this CEMP (refer Figure 1.1) and applied to the construction phase of the Project. Applicable controls outlined in the DCP have been incorporated into this CEMP and subplans.



SBA Architects, 2022

**Figure 1.1** Land application map for the Mamre Road Precinct DCP and proposed site location

### 1.2.3 Consultation

Consultation of the CEMP and sub-plans with relevant government agencies and stakeholders will be undertaken prior to commencement of works. A list of proposed stakeholders to be consulted is provided in Table 1.2. During the consultation process comments received from stakeholders will be addressed within the CEMP and relevant sub-plans.

**Table 1.2** Consultation summary

Document	Stakeholders
CEMP	Department of Planning and Environment (DPE)
	Roads and Maritime (RMS)
	Environmental Protection Agency (EPA)
	DPIE (Planning Secretary)
	Department of Primary Industry (DPI) – Fisheries
	Penrith City Council
	Transport for NSW (TfNSW)
Aboriginal Cultural Heritage Management Plan	Registered Aboriginal Parties (RAPs)

## 2 Project overview

### 2.1 Location

The Project site is located at 200 Aldington Road, Kemps Creek, NSW. The site comprises seven (7) separate allotments with a total area of approximately 72 hectares (ha) see Figure 1.1. The site is located approximately 5 kilometres (km) north-west of the future Western Sydney International (Nancy-Bird Walton) Airport (WSA), 13 km south-east of the Penrith CBD and 40 km west of the Sydney CBD.

### 2.2 Construction staging and activities

A summary of construction staging and associated activities is provided in Table 2.1. FKC will undertake consultation activities in accordance with the processes outlined in the CCS.

**Table 2.1 Construction activities**

Stage	Summary of activities	Timing
Pre-construction activities	<ul style="list-style-type: none"><li>• site establishment, including site boundary fencing, erection of signage and establishment of no-go areas;</li><li>• establishment of site compound and stockpile sites;</li><li>• establishment of site access points, traffic management measures;</li><li>• installation of erosion and sediment controls;</li><li>• conducting pre-clearance surveys-marking fauna habitat trees and buildings to be demolished prior to clearing works; and</li><li>• clearing of all existing vegetation identified for removal including grubbing activities and removal of vegetation off-site.</li></ul>	TBC following approval
Demolition	<ul style="list-style-type: none"><li>• demolition and clearing of all existing built form structures</li></ul>	
Drainage and earthworks	<ul style="list-style-type: none"><li>• drainage and infill of some of the existing farm dams;</li><li>• bulk earthworks including 'cut and fill' to create flat development platforms for the warehouse buildings, and site stabilisation works (if required); and</li><li>• stripping, stockpiling and management of topsoil and unsuitable materials.</li></ul>	
Construction	<ul style="list-style-type: none"><li>• construction of warehouse building, including ancillary office and car parking spaces;</li><li>• roadworks and access infrastructure;</li><li>• stormwater and drainage works including stormwater basins, stormwater pipes and pits, gross pollutant traps and associated works;</li><li>• electrical and communications conduits, recycled water, sewer and potable water reticulation; and</li><li>• inter-allotment, road and boundary retaining walls.;</li><li>• landscaping</li></ul>	
Post-construction	<ul style="list-style-type: none"><li>• rehabilitation;</li><li>• demobilisation of plant and equipment; and</li><li>• site clean-up.</li></ul>	



## 2.3 Plant and equipment

The following plant and equipment will be used during construction: (to be confirmed once approved and contractor engaged)

- XX
- XX

## 2.4 Construction hours

The working hours for construction must be undertaken between 7:00 am to 6:00 pm Monday – Friday, and 8:00 am to 1:00 pm Saturday. Work outside of these hours must be carried out in accordance with the conditions of consent.

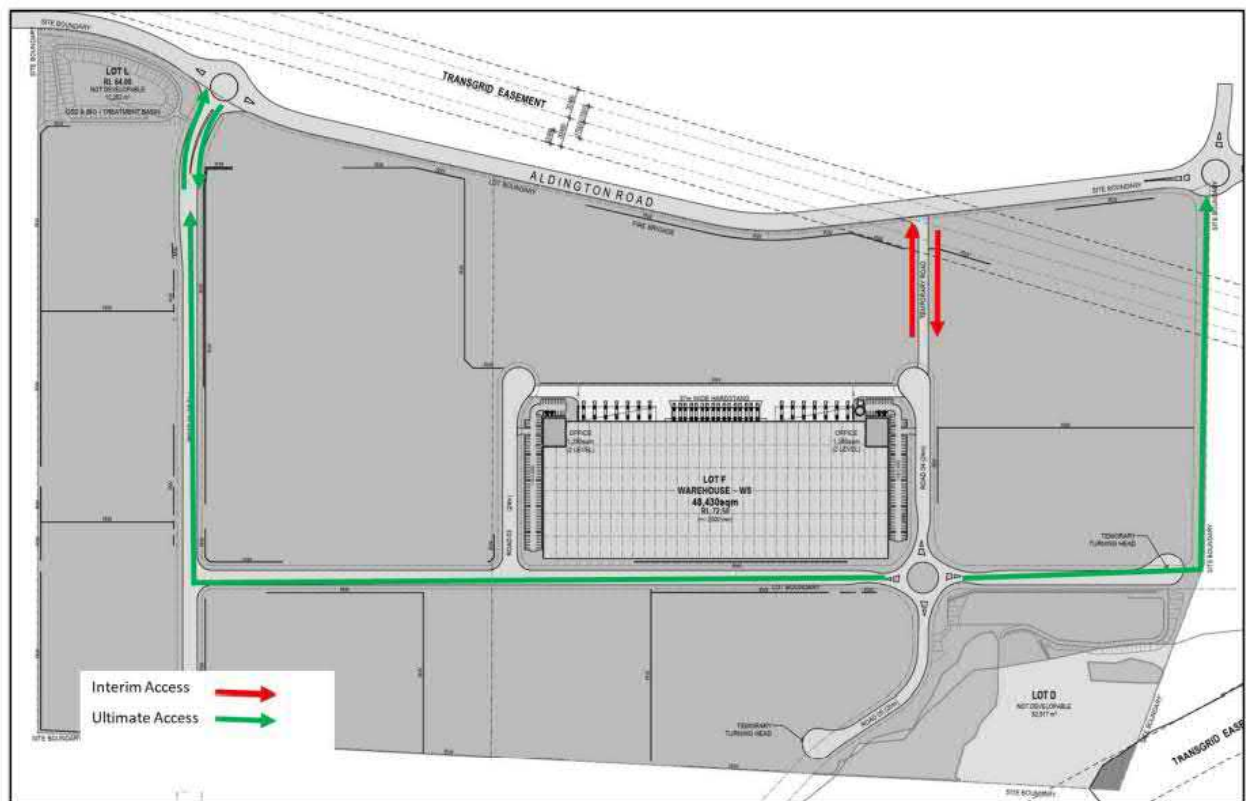
## 2.5 Construction site access

As per the recommendations outlined in the Transport and Accessibility Management Plan, prepared by Ason Group, dated 21 September 2021, a two-stage access strategy is proposed, with the long-term access for the Stage 1 development being via the Site's internal road network, rather than directly from Aldington Road.

Access to the site will be as follows:

- In the interim period it is proposed to access Aldington Road via a proposed temporary road as shown in Figure 3. The proposed temporary road is planned to provide a temporary access for Stage 1, while the Site's long-term road network is delivered and the ultimate connections to Adlington Road are completed.
- The long-term strategy will see access to Aldington Road via the Site's internal industrial roads to both the south and north of Stage 1. Once a permanent intersection is delivered, the temporary road way will be removed.

The above-mentioned proposed access routes are shown on Figure 2.1.



**Figure 2.1** Site access (Ason Group 2021)

## 2.6 Key Construction Contact details

Key contacts for the Project are provided in Table 2.2.

**Table 2.2** Contact details

Company	Role	Name	Contact
<b>Key site contact</b>			
XXX	Project Manager	XXX	XXX
XXX	Construction Manager	XXX	XXX
XXX	Environmental Representative	XXX	XXX
XXX	Safety Representative	XXX	XXX
<b>Government agencies</b>			
EPA	Pollution Incident (air, noise, water or waste)	-	131 555
DPE		-	
NSW Soil Conservation Service	Soil erosion and sediment control	-	02 9842 8300

**Table 2.2**      **Contact details**

Company	Role	Name	Contact
Emergencies			
NSW Police	In case of fire, medical or police emergency	-	000
Fire and Rescue NSW		-	
NSW Ambulance		-	
Other			
Blacktown Hospital	Medical incidents	-	9881 8000
Crime stoppers	Incidents such as theft, crime, car crash, non-threatening injuries	-	1800 333 000
Police Assistance Line		-	131 444
Poison Information Centre	Toxicology advice	-	131 126
IXOM (Chemical industry)	Incidents relating to transport, storage and use of chemical products	-	1800 033 111

# 3 Environmental management framework

## 3.1 Roles and responsibilities

The roles and responsibilities relevant to the Project are summarised in Table 3.1.

**Table 3.1** Roles and responsibilities

Role	Responsibilities
Project Manager	<ul style="list-style-type: none"><li>• ensure the CEMP is made available, communicated, maintained and understood by all project staff;</li><li>• responsible for the overall management of the construction and operation of the project;</li><li>• ensure the CEMP is updated with applicable conditions of approval following the provision of development consent from DPE;</li><li>• ensure that the requirements of the CEMP and sub-plans have been addressed in all contractor environmental management documentation;</li><li>• review of incidents, non-conformances and non-compliance; and</li><li>• ensuring project personnel and contractors are adequately trained and qualified to fulfil their roles.</li></ul>
Construction Manager	<ul style="list-style-type: none"><li>• implement and maintain the CEMP;</li><li>• ensure all project personnel comply with the requirements of the CEMP; and</li><li>• report any incidents, non-conformances to the project manager.</li></ul>
Environmental Representative	<ul style="list-style-type: none"><li>• oversee all works which are part of the project;</li><li>• ensure compliance with all environmental protection measures detailed in the CEMP, supporting management plans and conditions of approval;</li><li>• ensure all environmental controls are in place and adequately functioning during construction; and</li><li>• conduct construction inspections and complete reporting requirements e.g. progress reports, environmental incidents, non-compliance, corrective action and auditing</li></ul>
Safety Representative	
All Construction Personnel	<ul style="list-style-type: none"><li>• comply with requirements of this CEMP;</li><li>• report any actual or potential environmental incidents to the construction manager immediately;</li><li>• identify and report non-conforming or potentially hazardous work practices, equipment, machinery or products;</li><li>• only perform tasks for which they are trained and competent;</li><li>• assist with environmental incident investigations and applying corrective actions; and</li><li>• ensure all machinery, plant and equipment are in good working order and condition prior to use.</li></ul>

## 3.2 Statutory requirements

The Project must be carried out in accordance with:

- the conditions of consent;
- all written directions from the Planning Secretary;
- the EIS;
- the approved plans; and
- this CEMP and sub-plans.

The Project is required to adhere to the relevant requirements of the Acts and their subordinate legislation identified in Table 3.2.

**Table 3.2 Statutory requirements**

Act	Statutory instrument	Regulatory authority	Applicability
<b>State</b>			
<i>Biodiversity Conservation Act 2016</i> (BC Act)	Biodiversity Conservation Regulation 2017	-	Protection of threatened species, populations and communities and their habitats
<i>Contaminated Land Management Act 1997</i> (CM Act)	Contaminated Land Management Regulation 2013	-NSW EPA	-Identifies and control contaminated land and investigation requirements
<i>Environmental Planning and Assessment Act 1979</i> (EP&A Act)	Environmental Planning and Assessment Regulation 2000	DPIE	Modification to the Project scope requiring modification to the Development Approval
<i>Fisheries Management Act 1994</i> (FM Act)	Fisheries Management (General) Regulation 2019	DPI (Fisheries NSW)	-Controls works within waterways
<i>Heritage Act 1977</i>	Heritage Regulation 2012	Heritage NSW	-Protection of cultural heritage items
<i>National Parks and Wildlife Act 1974</i>	National Parks and Wildlife Regulation 2019	Heritage NSW	Protection of Aboriginal objects and sites. Duty to notify in the event that an Aboriginal object is uncovered.
<i>Protection of the Environment and Operations Act 1997</i> (POEO Act)	Protection of the Environment Operations (Waste) Regulation 2014	NSW EPA	Pollution incidents that have caused or give rise to material harm
<i>Waste Avoidance and Resource Recovery Act 2001</i>	-Waste exemptions under the POEO administration regulation	-NSW EPA	-Controls waste management and allows for resource recovery under exemptions.
<i>Water Management Act 2000</i> (WM Act)	Water Management (General) Regulation 2018	Natural Resources Access Regulator (NRAR)	-Areas within 40m of waterways
<i>Work Health and Safety Act 2011</i> (WHS Act)	Work Health and Safety Regulation 2017	-SafeWork NSW	-Controls safety requirements for work sites in NSW



**Table 3.2**      **Statutory requirements**

Act	Statutory instrument	Regulatory authority	Applicability
<b>Commonwealth</b>			
<i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)	-	DAWE	-Protection of biodiversity matters

### 3.2.1 Standards, Codes and Guidelines

The following standards, codes and guidelines are applicable to the construction of the Project:

- Australian Standards:
  - Australian Standard AS 2601-2001 The Demolition of Structures; and
  - Australian Standard AS1940-2004 The storage and handling of flammable and combustible liquids;
- NSW EPA Waste Classification Guidelines;
- Interim Construction Noise Guideline (DECC 2009);
- Managing Urban Stormwater: Soils and Construction – Volume 1: Blue Book (Landcom, 2004);
- Guidelines for Controlled Activities on Waterfront Land (reference);
- Planning for Bushfire Protection 2019; and
- Arrive Clean, Leave Clean Guidelines (Commonwealth of Australia).

### 3.2.2 Approvals, Licences and Permits

A summary of the approvals relevant to the Project are listed below:

- Conditions of consent for SSDA 10479

## 3.3 Inductions and environmental training

All Project staff will be made aware of the site-specific environmental controls through a site induction, and pre-start meetings/toolbox talks prior to the commencement of construction.

### 3.3.1 Site Specific Induction

The site induction will cover the following key aspects:

- purpose and objectives of the CEMP;
- roles and responsibilities, including due diligence and duty of care;
- overview of environmental risks and specific locations of environmental and cultural significance;
- the scope of legislative requirements and other licences and approvals;
- communication and notification requirements e.g. procedures for notifying and reporting incidents and complaints;

- key environmental management and controls stipulated in the CEMP;
- workplace health and safety issues, including high-risk activities and associated safeguards;
- emergency preparedness and response; and
- procedures for notifying and reporting incidents and complaints.

Site inductions will be recorded, including details of topics discussed, attendees and duration. Copies of the site inductions will be stored in a register and signed attendance sheets will be filed.

### 3.3.2 Toolbox Talks

Toolbox talks will be held weekly and tailored to specific environmental issues relevant to the upcoming works. Topics to be discussed will include (but not limited to):

- erosion and sediment control;
- traffic issues;
- weed management and site hygiene protocols (land zoned E2 Environmental Conservation);
- tree felling protocol
- pollution management; and
- hours of work.

### 3.3.3 Pre-start Meetings

Pre-start meetings will be conducted daily prior to commencement of works. Topics to be discussed will include (but not limited to):

- daily work activities;
- safe work practices;
- environmental controls;
- no-go zones / restricted work areas;
- hazards; and
- any other information which may be relevant to the day's work.

## 3.4 Incident and non-compliance response and handling procedure

### 3.4.1 Responsibility

The Environmental Representative will be responsible for the management and reporting of incident and non-compliances.

### 3.4.2 Notification requirements

#### i Incident Notification Requirements

The Planning Secretary must be notified in writing via the Major Projects website immediately after becoming aware of an incident. The notification must include:

- development application reference; and
- the location and nature of the incident.

## ii Non-Compliance Notification Requirements

The Planning Secretary must be notified in writing via the Major Projects website within seven (7) days after the becoming aware of any non-compliance with the conditions of consent. The notification must include:

- development application reference;
- the condition of consent that the development is non-compliant with;
- the way in which it does not comply and the reasons for the non-compliance (if known); and
- what actions have been, or will be, undertaken to address the non-compliance

### 3.4.3 Incidents

Incidents may comprise (but not limited to) the following:

- serious injuries requiring urgent medical help;
- there are threats to property or life;
- criminal activity e.g. you have witnessed a serious crime or accident;
- sewer or water service breaks;
- electricity service faults;
- fires and explosions; and
- release of pollution e.g. release of sediment into watercourse, chemical spill.

## i Pollution Incidents

Pollution incidents may comprise (but are not limited to) the following:

- pollution, or potential pollution of waterbodies;
- discharges of waters from site not in accordance with approval requirements;
- uncontrolled releases of chemicals, paint or fuels;
- a spill that causes pollution to land/soils; and
- excessive noise from vehicles, transport or construction activities near people's residence or workplace, especially outside of standard work hours

Where a pollution incident has caused or is threatening to cause 'Material harm to the environment', the regulatory agency must be notified. As defined in Section 147 of the *Protection of the Environment Operations Act 1997* (POEA Act):

*"(a)...harm to the environment is material if:*

- (4) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or*

*(ii) It results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations), and*

*(b) loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.”*

## ii      **Notifiable Incidents**

Under section 35 of the *Work Health and Safety Act 2011*, a notifiable incident relates to:

- the death of a person;
- a serious injury or illness of a person; or
- a potentially dangerous incident.

### 3.4.4      **Non-compliances**

A non-compliance refers to the failure to comply with a condition of consent (e.g. exceedance of the impact assessment criteria and performance criteria for noise and vibration) and requires notification to the Planning Secretary.

Non-compliance may be identified through routine weekly inspections, impromptu site inspections, via the CEMP review and audit process or following an incident.

The Environmental Representative is responsible for investigation and management of corrective and preventive actions in the event of non-compliance.

### 3.4.5      **Incidents and non-compliance handling procedure**

In the event of an incident / near-miss, the following steps should be taken:

1.      **Stop** works in the area and if safe to do so ensure the safety of personnel within the vicinity.
2.      **Notify** relevant persons e.g. emergency services or Construction Manager.
3.      **Isolate** the risk or hazard e.g. turn off machinery/plant, implement immediate site controls, set up exclusion zone.
4.      **Report** and notify relevant persons (e.g. Project Manager, regulatory agencies).

### 3.4.6      **Incidents and non-compliance register**

The following information should be recorded for all incidents/near misses/non-compliances:

- Time and date of the incident/near miss/non-compliance.
- A description of the incident/near miss /non-compliance.
- A sequence of events that led to the incident/near miss/non-compliance occurring.
- Person/s involved in the incident/near miss/non-compliance (including witnesses).
- Written statements from person/s involved (as applicable).
- Details of corrective actions.

### 3.4.7 Minor environmental incidents

In the event of a minor environment incident (including a near miss), all personnel shall follow the procedures outlined in sections 3.4.6 and 3.4.5.

### 3.4.8 Corrective Actions

Corrective actions may be triggered by an incident or non-compliance and will include immediate steps taken to control the event, as well as development of additional controls to prevent reoccurrence.

Corrective actions should be prioritised on the following hierarchy of controls:

1. **Elimination** – can activities and processes be eliminated to reduce the risk of reoccurrence?
2. **Substitution** – Can activities be substituted with another activity of lesser risk?
3. **Isolation** – can you isolate the hazard from any person exposed to it?
4. **Engineering controls** – can you reduce the risk of reoccurrence through engineering changes?
5. **Administrative controls** – can a change in work practices, additional training or additional checks reduce the risk?
6. **Personal Protective Equipment (PPE)** – can PPE be worn to protect personnel from harm?

Corrective actions will be documented on the Incident and non-compliance Form and be assigned to the appropriate personnel for close out. The Environmental Representative will be responsible for managing and overseeing the implementation of corrective actions on-site and ensuring appropriate documentation is completed and filed for record keeping. Records of all incidents and non-compliances and associated corrective actions are to be provided to the Project Manager.

### 3.4.9 Regulatory Agency Notification

#### i Material Harm Pollution Incident

A person engaged as an employee in carrying on an activity must, immediately after the person becomes aware of the incident, notify the employer of the incident and all relevant information about it (s148 of POEO Act). If the employer cannot be contacted, the person is required to notify each relevant authority (e.g. EPA, Fire and Rescue NSW, SafeWork NSW).

The Environmental Representative is responsible for determining if an incident is considered 'material harm' and notifying the appropriate regulatory authority and other response agencies in accordance with the requirements stipulated in Part 5.7 of the POEO Act.

#### ii Notifiable Incident

Under section 38 of the *Work Health and Safety Act 2011*, a person who conducts a business or undertaking must ensure that the regulator is notified immediately after becoming aware that a notifiable incident arising out of the conduct of the business or undertaking has occurred.

If there is a serious injury or illness, a death or a dangerous incident, the site manager will report it to SafeWork immediately on 13 10 50. The site must remain undisturbed until released by SafeWork NSW.



### iii Breach of Condition of Approval

The DPE Secretary should be notified by the Project Manager when there has been a breach of a condition of approval.

## 3.5 Complaints response

### 3.5.1 Responsibility

Environmental Representative will be responsible for investigating, recording and closing out any complaints received in accordance with the CCS (Appendix A). The complaints register will be maintained for the duration of construction.

### 3.5.2 Complaints handling procedure

Should complaints be received from the public in relation to the Project, they will be managed in accordance with Complaints Response Handling Procedure outlined in the CCS (refer Appendix A).

### 3.5.3 Complaints register

A complaints register will be maintained in accordance with the CCS (refer Appendix A). The register will record the following detail:

- date and time of the complaint;
- nature of the complaint;
- details of the complainant; and
- any actions taken to address the complaint.

## 3.6 Dispute resolution

The dispute resolution procedure is outlined in the CCS (refer Appendix A). This will be implemented for the duration of the Project.

## 4 Environmental management

The following section outlines the management strategies to be implemented for minimising impacts on the environment which may occur as a direct result of construction activities. Elements to be covered include:

- general;
- traffic management;
- erosion and sediment control;
- stormwater management;
- soil management; and
- waste Management.

Environmental Management sub-plans have been prepared and are attached as an Appendices to this CEMP. Sub-plans include:

- CCS (refer to Appendix A);
- Construction Air Quality Management Plan (refer to Appendix B);
- Construction Noise and Vibration Management Plan (refer to Appendix C);
- Flora and Fauna Management Plan (refer to Appendix D);
- Aboriginal Cultural Heritage Management Plan (refer to Appendix E);
- Erosion and Sediment Control Plan (refer to Appendix F); and
- Unexpected Contamination Protocol (refer to Appendix G).

The applicable controls provided in the DCP have been summarised in the relevant sub-plans and below sections of this CEMP.

### 4.1 General

General construction and environmental management controls are provided in Table 4.1. The applicable controls provided in the DCP relevant to bushfire prone land, salinity and utilities are also summarised in Table 4.1.

**Table 4.1 General construction environmental management**

Environmental management control	Person responsible	Timing/frequency	Reference/notes
All employees, contractors (and sub-contractors) must attend a site induction where they will be made aware of, and instructed to comply with the conditions of consent and the requirements of this CEMP.	Construction Manager	Prior to commencement of works	Condition XX
Site personnel must hold relevant licences to perform assigned tasks/work and provide evidence of these licences prior to commencement of works.	Construction Manager Safety Supervisor	Prior to commencement of works	
Notify DPIE in writing, at least one month before commencement of works, and if the construction is to be staged, at least one month before commencement of works to be carried out in that stage	Construction Manager	At least one month prior to commencement of works	Condition XX

**Table 4.1**      **General construction environmental management**

Environmental management control	Person responsible	Timing/frequency	Reference/notes
<b>Salinity Management</b>			
Construction techniques shall be employed that prevent structural damage to the development as a result of salinity (see Building in a Saline Environment).			Section 2.9 of the DCP
All works are to conform with the Western Sydney Salinity Code of Practice June 2003.			Section 2.9 of the DCP

## 4.2      Traffic

The environmental management controls in Table 4.2 will be implemented to ensure road safety and network efficiency during construction.

**Table 4.2**      **Environmental management controls for traffic**

Environmental management controls	Person responsible	Timing/frequency	Reference/notes
Implemented the management strategies outlined in the Preliminary Construction Traffic Management Plan	Project Manager	Duration of project	Preliminary Construction Traffic Management Plan prepared by Ason Group, dated 30 September 2020,
Site access will be to/from Mamre Road via Abbots Road and not Bakers Lane, to avoid conflict with the school peak periods. A temporary access driveway will be provided, which will be constructed on the alignment of the future Southern Site Access Road.	Construction Manager	At all times	
Minimise impacts of earthworks and construction on the local and regional road network	Construction Manager	Earthworks / construction	
Minimise conflicts with other road users including pedestrians through the implementation of appropriate driver training and traffic controls	Construction Manager	Duration of project	
Minimise road traffic noise through driver training and awareness	Construction Manager	Duration of project	
Implement traffic monitoring program to measure effectiveness of traffic controls	Construction Manager	Duration of project	

**Table 4.2 Environmental management controls for traffic**

Environmental management controls	Person responsible	Timing/frequency	Reference/notes
All loading/unloading of materials is to be carried out on-site			
All trucks entering/leaving site must have their loads covered and do not track dirt onto the public road network	Construction Manager	Duration of project	

### 4.3 Erosion and Sediment Control

The environmental management controls in Table 4.3 will be implemented to minimise potential impacts to existing soils and waterways. The applicable controls provided in the DCP relevant to erosion and sediment control are also summarised in Table 4.3.

**Table 4.3 Environmental management controls for soils**

Measure	Person responsible	Timing/frequency	Reference/notes
An Erosion and Sediment Control Plan must be prepared in accordance with the Managing Urban Stormwater, Soils and Construction Vol.1 (Landcom, 2004) prior to commencement of works	Construction Manager	Pre-Construction	Condition of approval XX
Install and maintain Erosion and Sediment Control measures, in accordance with the Erosion and Sediment Control Plan (ESCP)	Construction Manager	Pre-construction / construction	Condition of approval XX
A sediment controls such as a sediment fence, berm, or similar, will be positioned downslope of the stockpile to minimise sediment migration			Condition of approval XX
Install and maintain stabilised site access	Construction Manager	Pre-construction, duration of works	Condition of approval XX
Review and restore erosion and sediment control devices as per the ESCP	Construction Manager		Condition of approval XX
ESCPs must be updated to reflect site conditions at the time of construction.			Condition of approval XX
Erosion and sediment controls must be inspected weekly and after rain events	Environmental Representative	Construction After rain event	
The ESCP is to be implemented under the supervision of a CPESC. The relevant consent authority will require the CPESC to regularly audit and certify that the works are suitable to protect Wianamatta-South Creek and its tributaries, including audit reports.			Section 4.4.2 of the DCP

**Table 4.3 Environmental management controls for soils**

Measure	Person responsible	Timing/frequency	Reference/notes
Soil erosion and sediment control measures are to be provided on-site before the commencement of any earthworks or development activity, in accordance with the approved ESCP. These must be maintained throughout the course of construction until disturbed areas have been revegetated and the soil stabilised to the satisfaction of the relevant consent authority.			Section 4.4.2 of the DCP
Erosion and sediment control measures are to be installed in accordance with best practice (including Managing Urban Stormwater – Soils and Construction and Best Practice Erosion and Sediment Control, IECA).			Section 4.4.2 of the DCP
<p>The ESCP is to consider the following measures:</p> <ul style="list-style-type: none"> <li>• identify all areas likely to cause pollution of waterways from stormwater run-off and implement appropriate devices to stop the risk of pollution;</li> <li>• divert clean water around the construction site to prevent contamination;</li> <li>• retain as much natural vegetation as possible and limit site disturbance;</li> <li>• control stormwater that enters the construction site from upstream;</li> <li>• divert stormwater from undisturbed upper slopes onto stable areas;</li> <li>• retain and stockpile all excavated topsoil for future landscaping;</li> <li>• prevent sediment/silt from entering adjoining property by installing sediment control devices at the low side of sites and wash down areas;</li> <li>• install high efficiency sediment basins to ensure compliance with the water quality target throughout the construction and building phases;</li> <li>• provide a single, stabilised entry/exit point to the site;</li> <li>• prevent sediment, including building materials, from reaching the road or stormwater system. Sediment is to be removed by sweeping, shovelling or sponging. Under no circumstances shall sediment be hosed;</li> <li>• where a work zone permit over public property is applicable, debris control devices are to prevent spillage of building materials into stormwater drains;</li> <li>• compact all drainage lines when backfilling;</li> <li>• connect downpipes to the stormwater system as early as possible;</li> <li>• revegetate all disturbed areas, after on-site works are completed; and</li> <li>• maintain all sediment control devices during earthworks and construction.</li> </ul>			Section 4.4.2 of the DCP

## 4.4 Stormwater Management

The environmental management controls in Table 4.4 will be implemented to minimise impacts on existing watercourses and resources. The applicable controls provided in the DCP relevant to stormwater management are also summarised in Table 4.4.

**Table 4.4 Environmental management controls for stormwater**

Measure	Person responsible	Timing/frequency	Reference/notes
Implement the Erosion and Sediment Control Plan (ESCP)	Construction Manager	Duration of project	
Clean water diversions must be installed prior to the commencement of work.	Construction Manager	Construction	
Sediment-laden water should be diverted into temporary sediment control basins to capture the design storm volume.	Construction Manager	Construction	
Diversion of storm water around laydown or chemical /hazardous material storage areas.	Construction Manager	Construction	
Prevention of erosion using sediment trapping devices and structures to slow water velocity.	Construction Manager	Construction	
Implement drainage controls to prevent offsite discharge of runoff.	Construction Manager	Construction	
Where reasonable and feasible, and to minimise the potential for erosion and sedimentation of stockpile(s), stockpile profiles would typically be at angle of repose (the steepest angle at which a sloping surface formed of loose material is stable or 1v:3h) with a slight concave slope to limit the loss of sediments off the slope, or through the profile and the formation of a toe drain.	Construction Manager	Construction	
Stockpiles should be placed away from drainage lines, waterways and areas where they may be susceptible to wind erosion	Construction Manager	Construction	
Works on or adjacent to waterfront land must be carried out in accordance with the Guidelines for Controlled Activities on Waterfront Land	Construction Manager	Construction	
No refuelling or maintenance of machinery is to occur within 30m of a watercourse or drainage line. Refuelling activities must be supervised at all times and hoses must be fitted with a stop valve at the nozzle end	Construction Manager	Construction	
An adequate number of spill kits or absorbent material is to be kept on site and easily accessible to all staff. The spill kit should be capable of dealing with both large and small spills. Spills can be classified as follows: <ul style="list-style-type: none"> <li>• A small spillage &lt; 5 litres</li> <li>• A medium spillage - 6 to 100 litres</li> <li>• A large spillage &gt;100 litres</li> </ul>	Construction Manager	Construction	
All potentially contaminated stormwater (sediment and hydrocarbons) is treated prior to discharge to the environment or contained & disposed of off-site.	Construction Manager	Prior to discharge	

## 4.5 Soil Management

The management measures to prevent impacts from saline soils outlined in Table 4.5 will be implemented during construction of the Project.

**Table 4.5 Environmental management controls for soil**

Measure	Person responsible	Timing/frequency	Reference/notes
Implement the Erosion and Sediment Control Plan (ESCP)	Construction Manager	Duration of project	
Where possible, minimise ground disturbance in known sodic soil areas.	Construction Manager	Construction	
Majority of site is classified as non-saline to slightly saline. The following controls are to be implemented where practicable: <ul style="list-style-type: none"> <li>capping of the soil surface, both exposed when excavating and filling, with more permeable material which will prevent ponding and reduce capillary rise. This will also act as a drainage layer and reduce potential erosion.</li> <li>Minimising cut and fill - where possible use excavated soils in fill areas with similar salinity characteristics and placed back in the original order</li> <li>Minimising water infiltration - ensuring cut and fill areas are compacted well</li> <li>Maintain vegetation where possible and plant salt tolerant species - plants will also reduce soil erosion so should be considered in areas of disturbed soil</li> <li>Ensure the site is well drained</li> </ul>	Construction Manager	Construction	Section 7, Salinity, Aggressivity and Sodicity Assessment (ADE Consulting Group dated 23 March 2022)
Saline areas identified in the Douglas Partners Geotechnical and Groundwater Summary (21 September 2021) must be clearly delineated (norther east corner of the site).	Construction Manager	Construction	Douglas Partners Geotechnical and Groundwater Summary (21 September 2021)
Topsoil conservation shall be carried out in all areas where excavation or levelling is necessary, including trench lines, drilling areas and laydown areas.	Construction Manager	Construction	Blue Book
Storage areas for fuels, oils and chemicals to be used during construction must be covered and contained within an impervious bund to retain any spills of more than 125% of the volume of the largest container in the bunded area.	Construction Manager	Construction	Best Practice
Refuelling/lube trucks, will carry hydrocarbon spill kits and utilise spill trays during refuelling.	Construction Manager	Construction	Best Practice
An adequate number of spill kits or absorbent material is to be kept on site and easily accessible to all staff. The spill kit should be capable of dealing with both large and small spills. Spills can be classified as follows: <ul style="list-style-type: none"> <li>A small spillage &lt; 5 litres</li> <li>A medium spillage - 6 to 100 litres</li> <li>A large spillage &gt;100 litres</li> </ul>	Construction Manager	Construction	Best Practice

**Table 4.5 Environmental management controls for soil**

Measure	Person responsible	Timing/frequency	Reference/notes
Type and size of spill kits must be selected based on the type and volume of materials stored. Aquatic spill kits shall be available at worksites in close proximity to waterways.	Construction Manager	Construction	Best Practice

## 4.6 Waste

The Project will generate (but not limited to) the following waste during demolition and construction: excavation material, timber, concrete, bricks/pavers, tiles, metal, glass, furniture, fixtures and fittings, floor coverings, packaging, garden organics, containers, paper and cardboard, residual waste and hazardous material.

The environmental management controls in Table 4.6 will be implemented to minimise and manage waste from the Project.

**Table 4.6 Environmental management controls for waste**

Measure	Person responsible	Timing/frequency	Reference/notes
All waste will be separated into waste streams and contained within appropriate bins and/or disposed of in accordance with the EPA Guidelines.	Construction Manager	During construction	WMP – Section 3.1 and 5.1
All waste materials removed from the site must only be directed to a waste management facility or premises lawfully permitted to accept the materials	Construction Manager	Duration of project	Condition XX
Waste must be secured and maintained within designated waste storage areas and must not leave the site onto neighbouring public or private properties	Construction Manager	During construction	
All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with Safe Work Authority and EPA requirements	Construction Manager	Demolition / construction	WMP – Section 5.2
Reduce packaging waste by using returnable packaging such as pallets and reels	Construction Manager	Duration of project	WMP – Section 5.1
All Project personnel to be informed of site waste management procedures during site induction	Construction Manager	Prior to commencement of works	WMP – Section 5.1
All solid waste timber, concrete, tiles and rock that cannot be reused or recycled will be taken to an appropriate facility for treatment to recover further resources or for disposal to a licenced landfill	Construction Manager	Demolition / construction	WMP – Section 5.2
Portable, self-contained toilet and washroom facilities will be provided at the site and will be regularly emptied and serviced by a suitably qualified contractor	Construction Manager	Duration of project	WMP – Section 5.2



**Table 4.6 Environmental management controls for waste**

Measure	Person responsible	Timing/frequency	Reference/notes
Provision for the collection of batteries, fluorescent tubes and other recyclable resources will be provided onsite to enable offsite recycling	Construction Manager	Duration of project	WMP – Section 5.2
Drink container recycling will be provided onsite or these items sorted offsite for recycling at an appropriately licensed facility	Construction Manager	Duration of project	WMP – Section 5.2
All garbage will be disposed of via a council approved system	Construction Manager	Duration of project	WMP – Section 5.2
All waste bins will be kept clean and in good condition	Construction Manager	Duration of project	WMP – Section 5.3
All wastes shall be transported in accordance with relevant regulatory requirements. Where required, appropriately licenced transport contractors will be used.	Construction Manager	Duration of project	WMP – Section 7.2
All waste transportation vehicles will be covered appropriately to ensure waste cannot spill, leak or escape onto the road or wash into stormwater drains	Construction Manager	Duration of project	WMP – Section 5.2
Waste storage locations will be accessible and allow sufficient space for storage and servicing requirements	Construction Manager	Duration of project	
Where space is restricted, dedicated stockpile areas are to be delineated on the site, with regular transfers to dedicated skip bins for sorting. The positions of the designated waste holding areas on site will change according to building works and the progression of the development, with consideration of visual amenity, health and safety and accessibility in their selection.	Construction Manager	Duration of project	WMP – Section 5.3
All waste stockpile areas/skips for disposal or recycling shall be adequately contained to ensure that the waste does not fall, blow, wash or otherwise escape from the site. Stockpile locations will be sited to avoid contamination of stormwater drains during rain events.	Construction Manager	Duration of project	WMP – Section 5.3
Waste records, tracking and reporting procedures will be implemented	Construction Manager / Environmental Representative	Duration of project	
Waste/recycling storage locations will provide adequate space to accommodate all waste and recycling bins during demolition and construction works	Construction Manager	Duration of project	

**Table 4.6 Environmental management controls for waste**

Measure	Person responsible	Timing/frequency	Reference/notes
Recycling bins must be accessible to all demolition and construction employees and must be clearly sign posted and colour coded to ensure segregation of waste and recycling is effective.	Construction Manager	Duration of project	
All liquid and non-liquid wastes generated shall be classified in accordance with the requirements of NSW EPA (2014) Waste Classification Guidelines, Part 1: Classifying Waste and dispose of all wastes to a facility that may lawfully accept the waste	Construction Manager	Duration of project	WMP – Section 7.1, Condition XX
<b>Pre-Demolition Hazardous Waste Management</b> (hazardous material are limited to Asbestos containing material (ACM), Synthetic mineral fibre (SMF), Lead-based-paint, Polychlorinated Biphenyls (PCB) and Ozone Depleting Substances (ODS)	Construction Manager	Pre-demolition	Pre-demolition Hazardous Materials Survey Reports for Lot 20, 21, 22, 23, 30,31 and 32B
<b>Lot 20, Lot 21, Lot 22, Lot 30, Lot 31 - Asbestos</b>			
Non-friable asbestos - remove prior to refurbishment or demolition. If the amount of non-friable asbestos containing material is greater than 10square metres (m2),removal must be performed by a Class A or Class B licensed asbestos removal contractor who must notify SafeWork Australia. Clearance is required following the removal of greater than 10square metres (m2) of non-friable asbestos containing material.	Construction Manager	Pre-demolition	Pre-demolition Hazardous Materials Survey Reports for Lot 20, 21, 22, 30, 31
Friable asbestos- Remove prior to refurbishment or demolition by a Class A licensed asbestos removal contractor who must notify SafeWork Australia. Air monitoring must be performed during and after the removal. Asbestos waste must be disposed as hazardous special asbestos waste to an authorized asbestos waste facility. Clearance is required following the asbestos removal.	Construction Manager	Pre-demolition	Pre-demolition Hazardous Materials Survey Reports for Lot 20, 21, 22, 30, 31

**Table 4.6 Environmental management controls for waste**

Measure	Person responsible	Timing/frequency	Reference/notes
<b>Lot 20, Lot 30, Lot 31 SMF</b>			
Friable SMF - remove prior to refurbishment or demolition as a preventive action to minimise the generation of fibres and dust during refurbishment or demolition works. Removal can be performed by a hazardous materials removal contractor. The material can be disposed as a General waste construction. Clearance is not required but a visual inspection prior demolition is recommended.	Construction Manager	Pre-demolition	Pre-demolition Hazardous Materials Survey Reports for Lot 20, 30, 31
<b>Lot 20, Lot 21, Lot 22, Lot 23, Lot 30, Lot 31 , Lot 32B – SMF</b>			
Non-friable SMF - Maintain in current condition if to remain in situ, otherwise remove prior to refurbishment or demolition as a preventive action to minimise the generation of fibres and dust during refurbishment or demolition works. Removal can be performed by a hazardous materials removal contractor. The material can be disposed as a General waste construction. Clearance is not required	Construction Manager	Pre-demolition	Pre-demolition Hazardous Materials Survey Reports for Lot 20, 21, 22, 30, 31, 32B
<b>Lot 20 - Non-ozone depleting substances.</b>			
Require removal(de-gas) prior works by a Refrigerant Handling Licensed contractor for air conditioning and refrigeration systems and a Fixed System Installation and Decommissioning Licensed contractor for extinguisher systems in accordance with the Ozone Protection and Synthetic Greenhouse Gas (OSGG) Management Regulations 1995.	Construction Manager	Pre-demolition	Pre-demolition Hazardous Materials Survey Reports for Lot 20
<b>Lot 21 – PCB's</b>			
For removal of PCB leaking capacitors, contaminated materials and spillages it is recommended to restrict access to the area and remove as soon as possible by a hazardous removal contractor. EPA and SafeWork Australia must be notified. he management of PCBs must be performed in accordance with the EPA Polychlorinated Biphenyl (PCB) chemical control order 1997[19] If the concentration of PCBs less than 50mg/kg it can be disposed as general solid waste. Otherwise at an authorised PCB waste facility. It is recommended to obtain a clearance to ensure the area is safe prior to occupancy or work	Construction Manager	Pre-demolition	Pre-demolition Hazardous Materials Survey Reports for Lot 21

**Table 4.6 Environmental management controls for waste**

Measure	Person responsible	Timing/frequency	Reference/notes
Remove PCBs containing capacitors, prior to demolition or refurbishment by a hazardous removal contractor if the concentration of PCBs less than 50mg/kg it can be disposed as general solid waste. Otherwise dispose at an authorised PCB waste facility. Clearance is not required but a visual inspection prior demolition is recommended.	Construction Manager	Pre-demolition	Pre-demolition Hazardous Materials Survey Reports for Lot 21
<b>Lot 23 – Lead</b>			
Paint removal is not required. Maintain in current condition if to remain in situ, otherwise it is recommended to stabilise the surfaces by overpainting with a lead-free product prior to demolition or refurbishment. Visual inspection following the stabilisation and prior to demolition is recommended. As waste containing lead-based paint is pre-classified as per the EPA guidelines as hazardous waste, dispose of as a hazardous waste at an appropriate NSW EPA licensed landfill.	Construction Manager	Pre-demolition	Pre-demolition Hazardous Materials Survey Reports for Lot 23
<b>Lot 31 – Lead Flashing</b>			
Remove prior to refurbishment or demolition.	Construction Manager	Pre-demolition	Pre-demolition Hazardous Materials Survey Reports for Lot 31

# 5 Monitoring and reporting

## 5.1 Environmental monitoring and inspections

### 5.1.1 Environmental Monitoring

The Environmental Representative will conduct monitoring during pre-construction/construction to ensure compliance with this CEMP, relevant sub-plans and conditions of approval and to evaluate the effectiveness of environmental controls listed in Section 4.

### 5.1.2 Environmental Inspections

The Environmental Representative will undertake weekly inspections utilising the Site Inspection/Monitoring Checklist, provided in XXX.

Additional Erosion and Sediment Control inspections will be completed prior to adverse weather conditions and following a rainfall event of more than XX mm of rain within a 24-hour period.

Copies of the inspection reports will be kept with project records.

## 5.2 Audits

The Environmental Representative will undertake audits on a XX basis throughout construction to verify compliance with this CEMP, relevant sub-plans, conditions of consent and any other relevant statutory requirements such as licences and permits.

An audit checklist will be developed and maintained in the XX file/system.

## 5.3 Reporting

The reports listed in Table 5.1 will be prepared during the delivery of the Project.

**Table 5.1 Reporting requirements**

Report/form/checklist	Prepared by	Timing	Distributed to
Environmental monitoring and inspection checklists	Environmental Representative	weekly	Project Manager
Environmental audit report	Environmental Representative	-	-
Pre-construction compliance report	-	-	-
Incident reports	Environmental Representative	Notification within 24 hours of any incident or potential incident. Detailed report no later than 14 days after the incident	-
Non-compliance report	Environmental Representative		-
Environmental monthly report	Environmental Representative	Monthly	-

## 5.4 Records

All Project related documentation will be maintained. Documents stored within the file include (but not limited to) the following:

- copies of relevant planning approvals and documents, licences and permits;
- all completed induction forms and visitor sign-on register;
- records of routine environmental inspections; and
- records of any environmental incidents, complaints and non-compliances.

# 6 Review and improvement of environmental performance against CEMP

## 6.1 CEMP Review

This CEMP is a live document and will undergo reviews and amendments as necessary. Reviews will generally be undertaken in the following circumstances:

- if there is a change in the scope of the project;
- prior to commencement of construction to ensure any relevant conditions of consent and/or other approval, licence or permit requirements are incorporated;
- if there is a need to improve environmental controls to protect environmental values; and
- if there is an increase or introduction of a new environmental risk or impacts.

The Environmental Representative will be responsible for reviewing the CEMP and the Project Manager is responsible for approving these changes.

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Appendix A

# Community Consultation Strategy

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# 200 Aldington Road Industrial Estate

## Community Consultation Strategy

Prepared for Fife Kemps Creek Trust  
April 2022

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# 200 Aldington Road Industrial Estate

## Community Consultation Strategy

### Report Number

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E210906 RP#8

### Client

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Fife Kemps Creek Trust

### Date

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7 April 2022

### Version

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v1 Final

### Prepared by

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**Lia Zwolinski**

Senior Consultant

7 April 2022

### Approved by

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**David Bone**

Associate Director

7 April 2022

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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# Acronyms and abbreviations

Phrase	Definition
CCS	Community Consultation Strategy
CEMP	Construction Environmental Management Plan
DPI	Department of Primary Industry
DPIE	Department of Planning, Industry and the Environment
EES	DPIE (Environment, Energy and Science Group (EES))
EIS	Environmental Impact Statement
EPA	NSW Environmental Protection Authority
Ha	hectare
GFA	Gross floor area
LALC	Local Aboriginal Land Council
Km	Kilometre
LGA	Local Government Area
NRAR	Natural Resources Access Regulator
RMS	Roads and Maritime Service (NSW)
sqm	Square metre
WSA	Western Sydney International (Nancy-Bird Walton) Airport

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# 1 Introduction

## 1.1 Background

This Community Communication Strategy (CCS) has been prepared for the 200 Aldington Road Industrial Estate (the Project). The Project site is located at 200 Aldington Road, Kemps Creek, New South Wales on land formerly described as Lots 30-32 in DP 258949 and Lots 20-23 in DP 255560. The site is located within the Penrith Local Government Area (LGA) and forms part of the Mamre Road Precinct which sits within both the Western Sydney Employment Area and the Western Sydney Aerotropolis.

The site comprises seven separate allotments with a total area of approximately 72 hectares (ha). The site is located approximately 5 kilometres (km) north-west of the future Western Sydney International (Nancy-Bird Walton) Airport (WSA), 13 km south-east of the Penrith CBD and 40 km west of the Sydney CBD.

The Project is a staged development, and this CCS relates to Stage 1 of the Project, comprising estate-wide earthworks, infrastructure and services, construction, fit-out and operation of the Stage 1 warehouse building.

A State Significant Development (SSD) Application (SSD-10479) was submitted in November 2020. The SSD Application, Environmental Impact Statement (EIS) and supporting documents were exhibited from Wednesday 18 November 2020 until Tuesday 15 December 2020.

This CCS has been prepared in accordance with the requirements of the Conditions of Approval SSDA 10479 as demonstrated in Table 1.1.

**Table 1.1**      **Conditions of Approval Requirements**

Condition Reference	Requirement	Reference in this CCS

## 1.2 Purpose

This CCS describes how Fife Kemps Creek Pty Ltd (FKC) will manage community consultation with key stakeholders during the construction of the Project.

## 1.3 Project overview

An Environmental Impact Statement (EIS) has been submitted (and is awaiting approval) to the Department of Planning, Industry and Environment (DPIE) for a Concept State Significant Development (SSDA) Application under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), on behalf of Fife Kemps Creek Pty Ltd (a joint venture between Fife Capital and Stockland Managed entities). It relates to the concept approval (in accordance with Section 4.22 of the EP&A Act and Stage 1 works for the proposed industrial hub of land at 106 – 228 Aldington Road, Kemps Creek (200 Aldington Road). The amended SSDA seeks approval for the following development:

- 329,575 sqm of warehouse gross floor area (GFA);
- 17,000sqm of ancillary office GFA;
- 13 individual development lots for warehouse buildings with associated hardstand areas and two lots for drainage infrastructure purposes (each including a bio-retention basin);
- roads including:
  - internal road layouts;
  - southern road connection to Aldington Road;
  - northern boundary road (half road corridor) connecting to Aldington Road; and
  - road connections to adjoining landholdings to the north and east.
- provision for 1,546 car parking spaces; and
- associated concept site landscaping.

The CEMP and sub plans have been prepared for the progressive delivery of site preparation, earthworks and infrastructure works for Stage 1 which comprises the following activities:

- demolition and clearing of all existing built form structures;
- drainage and infill of existing farm dams and any ground dewatering;
- clearing of all existing vegetation;
- subdivision of the site into 15 individual lots;
- construction of a warehouse building with a total of 50,930 sqm of GFA, including:
  - 48,430 sqm of warehouse GFA;
  - 2,500 sqm of ancillary office GFA; and
  - 222 car parking spaces.
- bulk earthworks including 'cut and fill' to create flat development platforms for the warehouse buildings, and site stabilisation works (if required);
- roadworks and access infrastructure, including an interim access road and temporary junction with Aldington Road;

- stormwater and drainage works including stormwater basins, diversion of stormwater lines, gross pollutant traps and associated swale works;
- sewer and potable water reticulation; and
- inter-allotment, road and boundary retaining walls.

At the time of writing, the EIS had yet to be approved.

### 1.3.1 Construction Activities

A summary of construction staging, and associated activities is provided in Table 1.2.

**Table 1.2 Construction Activities**

Stage	Summary of activities	Timing
Pre-construction activities	<ul style="list-style-type: none"> <li>• site establishment, including site boundary fencing, erection of signage and establishment of no-go areas;</li> <li>• establishment of site compound and stockpile sites;</li> <li>• establishment of site access points, traffic management measures;</li> <li>• installation of erosion and sediment controls;</li> <li>• pre-clearance surveys and marking fauna habitat trees prior to clearing works; and</li> <li>• clearing of all existing vegetation, including grubbing activities and removal of vegetation off-site.</li> </ul>	
Demolition	<ul style="list-style-type: none"> <li>• demolition and clearing of all existing built form structures.</li> </ul>	
Drainage and earthworks	<ul style="list-style-type: none"> <li>• drainage and infill of existing farm dams and any ground dewatering;</li> <li>• subdivision of the site into 13 individual lots;</li> <li>• bulk earthworks including 'cut and fill' to create flat development platforms for the warehouse buildings, and site stabilisation works (if required); and</li> <li>• stripping, stockpiling and management of topsoil and unsuitable materials.</li> </ul>	
Construction	<ul style="list-style-type: none"> <li>• construction of warehouse building, including ancillary office and car parking spaces;</li> <li>• roadworks and access infrastructure;</li> <li>• stormwater and drainage works including stormwater basins, diversion of stormwater lines, gross pollutant traps and associated swale works;</li> <li>• sewer and potable water reticulation; and</li> <li>• inter-allotment, road and boundary retaining walls.</li> </ul>	
Post-construction	<ul style="list-style-type: none"> <li>• rehabilitation;</li> <li>• demobilisation of plant and equipment; and</li> <li>• site clean-up.</li> </ul>	

## 1.4 Community consultation strategy scope

This CCS identifies key stakeholders and describes communication tools used to facilitate communication between FKC and key stakeholders during construction of the Project. It also provides a program for monitoring, reporting and evaluating of the effectiveness of community consultation.

This CCS has been informed by the following documents:

- Conditions of Approval (reference);



- EIS and submissions;
- Construction Environmental Management Plan (CEMP) and sub-plans, including:
  - Flora and Fauna Management Plan;
  - Construction Noise and Vibration Management Plan;
  - Construction Air Quality Management Plan; and
  - Aboriginal Cultural Heritage Management Plan.

## 2 Roles and Responsibilities

The roles and responsibilities for implementation of the CCS are outlined in Table 2.1.

**Table 2.1**      **Roles and responsibilities**

Role	Company	Responsibilities
Community Engagement Representative	Principal (FKC)	<ul style="list-style-type: none"> <li>manage enquiries and complaints;</li> <li>monitoring and responding to Project phone calls and emails; and</li> <li>work with Contractor to management and response to community complaints.</li> </ul>
Project Manager	Principal (FKC)	
Construction Manager	Contractor	<ul style="list-style-type: none"> <li>support in the response to enquiries and complaints and ensure required actions are implemented;</li> <li>provide information for report, as required; and</li> <li>attend community and stakeholder meetings, as required.</li> </ul>
Site Supervisor	Contractor	<ul style="list-style-type: none"> <li>support in the response to enquiries and complaints where required; and</li> <li>report any community interactions (e.g. local community, media) to the Contractor's Community Liaison Officer.</li> </ul>
Community Liaison Officer	Contractor	<ul style="list-style-type: none"> <li>implement CCS; and</li> <li>assist the Community Engagement Representative with the management of enquiries and complaints.</li> </ul>
Environmental Representative	Contractor	<ul style="list-style-type: none"> <li>responding to the community regarding environmental performance;</li> <li>receive all community notifications; and</li> <li>available to the team to assist in the resolution of complaints where required.</li> </ul>
All Project personnel	Contractor and sub-contractors	<ul style="list-style-type: none"> <li>adhere to requirements of this CCS; and</li> <li>report any community interactions (e.g. local community, media) to the Contractor's Community Liaison Officer.</li> </ul>

## 3 Key stakeholders and potential issues

### 3.1 Key stakeholders

The following categories of stakeholders are relevant to the Project:

- State and local government agencies and representatives – government representatives at State and Local level, including local representatives and government agencies responsible for the regulation of the Project;
- utility providers – telecommunications, water and electricity etc;
- surrounding landholders – landholders adjoining the Project site;
- Indigenous stakeholders – traditional owner groups, local land councils and other Indigenous organisations;
- business operators and representatives – business operators and representatives in the local area which may experience indirect impacts on business operations;
- local community – residents and visitors within the Project area which may have an interest in the Project;
- special interest groups – community organisations and groups;
- educational facilities – schools and early learning centres; and
- media.

The key stakeholders which are affected by the Project or have an interest in the Project are summarised in Table 3.1. Key stakeholders will be consulted throughout the construction phase of the Project, as required.

**Table 3.1 Key Stakeholders**

Key stakeholders	Issues/potential issues/interests	Aim of engagement
<b>State and local government agencies and representatives</b>		
State Ministers and MPs		Inform
Department of Planning, Industry and the Environment (DPIE)	Compliance with conditions of approval Construction timing	Consult/inform
DPIE (Environment, Energy and Science Group (EES))	Environmental impacts	Consult
Environment Protection Authority (EPA)	Pollution incidents Licence requirements	Consult/inform
Department of Primary Industries (DPI) Fisheries	Impacts to aquatic ecology	Consult
Department of Transport	Traffic and access, road closures, road safety	Consult/inform
DPI Agriculture		Consult
Heritage NSW	Impacts to cultural heritage – Aboriginal objects, archaeological finds	Consult
Natural Resources Access Regulator (NRAR)	Impacts to riparian corridors and waterfront land	Consult

**Table 3.1**      **Key Stakeholders**

Key stakeholders	Issues/potential issues/interests	Aim of engagement
Penrith City Council	Environmental considerations and protection – traffic management, waterways, biodiversity, landscaping, stormwater management; staging	Consult
Roads and Maritime Services Division (Parramatta)	Traffic and access, road closures, road safety	Consult
Sydney Water (Parramatta)		
Western Sydney Planning Partnership		
NSW Police	Emergency and incident response; crime and safety; provide feedback on relevant management plans	Consult/inform
NSW Ambulance Service		
NSW Rural Fire Service (NSW RFS)		
Utility providers		
Endeavour Energy	Consultation and engagement during construction; provide feedback on relevant management plans	Consult/inform
Surrounding landholders		
Landholders along Aldington Road	Traffic/access impacts	Consult/inform
Properties which abut the Project site boundary	Traffic/access impacts; road changes; water management; flooding	Consult/inform
Indigenous Stakeholders		
Deerubbin Local Aboriginal Land Council (LALC)	Aboriginal archaeological impacts; impacts to Aboriginal cultural heritage	Consult
Darug Custodian Aboriginal Corporation		
Kamilaroi Yankuntjatjara Working Group		
Business operators		
Goodman Property Services (Aust) Pty		
Western Sydney Airport	Wildlife hazards, cumulative impacts	Consult inform
Pazit Pty Ltd	Business impacts during construction; road/access impacts	Consult inform
Oakdale South Industrial Estate	Business impacts	Consult/inform
Local community		
Residential housing community at Mount Vernon		Inform
Road users	Traffic and access impacts, road safety	Inform

**Table 3.1 Key Stakeholders**

Key stakeholders	Issues/potential issues/interests	Aim of engagement
Special Interest Groups		
Catholic Healthcare Emmaus Retirement Village	Potential traffic impacts from construction	Inform
Community groups		Inform / consult
Educational facilities		
Little Smarts Early Learning Centre	Potential traffic impacts on surrounding road network	Inform
Trinity Primary School		
Emmaus Catholic College		
Media		
Sydney Morning Herald	Impacts to the community	Sydney Morning Herald

### 3.2 Potential issues

Potential issues which may be experienced by stakeholders include (but are not limited to) those identified in Table 3.2.

**Table 3.2 Potential Issues**

Factor/impact	Description of potential issues	Mitigation and management measures
Air quality	<ul style="list-style-type: none"> <li>dust generation from construction activities and emissions from plant, equipment and vehicles;</li> <li>complaints from the community;</li> <li>negative media coverage; and</li> <li>damage to Company reputation.</li> </ul>	<ul style="list-style-type: none"> <li>implementation of measures outlined in the CAQMP;</li> <li>implementation of monitoring in accordance with the CAQMP; and</li> <li>notification to relevant stakeholders, as required.</li> </ul>
Noise and vibration	<ul style="list-style-type: none"> <li>noise from construction, lack of notification to affected stakeholders;</li> <li>noise impacts resulting from operation of machinery and equipment during earthworks and construction;</li> <li>vibration impacts resulting from construction activities;</li> <li>complaints from neighbouring landholders;</li> <li>negative media coverage; and</li> <li>damage to Company reputation.</li> </ul>	<ul style="list-style-type: none"> <li>implement measures outlined in the CNVMP;</li> <li>implement monitoring in accordance with the CNVMP;</li> <li>notification to relevant stakeholders, as required;</li> <li>site induction to cover noise mitigation and management measures and obligations; and</li> <li>toolbox talk and pre-start meetings to discuss noise mitigation and management measures where additional training/awareness is required e.g in response to a community complaint.</li> </ul>

**Table 3.2**      **Potential Issues**

Factor/impact	Description of potential issues	Mitigation and management measures
Traffic and access impacts	<ul style="list-style-type: none"> <li>during the EIS exhibition, the traffic impacts were raised by stakeholders;</li> <li>traffic and access disruptions to day-to-day operations for schools, road users and the local community;</li> <li>traffic congestion along Aldington Road and surrounding road network;</li> <li>disruptions, delays, temporary detours, changes to traffic conditions, and vehicle access to and from the Project site;</li> <li>impacts to landholders and businesses in the locality;</li> <li>damage to existing pavement; and</li> <li>increased safety risk on local roads from heavy/oversized vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>implement measures outlined in the Construction Traffic Management Plan; and</li> <li>consultation regarding traffic/access impacts.</li> </ul>
Vegetation removal	<ul style="list-style-type: none"> <li>removal of significant vegetation; and</li> <li>displacement of native and invasive fauna.</li> </ul>	<ul style="list-style-type: none"> <li>implement measures in the Flora and Fauna Management Plan.</li> </ul>
Visual	<ul style="list-style-type: none"> <li>concerns regarding impacts to visual amenity in the locality.</li> </ul>	<ul style="list-style-type: none"> <li>construction to occur in accordance with the approved design and conditions of consent; and</li> <li>community engagement and notification, as required for affected landholders.</li> </ul>
Business impact	during the EIS exhibition, local businesses raised concern of traffic impacts during construction.	<ul style="list-style-type: none"> <li>Construction Traffic Management Plan; and</li> <li>Construction Environmental Management Plan.</li> </ul>
Cultural heritage	<ul style="list-style-type: none"> <li>potential impacts to undiscovered Aboriginal artefacts or relics, or other heritage sites; and</li> <li>loss of cultural heritage values.</li> </ul>	<ul style="list-style-type: none"> <li>site induction to address cultural heritage issues and management measures;</li> <li>implement Unexpected Finds Protocol;</li> <li>engagement with relevant Registered Aboriginal Parties and Councils; and</li> <li>implementation of Cultural Heritage Management Plan.</li> </ul>
Rehabilitation	<ul style="list-style-type: none"> <li>potential for site stabilisation and rehabilitation failure.</li> </ul>	<ul style="list-style-type: none"> <li>Flora and Fauna Management Plan; and</li> <li>Landscape Management Plan.</li> </ul>

## 4 Community and stakeholder engagement

### 4.1 Objectives

The objectives of community and stakeholder engagement are to:

- ensure clear, timely and accurate information is provided to key stakeholders;
- ensure key stakeholders have access to relevant Project information through a range of communication tools;
- ensure key stakeholders informed about progress and major works relating to the Project;
- ensure affected stakeholders are informed of potential impacts and timing through advance notification;
- actively engage with the key stakeholders and encourage feedback;
- minimise Project complaints from stakeholders;
- ensure Project enquiries and complaints are managed and resolved in an efficient manner; and
- comply with the relevant community consultation requirements outlined in the Conditions of Approval.

### 4.2 Site Induction

All Project personnel will undertake a site-specific induction which will cover general environmental awareness training and responsibilities under the CEMP and sub-plans (refer Section 3.3 of the CEMP).

The site induction will also cover aspects of community and stakeholder management, including:

- protocols for reporting complaints and enquiries; and
- appropriate behaviour when interacting with the local community and stakeholders.

### 4.3 Communication tools and activities

The communication tools and activities to be applied to the construction phase are outlined in Table 4.1.

**Table 4.1** Communication tools and activities

Communication Tools and Activities	Target Audience	Description
Direct contact	Adjoining landholders, surrounding businesses	Telephone calls, face-to-face meetings, emails, letters)
Project email address	Local community, adjoining landholders, business operators	A dedicated email address will be established and maintained to keep key stakeholders informed about the Project and enable stakeholders to provide feedback and make enquiries about the Project

**Table 4.1**      **Communication tools and activities**

Communication Tools and Activities	Target Audience	Description
Project website	Local community, adjoining landholders, business operators	A dedicated website to provide information on the Project, including a general overview of the Project and contact details
Project website	Local community, adjoining landholders, business operators	A dedicated website to provide information on the Project, including a general overview of the Project and contact details
Project 24-hour phone number	Local community, adjoining landholders, business operators	A 24-hour Project phone number will be established for the community to provide feedback or make enquiries about the Project
Signage	Local community, adjoining landholders, surrounding business operators	Site signage will be erected on the site boundary (including site contact details). Signage will also be erected on Aldington Road and surrounds for management of any traffic diversions/disruptions.
Notification letters and emails	Adjoining landholders, Government representatives	Notification to inform directly affected stakeholders of commencement of works; work hours; type, location and duration of impacts during construction
Advertisement and media	Local community, adjoining landholders, business operators	Advertisements will be posted in newspapers to inform the community about Project, including the dedicated phone number, email and website to provide feedback or make enquiries.
Consultation records	Government representatives	Records of consultation carried out for documents required in the Conditions of Approval
Community meetings	Local community, affected businesses and landholders	Meetings to inform the community of the progress of development
Newspaper advertisements	Local community	Advertisements to summarise key project details and include contact phone number, email and postal address



## 4.4 Notification procedures

### 4.4.1 Regulatory Notification

A summary of key regulatory notification protocols is provided in Table 4.2. All environment incident notifications will be management in accordance with the CEMP.

**Table 4.2 Regulatory Notification**

Stakeholder to Notify	What to Notify	When to Notify	Responsibility to Notify
DPE	Commencement of construction	DPIE will be notified in writing at least 48 hours prior to the commencement of construction	Project Manager
DPE	Details of any non-compliance	Notify by email within 5 working days after becoming aware of any non-compliance with the development conditions of approval	Environmental Representative
Heritage NSW	Details of any material suspected of being a European or Aboriginal culturally significant (e.g site, artefact or relic)	Immediately upon discover of any archaeological/culturally significant site or relic that are encountered. NSW also to be notified immediately upon discovery of human remains	Environmental Representative
NSW EPA	Details of pollution incident – who, what, when, where, how, any other supporting information (e.g. photos)	Immediately upon identified of pollution incident causing or threatening material harm to the environment in accordance with the CEMP	Environmental Representative

### 4.4.2 Community Notification

**Table 4.3 Community notification**

Notification	Notification Procedure	Responsibility
Community notification	<p>Community notification is required in the following circumstances where works may impact on the community:</p> <ul style="list-style-type: none"><li>• commencement/completion of works or any other significant project milestones;</li><li>• changes to traffic/access i.e. changes or disruptions to local business access;</li><li>• out of hours work/extended hours of work;</li><li>• medium – high noise construction activities;</li><li>• hgh vibration impacts;</li><li>• changes or disruptions to utility services; and</li><li>• site investigations/inspections.</li></ul> <p>The notification must identify types and durations of works which may generated high-impact noise or disrupt traffic flows during works scheduling. The Project contact details must be included on the notification to provide the community to raise any concerns.</p>	

**Table 4.3**      **Community notification**

Notification	Notification Procedure	Responsibility
Signage	Signage must be installed at least seven days prior to any changes that may impact on traffic conditions, access etc.	

## 4.5 Enquiries procedure

The enquiries procedure is outlined in Table 4.3

**Table 4.4**      **Enquires procedure**

Step	Responsibility	Timing
Acknowledge the enquirer of receipt of the enquiry within two hours (where contact details are provided)		2 hours
For phone enquiries - provide a verbal response to enquirer within 24 hour (unless the enquirer is notified/agrees otherwise) advising when response can be expected		24 hours
Seek advice/information from relevant Project personnel and issue response to enquirer within 24 hours		
Record details in the Complaints and Enquiries Database within 48 hours of receiving the enquiry;		48 hours
Ensure all relevant detail is included in the Complaints and Enquiries Database		
Report to Environmental Representative on any enquiries received and responses/resolution.		Monthly

## 4.6 Complaints procedure

The complaints procedure is outlined in Table 4.4.

**Table 4.5**      **Complaints procedure**

Step	Responsibility	Timing
Record all initial complaint details in the Complaints and Enquiries Register		48 hours
Acknowledge receipt of the complainant within 2 hours (where contact details have been provided)		2 hours

**Table 4.5**      **Complaints procedure**

Step	Responsibility	Timing
Seek advice/information from relevant Project personnel. All urgent matters should be forwarded promptly and dealt with in the most efficient manner to ensure the complaint is addressed as quickly as reasonably practicable		24 hours
Advise the complainant of the resolution and how it has been closed out		
Document all actions in the Complaints and Enquiries Register within 48 hours		48 hours
Follow up with complainant (if necessary) to ensure that corrective actions are satisfactory.		1 week

Where a complainant indicates they are not satisfied with the response provided, the Community Engagement Representative and Principal's Project Manager shall meet to discuss additional actions. Where the complainant is still not satisfied, refer to the dispute resolution process in section 4.8.

The Community Engagement Representative will report monthly to the Environmental Representative on any complaints received, responses and resolution.

#### 4.7      Complaints register

A Complaints and Enquiries Register will be maintained for the duration of the Project. For each complaint received, the following information will be recorded in the register:

- date and time of the complaint;
- details of the complainant, including number of people affected in relation to the complaint;
- nature of the complaint;
- any actions taken to address the complaint, including responses provided to address the complaint such as written or transcript if verbal response is provided;
- verification of the closeout of the complaint, including whether a resolution was reached, with or without mediation; and
- details of any follow up with the complainant.

Upon request, the Complaints Register will be provided to the Secretary in accordance with Condition XX.

#### 4.8      Dispute resolution

In the event a complaint is unable to be resolved between the complainant and the relevant Project personnel, a third-party mediator may be used to assist with the resolution of the dispute.

The dispute resolution process is as follows:

- Third party mediator reviews complaint and responses provided.

- Third party mediator determines that the response is either satisfactory or mediation is required
- In either case, third-party mediator must contact the complainant to advise if they are closing the complaint or if they will initiate the mediation process.
- Mediation will occur at a time and date agreed between the third-party mediator and the complainant (preferably in-person). The third-party mediator and Principal's Project Manager must attend to meeting. Any other relevant Project personnel required to attend the meeting will be at the discretion of the Principal's Project Manager.
- Following the mediation meeting, the third-party mediator will advise of any additional actions required or whether the Third-party mediator is satisfied that the matter has been resolved.
- Any additional information must be recorded in the Complaints Register and closed out.

# 5 Monitoring, reporting and evaluation

## 5.1 Monitoring

Monitoring under this CCS will be undertaken by the Contractor during weekly inspections of construction activities to ensure compliance with the conditions of approval and this CCS. To minimise potential impacts on the community, weekly inspections will focus on key impact areas such as noise and vibration, traffic and access management and air quality impacts.

## 5.2 Reporting

### 5.2.1 Community Engagement Register

All records of stakeholder engagement will be recorded in the Community Engagement Register. This will include the following details:

- relevant parties involved/engaged, including name and contact details;
- time and date of engagement;
- communication tool/type of engagement; and
- summary of engagement, including written evidence or verbal transcript.

### 5.2.2 Monthly reporting

A monthly report summarising key stakeholder engagement activities will be prepared by the Community Engagement Representative and provided to the Environmental Representative on a monthly basis for inclusion in the monthly environmental reporting. The following information may be provided:

- number of complaints and enquiries received; and
- summary of stakeholder engagement activities e.g number of notifications issued.

### 5.2.3 Compliance reporting

Details of stakeholder engagement will be provided (as required) in order to meet compliance obligations outlined in the Conditions of Approval.

## 5.3 Evaluation and review

This CCS is a live document and is subject to ongoing review and updates for the duration of the Project.

Evaluation and review will be undertaken in accordance with the Conditions of Approval and Section 6.0 of the CEMP. Continuous improvement will be achieved via the ongoing evaluation of environmental performance and effectiveness of this CCS against the Conditions of Approval and legislative requirements.

Revisions to this CCS may result from the following:

- design/construction changes;
- following an incident or near miss;

- environmental audits;
- amendments to the Conditions of Approval;
- changes to company procedures or systems; and
- following a community complaint.

## 6 Emergency and Key Contacts

A summary of emergency and key contacts is provided in Table 4.5.

**Table 6.1**      **Emergency and key contacts**

Contact/Agency	Reason	Contact Number
Project Manager	-	
Construction Manager	-	
Community Liaison Officer		
Environmental Representative	-	
24-hour Project Information Line	Complaints/issues/enquiries	
Penrith City Council		
DPE	Non-compliance, change to project, regulatory advice	
DPI Agriculture		
DPI Fisheries	Aquatic ecology	
Roads and Maritime Service (RMS)	Traffic / access	
SafeWork NSW	Notifiable incidents	131 050
NSW EPA	Pollution Incident (air, noise, water, waste)	131 555
NSW Police	In case of fire, medical or police emergency. For pollution incidents that present an immediate threat to human health or property.	000
Fire and Rescue NSW		
NSW Ambulance		
Nepean Hospital	Medical incidents	(02) 4734 2000
Crime stoppers	Incidents such as theft, crime, car crash, non-threatening injuries	1800 033 111
Police Assistance Line		131 444
Poison Information Centre	Toxicology advice	131 126
IXOM (Chemical industry)	Incidents relating to transport, storage and use of chemical products	1800 033 111
Deerubbin Local Aboriginal Land Council (LALC)		
Darug Custodian Aboriginal Corporation	Aboriginal cultural heritage	
Kamilaroi Yankuntjatjara Working Group		

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Appendix B

# Construction Air Quality Management Plan

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# 200 Aldington Road Industrial Estate

## Construction Air Quality Management Plan

Prepared for Fife Kemps Creek Trust  
April 2022

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# 200 Aldington Road Industrial Estate

## Construction Air Quality Management Plan

### Report Number

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E210906 RP#2

### Client

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Fife Kemps Creek Trust

### Date

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7 April 2022

### Version

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v1 Final

### Prepared by

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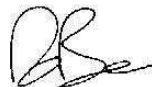
**Nena Lane-Kirwan**

Consultant

7 April 2022

### Approved by

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**David Bone**

Associate Director

7 April 2022

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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# Acronyms and abbreviations

Acronym	Description
BC Act	Biodiversity Conservation Act 2016
CM	Construction Manager
CEMP	Construction Environmental Management Plan
CCS	Community Communication Strategy
CNVMP	Construction Noise and Vibration Management Plan
CTMP	Construction Traffic Management Plan
DAWE	Department of Agriculture, Water and the Environment (Cth)
EIS	Environmental Impact Statement
ESCP	Erosion and Sediment Control Plan
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	Environmental Protection Agency
ER	Environmental Representative
FKC	Fife Kemps Creek Trust
GFA	Gross Floor Area
ha	hectare
km	kilometre
LGA	Local Government Area
m	metre
NSW	New South Wales
NRAR	Natural Resources Access Regulator
PCC	Penrith City Council
SS	Site Supervisor

# 1 Introduction

This Construction Air Quality Management Plan (CAQMP) has been prepared for implementation by Fife Kemps Creek Trust (FKC) (and its contractors) for the construction of the 200 Aldington Road Industrial Estate (the Project). The Project is located in Kemps Creek, New South Wales 2178, within the Penrith Local Government Area (LGA).

The following documents have been reviewed and applicable information incorporated into this CAQMP:

- Environmental Impact Statement (the EIS), prepared by Ethos Urban, dated 11 November 2020;
- *Insert consent reference;*
- Air Quality Impact Assessment (AQIA), prepared by Wilkinson Murray, dated 20 September 2021; and
- Mamre Road Precinct Development Control Plan 2011 (the DCP)

## 1.1 Project overview

This CAQMP forms a Request for Additional Information for the proposed Concept State Significant Development Application for a new industrial estate on land 106 – 228 Aldington Road, Kemps Creek.

The EIS for the project was placed on public exhibition between 18 November 2020 and 15 December 2020. During this period, a total of 18 submissions were received. These submissions were addressed and subsequent amendments to the project were made, as outlined in the Response to Submissions Report (dated 23 March 2021) prepared by Ethos Urban.

In written correspondence dated 28 April 2021, it was requested that FKC provide a further response to additional commentary raised by DPE, as well as additional comments raised by public authorities in their review of the first Response to Submissions Report. This was responded to via a second a Response to Submissions Report outlined by Ethos Urban (dated 22 September 2021).

Additional correspondence was received from DPE dated 15 November 2021 which has necessitated updates and additional information, as contained within this report.

### 1.1.1 Summary of the project for which development consent is now sought

Consent is sought for the following development. It represents minor amendments and does not represent a significant material change to what was previously proposed under the second RTS Report (22 September 2021)

- A concept masterplan with an indicative total building area of 342,865 sqm, comprising:
  - 325,865 sqm of warehouse gross floor area (GFA);
  - 17,010 sqm of ancillary office GFA;
  - 13 individual development lots for warehouse buildings with associated hardstand areas and two lots for water management infrastructure purposes (each including a bio retention basin);
  - Roads, including:
    - Internal road layouts;
    - Southern road connection to Aldington Road;

- Northern boundary road (half road corridor) connecting to Aldington Road;
- Road connections to adjoining landholdings to the north and east;
- Provision for 1,516 car parking spaces; and
- Associated concept site landscaping.
- Detailed consent for progressive delivery of site preparation, earthworks and infrastructure works (i.e., Stage 1 works) on the site, including:
  - Demolition and clearing of all existing built form structures;
  - Drainage and infill of existing farm dams and any ground dewatering;
  - Clearing of existing vegetation;
  - Subdivision of the site into 15 individual lots;
  - Construction of a warehouse building with a total of 50,300 sqm of GFA, including:
    - 47,800 sqm of warehouse GFA; 2,500 sqm of ancillary office GFA; and
    - 221 car parking spaces.
  - Bulk earthworks including 'cut and fill' to create level development platforms for the warehouse buildings, and site stabilisation works (if required);
  - Roadworks and access infrastructure, including an interim access road and a temporary junction with Aldington Road;
  - Stormwater works including stormwater basins, diversion of stormwater;
  - Utilities services including sewer and potable water reticulation; and
  - Road and boundary retaining walls.

## 1.2 Air Quality Impact Assessment

An AQIA was prepared by Wilkinson Murray Limited (2020) as part of the EIS submission. The report provides an assessment of the Project's impact upon air quality during the construction and operational phases.

## 1.3 Community Consultation

FKC has developed a Community Communication Strategy (CCS), which outlines key stakeholders and the engagement strategies to be adopted prior to and during construction works. In addition, a Complaints Response Handling Procedure. Refer to Appendix A of the CEMP.

Consultation will be carried out in reference to (but not limited to) the following:

- hazard identification and risk assessment processes;

- changes to FKC's Policies and Procedures which may affect environmental management, including any amendments to this CEMP;
- incidents, near misses and non-compliances, corrective actions and lessons learned;
- changes to applicable Environmental Legislation and Standards; and
- changing site conditions and work conditions.

FKC will undertake consultation activities in accordance with the processes outlined in the CCS.



## 2 Site description

### 2.1 Site location

The Project site is located at 200 Aldington Road, Kemps Creek, NSW. The site comprises seven separate allotments with a total area of approximately 72 hectares (ha). The site is located approximately 5 kilometres (km) north-west of the future Western Sydney International (Nancy-Bird Walton) Airport (WSA), 13 km south-east of the Penrith CBD and 40 km west of the Sydney CBD (refer Figure 2.1).

The site is located within the Mamre Road Precinct as identified by the State Environmental Planning Policy (Western Sydney Employment Area) 2009 (the SEPP).

### 2.2 Construction staging and activities

A summary of construction staging, and associated activities is provided in Table 2.1.

**Table 2.1 Construction activities**

Stage	Summary of activities	Timing
Pre-construction activities	<ul style="list-style-type: none"><li>• site establishment, including site boundary fencing, erection of signage and establishment of no-go areas;</li><li>• establishment of site compound and stockpile sites;</li><li>• establishment of site access points, traffic management measures;</li><li>• installation of erosion and sediment controls;</li><li>• pre-clearance surveys and marking fauna habitat trees prior to clearing works; and</li><li>• clearing of all existing vegetation, including grubbing activities and removal of vegetation off-site.</li></ul>	
Demolition	<ul style="list-style-type: none"><li>• demolition and clearing of all existing built form structures</li></ul>	
Drainage and earthworks	<ul style="list-style-type: none"><li>• drainage and infill of existing farm dams and any ground dewatering;</li><li>• subdivision of the site into 13 individual lots;</li><li>• bulk earthworks including 'cut and fill' to create flat development platforms for the warehouse buildings, and site stabilisation works (if required); and</li><li>• stripping, stockpiling and management of topsoil and unsuitable materials.</li></ul>	
Construction	<ul style="list-style-type: none"><li>• construction of warehouse building, including ancillary office and car parking spaces;</li><li>• roadworks and access infrastructure;</li><li>• stormwater and drainage works including stormwater basins, diversion of stormwater lines, gross pollutant traps and associated swale works;</li><li>• sewer and potable water reticulation; and</li><li>• inter-allotment, road and boundary retaining walls.</li></ul>	
Post-construction	<ul style="list-style-type: none"><li>• rehabilitation;</li><li>• demobilisation of plant and equipment; and</li><li>• site clean-up.</li></ul>	

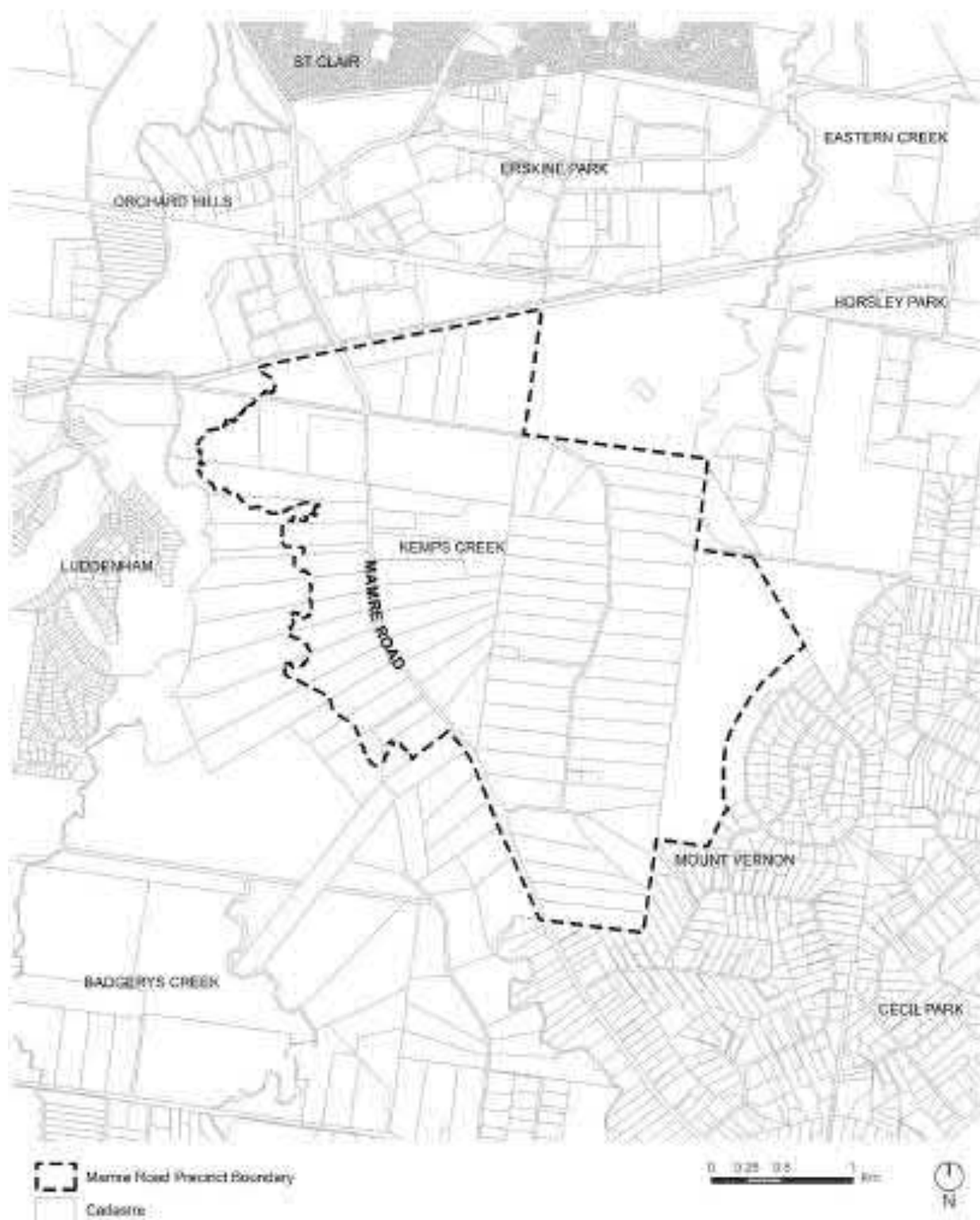


Figure 2.1 Project locality

# 3 Conditions of approval

This AQIA forms part of the CEMP and has been prepared in accordance with condition XXX of the development consent for SSD 10479. The condition requirements and where they have been addressed in this report are summarised in Table 3.1.

**Table 3.1**      **Conditions of Approval**

Conditions of Approval (CoA)	Condition	Where addressed in
<hr/>		
<hr/>		

## 4 Air quality standards and codes

Key policies and guidelines which are relevant to the preparation and implementation of the CAQMP include:

- *Environmental Planning and Assessment Act 1979* (EP&A Act);
- *Protection of the Environment Operations Act 1979* (POEO Act);
- The Approved Methods for the Modelling and Assessment of Air Pollutants in NSW guidelines (NSW EPA 2007); and
- National Environment Protection (Ambient Air Quality) Measure (NEPC 2016).

## 5 Air quality monitoring

The Environmental Protection Authority (EPA) does not at this stage have specific guidelines to consider dust from construction sites in terms of a risk assessment and management approach. It has developed a guideline entitled *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (2017), however, this guideline considers detailed modelling approaches and is not specifically relevant to construction dust impacts. A detailed modelling approach is not necessary for short term construction impacts that can be managed.

### 5.1 Monitoring locations

The nearest sensitive receives to the Project have been identified in Table 5.1 and Figure 5.1.

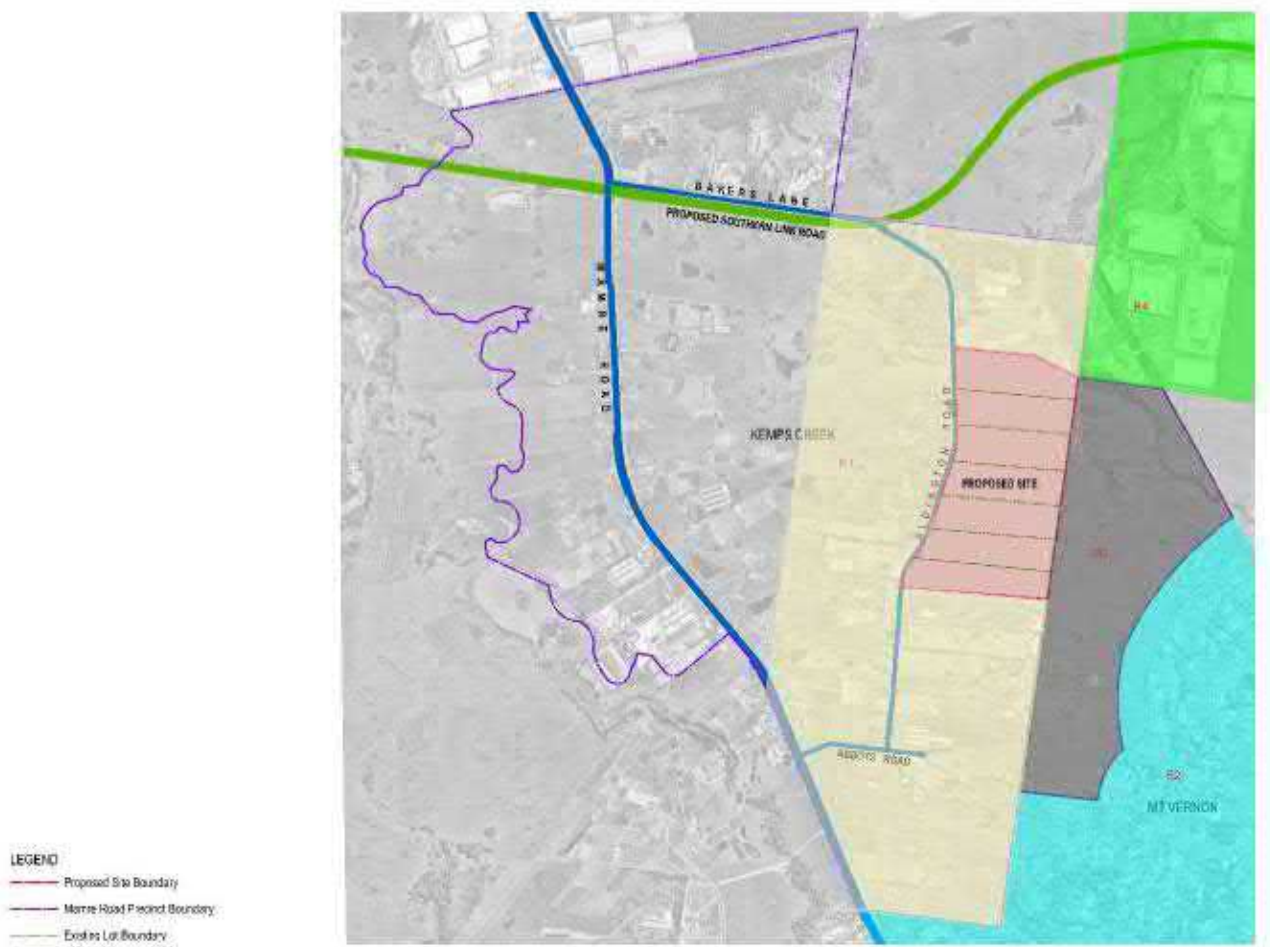
**Table 5.1** Surrounding sensitive receivers

Receiver ID	Receiver type
R1	Residential within IN1
R2	Residential within RU4
R3	Vacant within IN1
R4	R4 Industrial within IN1

### 5.2 Monitoring procedure

Visual dust monitoring will be undertaken daily and will include inspecting on-site dust deposition gauges and overall site activities to determine if dust is being generated as a direct result of construction works.

It was determined that specific real-time dust monitoring is not necessary for this Project.



Source: SBA Architects, Drawing No. MP02, Revision D, dated 01/10/2020 – as modified by WM.

**Figure 5.1** Sensitive Receiver Locations

## 6 Existing air quality levels

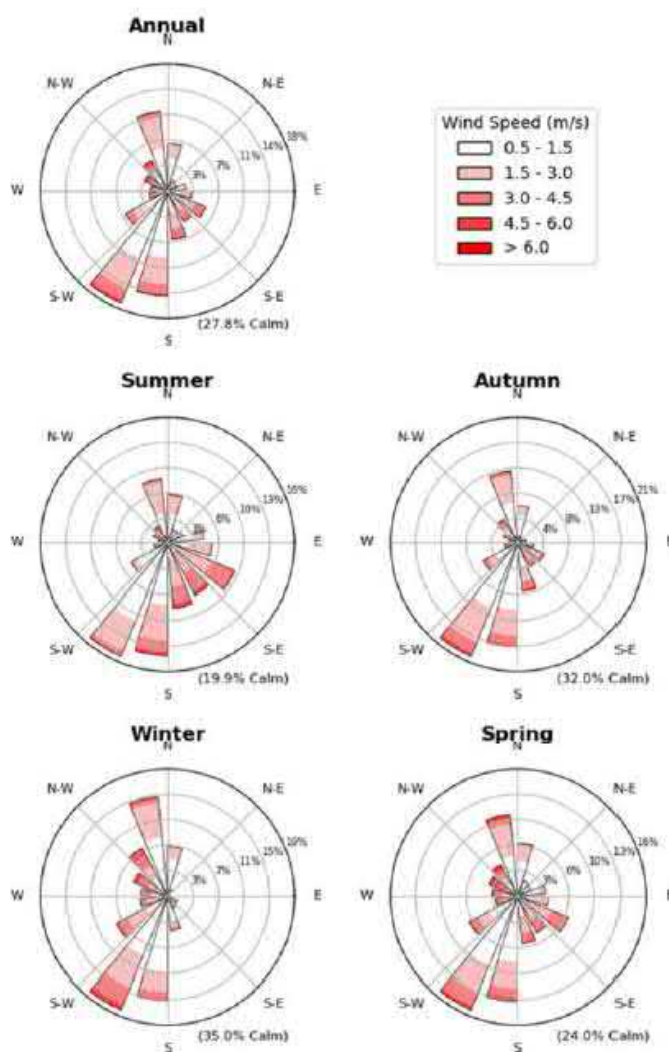
### 6.1 Climate

Meteorological conditions strongly influence air quality. Most significantly, with respect to dust and particulate matter, wind speed and wind direction affect the dispersion of air pollutants.

Observations of wind speed and direction from the Office of Environment and Heritage (OEH) air quality monitoring station (AQMS) at St Marys have been selected to represent typical wind patterns in the area surrounding the site. The St Marys AQMS is located approximately 6.2 km north-west from the centre of the site. The AQMS is located on a residential property approximately 160 m from Mamre Road.

Based on the representative data averaged for the period 2015 to 2019, winds within the south to south-west and north-west to north are most common in all four seasons. This data has been presented below in the wind rose plots.

**Windrose Plot – St Marys OEH AQMS, 2015-2019**



(Source Wilkinson Murray 2020)

## 7 Project specific criteria

The applicable impact assessment criteria for several air pollutants are outlined in *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (EPA 2017).

Air quality criteria are benchmarks set to protect the general health and amenity of the community in relation to air quality. The criteria presented in *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (EPA 2017) is consistent with the *National Environment Protection (Ambient Air Quality) Measure* (NEPM) (National Environment Protection Council 2016). It is noted that there are no criteria specified for deposited dust within the NEPM.

The criteria for pollutants that are relevant to this study are summarised in Table 7.1. The air quality impact assessment criteria relate to the total concentrations in the air and not just that from the Project. Therefore, some consideration of background levels needs to be made when using these goals to assess impacts.

**Table 7.1** Air quality criteria

Pollutant	Averaging period	Impact	Criteria
Nitrogen dioxide (NO <sub>2</sub> )	Annual	Total	62 µg/m <sup>3</sup>
	1-hour	Total	246 µg/m <sup>3</sup>
Total suspended particulates (TSP)	Annual	Total	90 µg/m <sup>3</sup>
Particulate matter ≤ 10 µm (PM <sub>10</sub> )	Annual	Total	25 µg/m <sup>3</sup>
	24-hour	Total	50 µg/m <sup>3</sup>
Particulate matter ≤ 2.5 µm (PM <sub>2.5</sub> )	Annual	Total	8 µg/m <sup>3</sup>
	24-hour	Total	25 µg/m <sup>3</sup>
Deposited dust (DD)	Annual	Total	4 g/m <sup>2</sup> /month
	Annual	Incremental	2 g/m <sup>2</sup> /month



## 8 Predicted air quality levels

### 8.1 Sources of emissions

Dust is the main source of emissions during the construction phase of the project. Potential activities that are likely to generate dust emissions include the demolition of existing structures and construction of new the warehouse and distribution facility on-site.

During the construction phase, earthwork activities including moving of material and truck movements along haul roads (wheel generated dust) is likely to lead to short-term elevate levels of:

- particulate matter (total suspended particulates (TSP), PM10 and PM2.5); and
- deposited dust.

Potential sources of air emissions associated with the project are likely to occur during both the construction and operation of the warehouse and distribution facility development.

The approved EIS (Ethos Urban 2020) outlines the air quality assessment conducted by Wilkinson Murray as part of the AQIA (2020). The assessment concluded that air quality during the construction phase can be adequately managed so that the short-term and temporary dust related impacts remain to be low risk, and negligible to moderate and insignificant impact on emissions compared to current conditions.

### 8.2 Asbestos

During the construction phase of the Project there is potential for asbestos to be present, although this is not anticipated. In the event that asbestos is uncovered work will cease immediately in the potential asbestos location and the site manager will be contacted. Once identified the asbestos will be removed by suitable qualified personnel and disposed of at a licensed disposal facility.

## 9 Management measures

This section outlines the management measures provided in the AQIA (Wilkinson Murray 2020) to mitigate impacts to air quality during the construction phase of the Project. These management measures are summarised in Table 9.1.

The Project site is located within the Mamre Road Precinct, and therefore the relevant controls of the DCP have been considered in this CAQMP and must be applied to the construction phase of the Project. The applicable controls provided in the DCP have been summarised in Table 9.1 below.

**Table 9.1 Construction air quality management measures**

Control	Timing	Responsibility	Source
<b>General</b>			
Any development likely to, or capable of, generating air emissions must comply with the Protection of the Environment Operations Act 1997 and associated regulations.	All phases	Project Manager	Section 4.3.3 of the DCP
Developments that involve back up power generation of electricity with diesel equipment that has the capacity to burn more than 3 megajoules of fuel per second must include a best practice review of reasonable and feasible diesel emission reduction technology.	Operation	Facility Manager	Section 4.3.3 of the DCP
Plan site layout so that machining and dust generating activities are located away from receptors, as far as possible.	Pre-construction	Project Manager	Section 7.1 of the AQIA
Avoid site runoff of water or mud.	Construction	Project Manager	Section 7.1 of the AQIA
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If being re-used, keep materials covered.	Construction	Project Manager	Section 7.1 of the AQIA
Cover, seed or fence stockpiles to prevent wind erosion.	Construction	Project Manager	Section 7.1 of the AQIA
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	Construction	Project Manager	Section 7.1 of the AQIA
Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	Construction	Project Manager	Section 7.1 of the AQIA

**Table 9.1 Construction air quality management measures**

Control	Timing	Responsibility	Source
<b>Communications</b>			
Develop and implement a stakeholder communications plan that includes: <ul style="list-style-type: none"> <li>community engagement before work commences on site;</li> <li>displays the name and contact details of the Responsible Person accountable for air quality and dust issues on the site boundary; and</li> <li>displays the head or regional office contact information.</li> </ul>	Pre-construction	Project Manager	Section 7.1 of the AQIA
Develop and implement a Dust Management Plan (DMP) that considers, as a minimum, the measures identified herein.	Pre-construction	Developer	Section 7.1 of the AQIA
Hold regular liaison meetings with any other high-risk construction sites within 500 m of the site boundary to ensure plans are coordinated.	Construction	Community Liaison	Section 7.1 of the AQIA
<b>Complaints and incident management</b>			
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	Construction	Project Manager	Section 7.1 of the AQIA
Make the complaints log available to relevant authorities including the Council, EPA etc.	Construction	Project Manager	Section 7.1 of the AQIA
Record any exceptional incidents that cause dust and/or air emissions, either on or off site, and the action taken to resolve the situation in the logbook.	Construction	Project Manager	Section 7.1 of the AQIA
<b>Monitoring</b>			
Undertake daily on-site and off-site inspection, where receptors are nearby, to monitor dust. Record inspection results and make available to relevant authorities. This should include regular dust soiling checks of surfaces such as street furniture, cars and window. Specific real-time dust monitoring is not necessary for this project.	Construction	Project Manager	Section 7.1 of the AQIA
<b>Construction vehicles, traffic and haulage</b>			
Ensure all vehicles switch off engines when stationary (no idling vehicles).	Construction	Project Manager	Section 7.1 of the AQIA
Impose and signpost a maximum-speed-limit of 25km/h on surfaced and 15km/h on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided).	Construction	Project Manager	Section 7.1 of the AQIA
Use water-assisted dust sweeper(s) on the access and local roads, as necessary.	Construction	Project Manager	Section 7.1 of the AQIA
Avoid dry sweeping of large areas.	Construction	Project Manager	Section 7.1 of the AQIA

**Table 9.1**      **Construction air quality management measures**

Control	Timing	Responsibility	Source
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	Construction	Project Manager	Section 7.1 of the AQIA
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	Construction	Project Manager	Section 7.1 of the AQIA
Record all inspections of haul routes and any subsequent action in a site logbook.	Construction	Project Manager	Section 7.1 of the AQIA
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	Construction	Project Manager	Section 7.1 of the AQIA
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	Construction	Project Manager	Section 7.1 of the AQIA
Access gates to be located at least 10m from receptors where possible.	Construction	Project Manager	Section 7.1 of the AQIA

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Attachment A

# Air Quality Impact Assessment

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200 ALDINGTON ROAD, KEMPS CREEK  
- WAREHOUSE DEVELOPMENT  
AIR QUALITY IMPACT ASSESSMENT

**REPORT NO. 20254  
VERSION B**

OCTOBER 2020

**PREPARED FOR**

ETHOS URBAN  
173 SUSSEX STREET  
SYDNEY NSW 2000

## DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
A	Draft	23 September 2020	Sam Demasi	John Wassermann
B	Final	7 October 2020	Sam Demasi	-

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### CASANZ

This firm is a member firm of the Clean Air Society of Australia and New Zealand and the work here reported has been carried out in accordance with the terms of that membership.



### Celebrating 50 Years in 2012

Wilkinson Murray is an independent firm established in 1962, originally as Carr & Wilkinson. In 1976 Barry Murray joined founding partner Roger Wilkinson and the firm adopted the name which remains today. From a successful operation in Australia, Wilkinson Murray expanded its reach into Asia by opening a Hong Kong office early in 2006. Today, with offices in Sydney, Newcastle, Wollongong, Queensland and Hong Kong, Wilkinson Murray services the entire Asia-Pacific region.



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## GLOSSARY OF AIR QUALITY TERMS

**Air Pollution** – The presence of contaminants or pollutant substances in the air that interfere with human health or welfare or produce other harmful environmental effects.

**Air Quality Standards** – The level of pollutants prescribed by regulations that are not to be exceeded during a given time in a defined area.

**Air Toxics** – Any air pollutant for which a national ambient air quality standard (NAAQS) does not exist (i.e. excluding ozone, carbon monoxide, PM-10, sulphur dioxide, nitrogen oxide) that may reasonably be anticipated to cause cancer; respiratory, cardiovascular, or developmental effects; reproductive dysfunctions, neurological disorders, heritable gene mutations, or other serious or irreversible chronic or acute health effects in humans.

**Airborne Particulates** – Total suspended particulate matter found in the atmosphere as solid particles or liquid droplets. Chemical composition of particulates varies widely, depending on location and time of year. Sources of airborne particulates include dust, emissions from industrial processes, combustion products from the burning of wood and coal, combustion products associated with motor vehicle or non-road engine exhausts, and reactions to gases in the atmosphere.

**Area Source** – Any source of air pollution that is released over a relatively small area, but which cannot be classified as a point source. Such sources may include vehicles and other small engines, small businesses and household activities, or biogenic sources, such as a forest that releases hydrocarbons, may be referred to as nonpoint source.

**Concentration** – The relative amount of a substance mixed with another substance. Examples are 5 ppm of carbon monoxide in air and 1 mg/l of iron in water.

**Emission** – Release of pollutants into the air from a source. We say sources emit pollutants.

**Emission Factor** – The relationship between the amount of pollution produced and the amount of raw material processed. For example, an emission factor for a blast furnace making iron would be the number of pounds of particulates per ton of raw materials.

**Emission Inventory** – A listing, by source, of the amount of air pollutants discharged into the atmosphere of a community; used to establish emission standards.

**Flow Rate** – The rate, expressed in gallons -or litres-per-hour, at which a fluid escapes from a hole or fissure in a tank. Such measurements are also made of liquid waste, effluent, and surface water movement.

**Fugitive Emissions** – Emissions not caught by a capture system.

**Hydrocarbons (HC)** – Chemical compounds that consist entirely of carbon and hydrogen.

**Hydrogen Sulphide (H<sub>2</sub>S)** – Gas emitted during organic decomposition. Also, a by-product of oil refining and burning. Smells like rotten eggs and, in heavy concentration, can kill or cause illness.

**Inhalable Particles** – All dust capable of entering the human respiratory tract.

**Nitric Oxide (NO)** – A gas formed by combustion under high temperature and high pressure in an internal combustion engine. NO is converted by sunlight and photochemical processes in ambient air to nitrogen oxide. NO is a precursor of ground-level ozone pollution, or smog.

**Nitrogen Dioxide (NO<sub>2</sub>)** – The result of nitric oxide combining with oxygen in the atmosphere; major component of photochemical smog.

**Nitrogen Oxides (NO<sub>x</sub>)** – A criteria air pollutant. Nitrogen oxides are produced from burning fuels, including gasoline and coal. Nitrogen oxides are smog formers, which react with volatile organic compounds to form smog. Nitrogen oxides are also major components of acid rain.

**Mobile Sources** – Moving objects that release pollution; mobile sources include cars, trucks, buses, planes, trains, motorcycles and gasoline-powered lawn mowers.

**Particulates; Particulate Matter (PM<sub>10</sub>)** – A criteria air pollutant. Particulate matter includes dust, soot and other tiny bits of solid materials that are released into and move around in the air. Particulates are produced by many sources, including burning of diesel fuels by trucks and buses, incineration of garbage, mixing and application of fertilizers and pesticides, road construction, industrial processes such as steel making, mining operations, agricultural burning (field and slash burning), and operation of fireplaces and woodstoves. Particulate pollution can cause eye, nose and throat irritation and other health problems.

**Parts Per Billion (ppb)/Parts Per Million (ppm)** – Units commonly used to express contamination ratios, as in establishing the maximum permissible amount of a contaminant in water, land, or air.

**PM<sub>10</sub>/PM<sub>2.5</sub>** – PM<sub>10</sub> is measure of particles in the atmosphere with a diameter of less than 10 or equal to a nominal 10 micrometers. PM<sub>2.5</sub> is a measure of smaller particles in the air.

**Point Source** – A stationary location or fixed facility from which pollutants are discharged; any single identifiable source of pollution; e.g. a pipe, ditch, ship, ore pit, factory smokestack.

**Scrubber** – An air pollution device that uses a spray of water or reactant or a dry process to trap pollutants in emissions.

**Source** – Any place or object from which pollutants are released.

**Stack** – A chimney, smokestack, or vertical pipe that discharges used air.

**Stationary Source** – A place or object from which pollutants are released and which does not move around. Stationary sources include power plants, gas stations, incinerators, houses etc.

**Temperature Inversion** – One of the weather conditions that are often associated with serious smog episodes in some portions of the country. In a temperature inversion, air does not rise because it is trapped near the ground by a layer of warmer air above it. Pollutants, especially smog and smog-forming chemicals, including volatile organic compounds, are trapped close to the ground. As people continue driving and sources other than motor vehicles continue to release smog-forming pollutants into the air, the smog level keeps getting worse.

## 1 INTRODUCTION

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Fife Capital and Stockland have entered into a joint venture to rezone and develop 106 to 228 Aldington Road, Kemps Creek as an industrial estate. The Site is known as 200 Aldington Road and is located within Penrith City Local Government Area.

Wilkinson Murray Pty Limited (WM) has been commissioned by Ethos Urban on behalf of the joint venture to undertake an air quality assessment to accompany a state significant development application (SSDA) for 200 Aldington Road.

SSDA 10479 is seeking consent for the Concept Plan as well as the construction and operation of Stage 1. Additional stages will follow soon after. The Department of Planning, Industry and Environment (DPIE) issued the Secretary's Environmental Assessment Requirements (SEARs) in July 2020.

The relevant section of the SEARs is reproduced below:

***"Air Quality** – including an assessment of air quality impact at sensitive receivers during construction and operation in accordance with NSW Environment Protection Authority guidelines and details of mitigation, management and monitoring measures"*

This assessment forms part of an Environmental Impact Assessment (EIS) for the project.

Mr Sam Demasi is suitably qualified to prepare such assessments. He is employed as an Associate of Wilkinson Murray and has been involved in many construction projects and prepared many similar assessments.

A review of this report shall be undertaken by Mr John Wassermann, a Director of Wilkinson Murray with over 30 years' experience in the field of acoustics and air quality. He is a member of the Engineers Australia and of Clean Air Society of Australia & New Zealand (CASANZ).

Wilkinson Murray is a member firm of CASANZ.

## 2 OVERVIEW OF THE PROJECT

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### 2.1 Proposal

The proposal seeks consent for the Concept Plan and Stage 1 development as per below:

- A concept masterplan with an indicative total building area of 375,755 sqm, comprising:
  - 357,355 sqm of warehouse gross floor area (GFA);
  - 18,200 sqm of ancillary office GFA;
  - 200 sqm café GFA;
  - 13 individual development lots for warehouse buildings with associated hardstand areas;
  - Internal road layouts and road connections to Aldington Road;
  - Provision for 1,700 car parking spaces; and
  - Associated site landscaping.
- Detailed consent for progressive delivery of site preparation, earthworks and infrastructure works (i.e. Stage 1 works) on the site, including:
  - Demolition and clearing of all existing built form structures;
  - Drainage and infill of existing farm dams and any ground dewatering;
  - Clearing of all existing vegetation;
  - Construction of a warehouse building with a total of 50,930 sqm of GFA, including:
    - 48,430 sqm of warehouse GFA;
    - 2,500 sqm of ancillary office GFA;
    - 231 car parking spaces; and
    - associated landscaping
- Bulk earthworks including 'cut and fill' to create flat development platforms for the warehouse buildings, and topsoiling and grassing / site stabilisation works;
- Roadworks, access infrastructure and associated landscaping;
- Stormwater and drainage works including stormwater basins, diversion of stormwater lines, gross pollutant traps and associated swale works;
- Sewer and potable water reticulation; and
- Inter-allotment, road and boundary retaining walls.

The current masterplan is show in **Figure 2-1**.

For the purpose of assessing impacts associated with construction and operation of this facility, this assessment considers worst case scenarios.

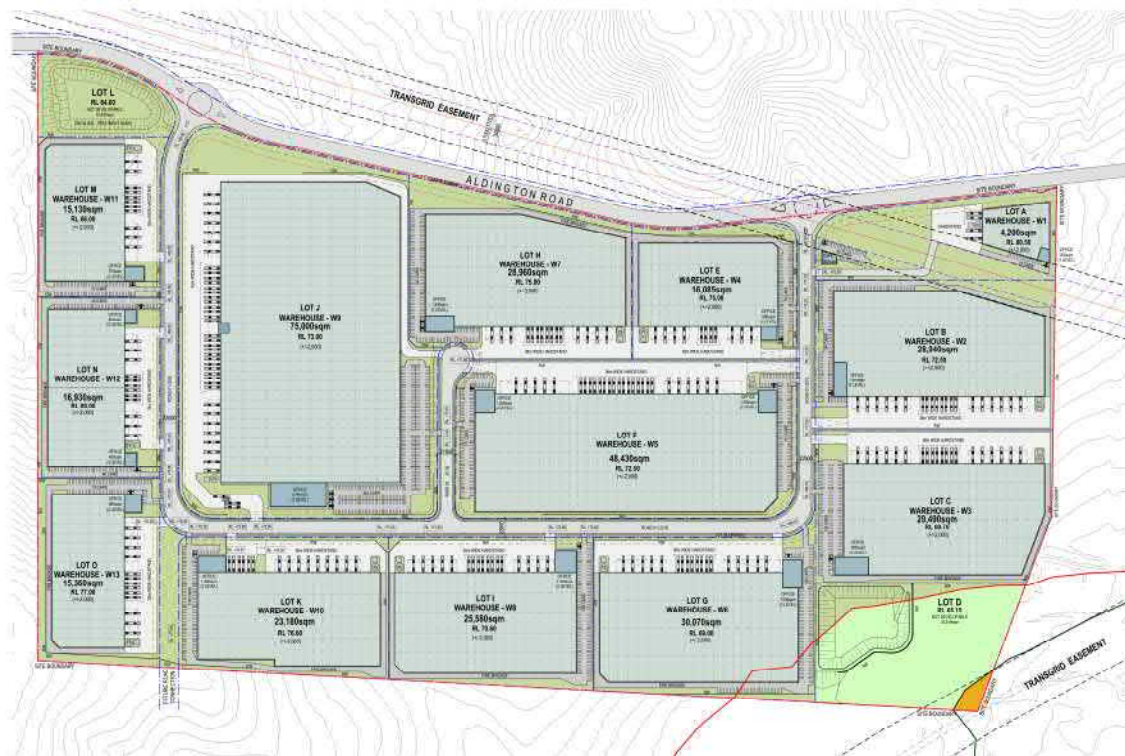
On this basis, it is assumed that all demolition and earthworks for the site will be undertaken as well as the construction of a single warehouse building (Warehouse W5). Furthermore, it is assumed that the warehouse is operating at capacity.

In terms of construction activities and in line with EPA guidelines, it is expected that Standard Construction Hours will be conditioned as follows:

- Monday to Friday 7:00am to 6:00pm;
- Saturday 8:00am to 1:00pm; and
- No work on Sunday and Public Holidays.

The Site is seeking to have the flexibility for each warehouse to operate 24 hours a day, every day of the week.

**Figure 2-1 Masterplan of the Site**



Source: SBA Architects, Drawing No. MP04, Revision F, dated 01/10/2020.

## 2.2 Location of Site & Surrounds

The Site is located in the suburb of Kemps Creek, within the Penrith City Local Government Area. Furthermore, it is within the Mamre Road Precinct forming part of the Western Sydney Employment Area. The Precinct covers an area of approximately 972 hectares and was rezoned in June 2020 to mostly *IN1 General Industrial*. Environmentally sensitive areas are zoned *E2 Environmental Conservation* with adjoining recreation areas zone accordingly.

Currently, the Site includes scattered residential dwellings (within a rural setting), vacant land and agricultural green houses. There are seven parcels of land that make up the Site within 106 to 228 Aldington Road, Kemps Creek covering an area of approximately 72 hectares. In terms of zoning, it is mostly *IN1 General Industrial* with the north-eastern corner of the Site zoned *E2 Environmental Conservation* and a larger section of the north-eastern corner, adjoining *E2*, zoned *RE2 Private Recreation*.

Mamre Road is a major arterial road that is located to the west of the Site and this road is planned to be upgraded in the near future. Investigations for the concept design for Stage 1 (M4 to Erskine Park Road) started in early 2020. Stage 2 will deliver the upgrade in the vicinity of the Site (Erskine Park Road to Kerrs Road); however, a definitive timeline is not known at this stage.

There are also several infrastructure projects currently being investigated including the Southern Link Road (M12 Motorway) to the north of the Site and the proposed Western Sydney Freight Line and potential Intermodal Terminal located to the west and north-west of the Site along Mamre Road.

Of the many current projects being constructed in the area, the Western Sydney Aerotropolis will result in increased road movements and introduce aircraft movements in the area. This in turn will impact the airshed in this region.

Immediately surrounding the Site to the north, south and west (across Aldington Road) are rural lands, some with residential dwellings; however, the area has been earmarked for industrial development. Immediately to the east is vacant rural land and further east the suburb of Mt Vernon is located. This suburb includes residences on large parcels of land and is zoned *RU4 Primary Production*.

Further north Oakdale West Industrial Estate (currently under construction) is located and to the north-east Oakdale South Industrial Estate (recently completed). Both of these estates are owned and managed by Goodman.

It is important to note that with reference to the State Environmental Planning Policy (Western Sydney Employment Area) – Mamre Road Precinct – Land Zoning Map, that the immediate area surrounding the site is identified as *IN1 General Industrial* with the exception of the north-eastern corner of the Site as previously mentioned. Notwithstanding this, from an air quality aspect, the most impacted receivers are the surrounding rural residences, further afield industrial estates are either completed or currently being developed.

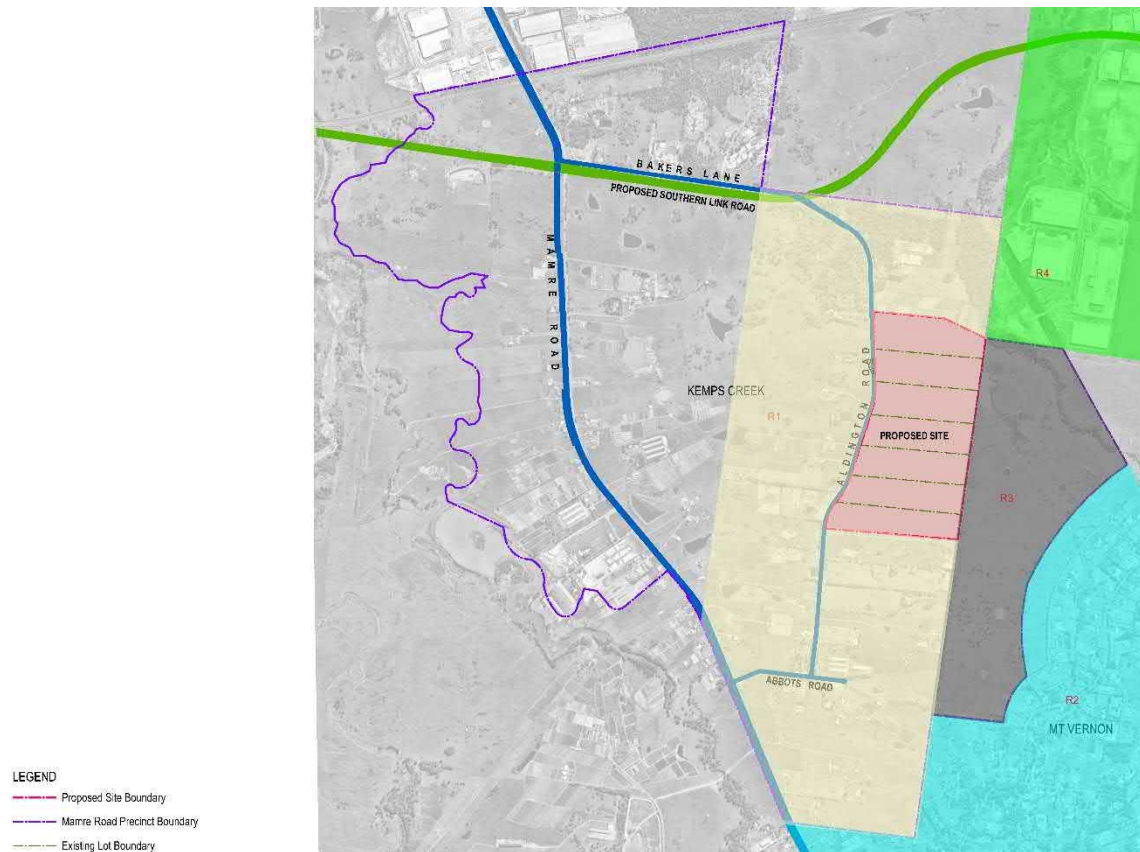
**Table 2-1** provides a summary of immediate surrounding sensitive receivers and **Figure 2-2** shows these receivers on an aerial as well as the Site boundary (including lot boundaries), the Mamre Road Precinct boundary and the approximate location of the proposed Southern Link Road.

**Table 2-1 Surrounding Sensitive Receivers**

Receiver ID	Receiver Type
R1	Residential within IN1
R2	Residential within RU4
R3	Vacant within IN1
R4	Industrial within IN1



**Figure 2-2 Location of Site and Surrounding Receivers**



Source: SBA Architects, Drawing No. MP02, Revision D, dated 01/10/2020 – as modified by WM.

## 2.3 Potential Sources of Air Emissions Associated with the Development

Air emissions are likely during both the construction and the operation of the warehouse development (Warehouse W5). The most likely sources are summarised in the following sections.

### 2.3.1 Sources during Construction

At the time of preparing this assessment a detailed construction programme was not developed, however the following stages and typical activities can be expected from this project:

#### Demolition:

- Likely to be the shortest and of least impact.
- Small number of structures to be removed using trucks, excavators and hand tools.

### **Earthworks:**

- Likely to be the longest stage of works and of most impact.
- Significant earthworks required that will involve a large number of trucks, excavators, dozers, graders and associated equipment.

### **Construction of Warehouses:**

- Given the staging it is likely to be of a short duration with less impact than earthworks.
- Building works likely to involve a high number of truck movements, cranes and power tools.

During the temporary phase of construction earthwork activities including moving of material and truck movements along haul roads (wheel generated dust) is likely to lead to short-term elevated levels of:

- Particulate Matter (Total Suspended Particulates (TSP), PM<sub>10</sub> and PM<sub>2.5</sub>)).
- Deposited Dust.

#### **2.3.2 Sources during Operation**

At the time of preparing this assessment the end users were not known, however based on typical warehouse usage, the following activities can be expected from this project.

- Off-site and on-site vehicular movements including trucks idling.
- Forklift movements.

These operations will result in wheel-generated dust from vehicles travelling (on sealed roads) within the complex and on the local road network as well as from vehicle exhaust and may result in the elevation of:

- Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>).
- Oxides of Nitrogen (NO<sub>x</sub>) and in particular as Nitrogen Dioxide (NO<sub>2</sub>).



### 3 AIR QUALITY CRITERIA

#### 3.1 Introduction

The Environmental Protection Authority (EPA) developed a guideline in 2017 entitled "*Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*" (Approved Methods) that sets out applicable impact assessment criteria for several air pollutants.

#### 3.2 Impact Assessment Criteria

Air quality criteria are benchmarks set to protect the general health and amenity of the community in relation to air quality. The sections below identify the pollutants of interest for this assessment and the applicable air quality criteria for each pollutant.

The criteria presented in the Approved Methods are consistent with the National Environment Protection Council's (NEPC), *National Environment Protection (Ambient Air Quality) Measure, 2016* (NEPM). It is noted that there are no criteria specified for deposited dust within the NEPM.

**Table 3-1** summarises the criteria for pollutants that are relevant to this study. The air quality impact assessment criteria relate to the total concentrations in the air and not just that from the project. Therefore, some consideration of background levels needs to be made when using these goals to assess impacts.

**Table 3-1 Impact Assessment Criteria**

Pollutant	Averaging period	Impact	Criteria
Nitrogen dioxide (NO <sub>2</sub> )	Annual	Total	62 µg/m <sup>3</sup>
	1-hour	Total	246 µg/m <sup>3</sup>
Total suspended particulates (TSP)	Annual	Total	90 µg/m <sup>3</sup>
Particulate matter ≤10 µm (PM <sub>10</sub> )	Annual	Total	25 µg/m <sup>3</sup>
	24-hour	Total	50 µg/m <sup>3</sup>
Particulate matter ≤2.5 µm (PM <sub>2.5</sub> )	Annual	Total	8 µg/m <sup>3</sup>
	24-hour	Total	25 µg/m <sup>3</sup>
Deposited dust (DD)	Annual	Total	4 g/m <sup>2</sup> /month
	Annual	Incremental	2 g/m <sup>2</sup> /month

## 4 EXISTING ENVIRONMENT

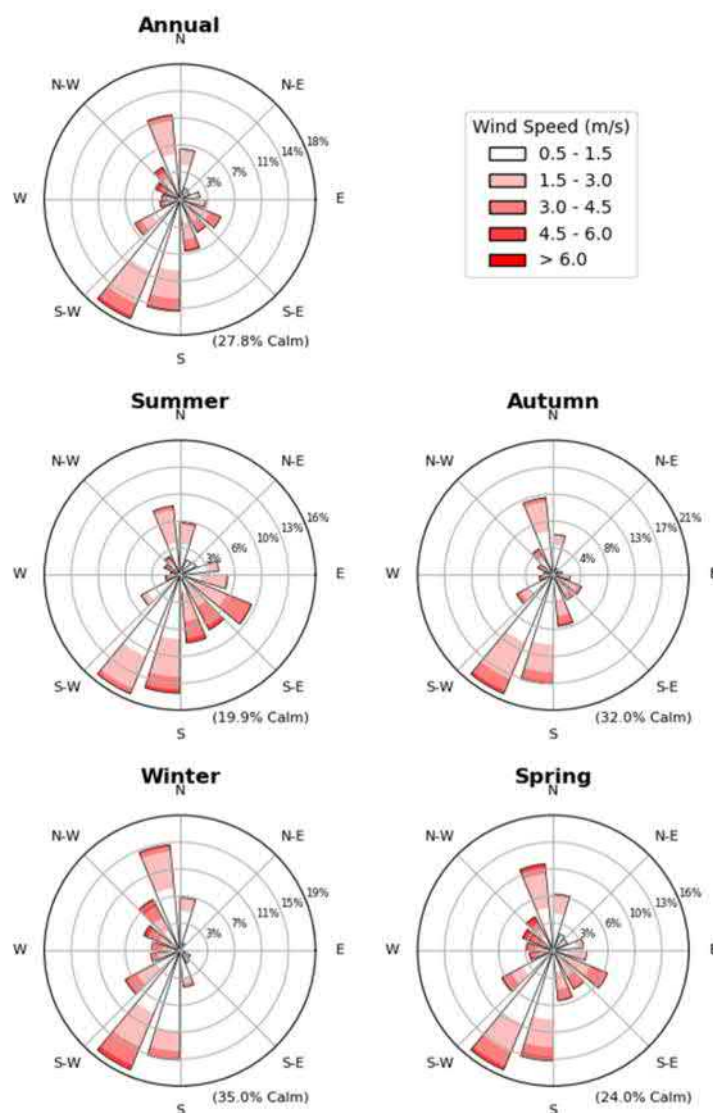
### 4.1 Local Climate

Meteorological conditions strongly influence air quality. Most significantly, with respect to dust and particulate matter, wind speed and wind direction affect the dispersion of air pollutants.

Observations of wind speed and direction from the Office of Environment and Heritage (OEH) air quality monitoring station (AQMS) at St Marys have been selected to represent typical wind patterns in the area surrounding the site. The St Marys AQMS is located approximately 6.2 kilometres north north-west from the centre of the site. The AQMS is located on a residential property approximately 160m from Mamre Road.

**Figure 4-1** presents annual and seasonal “wind rose” plots for the St Marys AQMS, averaged for the period 2015 to 2019, inclusive. As can be seen from the plots, winds from within the south to south-west and north-west to north octants are most common in all four seasons.

**Figure 4-1 Windrose Plot – St Marys OEH AQMS, 2015-2019**



## 4.2 Ambient Air Quality Data

Data from the St Marys AQMS has been used to establish typical ground level concentrations of the main airborne pollutants of interest. A summary of these pollutants over the five year period 2015 – 2019 is presented in **Table 4-1** together with the average over 5 years and impact criteria.

**Table 4-1 Air Quality Monitoring Results from St Marys – Annual Averages**

Year	PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )
2015	15.0	Note 1	8.3
2016	16.1	Note 2	7.5
2017	16.2	7.0	8.7
2018	Note 2	7.8	10.3
2019	24.6	9.9	7.6
5-year Average	18.0	8.2	8.5
Impact Criteria	25	8	62

Note 1: Observations of PM<sub>2.5</sub> at the St Marys AQMS began in 2016.

Note 2: Less than 75% valid data collected.

It should be noted that elevated particulate levels were measured in 2019 compared to the previous years. The elevated levels on the whole were due significant bushfires and dust storms in NSW from October to December. A review of the data from St Marys and comparison to the impact criteria indicates the following:

### PM<sub>10</sub>

- Measured annual average has been steady between 15.0 and 16.2 µg/m<sup>3</sup> with the exception of a sharp rise to 24.6 µg/m<sup>3</sup> for the 2019 year. The annual 2019 report is yet to be issued and so we have not been able to confirm events that lead to such differences. However, it is likely that the impact of the bushfires and local dust storms contributed to this sharp rise.
- Considering this data period, the annual impact criteria of 25 µg/m<sup>3</sup> has not been exceeded and the arithmetic average of the period is calculated to be 18.0 µg/m<sup>3</sup> which is at 72% of the annual impact criteria.

### PM<sub>2.5</sub>

- Measured annual average has ranged between 7.0 and 9.9 µg/m<sup>3</sup>. The higher 2019 level is likely due to bushfires and local dust storms.
- Considering this data period, the annual impact criteria of 8 µg/m<sup>3</sup> was exceeded for the 2019 year. The arithmetic average of the period is calculated to be 8.2 µg/m<sup>3</sup> which is slightly above (103%) the criteria.

### NO<sub>2</sub>

- Measured annual average has been quite steady between 7.5 and 8.7 µg/m<sup>3</sup> with a slight increase in 2018 to 10.3 µg/m<sup>3</sup>.
- Considering this data period, the annual impact criteria of 62 µg/m<sup>3</sup> is easily achieved and the arithmetic average of the period is calculated to be 8.5 µg/m<sup>3</sup> which is at 14% of the

annual impact criteria.

### 4.3 Emissions within Kemps Creek Airshed

The NSW Environment Protection Authority (EPA) has produced an air emissions inventory for both human-made and natural sources in NSW. The inventory extends to the greater metropolitan region (GMR) which is further categorised into three urban regions (Sydney, Newcastle and Wollongong).

Kemps Creek is within the Sydney region and the general airshed around Kemps Creek is currently controlled by human-made sources including road traffic noise from the many arterial roads, general industry (mostly warehouse distribution) as well as a small number of quarry and manufacturing sites. Wood burning and earthworks/construction are also contributors (particle pollution) to the general airshed.

The most current inventory report is for the 2013 calendar year, the previous report covered 2008. For this project, the following information from these reports has been summarised for the Sydney region and can be used to approximate the proportion within Kemp Creek.

**Table 4-2 Proportion of Total Estimated Annual Emissions (%)**

Year	PM <sub>10</sub>		PM <sub>2.5</sub>		NO <sub>x</sub> <sup>Note 1</sup>	
	Natural	Human	Natural	Human	Natural	Human
2008	19.1	80.9	8.1	91.9	1.7	98.3
2013	27.3	72.7	27.7	72.3	4.3	95.7

Note 1: It has been conservatively assumed that 100% of the NO<sub>x</sub> emissions are NO<sub>2</sub>.

For the three pollutants, **Table 4-2** shows a reduction in the proportion of human-made emissions between the 2008 calendar year and 2013 calendar year.

The inventory further provides the proportion of total emissions by human-made source type (refer **Figure 4-2** for 2013 data). Considering this data and the proportions within **Table 4-2**, **Table 4-3** summarises the contribution from road traffic.

**Table 4-3 Proportion of Total Estimated Annual Emissions – Road Traffic (%)**

Year	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub> <sup>1</sup>
2008	10.4	13.2	60.7
2013	8.7	9.3	53.0

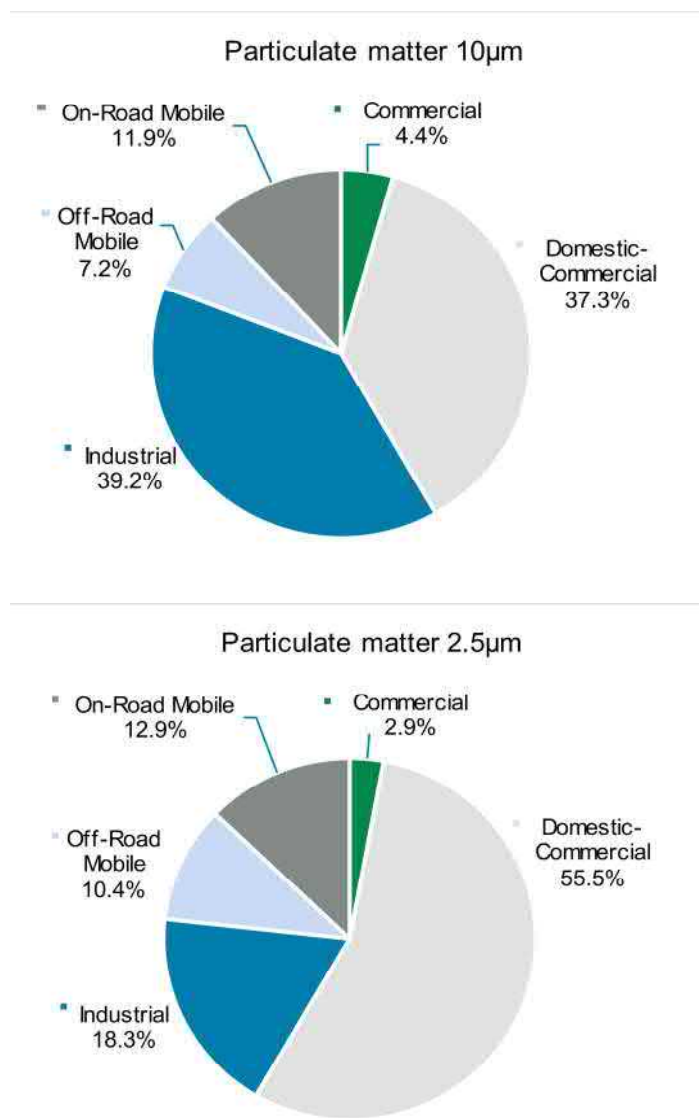
Note 1: It has been conservatively assumed that 100% of the NO<sub>x</sub> emissions are NO<sub>2</sub>.

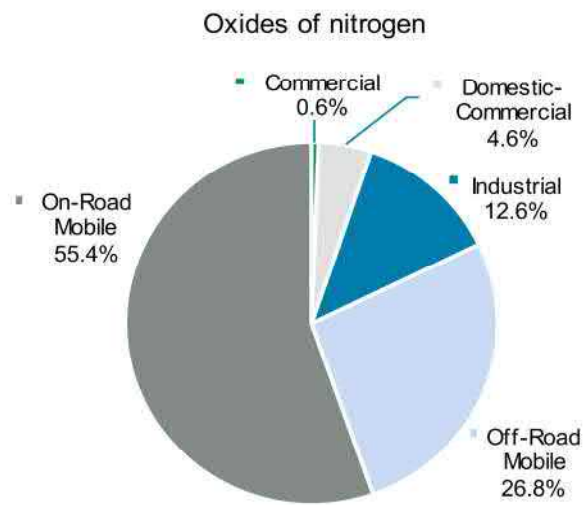
The table shows a reduction in the proportion of emissions from road traffic between the 2008 calendar year and 2013 calendar year despite an increase in traffic.

It is critical to note that since 2013 there have been many additional measures to improve exhaust emissions from road traffic including emission controls for new vehicles (Euro 5 standards to all light vehicles manufactured from November 2016) and improvements in fuel quality standards (February 2019). Furthermore, Australia is currently reviewing vehicle emission controls further, considering Euro 6 for light vehicles and Euro VI for heavy vehicles.

On this basis, it is considered conservative to assume the road traffic emissions for 2013 as per **Table 4-3** apply to the current environment.

**Figure 4-2 Proportions of Total Estimated Annual Emissions for Human-made Source Types (PM<sub>10</sub>, PM<sub>2.5</sub> and NO<sub>x</sub>) - Sydney Region - 2013**





## 5 ASSESSMENT OF AIR QUALITY DURING CONSTRUCTION WORKS

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### 5.1 Assessment Methodology

The EPA does not at this stage have specific guidelines to consider dust from construction sites in terms of a risk assessment and management approach. It has developed a guideline entitled '*Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*' (2017), however, this guideline considers detailed modelling approaches and is not specifically relevant to construction dust impacts. A detailed modelling approach is not necessary for short term construction impacts that can be managed.

A risk-based approach has however been developed in the United Kingdom by the Institute of Air Quality Management (IAQM). The guideline is entitled '*IAQM Guidance on the Assessment of Dust from Demolition and Construction*' (IAQM, 2014).

This approach has been widely used for performing qualitative assessments of dust emissions from construction sites and has been used in NSW by Wilkinson Murray and other consultants.

Furthermore, it has been accepted as a suitable approach in the absence of any guidance by Australian regulatory authorities.

This section presents a qualitative assessment of potential air quality impacts associated with the proposed works and has been conducted in general accordance with the methodology described in the previously IAQM Guideline.

This approach presents the risk of dust soiling and human health impacts associated with four types of activities that occur on construction sites (demolition, earthworks, construction and trackout) and involves the following steps:

- Step 1: Screen the need for a detailed assessment;
- Step 2: Assess the risk of dust impacts arising, based on:
  - The potential magnitude of dust emissions from the works; and
  - The sensitivity of the surrounding area.
- Step 3: Identify site-specific mitigation; and
- Step 4: Consider the significance of residual impacts, after the implementation of mitigation measures.

For this project, the process outlined above will be applied to the worst-case on-site and off-site activities that will result in the likely highest generation of dust. This approach will result in a conservative assessment of the potential risks for human health and dust soiling impacts.

For this project, the earthworks phase (and associated trackout) is considered the greatest potential to generate short-term high levels of dust. On this basis, this report has focused on the assessment of this worst-case scenario.

## 5.2 Risk Assessment of Dust Impacts from Proposed Construction Works

The following qualitative risk assessment of potential dust impacts has been conducted for the proposed construction works.

### 5.2.1 Step 1 – Screen the need for a detailed assessment

The IAQM guidance recommends that a risk assessment of potential dust impacts from construction activities be undertaken when human receptors are located within:

- 350m of the boundary of the site; or,
- 50m of the route(s) used by construction vehicles on public roads up to 500m from the site entrance(s).

As can be seen in **Figure 2-2**, the nearest receivers to the north, south and west are located within 350m of the proposed site and therefore, an assessment of dust impacts is considered necessary under the guideline.

### 5.2.2 Step 2A – Potential Dust Emission Magnitude

In accordance with the IAQM guidance (Section 7, Step 2: Assess the Risk of Dust Impacts), dust emission magnitudes from earthworks may be defined as:

- **Large:** total site area >10,000 sqm, potentially dusty soil type (e.g. clay), >10 heavy earth moving vehicles active at any one time, formation of bunds >8m in height, total material moved >100,000 tonnes;
- **Medium:** total site area 2,500 sqm – 10,000 sqm, moderately dusty soil type (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 4m – 8m in height, total material moved 20,000 tonnes – 100,000 tonnes; and,
- **Small:** total site area <2,500 sqm, soil type with large grain (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4m in height, total material moved <20,000 tonnes.

The areas affected by the proposed earthworks are in excess of 10,000 sqm and the material to be removed would exceed 100,000 tonnes.

Regarding dust “trackout” associated with haulage activities, dust emission magnitudes may be defined as:

- **Large:** >50 heavy vehicle outward movements per day, potentially dusty surface material, unpaved road length >100m;
- **Medium:** 10 – 50 heavy vehicle outward movements per day, moderately dusty surface material, unpaved road length 50m – 100m; and,
- **Small:** <10 heavy vehicle outward movements per day, surface material with low potential for dust release, unpaved road length <50m

Earthworks will result in the highest number of heavy vehicle movements, expected to be more than 50 heavy vehicle movements per day leaving the site (this would not occur for the entire duration), and all on-site haulage would include unpaved sections of road more than 100m long.



The dust emission magnitude is therefore:

- **Large** for earthworks.
- **Large** for trackout.

### 5.2.3 Step 2B – Sensitivity of Surrounding Area

The sensitivity of the surrounding area to dust impacts considers a number of factors, including:

- Specific receptor sensitivities;
- The number of receptors and their proximity to the works;
- Existing background dust concentrations; and,
- Site-specific factors that may reduce impacts, such as trees that may reduce wind-blown dust.

In accordance with the IAQM guideline, the following receptor sensitivity has been determined:

#### Industrial Receivers

- **Medium** sensitivity to dust soiling.
- **Medium** sensitivity to human health.

#### Residential Receivers

- **High** sensitivity to dust soiling.
- **High** sensitivity to human health.

Considering the above receptor sensitivities, **Table 5-1** and **Table 5-2** have been reproduced from the IAQM (only showing the “high” and “medium” receptor sensitivity applicable to this project) so that the sensitivity of the area can be determined.

It is critical to note that in the near future that the closest residential receivers will be developed in line with the Mamre Road Precinct requirements. It is therefore likely that the receptor sensitivity in the future will reduce from High to Medium for these nearby receivers.

For human health impacts, the mean background PM<sub>10</sub> concentration of below 24 µg/m<sup>3</sup> has been used given the local ambient air quality measured (refer **Section 4.2**).

**Table 5-1 Area Sensitivity Decision Matrix – Dust Soiling**

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	> 1	Medium	Low	Low	Low

**Table 5-2 Area Sensitivity Decision Matrix – Human Health**

Receptor Sensitivity	Annual Mean PM <sub>10</sub> concentration	No. of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	> 32 µg/m <sup>3</sup>	>100	High	High	High	Medium	Low
		10-100	High	High	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m <sup>3</sup>	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m <sup>3</sup>	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low Risk	Low	Low	Low
	< 24 µg/m <sup>3</sup>	>100	Medium	Low Risk	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	> 32 µg/m <sup>3</sup>	> 10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m <sup>3</sup>	> 10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m <sup>3</sup>	> 10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	< 24 µg/m <sup>3</sup>	> 10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low

The sensitivity of the surrounding area (both residential and industrial receivers) has been determined to be:

- For earthworks:
  - **Low** sensitivity to dust soiling.
  - **Low** sensitivity to health impacts.
- For trackout:
  - **Low** sensitivity to dust soiling.
  - **Low** sensitivity to health impacts.

#### 5.2.4 Step 2C – Define the risk of impacts

To define the risk of impacts, the dust emission magnitude ("large" for this site) is combined with the sensitivity of the area, as per **Table 5-3** and **Table 5-4** for earthworks and trackout, respectively.

**Table 5-3 Risk of Dust Impacts – Earthworks**

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

**Table 5-4 Risk of Dust Impacts – Trackout**

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

In accordance with **Table 5-3**, the proposed earthworks are considered to have a **low risk** of both dust soiling and human health impacts. In accordance with **Table 5-4**, the haulage activities are considered to have a **low risk** of both dust soiling and human health impacts.

It is important to note that the above risks assume that ***dust mitigation measures are not implemented***.

#### 5.2.5 Step 3 – Site-specific Mitigation

The IAQM guidance document identifies a range of appropriate dust mitigation measures that should be implemented as a function of the risk of impacts. These measures are presented in **Section 6**.

#### 5.2.6 Step 4 – Significance of Residual Impacts

In accordance with the IAQM guidance document, the final step in the assessment is to determine the significance of any residual impacts, following the implementation of mitigation measures. To this end, the guidance states:

*For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be "not significant".*

Based on the proposed works, and the advice in the IAQM guidance document, it is considered unlikely that these works would result in unacceptable air quality impacts, subject to the implementation of the mitigation measures outlined in **Section 7**.

## 6 ASSESSMENT OF AIR QUALITY DURING OPERATION

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### 6.1 Assessment Methodology

As mentioned previously in this assessment, in terms of air quality, the operation of this warehouse will generate additional traffic movements that will travel along Mamre Road.

The emissions would be of a similar nature to those already emitted by road traffic along the nearby road network, although at a much lower level and is therefore considered a low risk to the nearby receivers. Furthermore, the nearest residential receivers will, in the near future be developed into developments more compatible with the Mamre Road Precinct requirements. It is therefore likely that the receptor sensitivity in the future will reduce from High to Medium for these nearby receivers.

Similar to the assessment of construction dust (refer **Section 5**), an approach developed by the Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) has been referenced following an estimate of the contribution of the three main pollutants from the operation of Warehouse W5. The guideline is entitled "*Land-Use Planning & Development Control: Planning for Air Quality*" (EPUK & IAQM, 2017).

In particular Table 6.3 from the guideline has been referenced and reproduced as **Table 6-1**.

**Table 6-1 Impacts Descriptors for Individual Receptors**

**Table 6.3: Impact descriptors for individual receptors.**

Long term average Concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

**Explanation**

1. AQAL = Air Quality Assessment Level, which may be an air quality objective, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)'.
2. The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5%, will be described as Negligible.
3. The Table is only designed to be used with annual mean concentrations.
4. Descriptors for individual receptors only; the overall significance is determined using professional judgement (see Chapter 7). For example, a 'moderate' adverse impact at one receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.
5. When defining the concentration as a percentage of the AQAL, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme' concentration for an increase.
6. The total concentration categories reflect the degree of potential harm by reference to the AQAL value. At exposure less than 75% of this value, i.e. well below, the degree of harm is likely to be small. As the exposure approaches and exceeds the AQAL, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQAL.
7. It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQAL. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQAL, rather than being exactly equal to it.

## 6.2 Operational Assumptions

All the additional traffic associated with Lot F – Warehouse W5 will travel along Mamre Road and eventually onto other arterial roads (such as Elizabeth Drive) and toll roads (such as M4). On this basis, we have conservatively assumed that the road traffic portion of the emissions within the Kemps Creek airshed is exclusively controlled by the traffic on Mamre Road. This is clearly not the case given the many other roads in this region however allows a conservative assessment.

The typical annual average daily traffic (AADT) of the above mentioned three roads is:

- Mamre Road 18,818 (including 14% heavy vehicles) - 2017 RMS counts
- Elizabeth Drive 25,296 (including 19% heavy vehicles) - 2017 RMS counts
- M4 59,284 (estimate of > 10% heavy vehicles) - 2016 RMS counts

The project traffic consultants has stated a total number of 1,528 trips per day would be generated by Warehouse W5.

The additional movements result in an approximate increase to the overall traffic movements by 8% in the area.

### 6.3 Estimate of Increase in Pollutants

Considering the main three pollutants, PM<sub>10</sub>, PM<sub>2.5</sub> and NO<sub>2</sub>, and assuming a worst case 8% increase in traffic, **Table 4-3** presented the estimated increase in pollutant concentration due to the operation of Warehouse W5.

**Table 6-2 Increase in Concentration (ug/m<sup>3</sup>) due to Warehouse W5**

Pollutant	Existing Concentration (5 yr average)	Estimated <sup>1</sup> Concentration (Existing Traffic)	Estimated <sup>2</sup> Increase in Concentration (Warehouse W5 Operation Traffic)
PM <sub>10</sub>	18.0	1.6	0.13
PM <sub>2.5</sub>	8.2	0.8	0.06
NO <sub>2</sub>	8.5	4.5	0.36

Note 1: Applied correction to *Existing Concentration (5 yr average)* as per Table 4-3 for year 2013.

Note 2: Applied 8% correction to *Estimated Concentration (Existing Traffic)* considering worst case increase in traffic.

It can be clearly seen from the above that the increase in each pollutant due to the operational traffic associated with Warehouse W5 is negligible.

Further considering the EPUK & IAQM, 2017 guideline, the impact and significance of Warehouse W5 operation for each pollutant is defined as:

- PM<sub>10</sub> Negligible and Not Significant
- PM<sub>2.5</sub> Moderate (existing concentration is slightly above criteria) and Not Significant
- NO<sub>2</sub> Negligible and Not Significant

## 7 RECOMMENDED MITIGATION & MANAGEMENT

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### 7.1 Dust Mitigation Measures

The assessment of potential dust impacts from the proposed works indicates the proposed project is considered to have a **low risk** of both dust soiling and human health impacts for earthworks and for haulage (trackout) activities if dust mitigation measures are not implemented. The potential risk for the other stages of construction will be of either low or negligible given that the worst case scenario (earthworks and associated haulage) has been considered.

To ensure best practice management, the following mitigation measures are recommended so that construction dust impacts are minimised and remain low risk.

- **Communications**

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site, and:
  - Displays the name and contact details of the Responsible Person accountable for air quality and dust issues on the site boundary.
  - Displays the head or regional office contact information.
- Develop and implement a Dust Management Plan (DMP) that considers, as a minimum, the measures identified herein.

- **Site management**

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to relevant authorities (Council, EPA, etc).
- Record any exceptional incidents that cause dust and/or air emissions, either on or off site, and the action taken to resolve the situation in the logbook.
- Hold regular liaison meetings with any other high-risk construction sites within 500 m of the site boundary to ensure plans are coordinated.

- **Monitoring**

- Undertake daily on-site and off-site inspection, where receptors are nearby, to monitor dust. Record inspection results and make available to relevant authorities. This should include regular dust soiling checks of surfaces such as street furniture, cars and window. Specific real-time dust monitoring is not necessary for this project.

- **Preparing & Maintaining the Site**

- Plan site layout so that machining and dust generating activities are located away from receptors, as far as possible.
- Avoid site runoff of water or mud.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If being re-used, keep materials covered.

- Cover, seed or fence stockpiles to prevent wind erosion.
- **Construction vehicles and sustainable travel**
  - Ensure all vehicles switch off engines when stationary – no idling vehicles.
  - Impose and signpost a maximum-speed-limit of 25km/h on surfaced and 15km/h on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided).
- **Measures for general construction activities**
  - Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
  - Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
- **Measures specific to haulage**
  - Use water-assisted dust sweeper(s) on the access and local roads, as necessary.
  - Avoid dry sweeping of large areas.
  - Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
  - Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
  - Record all inspections of haul routes and any subsequent action in a site logbook.
  - Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
  - Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
  - Access gates to be located at least 10m from receptors where possible.

## **7.2 Operational Mitigation Measures**

Although no specific mitigation measures have been triggered, it would be sensible to:

- Limit unnecessary idling of truck engines on-site.
- Ensure truck maintenance is up to date.



## 8 CONCLUSION

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Wilkinson Murray Pty Limited has prepared an air quality impact assessment to form part of a State Significant Development Application (SSDA) for the warehouse development at 200 Aldington Road, Kemps Creek.

The application seeks approval for the Concept Plan, as well as the construction and operation of Stage 1 (Warehouse W5).

The assessment concludes:

- The construction phases can be adequately managed so that the short-term and temporary dust related impacts will remain to be low risk.
- Operational phase will result in similar emissions from the immediate road network, although estimated to result in a negligible increase. In accordance with the EPUK & IAQM guideline, the impact and significance has been determined to be negligible to moderate AND insignificant.

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Appendix C

# Construction Noise and Vibration Management Plan

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# 200 Aldington Road Industrial Estate

## Construction Noise Vibration Management Plan

Prepared for Fife Kemps Creek Trust  
April 2022

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# 200 Aldington Road Industrial Estate

## Construction Noise Vibration Management Plan

### Report Number

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E210906 RP#3

### Client

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Fife Kemps Creek Trust

### Date

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7 April 2022

### Version

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v1 Final

### Prepared by

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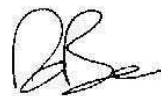
**Lia Zwolinski**

Senior Consultant

7 April 2022

### Approved by

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**David Bone**

Associate Director

7 April 2022

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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# Acronyms and abbreviations

Acronym	Description
BC Act	Biodiversity Conservation Act 2016
CM	Construction Manager
CEMP	Construction Environmental Management Plan
CCS	Community Communication Strategy
CNVMP	Construction Noise and Vibration Management Plan
CTMP	Construction Traffic Management Plan
DAWE	Department of Agriculture, Water and the Environment (Cth)
EIS	Environmental Impact Statement
ESCP	Erosion and Sediment Control Plan
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	Environmental Protection Agency
ER	Environmental Representative
FKC	Fife Kemps Creek Trust
GFA	Gross Floor Area
ha	hectare
km	kilometre
LGA	Local Government Area
m	metre
NSW	New South Wales
NRAR	Natural Resources Access Regulator
PCC	Penrith City Council
SS	Site Supervisor

# 1 Introduction

This Construction Noise and Vibration Management Plan (CNVMP) has been prepared for implementation by Fife Kemps Creek Trust (FKC) (and its contractors) for the construction of the 200 Aldington Road Industrial Estate (the Project). The Project is located in Kemps Creek, New South Wales 2178, within the Penrith Local Government Area (LGA).

The following documents have been reviewed and applicable information incorporated into this CNVMP:

- Environmental Impact Statement (the EIS), prepared by Ethos Urban, dated 11 November 2020;
- SSDA-10479;
- Noise and Vibration Impact Assessment, prepared by White Noise Acoustics, dated 05 August 2021; and
- Mamre Road Precinct Development Control Plan 2011 (the DCP)

## 1.1 Project overview

### 1.1.1 Background / context

This CNVMP forms a Request for Additional Information for the proposed Concept State Significant Development Application for a new industrial estate on land 106 – 228 Aldington Road, Kemps Creek.

The EIS for the project was placed on public exhibition between 18 November 2020 and 15 December 2020. During this period, a total of 18 submissions were received. These submissions were addressed and subsequent amendments to the project were made, as outlined in the Response to Submissions Report (dated 23 March 2021) prepared by Ethos Urban.

In written correspondence dated 28 April 2021, it was requested that FKC provide a further response to additional commentary raised by DPE, as well as additional comments raised by public authorities in their review of the first Response to Submissions Report. This was responded to via a second a Response to Submissions Report outlined by Ethos Urban (dated 22 September 2021).

Additional correspondence was received from DPE dated 15 November 2021 which has necessitated updates and additional information, as contained within this report.

### 1.1.2 Summary of the project for which development consent is now sought

Consent is sought for the following development. It represents minor amendments and does not represent a significant material change to what was previously proposed under the second RTS Report (22 September 2021)

- A concept masterplan with an indicative total building area of 342,865 sqm, comprising:
  - 325,865 sqm of warehouse gross floor area (GFA);
  - 17,010 sqm of ancillary office GFA;
  - 13 individual development lots for warehouse buildings with associated hardstand areas and two lots for water management infrastructure purposes (each including a bio retention basin);
  - Roads, including:



- Internal road layouts;
- Southern road connection to Aldington Road;
- Northern boundary road (half road corridor) connecting to Aldington Road;
- Road connections to adjoining landholdings to the north and east;
- Provision for 1,516 car parking spaces; and
- Associated concept site landscaping.
- Detailed consent for progressive delivery of site preparation, earthworks and infrastructure works (i.e., Stage 1 works) on the site, including:
  - Demolition and clearing of all existing built form structures;
  - Drainage and infill of existing farm dams and any ground dewatering;
  - Clearing of existing vegetation;
  - Subdivision of the site into 15 individual lots;
  - Construction of a warehouse building with a total of 50,300 sqm of GFA, including:
    - 47,800 sqm of warehouse GFA; 2,500 sqm of ancillary office GFA; and
    - 221 car parking spaces.
  - Bulk earthworks including 'cut and fill' to create level development platforms for the warehouse buildings, and site stabilisation works (if required);
  - Roadworks and access infrastructure, including an interim access road and a temporary junction with Aldington Road;
  - Stormwater works including stormwater basins, diversion of stormwater;
  - Utilities services including sewer and potable water reticulation; and
  - Road and boundary retaining walls.

## 1.2 Noise Impact Assessment

A Noise and Vibration Impact Assessment (NVIA) was prepared by White Noise Acoustics (2020), as part of the EIS submission. The assessment includes an acoustic investigation of the potential noise impacts associated with the proposal during construction and operation, including traffic movements in and around the site.

### 1.3 Community consultation

FKC has developed a Community Communication Strategy (CCS), which includes a Complaints Response Handling Procedure. Consultation of the CNVMP will occur with relevant government agencies and key stakeholders prior to commencement of works. Refer to Appendix A of the Construction Environmental Management Plan (CEMP).

Consultation with the community and relevant stakeholders will continue to occur throughout the construction of the Project. Consultation will be carried out in reference to (but not limited to) the following:

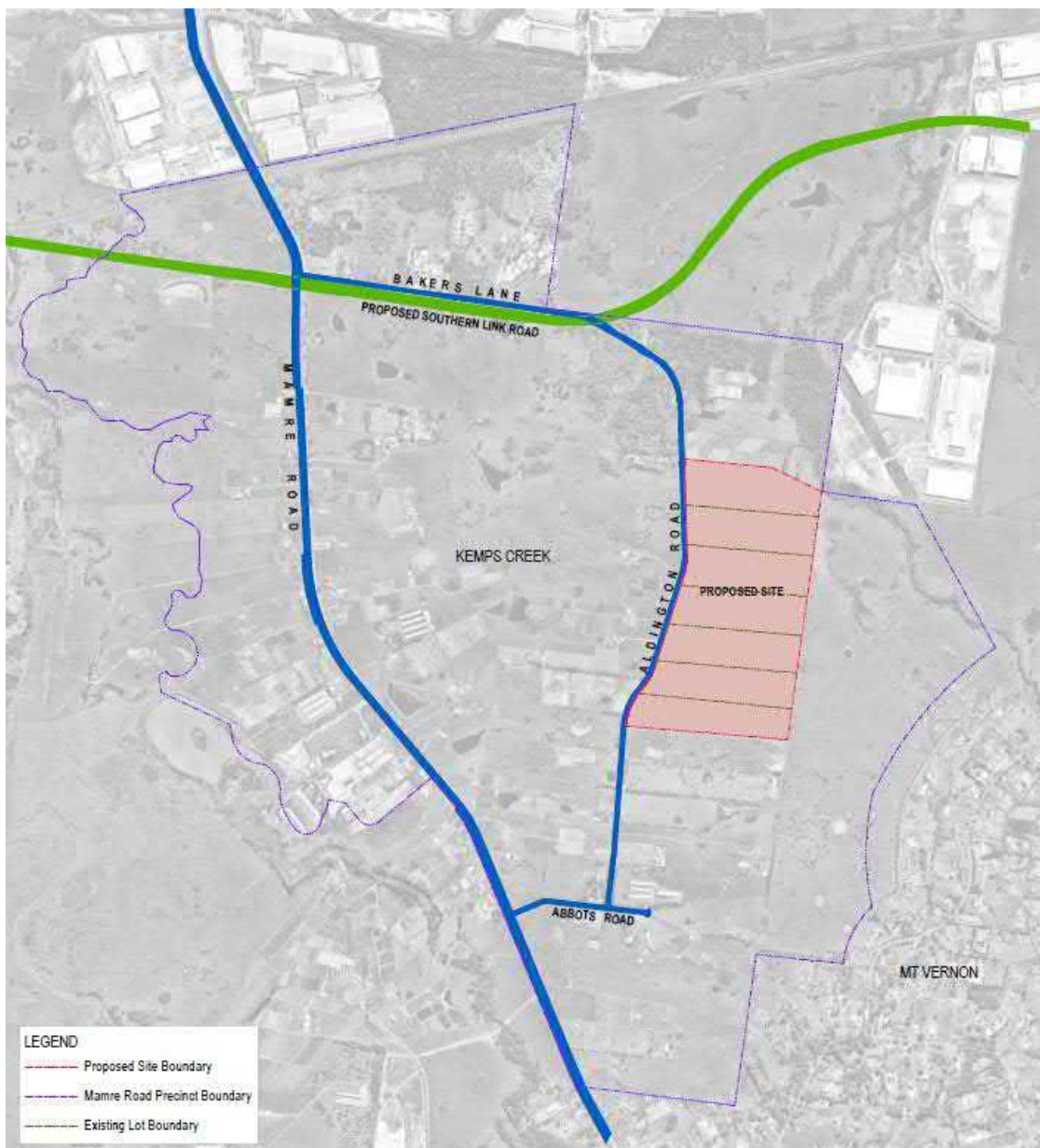
- hazard identification and risk assessment processes;
- changes to FKC's Policies and Procedures which may affect environmental management, including any amendments to this CEMP;
- incidents, near misses and non-compliances, corrective actions and lessons learned;
- changes to applicable Environmental Legislation and Standards; and
- changing site conditions and work conditions.

FKC will undertake consultation activities in accordance with the processes outlined in the CCS.

## 2 Site description

### 2.1 Site location

The Project site is located at 200 Aldington Road, Kemps Creek, NSW. The site comprises seven separate allotments with a total area of approximately 72 hectares (ha). The site is located approximately 5 kilometres (km) north-west of the future Western Sydney International (Nancy-Bird Walton) Airport (WSA), 13 km south-east of the Penrith CBD and 40 km west of the Sydney CBD (refer [Figure 2.1](#)) The site is located within the Mamre Road Precinct as identified by the State Environmental Planning Policy (Western Sydney Employment Area) 2009 (the SEPP).



**Figure 2.1** Project locality

## 2.2 Construction staging and activities

A summary of construction staging, and associated activities is provided in Table 2.1.

**Table 2.1 Construction activities**

Stage	Summary of activities	Timing
Pre-construction activities	<ul style="list-style-type: none"><li>• site establishment, including site boundary fencing, erection of signage and establishment of no-go areas;</li><li>• establishment of site compound and stockpile sites;</li><li>• establishment of site access points, traffic management measures;</li><li>• installation of erosion and sediment controls;</li><li>• pre-clearance surveys and marking fauna habitat trees prior to clearing works; and</li><li>• clearing of all existing vegetation, including grubbing activities and removal of vegetation off-site.</li></ul>	
Demolition	<ul style="list-style-type: none"><li>• demolition and clearing of all existing built form structures</li></ul>	
Drainage and earthworks	<ul style="list-style-type: none"><li>• drainage and infill of existing farm dams and any ground dewatering;</li><li>• subdivision of the site into 13 individual lots;</li><li>• bulk earthworks including 'cut and fill' to create flat development platforms for the warehouse buildings, and site stabilisation works (if required); and</li><li>• stripping, stockpiling and management of topsoil and unsuitable materials.</li></ul>	
Construction	<ul style="list-style-type: none"><li>• construction of warehouse building, including ancillary office and car parking spaces;</li><li>• roadworks and access infrastructure;</li><li>• stormwater and drainage works including stormwater basins, diversion of stormwater lines, gross pollutant traps and associated swale works;</li><li>• sewer and potable water reticulation; and</li><li>• inter-allotment, road and boundary retaining walls.</li></ul>	
Post-construction	<ul style="list-style-type: none"><li>• rehabilitation;</li><li>• demobilisation of plant and equipment; and</li><li>• site clean-up.</li></ul>	

# 3 Conditions of approval

This CNVMP forms part of the CEMP and has been prepared in accordance with condition XXX of the development consent for SSD 10479. The condition requirements and where they have been addressed in this report are summarised in Table 3.1.

Table 3.1 Conditions of Approval

Conditions of Approval (CoA)	Condition	Where addressed in

## 4 Noise and vibration standards and codes

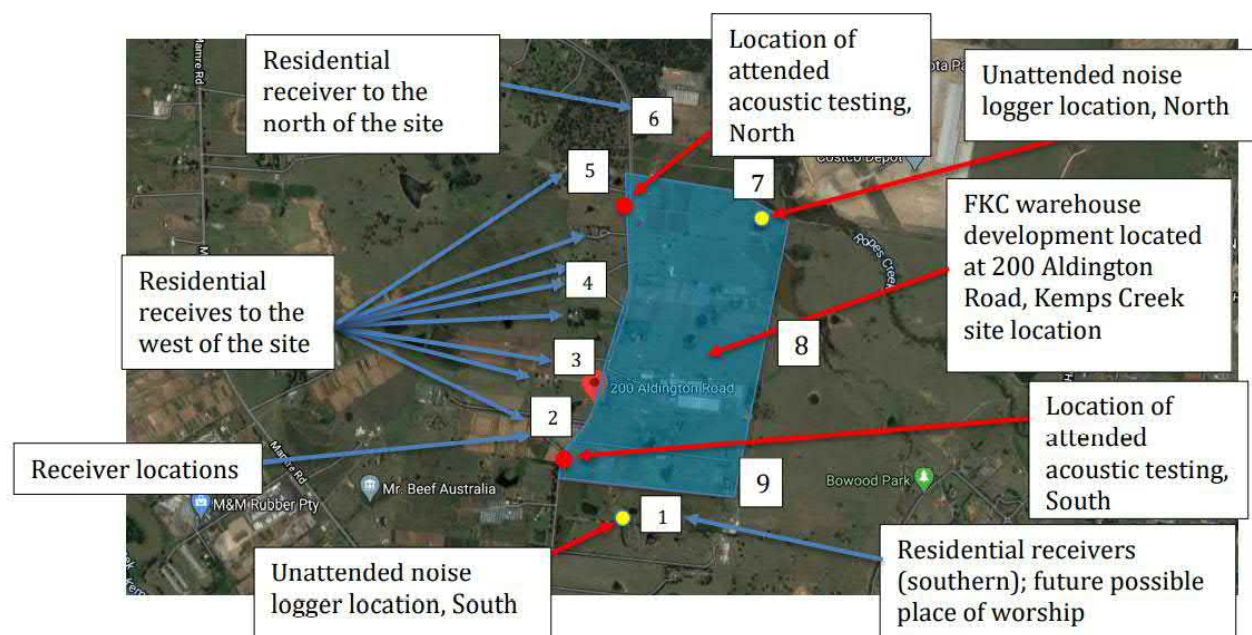
Key policies and guidelines which are relevant to the preparation and implementation of the CNVMP include the following:

- *Environmental Planning and Assessment Act 1979* (EP&A Act);
- *Protection of the Environment Operations Act 1979* (POEO Act);
- *NSW Industrial Noise Policy* (EPA, 2000);
- *Noise Policy for Industry* (EPA, 2017);
- *EPA's Interim Construction Noise Guideline* (DECC, 2009);
- *Australian Standard AS 2436-2010, Guide to noise and vibration control on construction, maintenance and demolition sites*;
- *DIN 4150-3 (1992-02) Structural vibration - Effects of vibration on structures* (German Institute for Standardisation, 1999); and
- *Environmental Noise Management Assessing Vibration: a technical guideline* (Department of Environment and Conservation, 2006).

# 5 Noise monitoring and receivers

## 5.1 Noise Monitoring

Noise monitoring was conducted as part of the NVIA. Attended noise monitoring was undertaken 17 August 2020 during various times of the day at the project site. Unattended noise logging was also conducted at two locations between 11 to 17 August 2020. The monitoring and receiver locations are shown on Figure 5.1.



**Figure 5.1 Monitoring and Receiver Locations**

## 5.2 Noise Receivers

Sensitive receivers surrounding the site, as identified in the NVIA, are summarised in Table 5.1.

**Table 5.1 Noise Receivers**

Receivers	Details	Distance from site (m)
R1	Residential receiver to the south – Currently includes a residential receiver, may include a future place of worship including the Hindu Temple. 240-242 Aldington Road, Kemps Creek Distance of 60m from the site	60 m south
R2	Residential receiver to the west of the site across Aldington Road. 201- 217 Aldington Road, Kemps Creek.	150 m west
R3	Residential receiver to the west of the site opposite on Aldington Road. 169-181 Aldington Road, Kemps Creek.	180 m west

**Table 5.1**      **Noise Receivers**

Receivers	Details	Distance from site (m)
R4	Residential receiver to the west of the site across Aldington Road. 183-197 Aldington Road and 129-139 Aldington Road, Kemps Creek.	200 m west
R5	Residential receiver to the west of the site across Aldington Road. 99-111 Aldington Road, Kemps Creek.	200 m west
R6	Residential to the north of the site on Aldington Road. 74-88 Aldington Road, Kemps Creek.	230 m north
R7	Industrial noise receiver (future) to the north of the site.	
R8	Industrial noise receiver (future) to the east of the site.	
R9	Industrial noise receiver (future) to the south-east of the site.	

### 5.3      Monitoring procedure

Noise monitoring will be undertaken using both attended and unattended noise loggers at monitoring locations (refer Table 6.1).



## 6 Existing noise levels

### 6.1 Meteorological conditions

As outlined in Condition X of the Project Approval, the noise criteria must apply to construction work under all meteorological conditions except for the follow:

- XX
- XX; and
- XX.

### 6.2 Ambient background noise levels

The site is located to the eastern side of Aldington Road, which experiences minimal amounts of localised traffic.

The site is classified as a rural area as defined in *Noise Policy for Industry* (NPfI) (EPA 2017). The NPfI describes rural land to have an acoustic environment dominated by natural sounds, little to no road traffic noise, low background noise levels and sparse settlement patterns.

The attended and unattended noise locations were selected to obtain suitable noise levels for the assessment of background noise levels ( $L_{90(t)}$ ) as well as the impact from traffic movements ( $Leq(t)$ ). The results of the acoustic survey are summarised in Table 6.1 and Table 6.2, which were used to inform the basis of the NVIA..

**Table 6.1 Attended noise monitoring results**

Measurement location	Time of measurement	$L_{Aeq, 15min}$ dB(A)	$L_{A90, 15min}$ dB(A)	Comments
Attended noise monitor				
Northern Location	9.05am to 9.20am	58	39	Noise level at the site dominated by vehicle movements on Aldington Road, surrounding land uses and natural sources
Southern Location	9.25am to 9.40am	56	41	

**Table 6.2 Noise logging results**

Measurement location	Time of measurement	Maximum repeatable $L_{Aeq, 15min}$ dB(A)	Representative background noise level (RBL) $L_{A90, 15min}$ dB(A)	Minimum assumed representative background noise levels (RBL) $L_{A90, 15min}$ dB(A) <sup>1</sup>
Northern location	Day	42	30	35
	Evening	40	29	30
	Night	33	25	30
Southern location	Day	50	32	35

**Table 6.2      Noise logging results**

Measurement location	Time of measurement	Maximum repeatable L <sub>Aeq, 15min</sub> dB(A)	Representative background noise level (RBL) L <sub>A90, 15min</sub> dB(A)	Minimum assumed representative background noise levels (RBL) L <sub>A90, 15min</sub> dB(A) <sup>1</sup>
	Evening	35	31	30
	Night	35	30	30

Note: Where background noise levels have been recorded below the minimum assumed representative background noise levels, the minimum RBL's have been used for the basis of the assessment as defined in the EPA Noise Policy for Industry.

# 7 Project specific criteria

## 7.1 Construction noise criteria

The construction noise management levels for works undertaken onsite are provided in. These are adopted from the NVIA (White Noise Acoustics 2020).

**Table 7.1 Construction noise management levels**

Time period	Receiver type	Construction noise management levels	High noise affected level
Recommended standard hours: <ul style="list-style-type: none"><li>Monday to Friday 7am to 6pm;</li><li>Saturday 8am to 1pm; and</li><li>No work on Sundays or public holidays.</li></ul>	Residential	63 dB(A) LAeq (15min)	75 dB(A) LAeq (15min)
When in use	Industrial	75 dB(A) Leq (15 min)	

Construction noise management levels are based on the Interim Construction Noise Guideline (DECCW 2009).

## 7.2 Construction vibration criteria

The assessment of construction related vibration was based on the following guidelines:

- Assessing Vibration – A Technical Guideline;
- British Standard BS 7385: Part 2-1993 “Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration” (BSI 1993); and
- German DIN 4150: Part 3 – 1999 “Effects of Vibration on Structure” (DIN 1999).

White Noise Acoustics (2020) have confirmed the proposed works are not expected to generate adverse vibration that would exceed the relevant criteria, therefore, nearest receivers are not likely to experience adverse vibration impacts.

## 8 Predicted noise levels

### 8.1 Earthworks

Construction vibration may occur during the earthworks particularly if outcrops of dolerite are encountered. Safe working distances for building damage will be complied with at all times and vibration monitoring will be undertaken to ensure acceptable levels of vibration are satisfied.

Based on the location of the site there are significant separation of areas where construction activities will be conducted from surrounding building. Based on the location of works that will be conducted there will be safe working distances relating to continuous vibration from construction equipment. Most construction activities will have intermittent vibration emissions and therefore, higher vibration levels occurring over shorter periods are acceptable for intermittent events.

Construction vibration is not expected to generated magnitudes of vibration with the potential to exceed the criteria applicable for human comfort and therefore the nearest residential receivers are not likely to experience adverse vibration impacts.

### 8.2 Construction

A quantitative assessment of the construction noise levels resulting from construction of the project has been undertaken. The assessment has been based on the expected noise levels to be generated on the site. Calculations of the resulting construction noise levels of the residential receivers within proximity to the site is detailed in Table 8.1.

**Table 8.1** Quantitative assessment of construction noise to neighbouring residence

Noise source	Equipment	Sound power levels dB(A) L <sub>10</sub>	Aggregate sound power level dB(A) L <sub>10</sub>	Calculated construction noise levels
Site demolition works	Jack hammer mounted on skid steer	118	122	Up to 55 dB(A) when items used externally
	Hand held jack hammer	11		
	Concrete saw	119		
	Skid steer	110		
	Power hand tools	109		
	Excavators	115		
	Trucks	110		
	Earth rollers	112		
Construction works	Pilining	115	120	Up to 50 dB(A) when items used externally
	Welder	101		
	Saw cutter	109		
	Dump truck	109		
	Concrete saw	119		

**Table 8.1**      **Quantitative assessment of construction noise to neighbouring residence**

Noise source	Equipment	Sound power levels dB(A) L <sub>10</sub>	Aggregate sound power level dB(A) L <sub>10</sub>	Calculated construction noise levels
	Power hand tools	109		
	Cranes	110		

### 8.3      Cumulative noise

Cumulative noise and vibration emissions from other works within the vicinity of the Project have the potential to impact nearby receivers. However, based on the results in the NVIA, the cumulative noise emissions from the Project will comply with the relevant noise emissions criteria providing the recommended acoustic treatments for the existing area are implemented.

## 9 Management measures

This section outlines the management measures provided in the NVIA to mitigate noise and vibration impacts during the construction phase of the Project. These management measures are summarised in Table 9.1.

The Project site is located within the Mamre Road Precinct, and therefore the relevant controls of the DCP have been considered in this CNVMP and must be applied to the construction phase of the Project. The applicable controls provided in the DCP have also been summarised in Table 9.1.

**Table 9.1 Construction noise and vibration measures**

Action	Timing	Responsibility	Source
<b>General</b>			
Development shall comply with the relevant Australian Standards for noise and vibration.	Construction	Contractor Project Manager	Section 4.3.1 of the DCP
<b>Use of machinery</b>			
Any machinery or activity considered to produce noise emissions from a premise shall be adequately sound-proofed so that noise emissions are in accordance with the provisions of the Protection of the Environment Operations Act 1997.	Construction	Contractor	Section 4.3.1 of the DCP
The use of high noise generating equipment including hydraulic hammers, rock cutters or the like should be minimised prior to 8 am Monday to Friday or 8.30 am Saturdays.	Construction	Contractor	Section 8.4 of the NVIA
The loading of trucks should be conducted such that there is not a requirement to stack truck on the roadways adjacent to the residential receivers.	Construction	Contractor	Section 8.4 of the NVIA
All plant and equipment are to be maintained such that they are in good working order	Construction	Contractor	Section 8.4 of the NVIA
<b>Complaints procedure</b>			
Details of the proposed construction (including demolition) works to be conducted on the site, including type of activities to be conducted as well as the expected duration of activities should be provided to the neighbouring receivers.	Pre-construction	Contractor Project Manager	Section 8.4 of the NVIA
If required a noise level measurement of the offending plant item generating complaints is to be conducted and noise mitigations undertaken to reduce noise levels to within noise management levels in the event magnitude of noise levels is found to be above suitable levels.	Construction	Contractor Project Manager	Section 8.4 of the NVIA

**Table 9.1**      **Construction noise and vibration measures**

Action	Timing	Responsibility	Source
A register of complaints is to be recorded in the event of complaints being received, including location, time of complaint, nature of the complaint and actions resulting from the complaint.	Construction	Project Manager	Section 8.4 of the NVIA

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Attachment A

# Noise impact assessment

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Ethos Urban

FKC Estate  
200 Aldington Road  
Kemps Creek

## Noise Impact Assessment

White Noise Acoustics  
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Document Control

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# 1 Introduction

White Noise Acoustics has been engaged to undertake the Noise Impact Assessment of the proposed FKC warehouse development located at 200 Aldington Road, Kemps Creek including the site wide concept plan and the proposed Lot F Development.

The proposed project includes the following

1. 14 buildings with a number of warehouses.
2. Associated parking and truck loading areas.

This assessment includes the acoustic investigation into the potential for noise impacts from the operation of the completed project as well as potential noise impacts from traffic movements on surrounding streets.

Additionally, construction noise management strategies are included in this report.

The proposed development is detailed in SBA Architects drawings, which include the typical floor plan for the development which is included below.

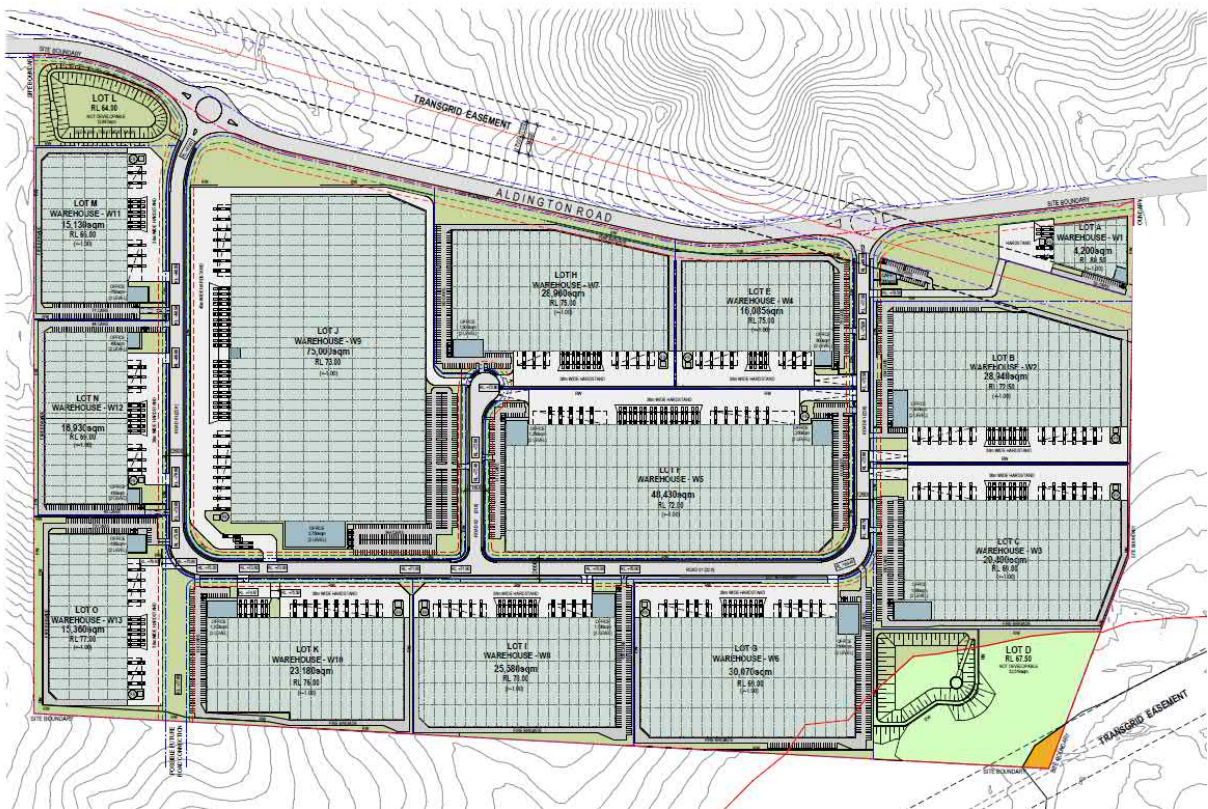


Figure 1 – Proposed development site plan

## 1.1 Development Description

The site is located on the eastern side of Aldington Road which carries traffic accessing the local residential areas. The surrounding area includes the following:

1. Existing properties located within the Rural area including residential properties surrounding the site. The surrounding land has been rezoned as IN1 including residential use and expected to be progressively redeveloped.
2. The potential future land use to the south of the site which may include a place of worship.

The site location is detailed in Figure 2 below.

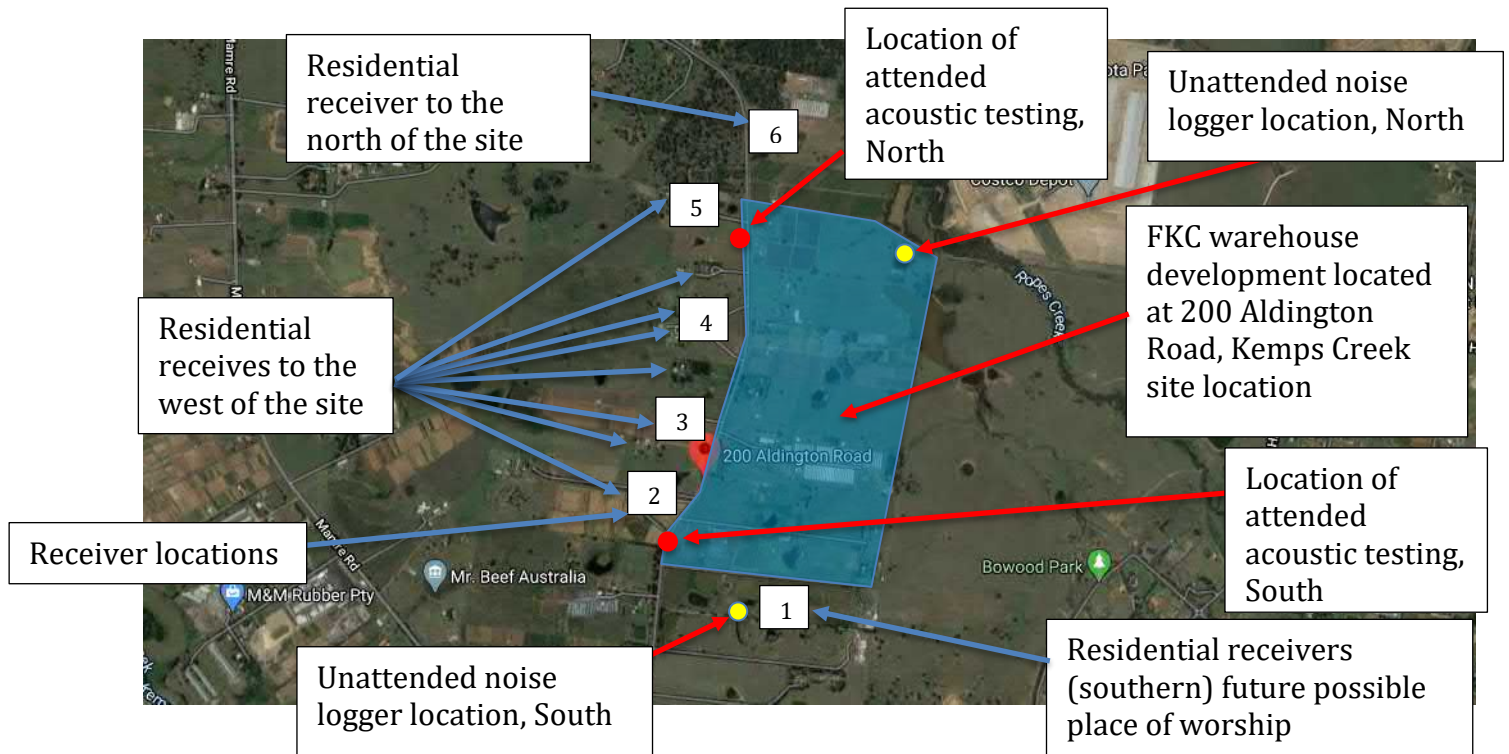


Figure 2 – FKC warehouse development located at 200 Aldington Road, Kemp's Creek site location

The surrounding receivers to the site include the following:

1. Receiver to the south – Currently includes a residential receiver, may include a future place of residence including the Hindu Temple. Distance of 60m from the site.
2. Residential receiver to the west of the site opposite on Aldington Road. Distance of 150m from the site.
3. Residential receiver to the west of the site opposite on Aldington Road. Distance of 180m from the site.
4. Residential receiver to the west of the site opposite on Aldington Road. Distance of 200m from the site.
5. Residential receiver to the west of the site opposite on Aldington Road. Distance of 200m from the site.
6. Residential to the north of the site on Aldington Road. Distance of 230m from the site.

The proposed development includes the following:

- A concept masterplan with an indicative total building area of 375,755 sqm, comprising:
  - 357,355 sqm of warehouse gross floor area (GFA);
  - 18,200 sqm of ancillary office GFA;
  - 200 sqm of café GFA;
  - 13 individual development lots for warehouse buildings with associated hardstand areas;
  - Internal road layouts and road connections to Aldington Road;
  - Provision for 1700 car parking spaces; and
  - Associated site landscaping.
- Detailed consent for site preparation, earthworks and infrastructure works (i.e. Stage 1 works) on the site, including:
  - Demolition and clearing of all existing built form structures;
  - Drainage and infill of existing farm dams and any ground dewatering;
  - Clearing of all existing vegetation;
  - Construction of a warehouse building with a total of 50,930 sqm of GFA, including:
    - 48,430 sqm of warehouse GFA;
    - 2,500 sqm of ancillary office GFA; and
    - 231 car parking spaces.
  - Bulk earthworks including 'cut and fill' to create flat development platforms for the warehouse buildings, and topsoiling and grassing / site stabilisation works;
  - Roadworks and access infrastructure;
  - Stormwater and drainage works including stormwater basins, diversion of stormwater lines, gross pollutant traps and associated swale works;
  - Sewer and potable water reticulation; and
  - Inter-allotment, road and boundary retaining walls.

The proposed warehouses are to include spaces for storage, distribution, and the like. The proposed warehouses are not designed for manufacturing or the like.

The site is located within the Penrith City Council region.



## 2 Existing Acoustic Environment

The site is located to the eastern side of Aldington Road which carries low traffic numbers associated with carrying local traffic.

The site is located within an area which is classified as a currently *Rural* area as defined in EPA's Noise Policy for Industry and includes the following (it is noted that the land and surrounds has now been rezoned to IN1 compared with existing rural residential):

1. An area with an acoustical environment that is dominated by natural sounds, having little or no road traffic noise and generally characterised by low background noise levels. Settlement patterns would be typically sparse.

The site is located in an area which would be defined as an *Industrial Interface* and defined within the EPA *Noise Policy for Industry INPFI*). The NPFI includes the following regarding these areas.

*The industrial interface assessment provisions recognise that a marginally reduced acoustic amenity is acceptable for existing residences co-located with existing industry, and that the availability of noise mitigation measures might be limited in these circumstances.*

*The industrial interface assessment generally applies only for existing situations (that is, an existing residential receiver near an existing industry that is proposing expansion or modification) and generally only for those residential receivers that are:*

- *in the immediate area surrounding the existing industry (that is, the region that extends from the boundary of the existing industry to the point where the noise level of the existing industry, measured at its boundary, has fallen by 5 dB or as agreed between the proponent and the relevant authority at the commencement of a noise impact assessment or related study), and*
- *where existing industrial noise levels (including noise from the premises under consideration) are above the relevant rural, suburban or urban recommended amenity noise levels.*

As part of this assessment an acoustic survey of the existing acoustic environment at the site was undertaken. The survey included attended noise level measurements at the site, during various times of the day on the 17<sup>th</sup> August 2020 as well as long term unattended noise logging at two locations which was undertaken between the 11<sup>th</sup> and 17<sup>th</sup> August 2020. During the testing periods of inclement weather have not been included in the assessment.

Noise logging was undertaken using a Rion NL-42EX type noise monitors with the following serial numbers and calibrations:

1. Logger 1 – Serial number 998079 and calibration number C19678
2. Logger 2 - Serial number 998081 and calibration number C19677

The noise logger locations include representative locations to the north and south of the site to obtain existing noise levels on the site as detailed in Figure 2 above. Both loggers were positioned such that it did not include façade corrects.

Attended noise level testing was conducted using a Bruel and Kjaer 2236C type meter. The meter was calibrated before and after testing and no significant drift was recorded.

## 2.1 Noise Survey Results

The attended and unattended noise locations were selected to obtain suitable noise levels for the assessment of background noise levels ( $L_{90(t)}$ ) as well as the impact from traffic movements ( $Leq(t)$ ). The results of the acoustic survey are detailed in the tables below which have been used as the basis of this assessment.

**Table 1 – Results of the Attended Noise Survey at the Site**

Measurement Location	Time of Measurement	$L_{Aeq, 15min}$ dB(A)	$L_{A90, 15min}$ dB(A)	Comments
Attended noise measurement location, Northern Location	9.05am to 9.20am	58	39	Noise level at the site dominated by vehicle movements on Aldington Road, surrounding land uses and natural sources
Attended noise measurement location, Southern Location	9.25am to 9.40am	56	41	



**Table 2 – Results of the Noise Logging at the Site**

Measurement Location	Time of Measurement	Maximum Repeatable L <sub>Aeq, 15min</sub> dB(A)	Representative Background noise Level (RBL) L <sub>A90, 15min</sub> dB(A)	Minimum assumed Representative Background Noise Levels L <sub>A90, 15min</sub> dB(A) <sup>1</sup>
Northern noise logger location, see figure 2 above	Day	42	30	35
	Evening	40	29	30
	Night	33	25	30
Southern noise logger location, see figure 2 above	Day	50	32	35
	Evening	35	31	30
	Night	35	30	30
<i>Note 1: Where background noise levels have been recorded below the minimum assumed representative background noise levels, the minimum RBL's have been used for the basis of the assessment as defined in the EPA Noise Policy for Industry</i>				

### 3 Internal Noise Level Criteria

Internal noise levels within the future development have been based on the relevant noise levels as detailed within the Australian Standard AS2107:2000 *Acoustics - Recommended design sound levels and reverberation times for building interiors*.

The recommended levels for various areas of the project are detailed in the following table. The recommended noise levels for packing and delivery areas of industrial developments detailed within AS2107:2016 have been used as the basis of this assessment.

**Table 3 - design Recommended design sound levels**

Type of Occupancy/Activity	Design sound level maximum ( $L_{Aeq,t}$ )
Industrial packaging and delivery areas	60
<i>Note: The relevant time period (t) for all areas detailed is 15 minutes.</i>	

### 4 Environmental Noise Intrusion Assessment

This section of the report details the assessment of environmental noise intrusion into the proposed development and the recommended acoustic treatments to ensure the recommended internal noise levels detailed in the Sections above are achieved.

Internal noise levels within the future areas of the development will result from the noise intrusion into the building through the external façade including glass, and other façade elements. Typically, the acoustic performance of building elements including the relatively light weight elements of the building façade, including glass and/or plasterboard constructions, will be the determining factors in the resulting internal noise levels.

Calculations of internal noise levels have been undertaken based on the measured environmental noise levels at the site and the characteristics of the building, including window openings, buildings constructions and the like.

## 4.1 External Glass Elements

The recommended acoustic constructions to the buildings external façade glass elements are detailed in the table below to ensure the recommended internal noise levels detailed above are achieved, with the façade building openings closed.

**Table 4 – External Glass Acoustic Requirements**

Façade Orientation	Level	Room Type	Recommended Glass Construction	Minimum Façade Acoustic Performance <sup>1</sup>
All Façade Orientation	All Levels	All Areas	4mm Float/Toughened	Rw 28
Note 1: The acoustic performance of the external façade includes the installed glazing and frame including (but not limited to) the façade systems seals and frame. All external glazing systems are required to be installed using acoustic bulb seals.				

The recommended glass constructions detailed in the table above include those required to ensure the acoustic requirements of the project are achieved. Thicker glazing may be required to achieve other project requirements such as structural, thermal, safety or other requirements and is to be advised by others.

## 4.2 External Building Elements

The proposed external building elements including standard light weight walls and roof construction are acoustically acceptable without additional acoustic treatment including metal sheeting or solid external wall cladding.

## 4.3 External Roof

The proposed standard light weight metal deck roof is acoustically acceptable to ensure internal noise levels are achieved without additional treatments.

## 5 External Noise Emission Assessment

This section of the report details the relevant noise level criteria for noise emissions generated on the site once completed.

The relevant authority which provides the required noise level criteria for noise levels generated on the site includes the NSW Environmental Protection Authority's (EPA) Noise Policy for Industry (NPfI).

### 5.1 NSW Environmental Protection Authority, Noise Policy for Industry

The NSW Environmental Protection Authority (EPA) Noise Policy for Industry (NPfI), previously Industrial Noise Policy, details noise criteria for the control of noise generated from the operation of developments and the potential for impact on surrounding receivers.

The NPI includes both intrusive and amenity criteria which are summarised below.

1. Intrusive noise level criteria, The NPfI states the following:

*'The intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (represented by the LAeq descriptor), measured over a 15minute period, does not exceed the background noise level by more than 5 dB when beyond a minimum threshold. This intrusiveness noise level seeks to limit the degree of change a new noise source introduces to an existing environment.'*

2. Amenity noise level criteria, The NPfI states the following:

*'To limit continuing increases in noise levels from application of the intrusiveness level alone, the ambient noise level within an area from all industrial noise sources combined should remain below the recommended amenity noise levels specified in Table 2.2 where feasible and reasonable. The recommended amenity noise levels will protect against noise impacts such as speech interference, community annoyance and some sleep disturbance.'*

*Project amenity noise level for industrial developments = recommended amenity noise level (Table 2.2) minus 5 dB(A)*

*Where the resultant project amenity noise level is 10 dB or more lower than the existing industrial noise level. In this case the project amenity noise levels can be set at 10 dB below existing industrial noise levels if it can be demonstrated that existing industrial noise levels are unlikely to reduce over time.*

*The LAeq is determined over a 15-minute period for the project intrusiveness noise level and over an assessment period (day, evening and night) for the project amenity noise level. This leads to the situation where, because of the different averaging periods, the same numerical value does not necessarily represent the same amount of noise heard by a person for different time periods. To standardise the time periods for the intrusiveness and amenity noise levels, this policy assumes that the LAeq,15min will be taken to be equal to the LAeq, period + 3 decibels (dB), unless robust evidence is provided for an alternative approach for the particular project being considered.*

*Project amenity noise level (ANL) is urban ANL (Table 2.1) minus 5 dB(A) plus 3 dB(A) to convert from a period level to a 15-minute level (dB = decibel; dB[A] = decibel [A-weighted]; RBL = rating background noise level).*

Noise level used in the assessment of noise emission from the site have been based on the noise level survey conducted at the site and detailed in this section of the report.

Consequently, the resulting noise level criteria are summarised in the table below. The criteria are nominated for the purpose of determining the operational noise limits for the operation of the site including mechanical plant associated with the development which can potentially affect noise sensitive receivers and operational noise levels from the future tenancies. For each assessment period, the lower (i.e. the more stringent) of the amenity or intrusive criteria are adopted. The calculated *Project Amenity Noise Level* includes either the Recommended Amenity Noise Level minus 5 dB(A) plus 3 dB(A) (for a 15minum period) or the measured existing Leq noise level – 10 dB if this is greater as determined by the NPfI.

**Table 5 – External Noise Level Criteria in Accordance with the NSW NPfI**

Location	Time of Day	Project Amenity Noise Level, LAeq, period <sup>1</sup> (dBA)	RBL LA90, 15 min dBA <sup>2</sup>	Measured LAeq, period Noise Level (dBA)	Intrusive LAeq, 15 min Criterion for New Sources (dBA)
Rural residences Northern Locations	Day	48	35	42	<b>40</b>
	Evening	43	30	40	<b>35</b>
	Night	38	30	33	<b>35</b>
Rural residences Western Locations	Day	48	35	50	<b>40</b>
	Evening	43	30	35	<b>35</b>
	Night <sup>4</sup>	38	30	35	<b>35</b>
Rural residences Southern Locations	Day	48	40	50	<b>40</b>
	Evening	43	35	35	<b>35</b>
	Night	38	35	35	<b>35</b>
<p>Note 1: Project Amenity Noise Levels corresponding to "Rural" areas, recommended noise levels.</p> <p>Note 2: LA90 Background Noise or Rating Background Level based on the assumed minimum rating of the EPA NPfI.</p> <p>Note 3: Project Noise Trigger Levels are shown in bold</p>					

## 5.2 Sleep Disturbance

This section of the report details the relevant sleep disturbance noise level criteria for the assessment of noise emissions from the site during night-time hours. The assessment of sleep disturbance includes intermittent noise levels from operations such as deliveries and vehicle movements on the site during night-time periods.

The EPA's *Industrial Noise Policy for Industry* (NPfI) and the *NSW Road Noise Policy* (RNP) includes suitable criteria for the assessment of potential sleep awakening events, which have been used as the basis of this report.

The NPfI includes the following commentary regarding possible sleep awakening events:

### 2.5 Maximum noise level event assessment

*The potential for sleep disturbance from maximum noise level events from premises during the night-time period needs to be considered. Sleep disturbance is considered to be both awakenings and disturbance to sleep stages.*

*Where the subject development/premises night-time noise levels at a residential location exceed:*

- *LAeq,15min **40 dB(A)** or the prevailing RBL plus 5 dB, whichever is the greater, and/or*

- $L_{AFmax}$  52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,

*A detailed maximum noise level event assessment should be undertaken. The detailed assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the rating background noise level, and the number of times this happens during the night-time period. Some guidance on possible impact is contained in the review of research results in the NSW Road Noise Policy.*

The RNP includes the following comments regarding sleep disturbance:

*From the research on sleep disturbance to date it can be concluded that:*

- *maximum internal noise levels below 50–55 dB(A) are unlikely to awaken people from sleep*
- *one or two noise events per night, with maximum internal noise levels of 65–70 dB(A), are not likely to affect health and wellbeing significantly.*

Based on the details of the relevant standards detailed above a summary of the sleep disturbance noise level criteria is detailed in the following table.

**Table 6 – Sleep Disturbance Criteria**

Type of Receiver	Location	Policy	Description	Noise Level
Residential Receiver	Within the residential dwelling	Road Noise Policy	1 or 2 events unlikely to awaken people from sleep	65-70 dB(A) $L_{max}$
			Maximum internal noise unlikely to awaken people from sleep	50-55 dB(A) $L_{max}$
	External Noise levels	Noise Policy for Industry	The potential for sleep disturbance from maximum noise level events	$L_{Aeq,15min}$ 40 dB(A)
				$L_{AFmax}$ 52 dB(A) Or $L_{AFmax}$ 55 dB(A)

Based on the details included within the NPfI and the RNP in the event a noise level of 55-59 dB(A)  $L_{max}$  or 49  $L_{Aeq 15 min}$  does not occur as a result of the use of the operation of the property (internally within the residential receiver) then noise levels are *unlikely to awaken people from sleep* and compliance with the requirements of the NPfI and the RNP regarding sleep disturbance would be achieved.

## 6 Noise Impact Assessment

An assessment of noise generated on the site has been undertaken on this section of the report. The assessment of noise levels generated on the site are summarised below:

1. **Mechanical Services Equipment** – At this stage of the project, the location of major plant items have been selected, however the exact selection to be installed is not known. As such a detailed assessment of noise associated from engineering services cannot be undertaken.

To ensure that future selections of plant items meet external noise levels at neighbouring properties a proof of concept approach has been considered.

In our experience, for this type of development the following mechanical systems may be installed, and their associated sound power levels are outlined below.

- Ventilation fans – 80dB(A) (Lw)
- Toilet exhaust fans – 45dBA (Lw)
- Air Conditioning Condensers – 80dBA (Lw)

For the proposed ventilation systems, it is anticipated that the physical fans would be installed on a plant area of the roof of the project with mechanical ductwork moving air from the warehouses areas to the roof as required. A dedicated plant deck area will be provided on the roof of each warehouse.

On the assumption of the Sound Power Level above and the ductwork that is installed is acoustically treated with 50mm internal lining or attenuators (depending on the exact location), compliance would be achieved.

Toilet exhaust fans for the units will individually discharge from the amenity areas of the future warehouses using in ceiling or roof top mounted fans. It is recommended that 1m with acoustic flexible ducting is used on the intake and discharge side of the fan or a section of internally lined ductwork, on this assumption compliance would be achieved.

Roof op plant areas for individual warehouse amenities (office areas) would be provided using condensers located on the roof or ground level. It is expected that each warehouse will include a number of administration areas which will require condenser equipment. Providing this equipment is located on ground level with a line of sight barrier to neighbouring residential properties if located within 25m, or an acoustic screen is included to any condenser equipment located on the roof then the resulting noise emissions will comply with the relevant noise emission criteria.



Details of the required mechanical services equipment and acoustic treatments to ensure the relevant noise level criteria is achieved will be provided as part of the *Construction Certificate* submission of the project.

Experience with similar projects confirms that the acoustic treatment of mechanical services is both possible and practical to ensure noise emission criteria is achieved.

Expected noise levels from the operation of mechanical plant are detailed in the *Predicted Noise Emissions* section of this report below.

2. **Use of the Warehouses, Internally** – The proposed future use of the warehouses will include spaces with the potential for materials movement and storage. The future use of each warehouse will include the potential for the following equipment of the site, including expected noise levels:
- Material handling equipment (forklifts) for each warehouse, with a noise levels of up to 90 dB(A) (SWL).
  - Heavy and light vehicle movements to each warehouse with a noise level of up to 95 dB(A).

Expected noise levels from the internal use of warehouses are detailed in the *Predicted Noise Emissions* section of this report below.

3. **Use of the Warehouses, Externally** - For the purpose of this assessment it has been assumed that the use of the external hardstand areas of the project will be used at all times. The proposed hard stand areas for the warehouse areas is included in the figure below.

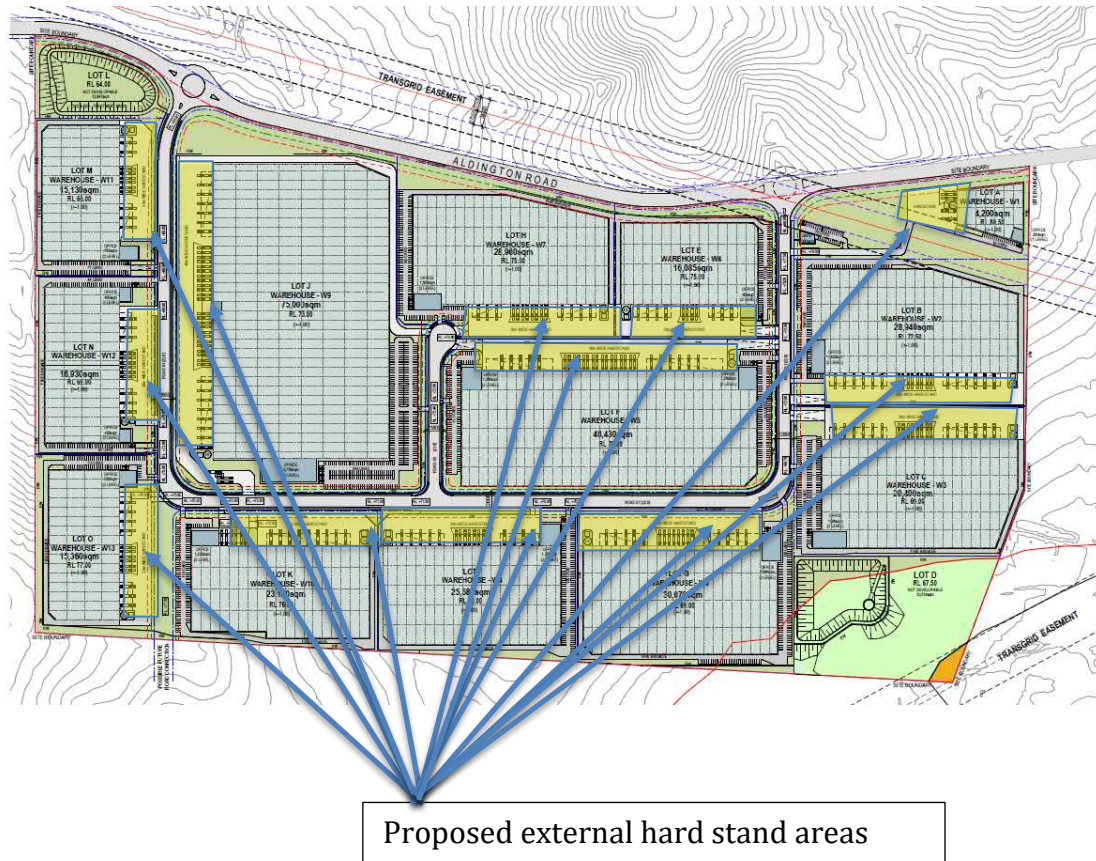


Figure 4 – Proposed Hardstand External Areas

The assessment of noise emissions from the use of the external areas of the project has been undertaken based on the following assumptions:

1. During daytime and evening periods area each hard stand can be used simultaneously by up to 5 trucks and 2 forklifts at any one time for each warehouse.
2. During night-time hours the hard stands can be used simultaneously including 1 truck and 1 forklift for each warehouse.
3. The noise levels resulting from the use of the external areas will include a source noise (sound power levels) of 90 dB(A) for forklifts and 105 dB(A) for trucks.

It is noted that the proposed layout of the proposed facility may include the future warehouses which may result in an acoustic screening from the use of the hardstand areas to the potentially worst affected residential receivers within the vicinity of the site.

Expected noise levels from the external use of warehouses are detailed in the *Predicted Noise Emissions* section of this report below.

4. **Traffic Movements on the Site** - An assessment of the resulting noise levels from traffic movements within the development has been undertaken. The assessment has included the expected parking numbers for the future development, including parking numbers as detailed in the table below and included in Appendix D.

**Table 7 – Proposed Parking Numbers**

<b>Warehouse Number</b>	<b>Proposed Car parking Numbers</b>
Lot A	49
Lot B	134
Lot C	136
Lot D	Not developed
Lot E	75
Lot F	224
Lot G	138
Lot H	142
Lot I	120
Lot J	344
Lot K	110
Lot L	Not Developed
Lot M	71
Lot N	84
Lot O	73
Total	1711

For the purpose of this assessment the following assumptions regarding the use of the carparking has been included as part of this assessment:

1. During day time periods the maximum use of the carparking areas will include all car parking spaces being used in any 1 hour period.
2. During night time hours 20% of the carparking spaces will be use in any 1 hour period.
3. The assessment include predicted noise levels resulting from the use of the carparking areas using a FHWA model, results are included in *Predicted Noise Emissions* section of this report below.

## **6.1 Predicted Noise Emissions**

This section of the report details the resulting predicted noise emissions from the operation of the proposed site to the surrounding receivers, including the sources detailed in the section above and the receiver locations detailed in Figure 2 of this report.

The receiver locations have been selected as the potentially worst affected locations and compliance at these locations represents compliance at all surrounding locations.

The assessment includes the potentially worst-case periods including the following the use of all warehouses simultaneously including the conditions detailed in the section above.

Predictions have been undertaken for the contribution of noise from the proposed development for the various are which are detailed in the following tables.

**Table 8 – External Noise Emission Predictions – Mechanical Services Equipment**

Receiver Location	Time of Day	Predicted Noise Emissions LAeq, 15min (dBA)														Cumulative Predicted Noise Levels LAeq, 15min (dBA)	Project Noise Level Criteria LAeq, 15min (dBA)
		Warehouse Source															
		A	B	C	E	F	G	H	I	J	K	M	N	O			
1	Day	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21	23.9	40
	Evening	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21	23.9	35
	Night	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21	23.9	35
2	Day	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	40
	Evening	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	35
	Night	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	35
3	Day	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	40
	Evening	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	35
	Night	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	35
4	Day	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	40
	Evening	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	35
	Night	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	35
5	Day	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	40
	Evening	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	35
	Night	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	35
6	Day	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	40
	Evening	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	35
	Night	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	21.1	35

**Table 9 – External Noise Emission Predictions – Internal Warehouse Noise Activities**

Receiver Location	Time of Day	Predicted Noise Emissions LAeq, 15min (dBA)														Cumulative Predicted Noise Levels LAeq, 15min (dBA)	Project Noise Level Criteria LAeq, 15min (dBA)
		Warehouse Source															
		A	B	C	E	F	G	H	I	J	K	M	N	O			
1	Day	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	18	20	24.4	40	
	Evening	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	18	20	24.4	35	
	Night	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	18	20	24.4	35	
2	Day	<10	<10	<10	<10	<10	<10	<10	<10	20	<10	19	<10	<10	24.6	40	
	Evening	<10	<10	<10	<10	<10	<10	<10	<10	20	<10	19	<10	<10	24.6	35	
	Night	<10	<10	<10	<10	<10	<10	<10	<10	20	<10	19	<10	<10	24.6	35	
3	Day	<10	<10	<10	<10	<10	<10	20	<10	<10	<10	<10	<10	<10	23.4	40	
	Evening	<10	<10	<10	<10	<10	<10	20	<10	<10	<10	<10	<10	<10	23.4	35	
	Night	<10	<10	<10	<10	<10	<10	20	<10	<10	<10	<10	<10	<10	23.4	35	
4	Day	<10	<10	<10	<10	<10	<10	20	<10	<10	<10	<10	<10	<10	23.4	40	
	Evening	<10	<10	<10	<10	<10	<10	20	<10	<10	<10	<10	<10	<10	23.4	35	
	Night	<10	<10	<10	<10	<10	<10	20	<10	<10	<10	<10	<10	<10	23.4	35	
5	Day	20	19	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	23.4	40	
	Evening	20	19	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	23.4	35	
	Night	20	19	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	23.4	35	
6	Day	20	19	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	24.6	40	
	Evening	20	19	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	24.6	35	
	Night	20	19	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	24.6	35	

**Table 10 – External Noise Emission Predictions – External (Hard Stand) Warehouse Noise Activities**

Receiver Location	Time of Day	Predicted Noise Emissions LAeq, 15min (dBA)														Cumulative Predicted Noise Levels LAeq, 15min (dBA)	Project Noise Level Criteria LAeq, 15min (dBA)
		Warehouse Source															
		A	B	C	E	F	G	H	I	J	K	M	N	O			
1	Day	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	25	30	31.5	40	
	Evening	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	25	30	31.5	35	
	Night	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	23	28	29.7	35	
2	Day	<10	<10	<10	<10	<10	<10	<10	<10	28	<10	28	<10	<10	31.4	40	
	Evening	<10	<10	<10	<10	<10	<10	<10	<10	28	<10	28	<10	<10	31.4	35	
	Night	<10	<10	<10	<10	<10	<10	<10	<10	26	<10	26	<10	<10	29.6	35	
3	Day	<10	<10	<10	21	<10	<10	21	<10	15	<10	17	<10	<10	26.3	40	
	Evening	<10	<10	<10	21	<10	<10	21	<10	15	<10	17	<10	<10	26.3	35	
	Night	<10	<10	<10	19	<10	<10	19	<10	13	<10	15	<10	<10	25.4	35	
4	Day	23	21	<10	21	19	<10	21	<10	<10	<10	<10	<10	<10	28.7	40	
	Evening	23	21	<10	21	19	<10	21	<10	<10	<10	<10	<10	<10	28.7	35	
	Night	21	19	<10	19	<10	<10	19	<10	<10	<10	<10	<10	<10	27.1	35	
5	Day	30	28	<10	19	15	<10	<10	<10	<10	<10	<10	<10	<10	32.6	40	
	Evening	30	28	<10	19	15	<10	<10	<10	<10	<10	<10	<10	<10	32.6	35	
	Night	28	26	<10	17	13	<10	<10	<10	<10	<10	<10	<10	<10	30.8	35	
6	Day	25	30	29	17	17	<10	<10	<10	<10	<10	<10	<10	<10	33.6	40	
	Evening	25	30	29	17	17	<10	<10	<10	<10	<10	<10	<10	<10	33.6	35	
	Night	23	28	27	15	15	<10	<10	<10	<10	<10	<10	<10	<10	31.7	35	

Table 11 – External Noise Emission Predictions – External Parking

Receiver Location	Time of Day	Predicted Noise Emissions LAeq, 15min (dBA)													Cumulative Predicted Noise Levels LAeq, 15min (dBA)	Project Noise Level Criteria LAeq, 15min (dBA)
		Warehouse Source														
		A	B	C	E	F	G	H	I	J	K	M	N	O		
1	Day	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	37	39	31.5	40
	Evening	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	29	31	31.5	35
	Night	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	29	31	29.7	35
2	Day	<10	<10	<10	<10	<10	<10	23	<10	11	<10	12	<10	<10	31.4	40
	Evening	<10	<10	<10	<10	<10	<10	15	<10	<10	<10	<10	<10	<10	31.4	35
	Night	<10	<10	<10	<10	<10	<10	15	<10	<10	<10	<10	<10	<10	29.6	35
3	Day	<10	<10	<10	<10	<10	<10	27	<10	11	<10	17	<10	<10	26.3	40
	Evening	<10	<10	<10	<10	<10	<10	19	<10	<10	<10	<10	<10	<10	26.3	35
	Night	<10	<10	<10	<10	<10	<10	19	<10	<10	<10	<10	<10	<10	25.4	35
4	Day	15	11	<10	26	<10	<10	16	<10	<10	<10	<10	<10	<10	28.7	40
	Evening	<10	<10	<10	18	<10	<10	<10	<10	<10	<10	<10	<10	<10	28.7	35
	Night	<10	<10	<10	18	<10	<10	<10	<10	<10	<10	<10	<10	<10	27.1	35
5	Day	18	14	<10	18	11	<10	<10	<10	<10	<10	<10	<10	<10	32.6	40
	Evening	11	<10	<10	11	<10	<10	<10	<10	<10	<10	<10	<10	<10	32.6	35
	Night	11	<10	<10	11	<10	<10	<10	<10	<10	<10	<10	<10	<10	30.8	35
6	Day	16	12	<10	11	<10	<10	<10	<10	<10	<10	<10	<10	<10	33.6	40
	Evening	12	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	33.6	35
	Night	12	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	31.7	35



**Table 12 – External Noise Emission Predictions – Cumulative Noise Impacts**

Location	Time of Day	Predicted Noise Emissions LAeq, 15min (dBA) - Noise Source				Cumulative Predicted Noise Levels LAeq, 15min (dBA)	Project Noise Level Criteria LAeq, 15min (dBA)
		Internal	External	Plant Noise	External Parking		
1	Day	23.9	24.4	31.5	41.2	41.8 <sup>1</sup>	40
	Evening	23.9	24.4	29.7	33.4	35.6 <sup>2</sup>	35
	Night	23.9	24.4	29.7	33.4	35.6 <sup>2</sup>	35
2	Day	21.1	24.6	31.4	25.2	33.3	40
	Evening	21.1	24.6	29.6	21.8	31.7	35
	Night	21.1	24.6	29.6	21.8	31.7	35
3	Day	21.1	23.4	26.3	28.0	31.5	40
	Evening	21.1	23.4	25.4	23.0	29.5	35
	Night	21.1	23.4	25.4	23.0	29.5	35
4	Day	21.1	23.4	28.7	27.6	32.2	40
	Evening	21.1	23.4	27.1	22.6	30.2	35
	Night	21.1	23.4	27.1	22.6	30.2	35
5	Day	21.1	23.4	32.6	24.0	33.9	40
	Evening	21.1	23.4	30.8	21.3	32.2	35
	Night	21.1	23.4	30.8	21.3	32.2	35
6	Day	21.1	24.6	33.6	22.3	34.6	40
	Evening	21.1	24.6	31.7	21.3	33.1	35
	Night	21.1	24.6	31.7	21.3	33.1	35

Based on the assessment of external noise emissions the resulting impact on the surrounding receivers will be comply with the relevant noise emission criteria, with exception to location 1 which include the following notes:

1. Note 1 – Day time noise levels in the event that all operations are conducted simultaneous with the maximum expected noise levels may include a noise level of 41.8 dB(A) Leq which is 1.8 dB above the NPfI noise emission level. The resulting noise level is similar to a magnitude of noise which less than existing noise sources at the site such as wind noise, natural noise sources and other noise levels resulting from activities within the local area. A magnitude of noise of 41.8 dB(A) represents a quiet noise which is similar to a low voice or the like. Based on the predicted noise level the resulting impact will not negatively impact on the amenity of the adjacent residential receiver and is therefore acoustically acceptable.
2. Note 2 – evening and night time noise levels in the event that all operations are conducted simultaneous with the maximum expected noise levels may include a noise level of 35.6 dB(A) Leq which is 0.6 dB above the NPfI noise emission level. The resulting noise level will not be perceivable above the equivalent criteria of 35 dB(A) and will not negatively impact on the amenity of the adjacent residential receiver and is therefore acoustically acceptable.

It is noted that predictions have been based on the possible maximum operating conditions. In the event the future warehouses do not include activities generating maximum noise levels or do not operate simultaneously a reduction in the predicted noise levels above will result.

### 6.1.1 Sleep Disturbance Assessment

Based on the proposed use of the site an assessment of potential for a sleep disturbance event has been undertaken. The assessment includes the potential for a maximum noise level from a heavy vehicle on the site within the closest proximity of the site to neighbours opposite the site. The sample calculation for potential maximum sleep disturbance noise levels are included below.

**Table 13 – Sleep Disturbance Noise Calculation to Residential Receiver**

	Noise Level
Noise Source – Vehicle Movement	105 dB(A) Lmax
Distance Correction (120m)	-49.6
Correction for open window of neighbours building	-6
Resulting Noise Level within bedroom	49.4 dB(A) Lmax
<i>unlikely to awaken people from sleep</i> Noise Level	50 dB(A) Lmax

Based on the results of the assessment detailed above the resulting maximum noise level from the operation of the site will comply with the relevant criteria for sleep disturbance and will be acceptable.

The assessment includes the assumption that there is no line of sight barrier and the activity is being used at the closest location from the site. In the event there is an additional distance or a line of sight barrier from activities on the site (including future buildings on the site) then the resulting maximum noise levels will be less than that detailed in the table above.

## **6.2 Recommended Acoustic Mitigations**

The recommended mitigations and management controls should be included in the design, construction and operation of the site (in addition to those included in the sections above) to ensure suitable on-going operation of the site include the following:

1. All external hardstand, driveways and the like should include a surface which does not include speed humps or the like.
2. Any grates or metal drainage points should be securely fixed to prevent movement as vehicles pass over.
3. All external surfaces being used for vehicles and forklifts should be brush finishes (ie not polished or painted).
4. Any expansion joints should include flush finishes including cover plates where vehicles pass over as identified by the acoustic engineer during the detailed design of the building.
5. A site contact should be provided to residence for complaints.

## 7 Additional Traffic Noise on Surrounding Roadways

This section of the report details the assessment of future traffic noise on surrounding streets as a result of vehicles using the site.

The suitable noise criteria for the assessment of road traffic noise generated by vehicles using the site are set out in the NSW Government's NSW Road Noise Policy (RNP). Table 3 of the standard details the assessment criteria to be applied at residences potentially impacted by additional traffic volumes based on the road category and land use. The relevant noise criteria is detailed in the table below.

Table 3 Road traffic noise assessment criteria for residential land uses

Road category	Type of project/land use	Assessment criteria – dB(A)	
		Day (7 a.m.–10 p.m.)	Night (10 p.m.–7 a.m.)
Freeway/ arterial/ sub-arterial roads	1. Existing residences affected by noise from new freeway/arterial/sub-arterial road corridors	L <sub>Aeq</sub> , (15 hour) 55 (external)	L <sub>Aeq</sub> , (9 hour) 50 (external)
	2. Existing residences affected by noise from redevelopment of existing freeway/arterial/sub-arterial roads	L <sub>Aeq</sub> , (15 hour) 60 (external)	L <sub>Aeq</sub> , (9 hour) 55 (external)
	3. Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments		
Local roads	4. Existing residences affected by noise from new local road corridors	L <sub>Aeq</sub> , (1 hour) 55 (external)	L <sub>Aeq</sub> , (1 hour) 50 (external)
	5. Existing residences affected by noise from redevelopment of existing local roads		
	6. Existing residences affected by additional traffic on existing local roads generated by land use developments		

Note: Land use developers must meet internal noise goals in the Infrastructure SEPP (Department of Planning NSW 2007) for sensitive developments near busy roads (see Appendix C10).

In addition to the table above the RNP includes criteria for sites where existing noise levels exceed those levels detailed in the table above. Section 3.4.1 *Process of applying the criteria* includes the following:

*For existing residences and other sensitive land uses affected by additional traffic on existing roads generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB above that of the corresponding 'no build option'.*

The future form and use of Aldington Road is yet to be confirmed. Aldington Road may connect to a future arterial road way and until this is known there would be limited value in estimating existing traffic numbers as future traffic numbers using the roadway could include an Annual Average Daily Traffic (AADT) of 2,000 to 20,000 AADT. This assessment includes the current conditions of traffic noise at the site.

Based on the exiting noise levels measured at the site and detailed in this report the relevant criteria for additional traffic noise will be based on the 2 dB objective above exiting noise levels and are detailed in the table below.

**Table 14 – Additional Traffic Noise Criteria**

Measurement Location	Time of Measurement	Maximum Repeatable $L_{Aeq, 15min}$ dB(A)	Sub arterial Road Criteria	Resulting Additional Traffic Noise Criteria
Residence Opposite on Addington Road, Locations 2 detailed in Figure 2 of this report	Day	50	60	60
	Night	35	55	55

Based on the proposed development and potential traffic generated by use of the site the following assumption have been made:

1. Day time Worst 1 hour periods may include all available carparking entering or exiting the site in 1 hour period as well as possible truck movements including the following:
  - a. Additional car and small vans using the site – Up to 1783
  - b. Heavy trucks and semi reticulated trucks – Up to 30
2. Night time Worst 1 hour periods may include up to 20% of the available carparking entering or exiting the site in 1 hour period as well as possible truck movements including the following:
  - a. Additional car and small vans using the site – 356
  - b. Heavy trucks and semi reticulated trucks – Up to 15

Based on the expected use of the site the calculated future traffic noise levels are detailed in the table below.

**Table 15 – Calculated Future Additional Traffic Noise Levels**

Location	Time of Measurement	Additional Traffic Noise Criteria $L_{Aeq, 1 hr}$ dB(A)	Calculated Traffic Noise Levels $L_{Aeq, 1 hr}$ dB(A)
Residence opposite the site on Aldington Road	Day	60	52
	Night	55	45

Based on the results of the additional traffic assessment the proposed development will be compliant with the relevant RNP criteria.

The table below details the sample calculation of the CORTN calculation undertaken for the day time and night-time periods for the potentially impacted receivers west of the site opposite on Aldington Road (see figure 2 above).

It is noted that the future areas of the development will be developed to include industrial use.

**Table 16 – CORTN Calculations – Residence to the West on Aldington Road (Location 2)**

Descriptor	Day time period	Night Time Period
Number of Vehicle Movements <sup>1</sup>	1900	380
Percentage of Heavy Vehicles	5%	5%
Expected Speed	70 km/h	70 km/h
Receiver Height above ground	1.5m	1.5m
Angle of View	180°	180°
Gradient of Road	Flat	Flat
Façade Corrections	Non	Non
Barrier Corrections	Non	Non
Distance to building façade	100m	100m
<b>Predicted Noise Level</b>	<b>51.7 dB(A)</b> L <sub>Aeq</sub> (1 hour)	<b>44.7 dB(A)</b> L <sub>Aeq</sub> (1 hour)
Project Criteria	60 dB(A) L <sub>Aeq</sub> (1 hour)	55 dB(A) L <sub>Aeq</sub> (1 hour)
<i>Note 1 – Including future traffic numbers in addition to existing traffic movements.</i>		

Based on the assessment of additional traffic numbers on Aldington Road the resulting noise levels from additional traffic numbers associated with the site will comply with the requirements of the RNP criteria.

## 8 Construction Noise and Vibration Management Plan

This section of the report details the assessment of noise associated with the proposed demolition activities associated with the development. The assessment has been undertaken to assess the potential noise impacts from construction and demolition on surrounding receivers to the site.

The proposed construction and demolition activities to be undertaken on the site include the removal of the existing buildings and construction of the new development. The development will then be constructed using normal construction processes.

The EPA's Interim Construction Noise Guideline defines normal day time hours as the following:

### 2.2 Recommended standard hours

The recommended standard hours for construction work are shown in Table 1; however, they are not mandatory. There are some situations, as described below, where construction work may need to be undertaken outside of these hours. The likely noise impacts and the ability to undertake works during the recommended standard hours should be considered when scheduling work.

**Table 1:** Recommended standard hours for construction work

Work type	Recommended standard hours of work*
Normal construction	Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays
Blasting	Monday to Friday 9 am to 5 pm Saturday 9 am to 1 pm No blasting on Sundays or public holidays

\* The relevant authority (consent, determining or regulatory) may impose more or less stringent construction hours.

It is noted that alternative construction hours may be approved for the site and including the projects *Conditions of Consent*.



## 8.1 Proposed Appliances

The proposed appliances which will be used as part of the demolition required as part of the development are detailed in the table below (including internal strip out/demolition):

**Table 17 – Noise Level from Expected Demotion Appliances**

Tasks	Equipment	Sound Power Levels per task dB(A) L <sub>10</sub>	Aggregate Sound Power Level per Task dB(A) L <sub>10</sub>
Site Demolition and Earth works	Jack hammer mounted on skid steer	118	122
	Hand held jack hammer	111	
	Concrete saw	119	
	Skid steer	110	
	Power hand tools	109	
	Excavators	115	
	Trucks	110	
	Earth Rollers	112	
Construction Works	Piling	115	120
	Welder	101	
	Saw cutter	109	
	Dump truck	109	
	Concrete saw	119	
	Power hand tools	109	
	Cranes	110	
Notes: Noise levels of proposed equipment to be used on the site based on the Australian Standard AS2436-2010 and noise level measurements previously undertaken of similar equipment on construction sites.			

## 8.2 Construction Noise Criteria

This section of the report details the relevant construction noise criteria which is applicable to the site.

### 8.2.1 Interim Construction Noise Guideline

Noise criteria for construction and demolition activities are discussed in the *Interim Construction Noise Guideline* (ICNG). The ICNG also recommends procedures to address potential impacts of construction noise on residences and other sensitive land uses. The main objectives of the ICNG are summarised as follows:

- Promote a clear understanding of ways to identify and minimise noise from construction works;
- Focus on applying all “feasible” and “reasonable” work practices to minimise construction noise impacts;
- Encourage construction to be undertaken only during the recommended standard hours unless approval is given for works that cannot be undertaken during these hours;
- Streamline the assessment and approval stages and reduce time spent dealing with complaints at the project implementation stage; and
- Provide flexibility in selecting site-specific feasible and reasonable work practices in order to minimise noise impacts.

The ICNG contains a quantitative assessment method which is applicable to this project. Guidance levels are given for airborne noise at residences and other sensitive land uses.

The quantitative assessment method involves predicting noise levels at sensitive receivers and comparing them with the Noise Management Levels (NMLs). The NML affectation categories for receivers have been reproduced from the guideline and are listed in the table below.

**Table 18 – Noise Management Levels from Construction – Quantitative Assessment**

Receiver Type	Time of Day	Noise Management Level LAeq(15minute) <sup>1,2</sup>	How to Apply
Residential	Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	<p>The noise affected level represents the point above which there may be some community reaction to noise.</p> <ul style="list-style-type: none"> <li>Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level.</li> <li>The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.</li> </ul>
		Highly noise affected 75 dBA	<p>The highly noise affected level represents the point above which there may be strong community reaction to noise.</p> <ul style="list-style-type: none"> <li>Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: <ol style="list-style-type: none"> <li>Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences).</li> <li>If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.</li> </ol> </li> </ul>
	Outside recommended standard hours	Noise affected RBL + 5 dB	<ul style="list-style-type: none"> <li>A strong justification would typically be required for works outside the recommended standard hours.</li> <li>The proponent should apply all feasible and reasonable work practices to meet the noise affected level.</li> <li>Where all feasible and reasonable practices have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.</li> </ul>

Table 18 – Continued

Receiver Type	Time of Day	Noise Management Level LAeq(15minute) <sup>1,2</sup>	How to Apply
Industrial Receivers	When is use	LAeq (15 min) 75 dB(A)	During construction, the proponent should regularly update the occupants of the commercial and industrial premises regarding noise levels and hours of work.
<p><i>Note 1</i> Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.</p> <p><i>Note 2</i> The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the NSW Industrial Noise Policy (EPA 2000).</p>			

Based on the table above the suitable construction noise management levels for works undertaken on the site is detailed in Table 14 below.

Table 19 – Site Construction Noise Management Levels

Noise Source	Time Period	Receiver Type	Construction Noise Management Level	'High Noise Affected' Level
Construction Noise	Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Residential	63 dB(A) LAeq (15min)	75 dB(A) LAeq (15min)
	When in Use	Industrial Receivers	75 dB(A) Leq (15 min)	
<i>Note 1: Construction noise management levels based on the Interim Construction Noise Guideline</i>				

### 8.3 Construction Vibration Criteria

Effects of ground borne vibration on buildings may be segregated into the following three categories:

- Human comfort – vibration in which the occupants or users of the building are inconvenienced or possibly disturbed. Refer to further discussion in Section 7.3.1.
- Effects on building contents – where vibration can cause damage to fixtures, fittings and other non-building related objects. Refer to further discussion in Section 7.3.2 and 7.3.3.
- Effects on building structures – where vibration can compromise the integrity of the building or structure itself. Refer to further discussion in Section 7.3.2 and 7.3.3.

#### 8.3.1 Vibration Criteria – Human Comfort

Vibration effects relating specifically to the human comfort aspects of the project are taken from the guideline titled “*Assessing Vibration – A Technical Guideline*”. (AVTG) This type of impact can be further categorised and assessed using the appropriate criterion as follows:

- Continuous vibration – from uninterrupted sources (refer to Table 20).
- Impulsive vibration – up to three instances of sudden impact e.g. dropping heavy items, per monitoring period (refer to Table 16).
- Intermittent vibration – such as from drilling, compacting or activities that would result in continuous vibration if operated continuously (refer to Table 22).

**Table 20 Continuous vibration acceleration criteria (m/s<sup>2</sup>) 1 Hz-80 Hz**

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day or night-time	0.020	0.014	0.040	0.028
		0.04	0.029	0.080	0.058
Workshops	Day or night-time	0.04	0.029	0.080	0.058

**Table 21 Impulsive vibration acceleration criteria (m/s<sup>2</sup>) 1 Hz-80 Hz**

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day or night-time	0.64	0.46	1.28	0.92
Workshops	Day or night-time	0.64	0.46	1.28	0.92

**Table 22 Intermittent vibration impacts criteria (m/s<sup>1.75</sup>) 1 Hz-80 Hz**

Location	Daytime		Night-time	
	Preferred Values	Maximum Values	Preferred Values	Maximum Values
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

### 8.3.2 Vibration Criteria – Building Contents and Structure

The vibration effects on the building itself are assessed against international standards as follows:

- For transient vibration: British Standard BS 7385: Part 2-1993 “Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration” (BSI 1993); and
- For continuous or repetitive vibration: German DIN 4150: Part 3 – 1999 “Effects of Vibration on Structure” (DIN 1999).

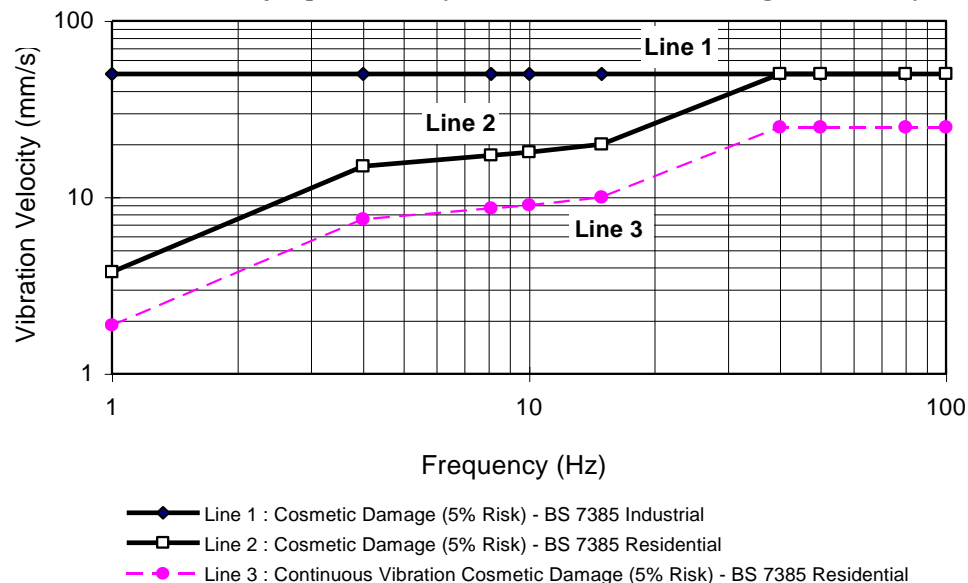
### 8.3.3 Standard BS 7385 Part 2 - 1993

For transient vibration, as discussed in standard BS 7385 Part 2-1993, the criteria are based on peak particle velocity (mm/s) which is to be measured at the base of the building. These are summarised in Table 23 and illustrated in the Figure below.

**Table 23 Transient vibration criteria as per standard BS 7385 Part 2 - 1993**

Line in Figure below	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
		4 Hz to 15 Hz	15 Hz and Above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Standard BS 7385 Part 2 – 1993 states that the values in Table 23 relate to transient vibration which does not cause resonant responses in buildings. Where the dynamic loading caused by continuous vibration events is such as that results in dynamic magnification due to resonance (especially at the lower frequencies where lower guide values apply), then the values in Table 23 may need to be reduced by up to 50% (refer to Line 3 in the Figure below).



**Figure 10 - BS 7385 Part 2 – 1993, graph of transient vibration values for cosmetic damage**

In the lower frequency region where strains associated with a given vibration velocity magnitude are higher, the recommended values corresponding to Line 2 are reduced. Below a frequency of 4 Hz where a high displacement is associated with the relatively low peak component particle velocity value, a maximum displacement of 0.6 mm (zero to peak) is recommended. This displacement is equivalent to a vibration velocity of 3.7 mm/s at 1 Hz.

The standard also states that minor damage is possible at vibration magnitudes which are greater than twice those given in Table 23, and major damage to a building structure may occur at values greater than four times the tabulated values.

Fatigue considerations are also addressed in the standard and it is concluded that unless calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the values in Table 23 should not be reduced for fatigue considerations.

### 8.3.3.1 Standard DIN 4150 Part 3 - 1999

For continuous or repetitive vibration, standard DIN 4150 Part 3-1999 provides criteria based on values for peak particle velocity (mm/s) measured at the foundation of the building; these are summarised in Table 24. The criteria are frequency dependent and specific to particular categories of structures.

**Table 24 Structural damage criteria as per standard DIN 4150 Part 3 - 1999**

Type of Structure	Peak Component Particle Velocity, mm/s			
	Vibration at the foundation at a frequency of			Vibration of horizontal plane of highest floor at all frequencies
	1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz <sup>1</sup>	
Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
Structures that, because of their sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and are of great intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8
<i>Note 1: For frequencies above 100Hz, at least the values specified in this column shall be applied.</i>				



## **8.4 Construction Noise Management – Qualitative Assessment**

Based on the assessment conducted of the expected construction noise levels generated from the construction of the project noise levels are generally expected to require the building contractor to engage in management of activities on the site.

The following management controls are recommended to mitigate construction noise levels on the site:

1. All plant and equipment are to be maintained such that they are in good working order.
2. A register of complaints is to be recorded in the event of complaints being received, including location, time of complaint, nature of the complaint and actions resulting from the complaint.
3. If required a noise level measurement of the offending plant item generating complaints is to be conducted and noise mitigations undertaken to reduce noise levels to within Noise Management levels in the event magnitude of noise levels is found to be above suitable levels.
4. The use of high noise generating equipment including hydraulic hammers, rock cutters or the like should be minimised prior to 8am Monday to Friday or 8.30am Saturdays.
5. The loading of trucks should be conducted such that there is not a requirement to stack truck on the roadways adjacent to the residential receivers.

In addition to the recommended mitigations above details of the proposed construction (including demolition) works to be conducted on the site, including type of activities to be conducted as well as the expected duration of activities should be provided to the neighbouring receivers.

A detailed construction noise and vibration management plan is to be provided by the building contractor as part of the construction certificate.

## 8.5 Construction Noise Assessment – Quantitative Assessment

A quantitative assessment of the construction noise levels resulting from the proposed works to has been undertaken.

The assessment has been based on the expected noise levels to be generated on the site including those detailed in Section 8.1 above. Calculations of the resulting construction noise levels of the residential receivers within proximity to the site is detailed in the table below.

**Table 25 Quantitative Assessment of Construction Noise to Neighboring Residence**

Source Noise	Equipment	Sound Power Levels dB(A) L <sub>10</sub>	Aggregate Sound Power Level dB(A) L <sub>10</sub>	Calculated Construction Noise Levels
Site Demolition works	Jack hammer mounted on skid steer	118	122	Up to 55 dB(A) when items used externally
	Hand held jack hammer	111		
	Concrete saw	119		
	Skid steer	110		
	Power hand tools	109		
	Excavators	115		
	Trucks	110		
	Earth Rollers	112		
Construction Works	Piling	115	120	Up to 50 dB(A) when items used externally
	Welder	101		
	Saw cutter	109		
	Dump truck	109		
	Concrete saw	119		
	Power hand tools	109		
	Cranes	110		

Based on the qualitative assessment of construction noise suitable management controls and community notifications are required to be conducted.

The required management of construction noise impacts are include in Section 9.4 above.

Subject to the implementation of these management measures, acoustic impacts during construction of the proposal will be acceptable.

## **8.6 Construction Vibration**

Construction vibration may occur during the earthworks particularly if outcrops of dolerite are encountered. Safe working distances for building damage will be complied with at all times and vibration monitoring will be undertaken to ensure acceptable levels of vibration are satisfied.

Based on the location of the site there are significant separation of areas where construction activities will be conducted from surrounding building. Based on the location of works that will be conducted there will be safe working distances relating to continuous vibration from construction equipment. Most construction activities will have intermittent vibration emissions and therefore, higher vibration levels occurring over shorter periods are acceptable for intermittent events.

Construction vibration is not expected to generated magnitudes of vibration with the potential to exceed the criteria applicable for human comfort and therefore the nearest residential receivers are not likely to experience adverse vibration impacts.

## 9 Conclusion

This report details the Noise Impact Assessment of the proposed development at proposed FKC warehouse development located at 200 Aldington Road, Kemps Creek.

This report details the required acoustic constructions of the building's façade, including external windows, to ensure that the future internal noise levels comply with the relevant noise levels of the Australian Standard AS2107:2016. Providing the recommended constructions detailed in this report are included in the construction of the project the required internal noise levels will be achieved.

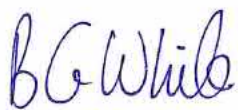
External noise emissions from the site have been assessed and detailed in accordance with the NSW Environmental Protection Authorities Noise Policy for Industry (previously the Industrial Noise Policy). The future design and treatment of all building services associated with the project can be acoustically treated to ensure all noise emissions from the site comply with the EPA NPfI criteria. Details of the equipment and associated acoustic treatments will be provided as part of the CC submission of the project.

An assessment of additional traffic noise generated by vehicles using the site has been undertaken and calculated noise levels comply with the requirements of the EPA's *Road Noise Policy*.

A construction noise and vibration assessment of the expected construction activities required to be used to complete the project has been undertaken and mitigation measures to be applied during the construction stage of the project. Subject to the undertaking these management measures, the project will have acceptable noise levels during the construction period.

For any additional information please do not hesitate to contact the person below.

Regards



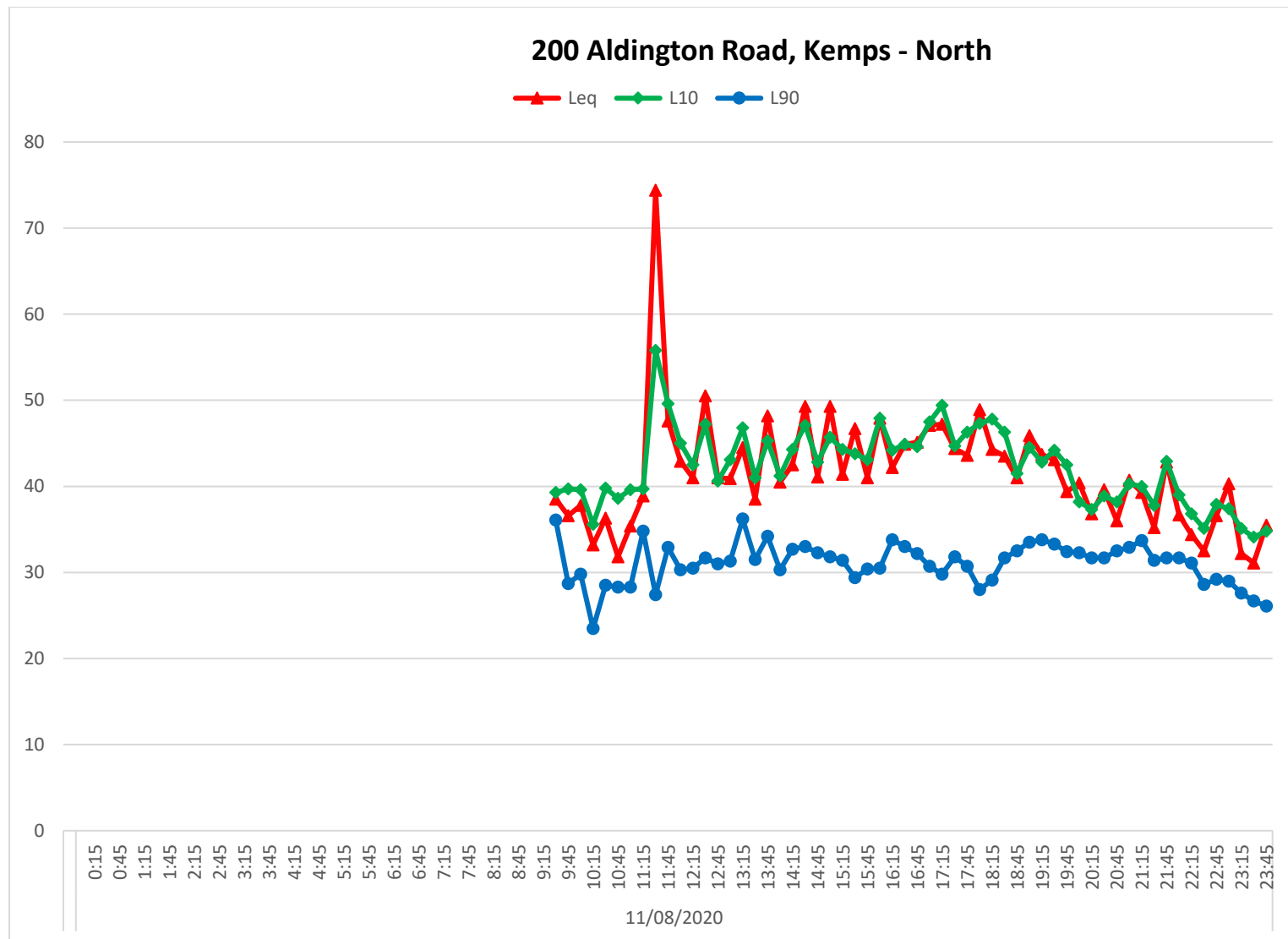
Ben White  
Director  
White Noise Acoustics

## 10 Appendix A – Glossary of Terms

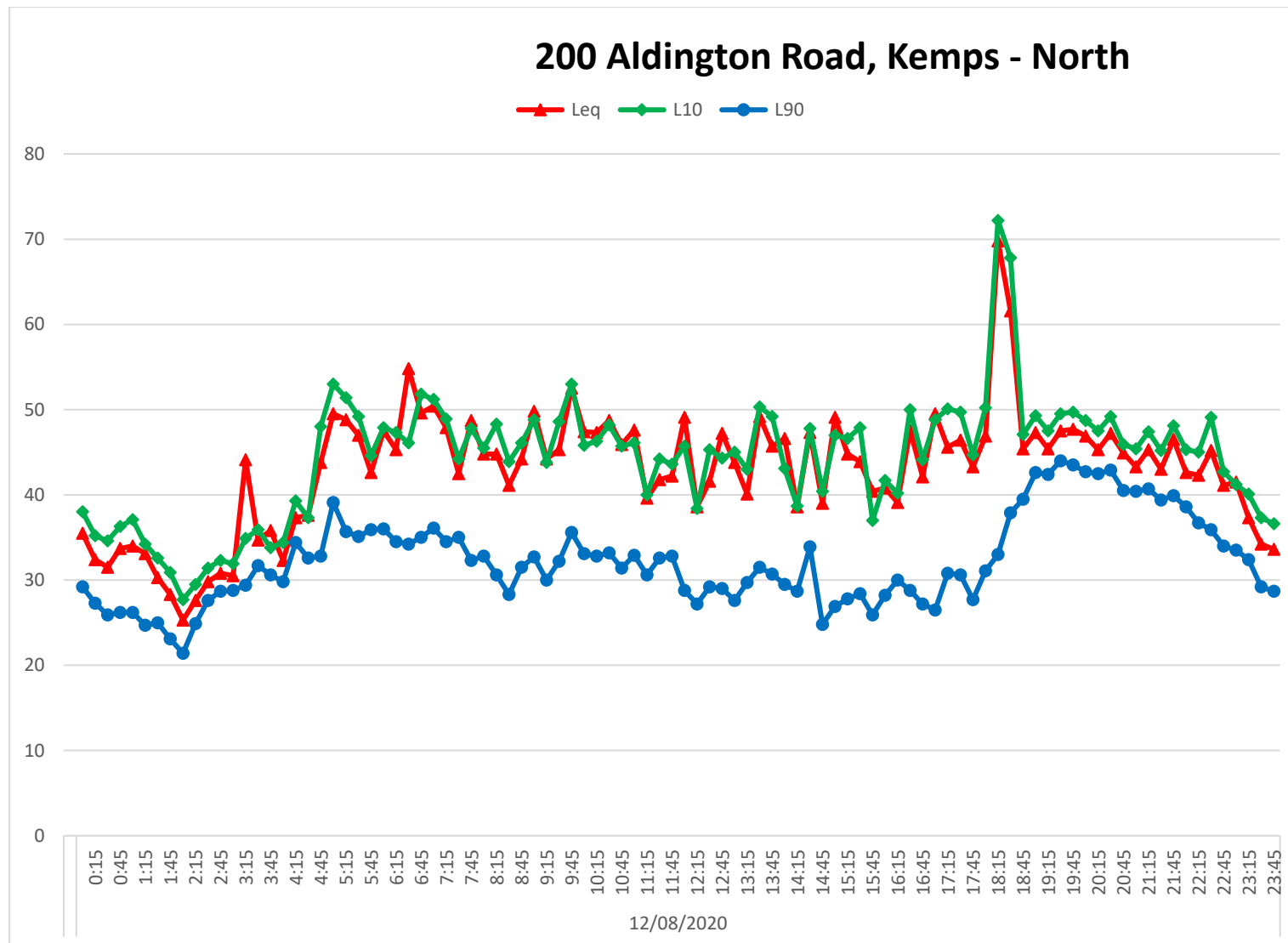
<i>Ambient Sound</i>	The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.
<i>Audible Range</i>	The limits of frequency which are audible or heard as sound. The normal ear in young adults detects sound having frequencies in the region 20 Hz to 20 kHz, although it is possible for some people to detect frequencies outside these limits.
<i>Character, acoustic</i>	The total of the qualities making up the individuality of the noise. The pitch or shape of a sound's frequency content (spectrum) dictate a sound's character.
<i>Decibel [dB]</i>	The level of noise is measured objectively using a Sound Level Meter. The following are examples of the decibel readings of every day sounds; <ul style="list-style-type: none"> <li>0dB the faintest sound we can hear</li> <li>30dB a quiet library or in a quiet location in the country</li> <li>45dB typical office space. Ambience in the city at night</li> <li>60dB Martin Place at lunch time</li> <li>70dB the sound of a car passing on the street</li> <li>80dB loud music played at home</li> <li>90dB the sound of a truck passing on the street</li> <li>100dB the sound of a rock band</li> <li>115dB limit of sound permitted in industry</li> <li>120dB deafening</li> </ul>
<i>dB(A)</i>	<i>A-weighted decibels</i> The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter. The sound pressure level in dB(A) gives a close indication of the subjective loudness of the noise.
<i>Frequency</i>	Frequency is synonymous to <i>pitch</i> . Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
<i>Loudness</i>	A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on
<i>L<sub>Max</sub></i>	The maximum sound pressure level measured over a given period.
<i>L<sub>Min</sub></i>	The minimum sound pressure level measured over a given period.
<i>L<sub>1</sub></i>	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
<i>L<sub>10</sub></i>	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
<i>L<sub>90</sub></i>	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L <sub>90</sub> noise level expressed in units of dB(A).
<i>L<sub>eq</sub></i>	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
<i>Background Sound Low</i>	The average of the lowest levels of the sound levels measured in an affected area in the absence of noise from occupants and from unwanted, external ambient noise sources. Usually taken to mean the L <sub>A90</sub> value
<i>Ctr</i>	A frequency adaptation term applied in accordance with the procedures described in ISO 717.

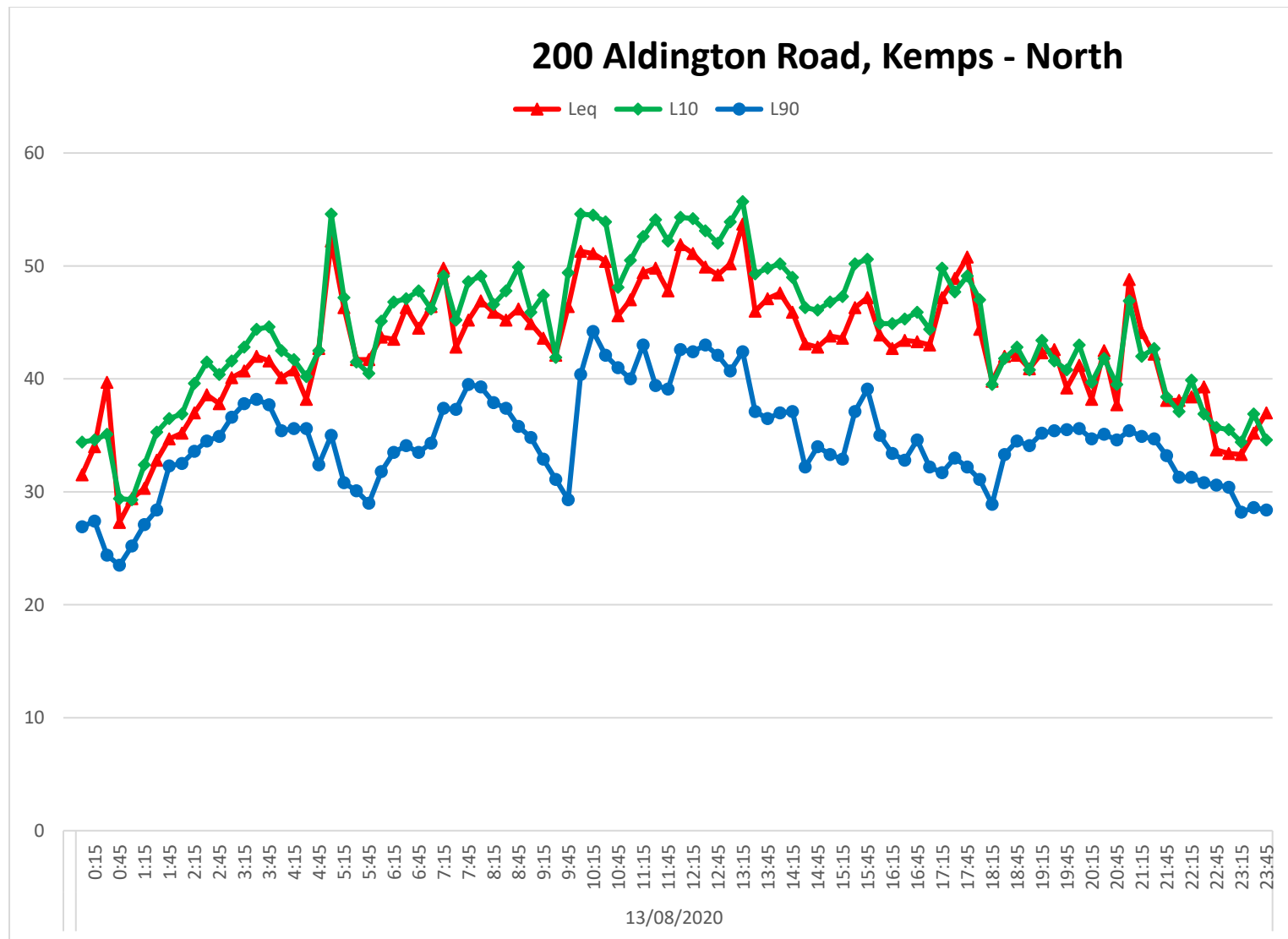
<i>dB (A)</i>	'A' Weighted overall sound pressure level
<i>Noise Reduction</i>	The difference in sound pressure level between any two areas. The term "noise reduction" does not specify any grade or performance quality unless accompanied by a specification of the units and conditions under which the units shall apply
<i>NR Noise Rating</i>	Single number evaluation of the background noise level. The NR level is normally around 5 to 6 dB below the "A" weighted noise level. The NR curve describes a spectrum of noise levels and is categorised by the level at 1000 Hz ie the NR 50 curve has a value of 50 dB at 1000 Hz. The NR rating is a tangential system where a noise spectrum is classified by the NR curve that just encompasses the entire noise spectrum consideration.
<i>R<sub>w</sub></i>	Weighted Sound Reduction Index - Laboratory test measurement procedure that provides a single number indication of the acoustic performance of a partition or single element. Calculation procedures for R <sub>w</sub> are defined in ISO 140-2:1991 "Measurement of Sound Insulation in Buildings and of Building Elements Part 2: Determination, verification and application of precision data".
<i>R'<sub>w</sub></i>	Field obtained Weighted Sound Reduction Index - this figure is generally up to 3-5 lower than the laboratory test determined level data due to flanked sound transmission and imperfect site construction.
<i>Sound Isolation</i>	A reference to the degree of acoustical separation between any two areas. Sound isolation may refer to sound transmission loss of a partition or to noise reduction from any unwanted noise source. The term "sound isolation" does not specify any grade or performance quality and requires the units to be specified for any contractual condition
<i>Sound Pressure Level, L<sub>p</sub> dB</i>	A measurement obtained directly using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the rms sound pressure to the reference sound pressure of 20 micro Pascals.
<i>Sound Power Level, L<sub>w</sub> dB</i>	Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power levels is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt
<i>Speech Privacy</i>	A non-technical term but one of common usage. Speech privacy and speech intelligibility are opposites and a high level of speech privacy means a low level of speech intelligibility. It should be recognised that acceptable levels of speech privacy do not require that speech from an adjacent room is inaudible.
<i>Transmission Loss</i>	Equivalent to Sound Transmission Loss and to Sound Reduction Index in terminology used in countries other than Australia. A formal test rating of sound transmission properties of any construction, by usually a wall, floor, roof etc. The transmission loss of all materials varies with frequency and may be determined by either laboratory or field tests. Australian Standards apply to test methods for both situations.

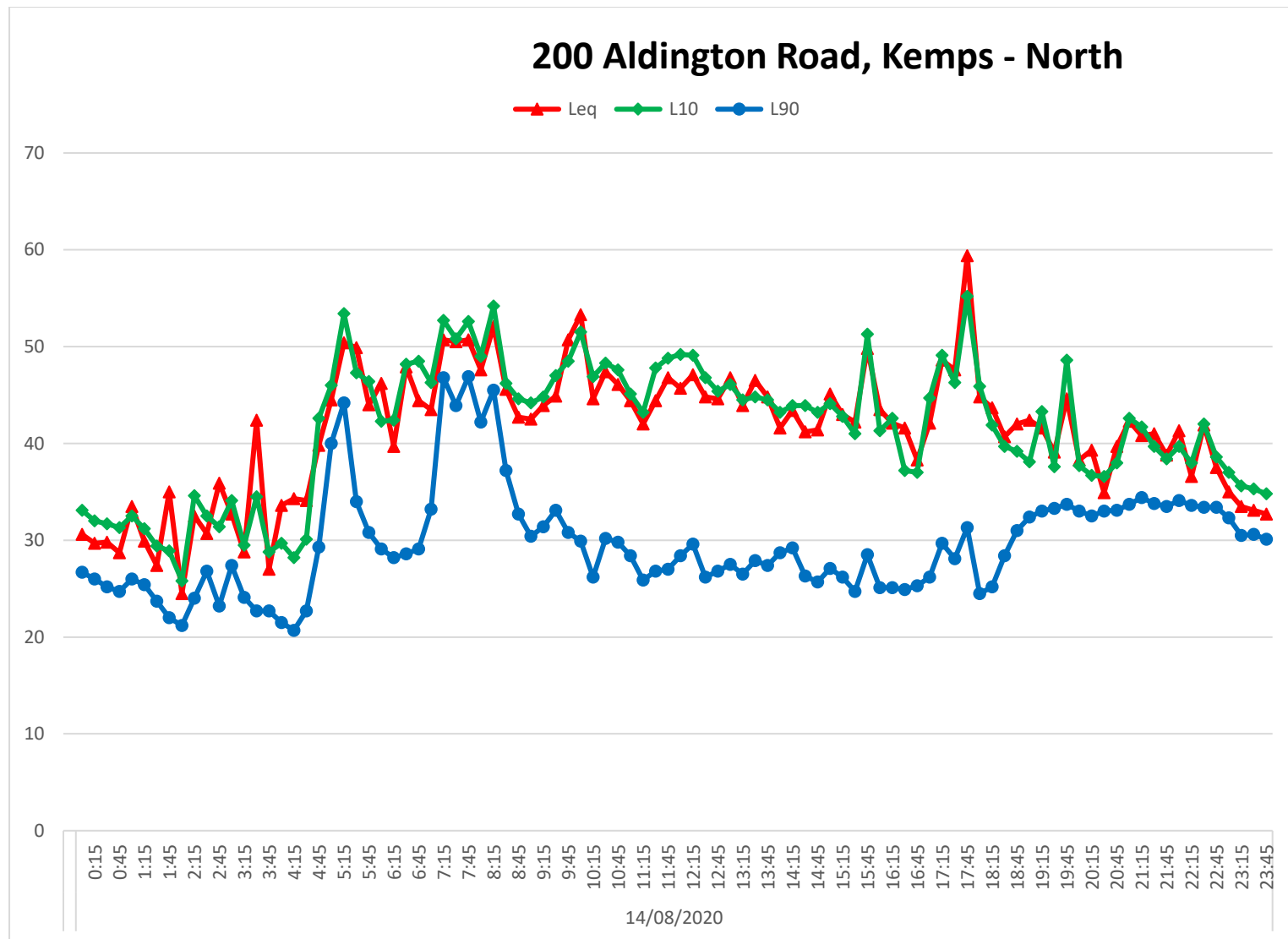
## **11 Appendix B – Noise Logging Results, Northern Logger**

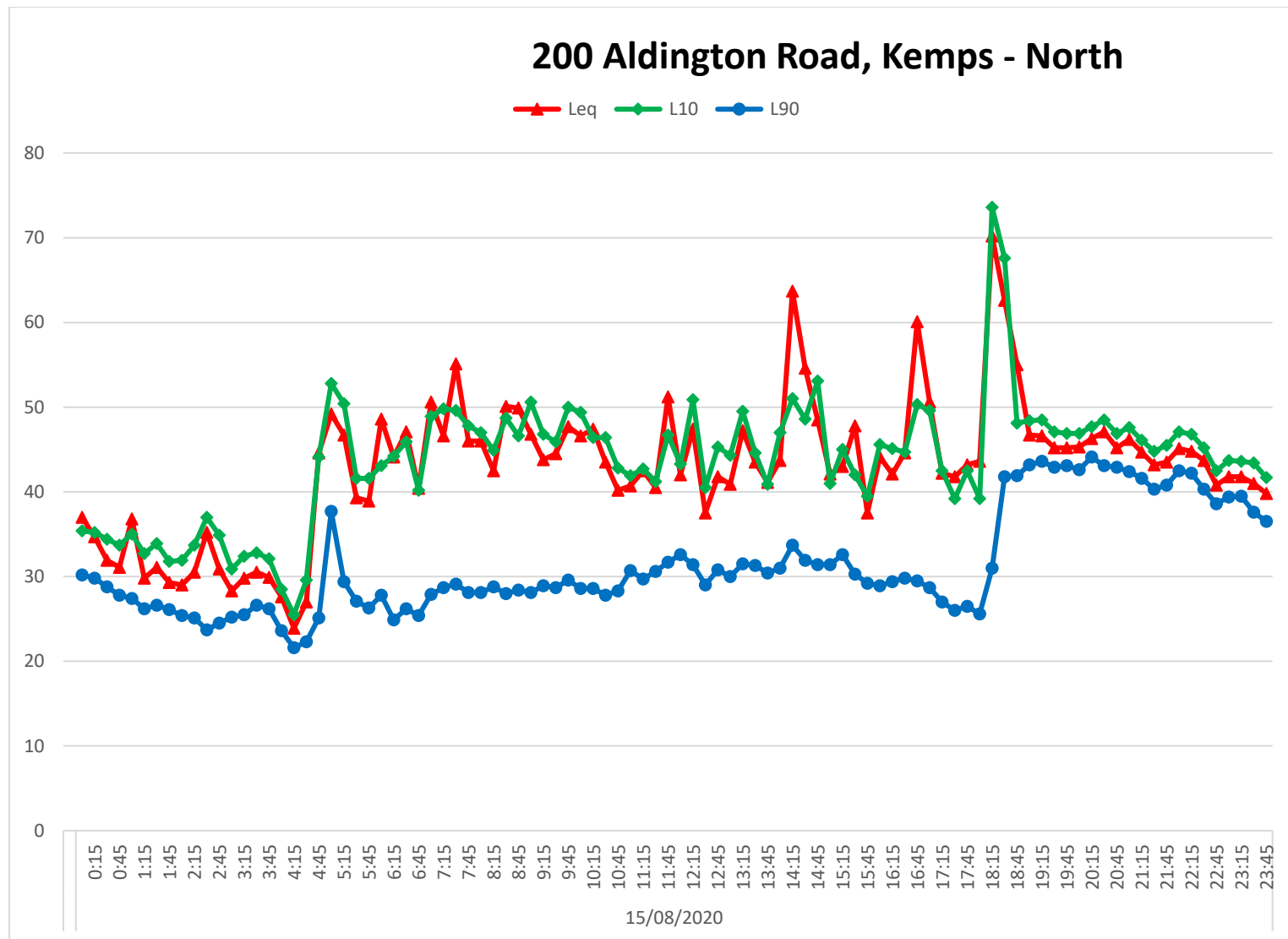


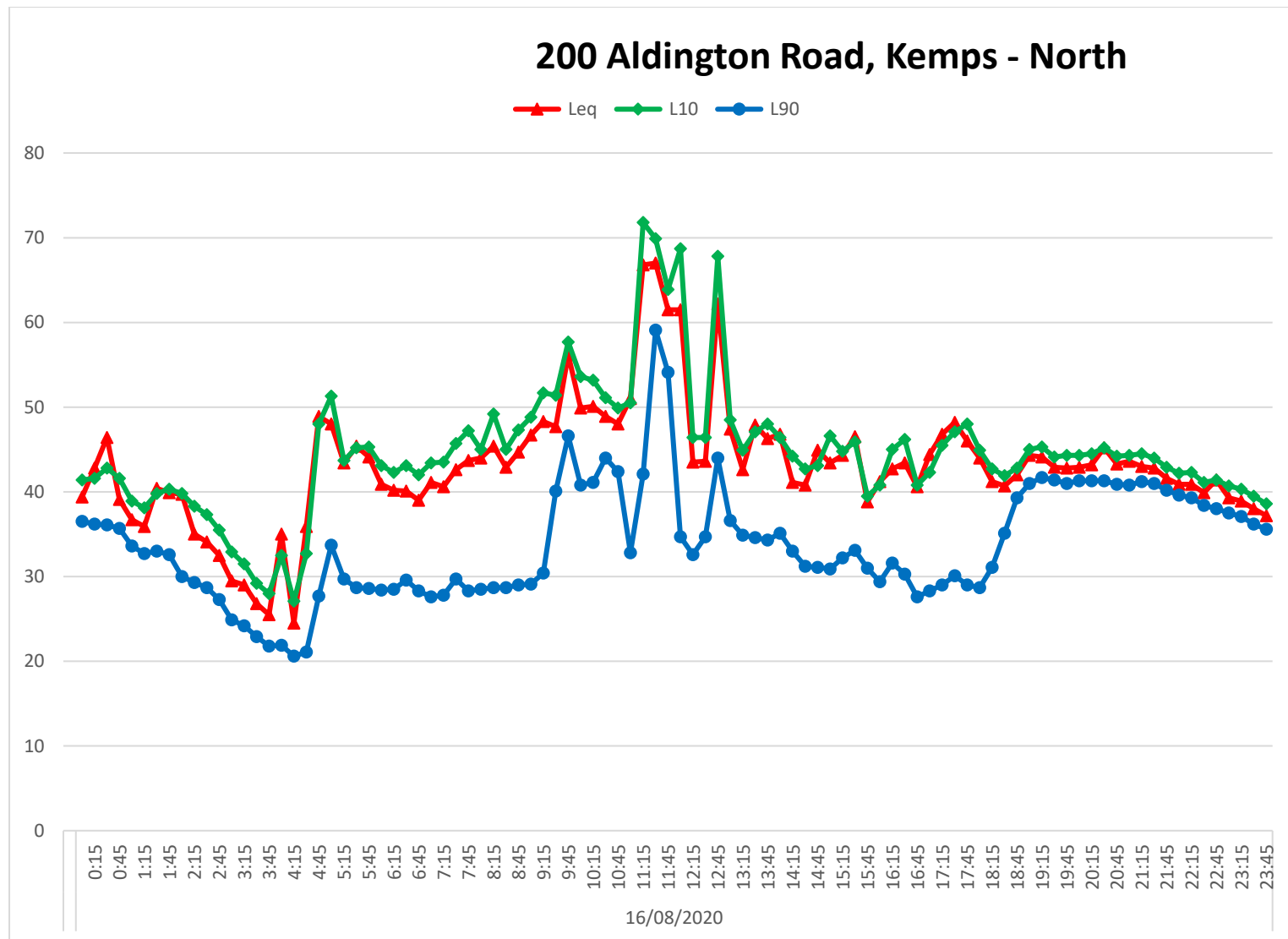


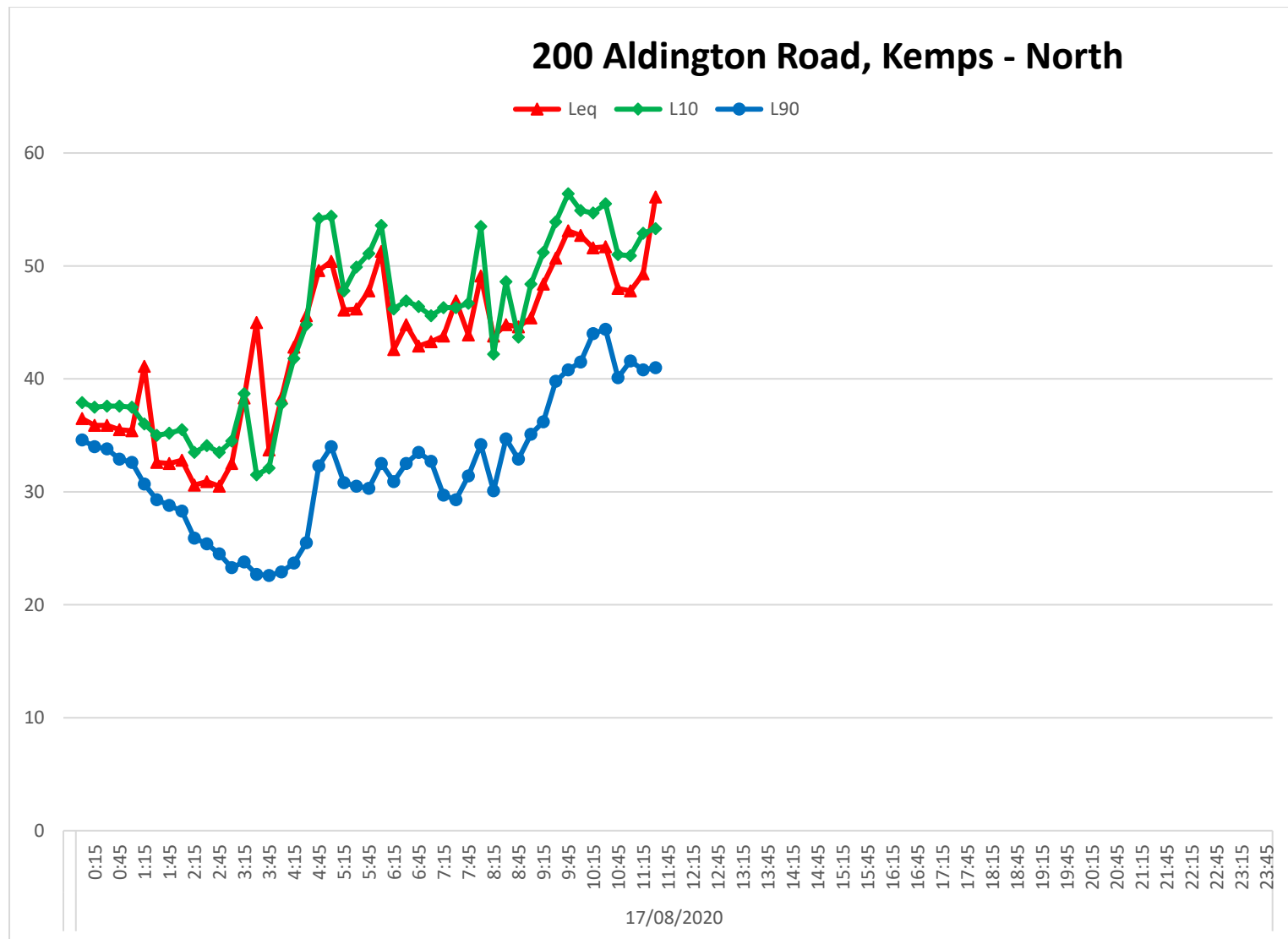




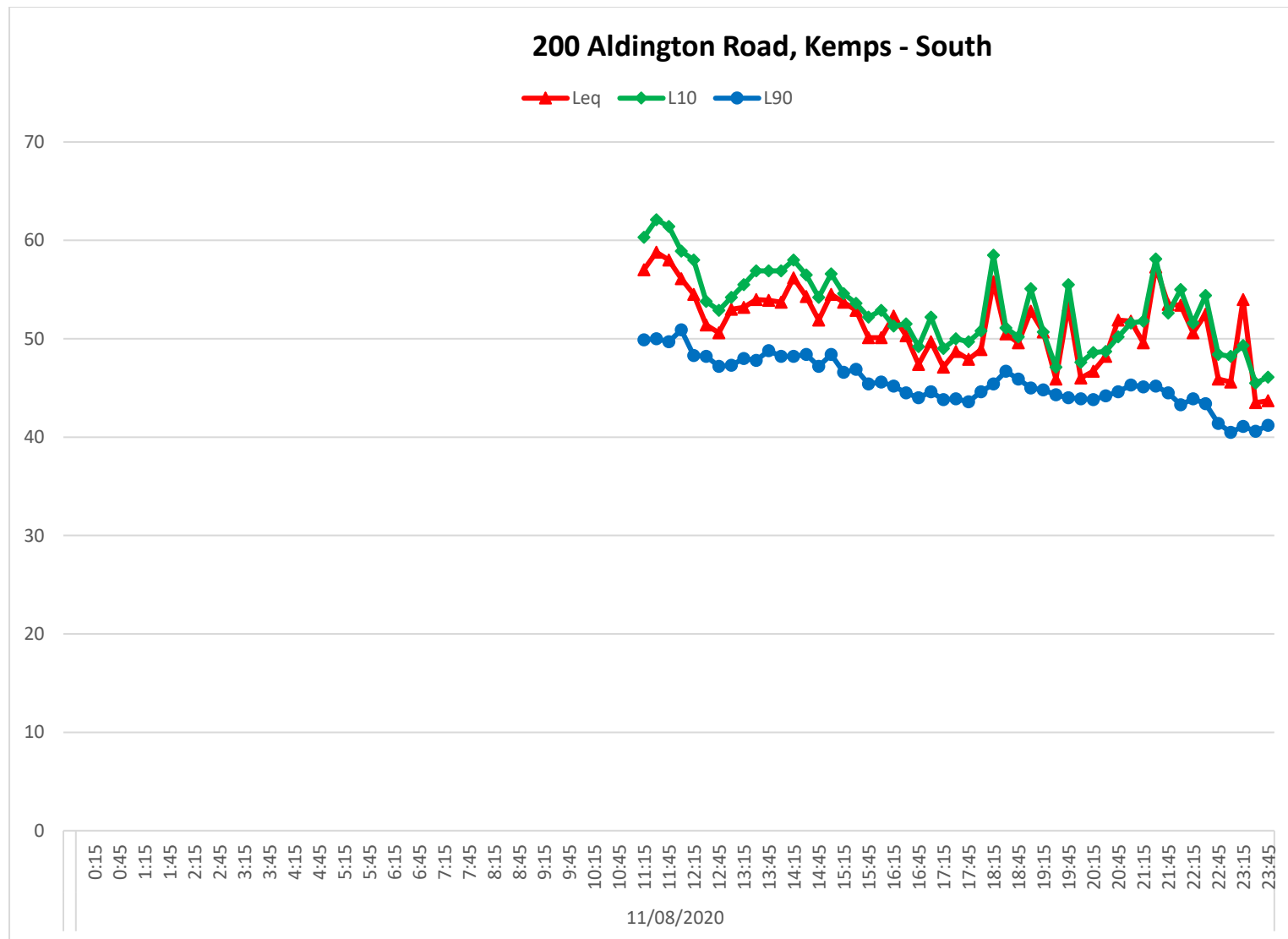




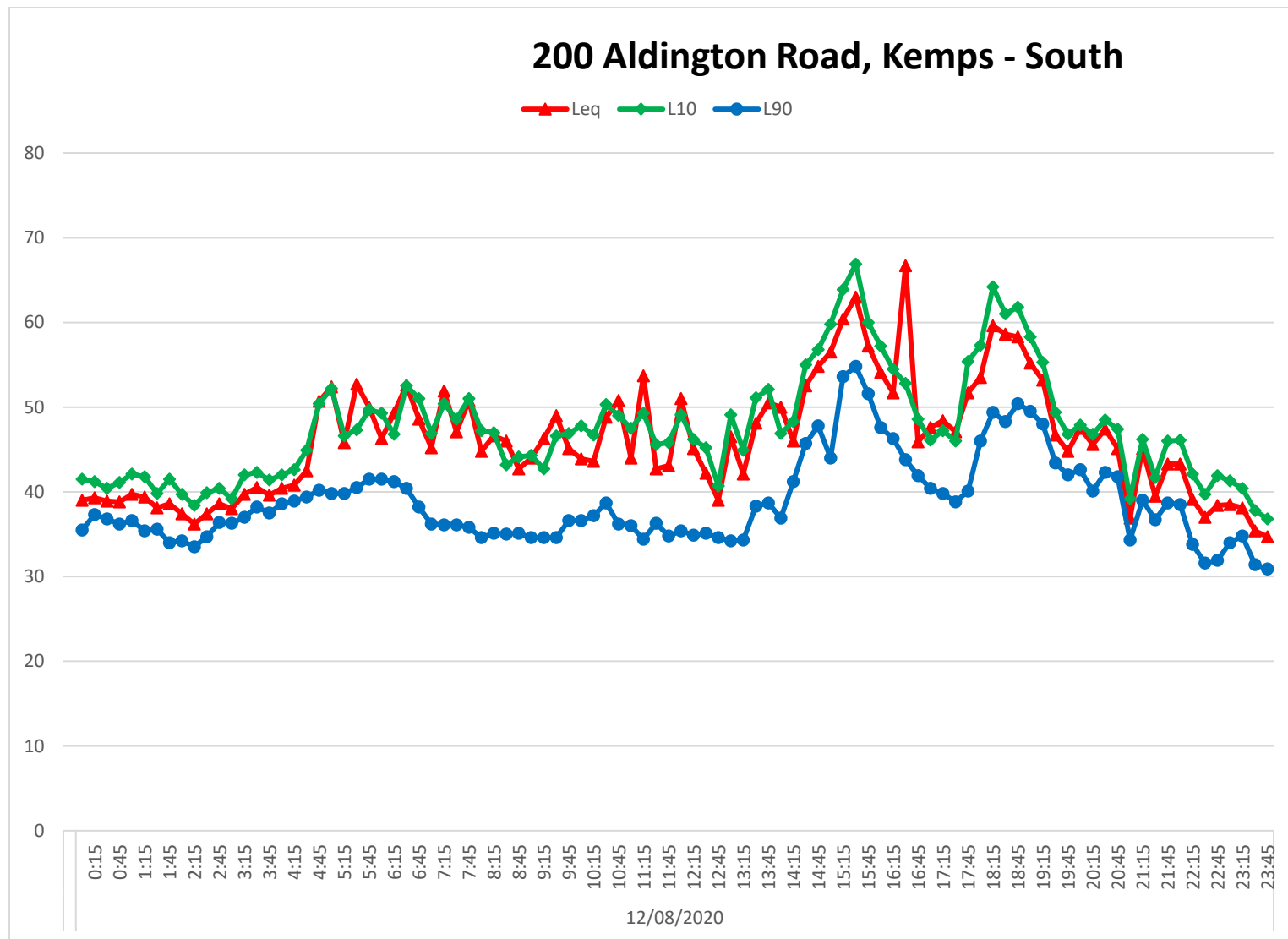


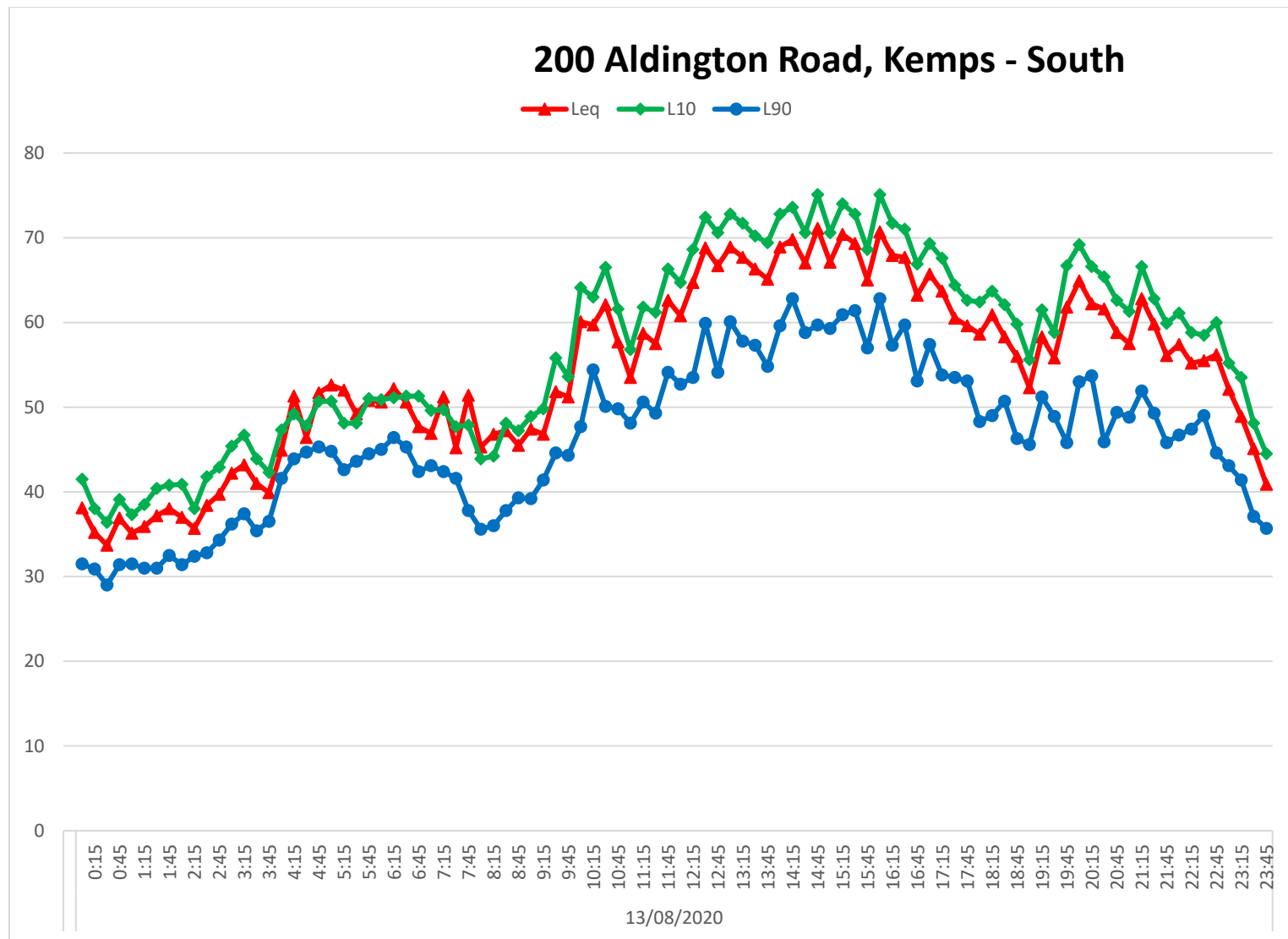


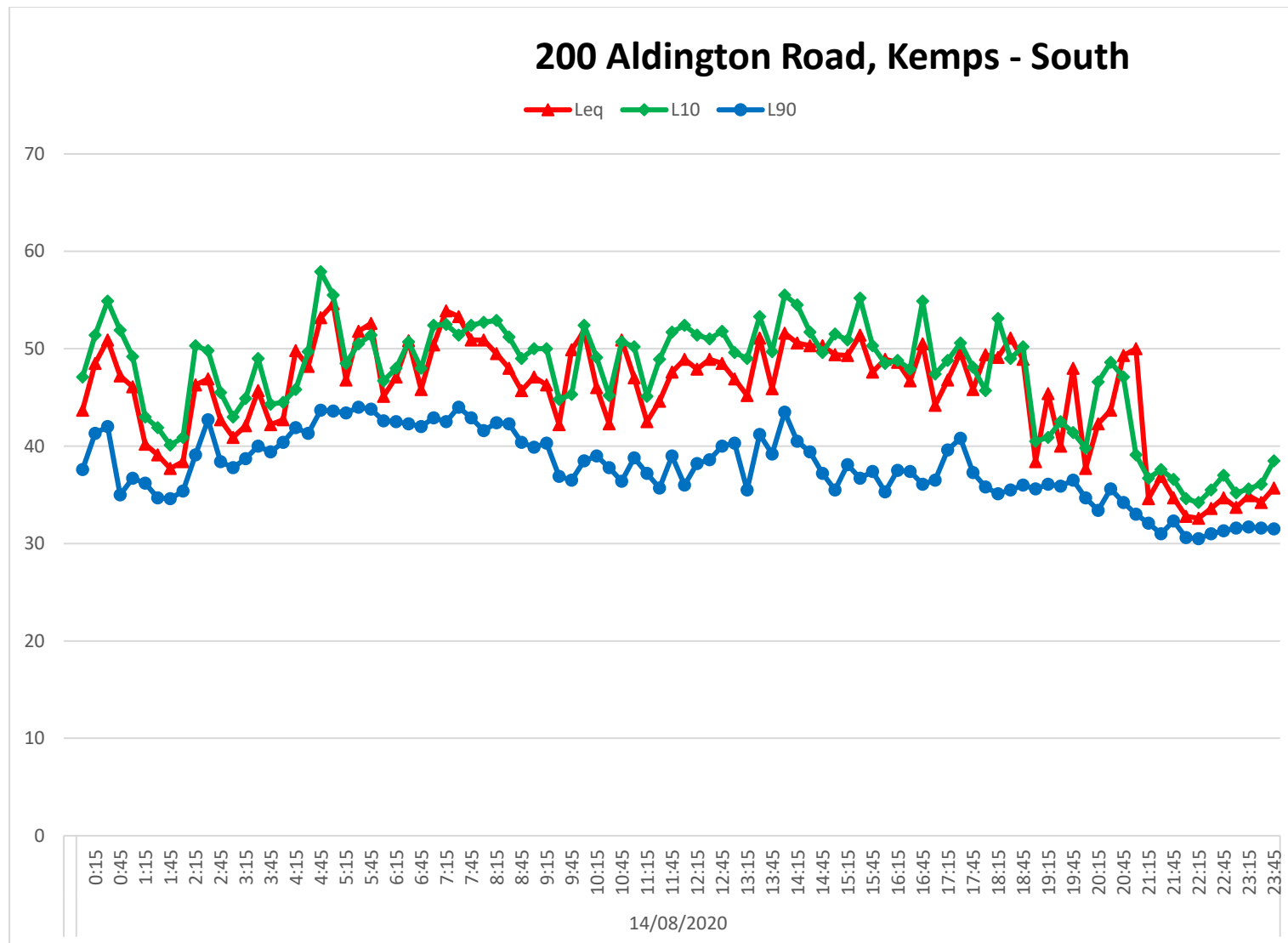
## **12 Appendix C – Noise Logging Results, Southern Logger**

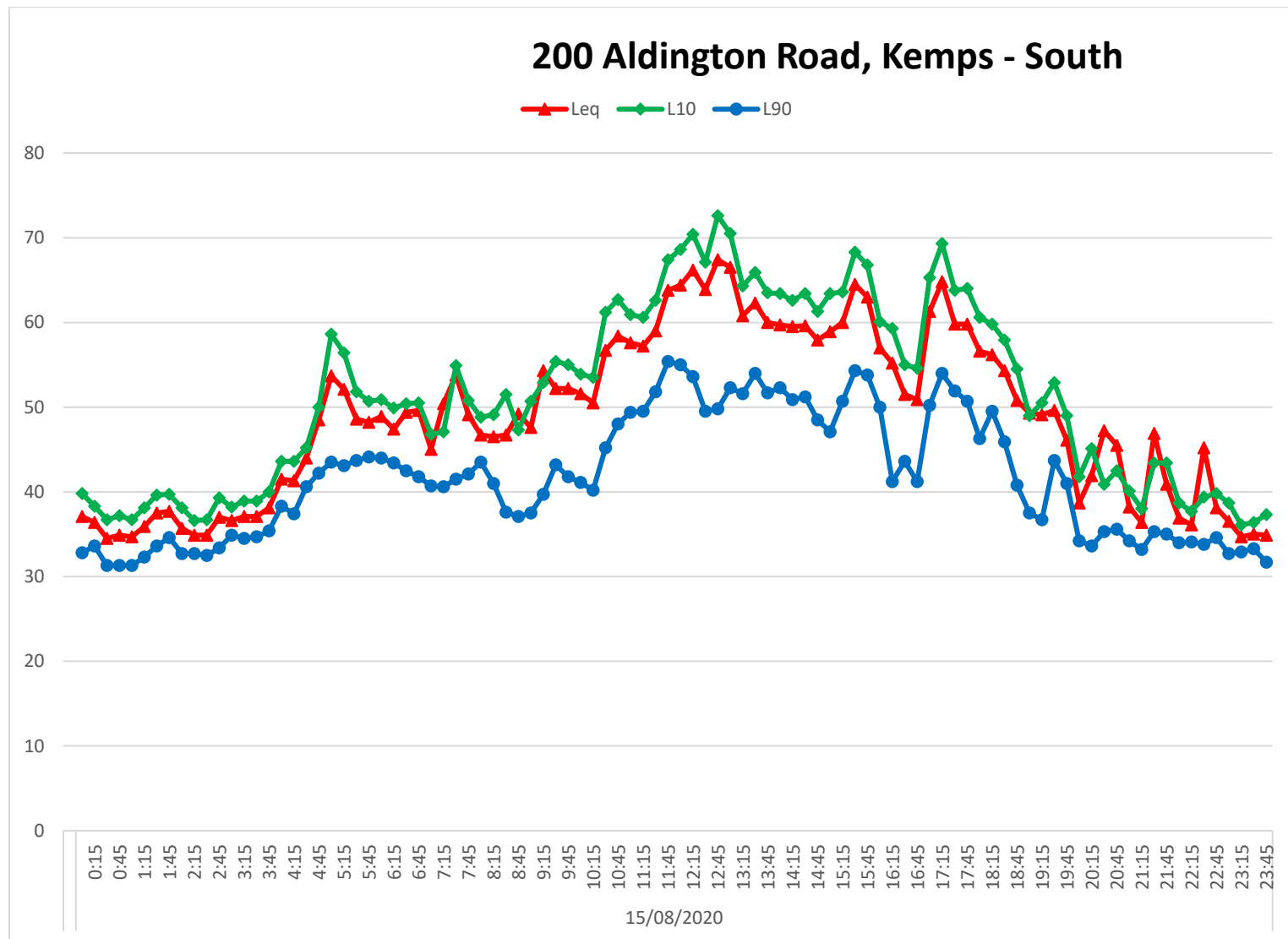


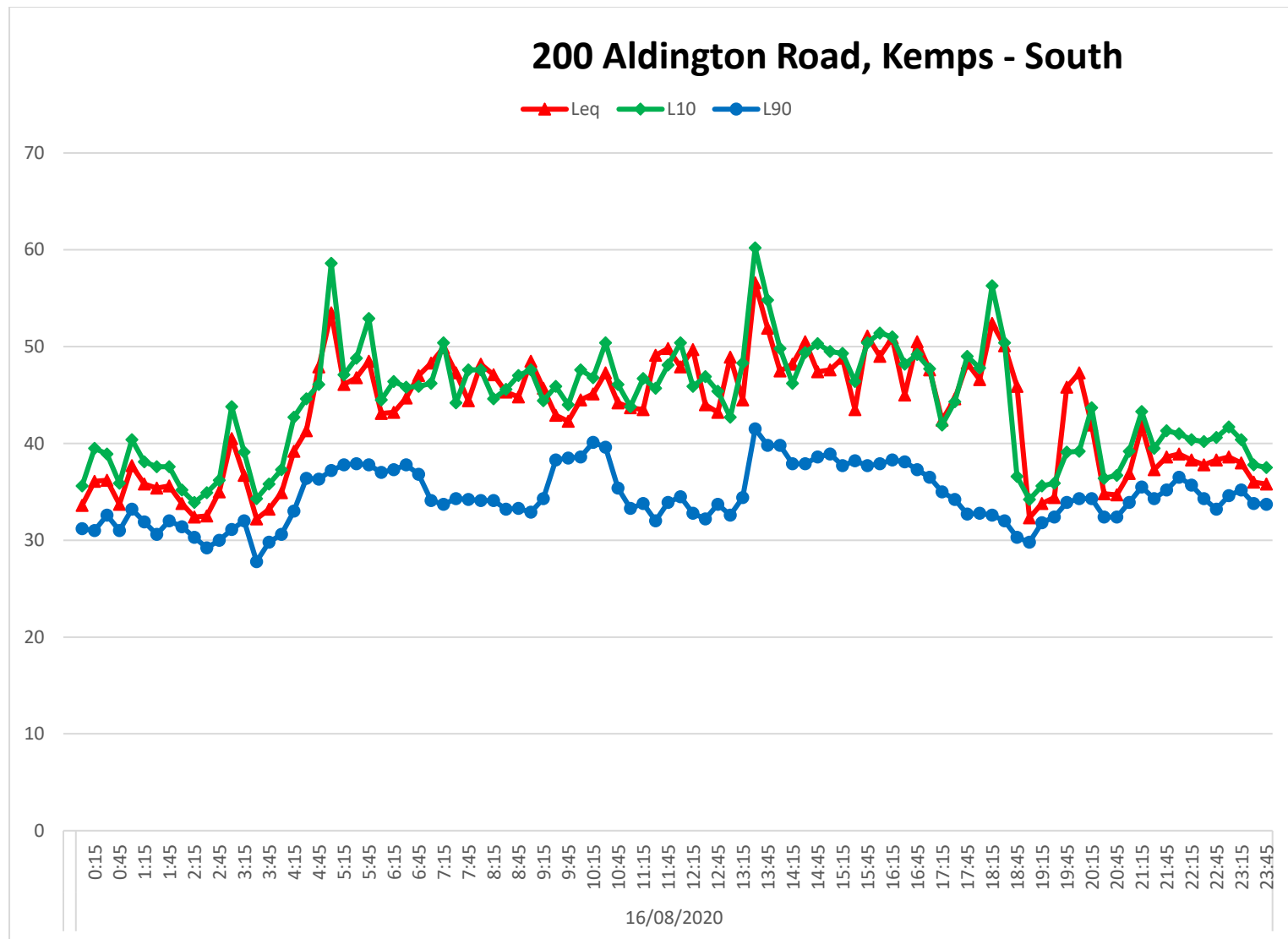


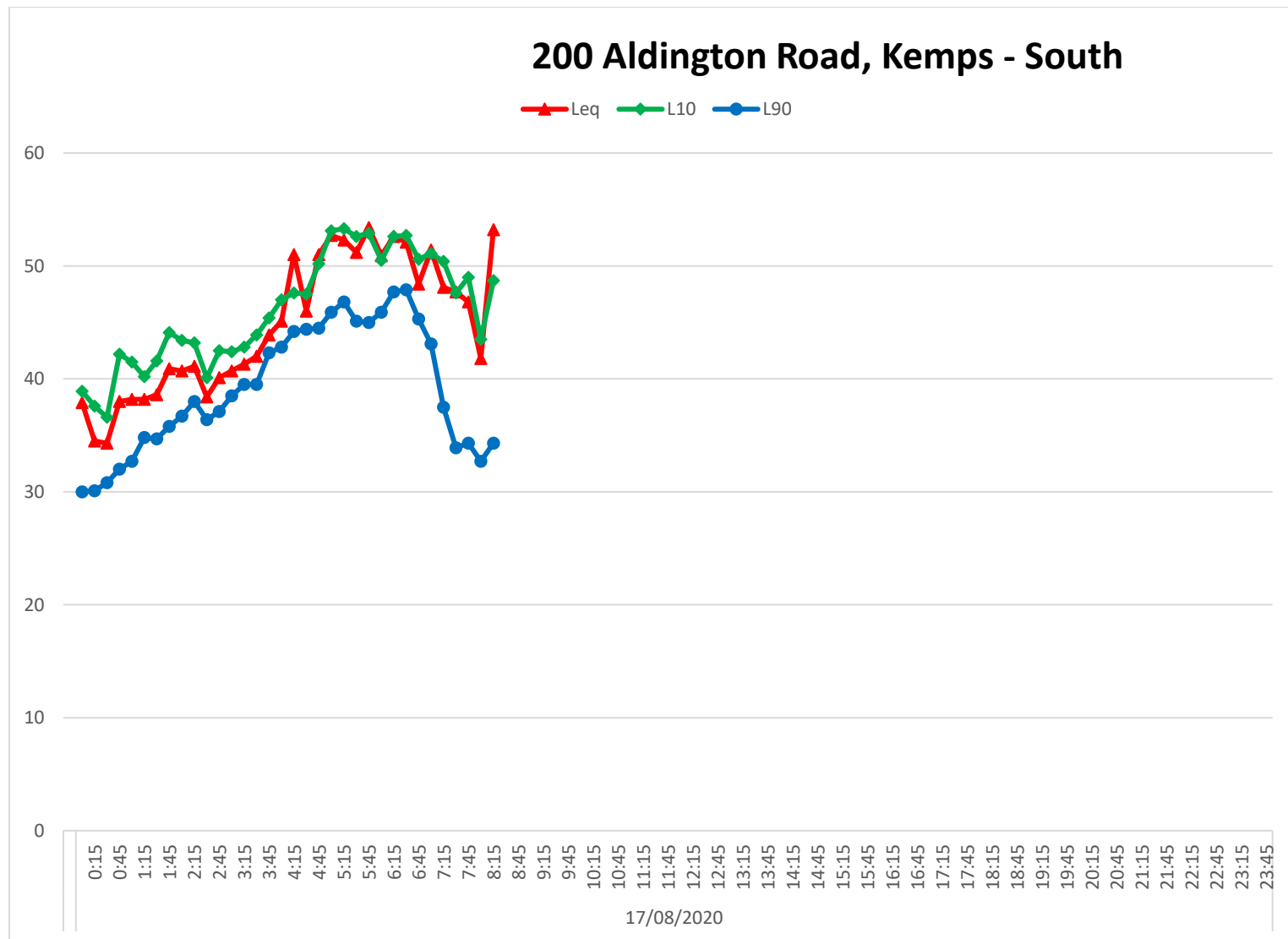












## **13 Appendix D – Proposed Car Parking**



AREA SCHEDULE		
*All areas subject to survey		
SITE AREA	720,787sqm	
ELECTRICAL EASEMENT	17,705sqm	
BASIN LOT L	12,847sqm	
FLOOD BASIN LOT D	32,519sqm	
ESTATE ROAD RESERVE	42,768sqm	
ROAD WIDENING (Aldington Rd)	2,437sqm	
FUTURE ROAD CONNECTION	3,875sqm	
NET DEVELOPABLE SITE AREA	608,636sqm	
TOTAL WAREHOUSE	357,355sqm	
TOTAL OFFICE (Aprox. 5% WH)	18,200sqm	
CAFE	200sqm	
TOTAL BUILDING AREA	375,755sqm	
CARPARKING REQUIRED (RMS WH1/300 OFFICE1/40)	1,693 CARS	
PROVIDED	1,700 CARS	
SITE COVERAGE	62%	

LOT A		
SITE AREA	12,530sqm	
OFFICE	200sqm	
WAREHOUSE - W1	4,200sqm	
CAFE	200sqm	
TOTAL GFA	4,600sqm	
CARPARKING PROV.	49 CARS	

LOT I		
SITE AREA	42,460sqm	
OFFICE	1,300sqm	
WAREHOUSE - W8	25,580sqm	
TOTAL GFA	26,880sqm	
CARPARKING PROV.	120 CARS	

LOT B		
SITE AREA	46,604sqm	
OFFICE	1,500sqm	
WAREHOUSE - W2	28,940sqm	
TOTAL GFA	30,440sqm	
CARPARKING PROV.	134 CARS	

LOT J		
SITE AREA	124,463sqm	
OFFICE	3,750sqm	
WAREHOUSE - W9	75,000sqm	
TOTAL GFA	78,750sqm	
CARPARKING PROV.	344 CARS	

LOT C		
SITE AREA	49,495sqm	
OFFICE	1,500sqm	
WAREHOUSE - W3	29,490sqm	
TOTAL GFA	30,990sqm	
CARPARKING PROV.	136 CARS	

LOT K		
SITE AREA	40,232sqm	
OFFICE	1,200sqm	
WAREHOUSE - W10	23,180sqm	
TOTAL GFA	24,380sqm	
CARPARKING PROV.	110 CARS	

LOT D - Not Developable		
SITE AREA	32,519sqm	

LOT L - Not Developable		
SITE AREA	12,847sqm	

LOT E		
SITE AREA	29,824sqm	
OFFICE	800sqm	
WAREHOUSE - W4	16,085sqm	
TOTAL GFA	16,885sqm	
CARPARKING PROV.	75 CARS	

LOT M		
SITE AREA	27,596sqm	
OFFICE	750sqm	
WAREHOUSE - W11	15,130sqm	
TOTAL GFA	15,880sqm	
CARPARKING PROV.	71 CARS	

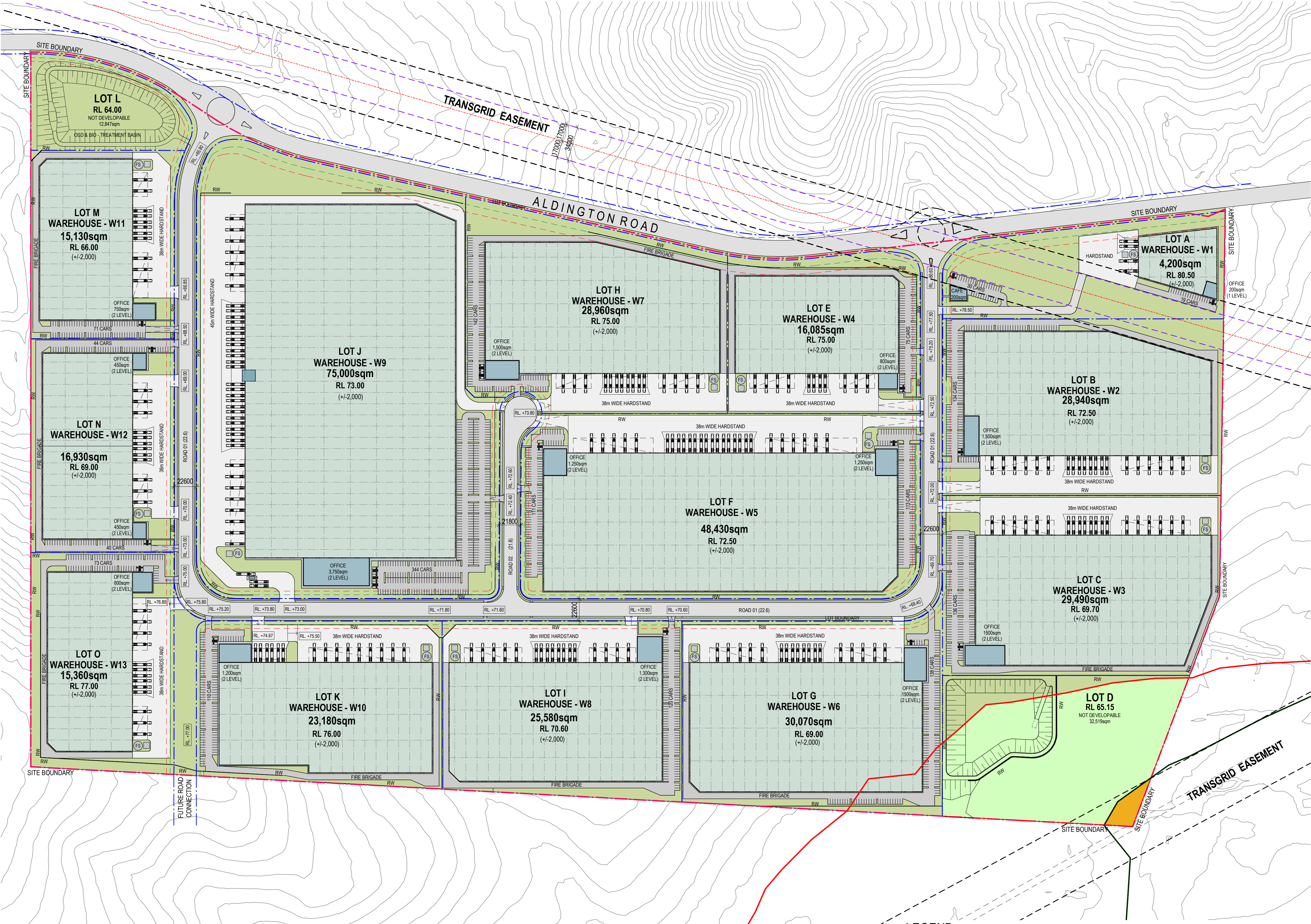
LOT F		
SITE AREA	74,294sqm	
OFFICE	2,500sqm	
WAREHOUSE - W5	48,430sqm	
TOTAL GFA	50,930sqm	
CARPARKING PROV.	224 CARS	

LOT N		
SITE AREA	31,067sqm	
OFFICE	900sqm	
WAREHOUSE - W12	16,930sqm	
TOTAL GFA	17,830sqm	
CARPARKING PROV.	84 CARS	

LOT G		
SITE AREA	50,016sqm	
OFFICE	1,500sqm	
WAREHOUSE - W6	30,070sqm	
TOTAL GFA	31,570sqm	
CARPARKING PROV.	138 CARS	

LOT O		
SITE AREA	31,699sqm	
OFFICE	800sqm	
WAREHOUSE - W13	15,360sqm	
TOTAL GFA	16,160sqm	
CARPARKING PROV.	73 CARS	

LOT H		
SITE AREA	48,356sqm	
OFFICE	1,500sqm	
WAREHOUSE - W7	28,960sqm	
TOTAL GFA	30,460sqm	
CARPARKING PROV.	142 CARS	



#### Assumptions

- 01 ALDINGTON RD RESERVE - 24.8m DISTRIBUTOR ROAD
- 02 INTERNAL ESTATE ROAD 01 RESERVE - 22.6m INDUSTRIAL ROAD
- 03 INTERNAL ESTATE ROAD 02 RESERVE - 21.8m INDUSTRIAL ROAD
- 04 PARKING RATE PROVIDED RMS WH 1 SPACE PER 300sqm / OFFICE 1 SPACE PER 40sqm
- 05 BUILDING SETBACK TO ALDINGTON RD - 15m
- 06 LANDSCAPE SETBACK TO ALDINGTON RD - 7.5m
- 07 BUILDING SETBACK FROM ESTATE RD - 7.5m
- 08 LANDSCAPE SETBACK FROM ESTATE RD - 3.75m

#### LEGEND

- Site Boundary
- Lot Boundary
- Road Boundary
- Building Setback
- Landscape Setback
- RE2 Zone
- Environmental Conservation zone
- Building Outline
- Building Above Outline
- Easement
- Retaining Wall
- Fire Services



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Appendix D

# Construction Flora and Fauna Management Plan

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# 200 Aldington Road Industrial Estate

State Significant Development (SSD-10479)

## Flora and Fauna Management Plan

Prepared for Fife Kemps Creek Trust  
April 2022

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# 200 Aldington Road Industrial Estate

## Flora and Fauna Management Plan

### Report Number

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E210906 RP#4

### Client

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Fife Kemps Creek Trust

### Date

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April 2022

### Version

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v1 Final

### Prepared by

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Consultant

19 April 2022

### Approved by

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19 April 2022

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# Abbreviations

Abbreviation	Description
Aerotropolis SEPP	State Environmental Planning Policy (Western Sydney Aerotropolis) 2020
BAM	Biodiversity Assessment Method
BC Act	Biodiversity Conservation Act 2016
BDAR	Biodiversity development assessment report
CEMP	Construction Environmental Management Plan
CCS	Community Communication Strategy
CNVMP	Construction Noise and Vibration Management Plan
CTMP	Construction Traffic Management Plan
DPIE	Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
EPBC Act	Commonwealth <i>Environmental Protection and Biodiversity Conservation Act 1999</i>
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
FFMP	Flora and Fauna Management Plan
GFA	Gross floor area
Ha	Hectares
Km	Kilometres
LGA	Local government area
PCTs	Plant community types
SSDA	State Significant Development Application
TECs	Threatened ecological communities
VMP	Vegetation Management Plan

# 1 Introduction

This Flora and Fauna Management Plan (FFMP) has been prepared for implementation by Fife Kemps Creek Trust (FKC) (and its contractors) for the construction of the 200 Aldington Road Industrial Estate (the Project). The Project is located in Kemps Creek, New South Wales 2178, within the Penrith Local Government Area (LGA).

The following documents have been reviewed and applicable information incorporated into this FFMP:

- Environmental Impact Statement (the EIS), prepared by Ethos Urban, dated 11 November 2020;
- SSDA 10479;
- Biodiversity Development Assessment Report (BDAR), prepared by Eco Logical, dated 15 October 2020;
- Riparian Assessment, prepared by Eco Logical, dated 15 October 2020; and
- Mamre Road Precinct Development Control Plan, dated November 2021 (the DCP).

## 1.1 Project overview

### 1.1.1 Background / context

This FFMP forms a Request for Additional Information for the proposed Concept State Significant Development Application for a new industrial estate on land 106 – 228 Aldington Road, Kemps Creek.

The EIS for the project was placed on public exhibition between 18 November 2020 and 15 December 2020. During this period, a total of 18 submissions were received. These submissions were addressed and subsequent amendments to the project were made, as outlined in the Response to Submissions Report (dated 23 March 2021) prepared by Ethos Urban.

In written correspondence dated 28 April 2021, it was requested that FKC provide a further response to additional commentary raised by DPE, as well as additional comments raised by public authorities in their review of the first Response to Submissions Report. This was responded to via a second a Response to Submissions Report outlined by Ethos Urban (dated 22 September 2021).

Additional correspondence was received from DPE dated 15 November 2021 which has necessitated updates and additional information, as contained within this report.

### 1.1.2 Summary of the project for which development consent is now sought

Consent is sought for the following development. It represents minor amendments and does not represent a significant material change to what was previously proposed under the second RTS Report (22 September 2021)

- A concept masterplan with an indicative total building area of 342,865 sqm, comprising:
  - 325,865 sqm of warehouse gross floor area (GFA);
  - 17,010 sqm of ancillary office GFA;
  - 13 individual development lots for warehouse buildings with associated hardstand areas and two lots for water management infrastructure purposes (each including a bio retention basin);
  - Roads, including:

- Internal road layouts;
- Southern road connection to Aldington Road;
- Northern boundary road (half road corridor) connecting to Aldington Road;
- Road connections to adjoining landholdings to the north and east;
- Provision for 1,516 car parking spaces; and
- Associated concept site landscaping.
- Detailed consent for progressive delivery of site preparation, earthworks and infrastructure works (i.e., Stage 1 works) on the site, including:
  - Demolition and clearing of all existing built form structures;
  - Drainage and infill of existing farm dams and any ground dewatering;
  - Clearing of existing vegetation;
  - Subdivision of the site into 15 individual lots;
  - Construction of a warehouse building with a total of 50,300 sqm of GFA, including:
    - 47,800 sqm of warehouse GFA; 2,500 sqm of ancillary office GFA; and
    - 221 car parking spaces.
  - Bulk earthworks including 'cut and fill' to create level development platforms for the warehouse buildings, and site stabilisation works (if required);
  - Roadworks and access infrastructure, including an interim access road and a temporary junction with Aldington Road;
  - Stormwater works including stormwater basins, diversion of stormwater;
  - Utilities services including sewer and potable water reticulation; and
  - Road and boundary retaining walls.



## 1.2 Biodiversity Development Assessment Report

A Biodiversity Development Assessment Report (BDAR) was prepared by Eco Logical (2020a), as part of the EIS submission. The report provides an assessment of the Project's impact upon biodiversity values within the site, including any impacts to plant community types (PCTs) and threatened species habitat. Recommendations are provided to avoid, minimise and mitigate any impacts to biodiversity values.

## 1.3 Riparian Assessment

A Riparian Assessment was prepared by Eco Logical (2020b), as part of the submission. The report determines potential impacts on the riparian and aquatic ecology of the Project from the removal of Dam 1 to 8 and Dam 10 and makes recommendations to mitigate those impacts. This also includes impacts to mapped watercourse and riparian corridors within the site.

## 2 Site description

### 2.1 Site location

The Project site is located at 200 Aldington Road, Kemps Creek, NSW. The site comprises seven (7) separate allotments with a total area of approximately 72 hectares (ha). The site is located approximately 5 kilometres (km) north-west of the future Western Sydney International (Nancy-Bird Walton) Airport (WSA), 13 km south-east of the Penrith CBD and 40 km west of the Sydney CBD (refer Figure 2.1).

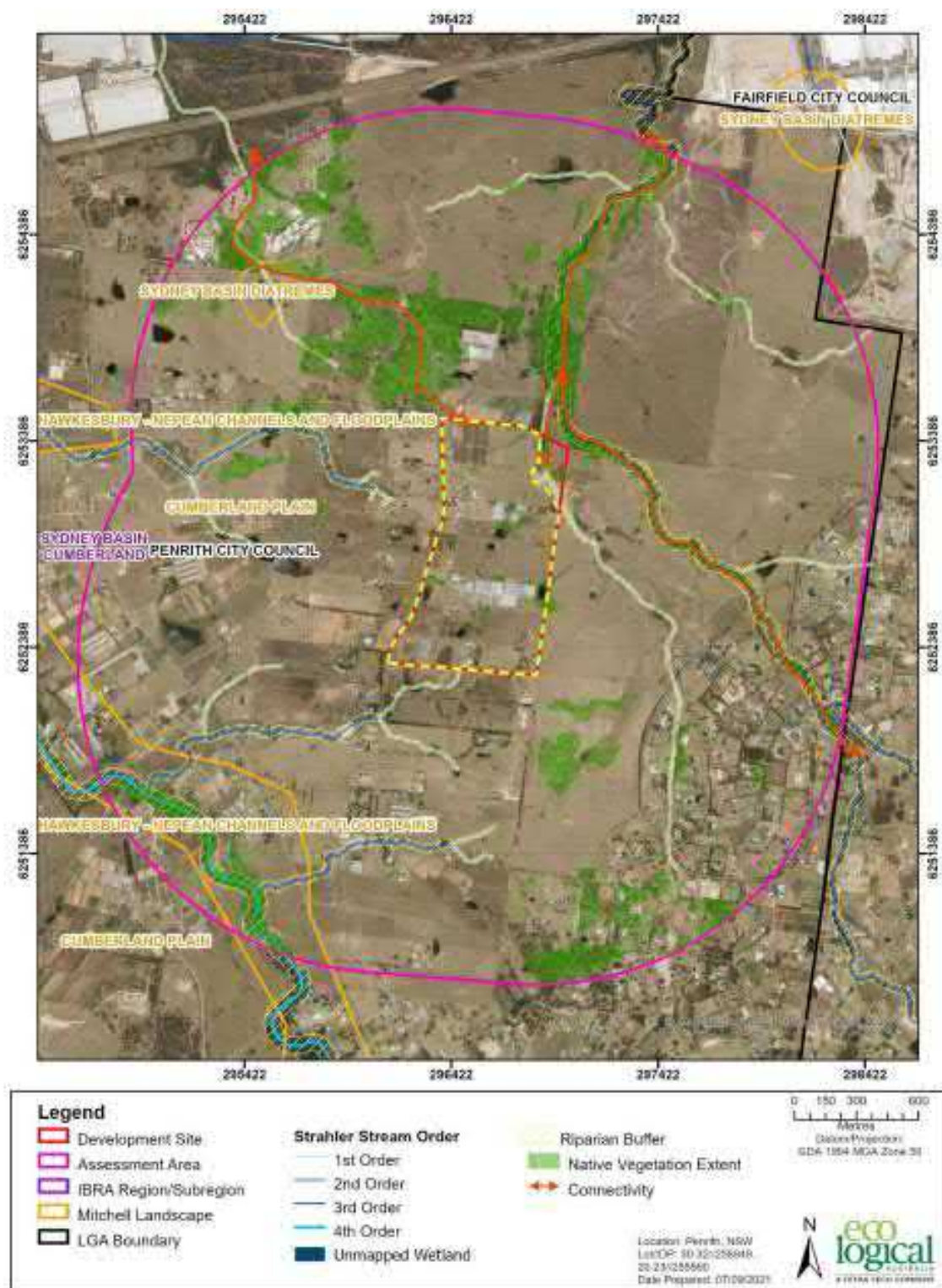
The site is located within the Mamre Road Precinct as identified by the State Environmental Planning Policy (Western Sydney Employment Area) 2009 (the SEPP). The Mamre Road Precinct will be a world-class industrial area, primarily catering for warehousing and logistics on larger consolidated land parcels close to the Western Sydney Airport. The Precinct will accommodate an intermodal terminal serviced by the planned Western Sydney Freight Line and a dedicated freight road network, and has convenient and quick access to the M12 and Elizabeth Drive. Connectivity to the broader Western Sydney Employment Area will be improved.

### 2.2 Construction staging and activities

A summary of construction staging, and associated activities is provided in Table 2.1.

**Table 2.1 Construction activities**

Stage	Summary of activities	Timing
Pre-construction activities	<ul style="list-style-type: none"><li>• Site establishment, including site boundary fencing, erection of signage and establishment of no-go areas.</li><li>• Establishment of site compound and stockpile sites.</li><li>• Establishment of site access points, traffic management measures.</li><li>• Installation of erosion and sediment controls.</li><li>• Pre-clearance surveys and marking fauna habitat trees prior to clearing works.</li><li>• Clearing of all existing vegetation, including grubbing activities and removal of vegetation off-site.</li></ul>	
Demolition	<ul style="list-style-type: none"><li>• Demolition and clearing of all existing built form structures.</li></ul>	
Drainage and earthworks	<ul style="list-style-type: none"><li>• Drainage and infill of existing farm dams and any ground dewatering.</li><li>• Subdivision of the site into 13 individual lots.</li><li>• Bulk earthworks including 'cut and fill' to create flat development platforms for the warehouse buildings, and site stabilisation works (if required).</li><li>• Stripping, stockpiling and management of topsoil and unsuitable materials.</li></ul>	
Construction	<ul style="list-style-type: none"><li>• Construction of warehouse building, including ancillary office and car parking spaces.</li><li>• Roadworks and access infrastructure.</li><li>• Stormwater and drainage works including stormwater basins, diversion of stormwater lines, gross pollutant traps and associated swale works.</li><li>• Sewer and potable water reticulation.</li><li>• Inter-allotment, road and boundary retaining walls.</li></ul>	
Post-construction	<ul style="list-style-type: none"><li>• Rehabilitation.</li><li>• Demobilisation of plant and equipment.</li><li>• Site clean-up.</li></ul>	



Source: Biodiversity Development Assessment Report, ecological, 22 September 2021

**Figure 2.1** Site location

# 3 Conditions of approval

This FFMP forms part of the Construction Environmental Management Plan (CEMP) and has been prepared in accordance with condition XXX of the development consent for SSD-10479. The condition requirements and where they have been addressed in this report are summarised in Table 3.1.

**Table 3.1**      **Flora and fauna consent conditions of SSD-10479**

Number	Consent condition	Where addressed in this report
<hr/>		

## 4 Site assessment

The following section outlines the findings of desktop and field surveys conducted to support the biodiversity development assessment report (BDAR), submitted as part of the Environmental Impact Statement, dated 11 November 2020.

### 4.1 Biodiversity Development Assessment Reports

To support the State Significant Development Application (SSDA), a Biodiversity Development Assessment Report (BDAR) was prepared by Eco Logical Australia (dated 15 October 2020) which describes the biodiversity values within the development site; the impacts and outlines the measures to be taken to avoid, minimise and mitigate impacts to the Plant Community Types and threatened species habitat present within the development footprint and development site.

An additional BDAR report was prepared by Eco Logical Australia (dated 22 September 2021) in response to submissions following public exhibition of the project.

#### 4.1.1 Results

##### i Plant community types

The field survey determined that the vegetation within the site is consistent with the following PCTs across multiple vegetation zones (refer Figure 4.1):

- Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion (PCT 835);
- Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion (PCT 850); and
- Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion (PCT 1232).

As summarised in Table 4.1 a total of 3.041 ha of native vegetation will be directly impacted by the Project.

**Table 4.1 Summary of plant community types impacted by the Project**

Vegetation zone	PCT ID	PCT Name	Condition	Direct impact (ha)
1	835	Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	Moderate	0.222
2	835	Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	Low – moderate	1.106
3	850	Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Low	0.115
4	1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	Low	0.926
5	1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	Moderate	0.672

## ii Threatened ecological communities

Through floristic analysis, it was determined that the PCTs located within the site correspond to TECs protected under the NSW *Biodiversity Conservation Act 2016* (BC Act). The PCTs weren't found to correspond with TECs protected under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

A summary of the TECs found on-site are summarised in Table 4.2 and Figure 4.2.

**Table 4.2 Threatened ecological communities under the BC Act**

PCT ID	Listing status	Name	Area (ha)
835	Endangered	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	1.69
850	Critically endangered	Cumberland Plain Woodland of the Sydney Basin Bioregion	0.12
1232	Endangered	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	1.91

## iii Threatened flora and fauna species

Habitat assessments were undertaken during the field survey to determine the likelihood of threatened flora and fauna species occurring within the site. Habitat assessments for fauna species involved a search of hollow bearing trees within the site in addition to searches for evidence of fauna foraging such as chewed cones and sap trees or roosting habitat.

Targeted fauna surveys were not completed as part of the site survey, and therefore presence was assumed for species credit species, including Green and Golden Bell Frog and Southern Myotis.

Prior to commencement of works additional fauna survey's will be conducted.





Figure 4.1 PCTs within the site

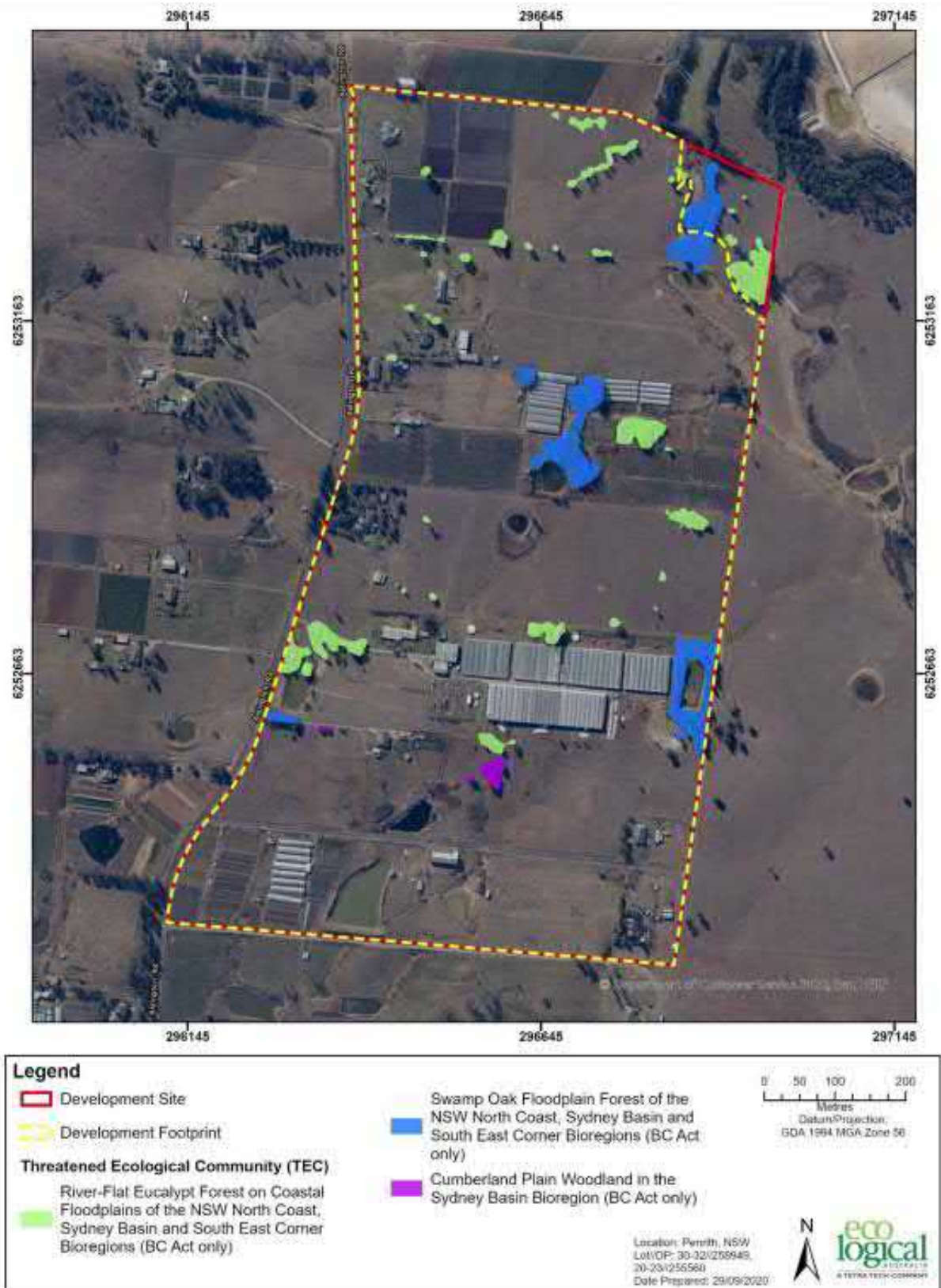


Figure 4.2 TECs within the site



## 5 Management measures

This section outlines the management measures to be implemented during construction and includes management measures relating to the loss of habitat for native fauna species due to vegetation removal. The Project site is located within the Mamre Road Precinct, and therefore the relevant controls of the Mamre Road Precinct Development Control Plan 2021 (the DCP) have been considered in this FFMP and must be applied to the construction phase of the Project. The applicable controls provided in the DCP have been summarised in Table 5.1 below.

The Project has been designed to avoid and minimise impacts to flora and fauna where possible and is located within an area of predominately non-native vegetation.

**Table 5.1**      **Management measures**

Control	Timing	Responsibility	Source
A Vegetation Management Plan (VMP) for the rehabilitation and conservation of native vegetation and habitat is to be prepared for land located within E2 Environmental Conservation, RE1 Public Recreation or a Riparian Corridor. The VMP is to be prepared in accordance with the requirements of NSW Natural Resources Assessment Regulator and the Department of Planning, Industry and Environment.	Pre construction	Environmental Representative Project Manager	Appendix B of the DCP Appendix B FFMP
Pre-construction surveys prior to removal or disturbance (seasonally dependent and before torpor) to human made structures, to ensure roosting habitat for microbat species including mine shafts, storm water tunnels, old or derelict buildings, bridges and culverts are retained where possible to ensure any individuals are dispersed or relocated as per best practice.	Pre construction	Environmental Representative Project Manager	Appendix B of the DCP
A pre-clearance assessment for any native fauna immediately prior to any clearing of native vegetation to ensure that arboreal mammals, roosting and hollow-using birds, bats and reptiles are stopped from accessing any vegetation to be cleared, and are removed if present prior to clearing according to EES' policy on the Translocation of Threatened Fauna in NSW.	Prior to clearing	Environmental Representative Project Manager	Appendix B of the DCP
Minimise clearing of native vegetation within the blue-green network, which comprises land zoned E2 Environmental Conservation, RE1 Public Recreation, RE2 Private Recreation and riparian corridors. Note: Clause 33K of WSEA SEPP also applies.	During Construction	Construction Manager	Section 2.2.3 of the DCP
No clearing of native vegetation shall occur within the Precinct on land zoned Environmental Conservation (E2), Public Recreation (RE1), and Private Recreation (RE2) without having regard to the <i>NSW Biodiversity Conservation Act 2016</i> .	During Construction	Construction Manager	Section 2.2.3 of the DCP
A Vegetation Management Plan (VMP) for the rehabilitation and conservation of native vegetation is to be prepared by a suitably qualified expert for land within the blue-green network.	During Construction	Environmental Representative Project Manager	Section 2.2.3 of the DCP
Avoid impacts on habitat features which provide essential habitat for threatened species and other fauna including large trees including dead trees at (>50cm trunk diameter at breast height) and avoid impacts to soil within the dripline of the retained trees.	During Construction	Construction Manager	Section 2.2.3 of the DCP
Where required, native animals are to be relocated from development sites in accordance with the former Office of Environment and Heritage's Policy on the Translocation of Threatened Fauna in NSW.	During Construction	Construction Manager Environmental Representative	Section 2.2.3 of the DCP
Any mature native tree removed is to be replaced by at least 2 trees selected from the Plant List (Appendix C of the Mamre DCP) which would develop to a similar size at maturity.	During Construction	Construction Manager Environmental Representative	Section 2.2.3 of the DCP

**Table 5.1**      **Management measures**

Control	Timing	Responsibility	Source
<p>Mitigation for threatened ecological communities is to be undertaken in accordance with:</p> <ul style="list-style-type: none"> <li>• Best Practice Guidelines: Cooks River/Castlereagh Ironbark Forest (NSW DECC, 2008) within and adjacent to the TEC; and,</li> <li>• Recovering Bushland on the Cumberland Plain: Best Practice Guidelines for the Management and Restoration of Bushland (NSW DECC, 2005).</li> </ul>	During Construction	Construction Manager	Section 2.2.3 of the DCP
Pest control techniques implemented during and post construction are to be in accordance with regulatory requirements for chemical use and address the relevant pest control strategy and are to reduce the risk of secondary poisoning (e.g. from Pindone or second-generation rodenticides).	During Construction Post Construction	Construction Manager Environmental Representative	Section 2.2.3 of the DCP
Where high intensity lighting is necessary for site operation, safety and security, it is to be designed to avoid light spill into adjoining natural areas. Australian Standard AS 4282 or updates to that standard are to be considered as a minimum.	During Construction	Construction Manager Environmental Representative	Section 2.2.3 of the DCP
Where a development footprint contains or is within 100m of known microbat colonies or habitat likely to support microbat colonies, street lighting must be of the type that will not attract insects.	During Construction	Construction Manager Environmental Representative	Section 2.2.3 of the DCP
Where noise adjacent to natural areas is likely to impact wildlife, the proponent must manage the timing of noise producing activities, including installing appropriate noise treatment barriers along major roads and other attenuation measures.	During Construction	Construction Manager Environmental Representative	Section 2.2.3 of the DCP
Ensure appropriate mitigation strategies (including fauna-sensitive road design elements) are employed to minimise vehicle strike during and after road construction and upgrading.	During Construction	Construction Manager Environmental Representative	Section 2.2.3 of the DCP
<p>Ensure movement of fauna is facilitated within and through wildlife corridors by:</p> <ul style="list-style-type: none"> <li>• ensuring that activities do not create barriers to the movement of fauna along and within wildlife corridors;</li> <li>• separating fauna from potential construction hazards through the pre-construction and construction process.</li> </ul>	During Construction	Construction Manager Environmental Representative	Section 2.2.3 of the DCP
The locations for weed management, site rehabilitation and nest boxes are to be installed on development adjoining land zoned E1 National Parks and Nature Reserves, E2 Environmental Conservation or lands managed as a reserve.	Construction	Construction Manager Environmental Representative	Appendix B of the DCP

**Table 5.1**      **Management measures**

Control	Timing	Responsibility	Source
A weed eradication management plan is to be implemented prior to and during construction. Refer to Appendix C of this FFMP.	Prior to and during construction	Construction Manager Environmental Representative	Appendix C of FFMP
Avoid impacts on habitat features which provide essential habitat for threatened species and other fauna including large trees including dead trees at (>50cm trunk diameter at breast height) and avoid impacts to soil within the dripline of the retained trees.	During Construction	Construction Manager Environmental Representative	Section 2.2.3 of the DCP
<b>Tree clearing</b>			
A tree-felling protocol is to be implemented to avoid impacts to birds, arboreal mammals and reptiles, raptor nests (almost all large raptors in Wilton are threatened), dreys, dens, hollows and other nests in trees that are to be cleared.	During clearing	Construction Manager Environmental Representative	Appendix B Mamre DCP
Where possible, tree felling of hollow bearing trees should be undertaken outside of spring and summer (main breeding season for native birds and microbats). If this is not possible, strict pre-clearing protocols must be observed when removing tree hollows.	During clearing	Contractor Environmental Representative	Section 2.2.5 of the BDAR
All hollow-bearing trees within the footprint will be removed. Given the tree species present and the young age of many potential hollow bearing trees it is not anticipated that nest boxes to replace habitat features will be required. However, should pre-clearing surveys identify habitat for threatened fauna species across the project area, nest boxes would be installed in larger trees to be retained in the VMP area prior to clearing commencing. Pre-clearance and clearance survey to be undertaken by suitably qualified and licensed ecologists...	Prior to clearing	Environmental Representative Project Manager	Section 2.2.5 of the BDAR
Temporary fencing and signage to be installed at the edge of the development site to prevent entry into the adjacent retained vegetation.	Construction	Construction Manager Environmental Representative	Section 2.2.5 of the BDAR
Boundaries of the impact area to be clearly delineated with heavy duty fencing, retained areas marked with “No Go” signage, in particular in the areas adjacent to PCT 835 which is being retained.	Entirety of Project	Construction Manager Environmental Representative	Section 2.2.5 of the BDAR
<b>Erosion and Sedimentation</b>			
Install permanent sediment barriers and erosion control during and post construction to prevent runoff into adjacent creek lines and wetlands, maintain controls throughout construction and undertake regular inspections (weekly – or daily if raining).	Entirety of Project	Construction Manager	Section 2.2.5 of the BDAR

**Table 5.1**      **Management measures**

Control	Timing	Responsibility	Source
<b>Construction hours</b>			
Daily timing of construction activities is recommended in accordance with Table 1 of the Interim Noise Guidelines (2009).	Entirety of Project	Construction Manager	Section 2.2.5 of the BDAR
<b>Construction Traffic</b>			
<p>Demonstration of how construction traffic will avoid remnant wildlife corridors and native vegetation communities by:</p> <ul style="list-style-type: none"> <li>o Using clearly defined access and egress points to and from a development site;</li> <li>• keep to designated routes within the development site and to and from the site;</li> <li>• position parking and equipment and material laydown areas away from land with biodiversity values;</li> <li>• adhere to construction zone speed limits of 20km/h across a subject site;</li> <li>• install temporary fencing prior to site works commencing to limit areas impacted by the works and accessible by construction traffic ;</li> <li>• site design must allow public access to fencing for ongoing maintenance; and</li> </ul> <p>the integrity of site fencing must be protected during construction.</p>	During Construction	Construction Manager Project Manager	Appendix B Mamre DCP
<b>Water usage</b>			
All water being used onsite (e.g dust management, cleaning, processes) is to be managed appropriately on site in accordance with a water management plan or similar.	Entirety of Project	Construction Manager Project Manager	Section 2.2.5 of the BDAR
<b>Pathogen species - Phytophthora</b>			
<p>Phytophthora control measures must be undertaken from the commencement of the project to minimise the risk of spread and to the site. The following guidelines should be followed:</p> <ul style="list-style-type: none"> <li>• <a href="https://www.rbgsyd.nsw.gov.au/science/plants/pestsdiseases/phytophthora-dieback/disinfection-procedures">https://www.rbgsyd.nsw.gov.au/science/plants/pestsdiseases/phytophthora-dieback/disinfection-procedures</a></li> <li>• <a href="http://www.environment.gov.au/biodiversity/invasivespecies/publications/management-phytophthora-cinnamomibiodiversity-conservation">http://www.environment.gov.au/biodiversity/invasivespecies/publications/management-phytophthora-cinnamomibiodiversity-conservation</a></li> </ul> <p>Vehicles, machinery and building refuse should remain only within the development site and disposed of at an appropriate waste management facility. Weed management to be undertaken where required. Vehicles should be washed down before entering and exiting the site to prevent the spread of weeds to or from the development site and adjacent vegetation. In particular, machinery work on or nearby dams are required to be washed down in order to prevent the spread of chytrid fungus into or from the development site. If water trucks are being used for dust control, implement procedures such as daily cleaning of the water truck and equipment.</p>	Entirety of project	Construction Manager Environmental Representative	Section 2.2.5 of the BDAR

**Table 5.1**      **Management measures**

Control	Timing	Responsibility	Source
Incorporation of best practice site hygiene protocols to manage the potential spread of Phytophthora and Myrtle Rust for land adjacent to land zoned E1 National Parks and Nature Reserves, E2 Environmental Conservation or lands managed as a reserve. In accordance with best practice guideline 'Arrive Clean, Leave Clean: Guidelines (Commonwealth of Australia, 2015).	Entirety of project	Construction Manager Environmental Representative	Appendix B Mamre DCP
The locations for weed management, site rehabilitation and nest boxes are to be installed on development adjoining land zoned E1 National Parks and Nature Reserves, E2 Environmental Conservation or lands managed as a reserve.		Construction Manager Environmental Representative	Appendix B Mamre DCP
<b>Environmental inductions</b>			
All staff working on the project will undertake an environmental induction as part of their site familiarisation. Site briefings should be updated based on phase of the work. This induction will include items such as:	All staff entering and working onsite	All site personnel	Section 2.2.5 of the BDAR
<ul style="list-style-type: none"> <li>• site environmental procedures (vegetation management, sediment and erosion control, exclusion fencing);</li> <li>• threatened species habitat and TECs;</li> <li>• what to do in case of environmental emergency (chemical spills, fire, injured fauna);</li> <li>• key contacts in case of environmental emergency;</li> <li>• what to do in the case of finding a threatened species; and</li> <li>• what to do in the case of finding fauna on the site.</li> </ul>			

## 5.1 Invasive species

There is potential for invasive exotic flora species to be spread within and outside of the site. This could occur from the movement of construction vehicles, plant and equipment through the site and onto adjoining land. The introduction of invasive species may result in the loss of biodiversity and habitat value, smothering of native juvenile plants, harbouring of feral animals and alteration of vegetation structure and riparian function. Mitigation measures should be implemented to reduce to spread of invasive species across the site, including the washdown of vehicles, plant and equipment when entering and existing the site.

Landscape maintenance works will be required through the construction and operational phases to ensure existing weed species growing on-site are controlled. This includes the ongoing maintenance and weeding of re-vegetated areas.

## 5.2 Landscaping and planting

High density planting may be required to provide bank stabilisation following construction of the batters surrounding the basins which form part of the bio-detention systems.

Deciduous trees should only be used in areas of parkland to avoid excessive amounts of leaf drop entering the stormwater system. A buffer must be established between mowed lawns and stormwater drains to prevent the grass clippings entering the stormwater system.

The site is partially located within the 8 km wildlife buffer zone surrounding the Western Sydney International (Nancy-Bird Walton) Airport as prescribed in the State Environmental Planning Policy (Western Sydney Aerotropolis) 2020 (Aerotropolis SEPP). A Key objective of the Aerotropolis SEPP is to safeguard the 24-hour operation of the airport, this includes minimising fauna attraction within the wildlife buffer zone surrounding the airport. Planting has been addressed by careful consideration to plant species proposed to be planted on site to limit the attraction of fauna species. This includes landscaping and planting within land zoned RE2 and E2 in addition to the proposed vegetation management area within the site, which has the potential to attract fauna species. Areas outside of the development footprint in these zones will not be modified and the existing plant communities and farm dam capacities will not be altered.

No significant bird life was identified during field studies and the plantings proposed will not include fruit bearing trees or other species which may attract fauna identified as problematic in the Aerotropolis SEPP.

## 5.3 Water quality protection

Water quality protection measures should be implemented for the following activities:

- clearing of groundcover (e.g grasses, herbs and shrubs, including exotic species) to bare earth;
- clearing of any native vegetation or mechanical weed removal within the riparian buffer zone;
- construction of any permanent car parks and roads;
- establishment of temporary staging areas, compounds and storage areas of oils and chemicals;
- establishment of wastewater discharge points, including pumping of groundwater from any below-ground excavation and vehicle wash down bays; and
- construction and maintenance of sediment detention and water quality ponds vegetated with macrophytes help filter and uptake nutrients and pollutants bound to sediment. Ponds may need periodic cleaning to remove excessive sediment, especially in the early stages of development. Overflow points should lead through a secondary pond and/or slow channel planted with dense reeds rather than directly into the creek line.

## 5.4 Protected areas

### 5.4.1 'No go' areas

Areas of native vegetation that are to be retained are to be clearly delineated as 'no go' areas, including the fencing and signage of these areas. This includes areas adjacent to isolated patches of PCT 835 which are required to be retained. Where fencing is required in close proximity to identified Aboriginal Cultural areas, consultation with the project archaeologist and adherence to the requirements of the ACHAR will be required prior to works being undertaken in these areas.

Other 'no-go areas' as identified in the EIS should be avoided during the construction phase, including areas that hold archaeological potential (refer page 79 of the EIS).

### 5.4.2 Vegetation management area

A vegetation management area will be retained in the north-east corner of the site (refer Figure 5.1). This area contains an existing wetland environment downstream of Dam 11, which experiences waterflow during high rainfall events. It also contains a damp area and small isolated pools which form during high rainfall events.

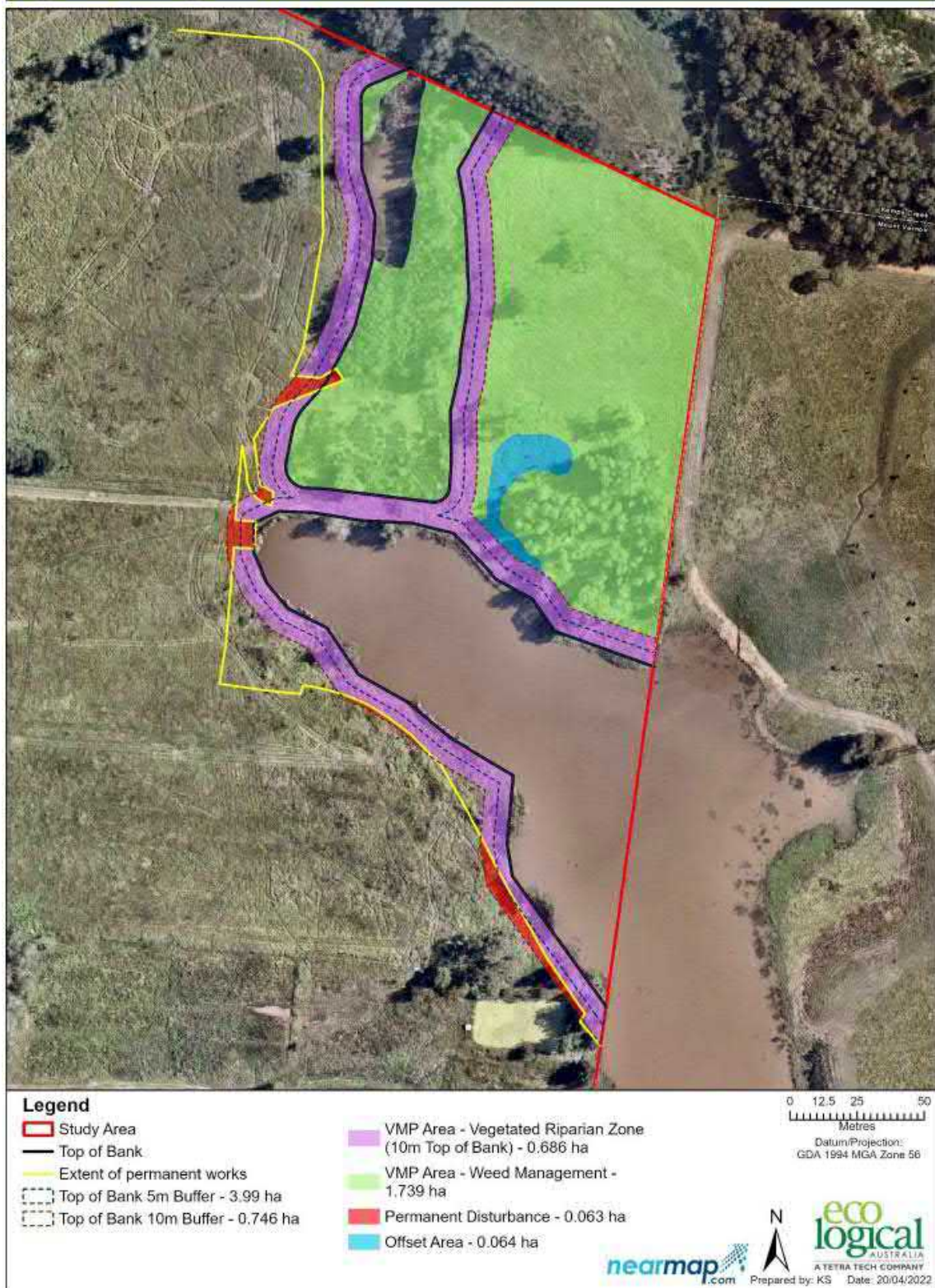
This area will facilitate the movement of fauna between the Ropes Creek riparian corridor and adjacent riparian corridors outside of the site boundary, which would otherwise be impacted by disturbance to the Ropes Creek riparian corridor. This will ensure connectivity between riparian corridors in addition to the genetic exchange of habitat amongst riparian corridors.

The following mitigation measures should be implemented when managing the vegetation management area:

- any disturbance to terrestrial or riparian vegetation in this area must be avoided;
- higher disturbance activities are to be located as far from the vegetation management area as possible to avoid disturbance to fauna which rely on the Ropes Creek riparian corridor for refuge, roosting, navigation, foraging and breeding;
- a five metre construction buffer must be established around the vegetation management area prior to the commencement of the construction phase; and
- native species should be planted to provide stability to the outer banks of the 1<sup>st</sup> order waterbody which runs through the area.



## Vegetation Management Plan Area



**Figure 5.1** Project overview showing vegetation management area

# References

Ecological 2020a, *200 Aldington Road Industrial Estate – Biodiversity Development Assessment Report*, prepared by Eco Logical Australia Pty Ltd for Fife Kemps Creek Trust.

Ecological 2020b, *200 Aldington Road Industrial Estate – Riparian Assessment*, prepared by Eco Logical Australia Pty Ltd for Fife Kemps Creek Trust.

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Attachment A

# Vegetation Management Plan

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# 200 Aldington Road Industrial Estate

State Significant Development (SSD-10479)

Appendix A - Vegetation Management Plan

Prepared for Fife Kemps Creek Trust  
March 2022

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# 200 Aldington Road Industrial Estate

## Vegetation Management Plan

### Report Number

E210906 RP#4

### Client

Fife Kemps Creek Trust

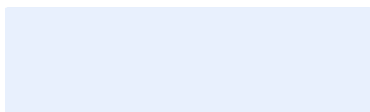
### Date

March 2022

### Version

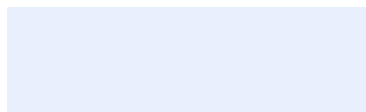
v1 Draft

### Prepared by



d mmmm yyyy

### Approved by



d mmmm yyyy

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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## APPENDICES

A – Accepted Weed Removal Techniques

B – VMP Planting Plans

## Abbreviations

Abbreviation	Description
Aerotropolis SEPP	State Environmental Planning Policy (Western Sydney Aerotropolis) 2020
BAM	Biodiversity Assessment Method
BC Act	Biodiversity Conservation Act 2016
BDAR	Biodiversity development assessment report
CEMP	Construction Environmental Management Plan
CCS	Community Communication Strategy
CNVMP	Construction Noise and Vibration Management Plan
CTMP	Construction Traffic Management Plan
DPIE	Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
EPBC Act	Commonwealth <i>Environmental Protection and Biodiversity Conservation Act 1999</i>
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
FFMP	Flora and Fauna Management Plan
GFA	Gross floor area
Ha	Hectares
Km	Kilometres
LGA	Local government area
PCTs	Plant community types
SSDA	State Significant Development Application
TECs	Threatened ecological communities
VMP	Vegetation Management Plan



# 1 Introduction

This Vegetation Management Plan (VMP) has been prepared for implementation by Fife Kemps Creek Trust (FKC) (and its contractors) for the construction of the 200 Aldington Road Industrial Estate (the Project). The Project is located in Kemps Creek, New South Wales 2178, within the Penrith Local Government Area (LGA).

The following documents have been reviewed and applicable information incorporated into this VMP:

- Environmental Impact Statement (the EIS), prepared by Ethos Urban, dated 11 November 2020;
- SSDA-10479;
- Biodiversity Development Assessment Report (BDAR), prepared by Eco Logical, dated 15 October 2020;
- Riparian Assessment, prepared by Eco Logical, dated 15 October 2020; and
- Mamre Road Precinct Development Control Plan, dated November 2021 (the DCP).
- National Airport Safeguarding Framework

## 1.1 Project overview

### 1.1.1 Background / context

This VMP forms a Request for Additional Information for the proposed Concept State Significant Development Application for a new industrial estate on land 106 – 228 Aldington Road, Kemps Creek.

The EIS for the project was placed on public exhibition between 18 November 2020 and 15 December 2020. During this period, a total of 18 submissions were received. These submissions were addressed and subsequent amendments to the project were made, as outlined in the Response to Submissions Report (dated 23 March 2021) prepared by Ethos Urban.

In written correspondence dated 28 April 2021, it was requested that FKC provide a further response to additional commentary raised by DPE, as well as additional comments raised by public authorities in their review of the first Response to Submissions Report. This was responded to via a second a Response to Submissions Report outlined by Ethos Urban (dated 22 September 2021).

Additional correspondence was received from DPE dated 15 November 2021 which has necessitated updates and additional information, as contained within this report.

### 1.1.2 Summary of the project for which development consent is now sought

Consent is sought for the following development. It represents minor amendments and does not represent a significant material change to what was previously proposed under the second RTS Report (22 September 2021)

- A concept masterplan with an indicative total building area of 342,865 sqm, comprising:
  - 325,865 sqm of warehouse gross floor area (GFA);
  - 17,010 sqm of ancillary office GFA;
  - 13 individual development lots for warehouse buildings with associated hardstand areas and two lots for water management infrastructure purposes (each including a bio retention basin);

- Roads, including:
  - Internal road layouts;
  - Southern road connection to Aldington Road;
  - Northern boundary road (half road corridor) connecting to Aldington Road;
  - Road connections to adjoining landholdings to the north and east;
- Provision for 1,516 car parking spaces; and
- Associated concept site landscaping.
- Detailed consent for progressive delivery of site preparation, earthworks and infrastructure works (i.e., Stage 1 works) on the site, including:
  - Demolition and clearing of all existing built form structures;
  - Drainage and infill of existing farm dams and any ground dewatering;
  - Clearing of existing vegetation;
  - Subdivision of the site into 15 individual lots;
  - Construction of a warehouse building with a total of 50,300 sqm of GFA, including:
    - 47,800 sqm of warehouse GFA; 2,500 sqm of ancillary office GFA; and
    - 221 car parking spaces.
  - Bulk earthworks including 'cut and fill' to create level development platforms for the warehouse buildings, and site stabilisation works (if required);
  - Roadworks and access infrastructure, including an interim access road and a temporary junction with Aldington Road;
  - Stormwater works including stormwater basins, diversion of stormwater;
  - Utilities services including sewer and potable water reticulation; and
  - Road and boundary retaining walls.

## 1.2 Biodiversity Development Assessment Report

A Biodiversity Development Assessment Report (BDAR) was prepared by Eco Logical (2020a), as part of the EIS submission. The report provides an assessment of the Project's impact upon biodiversity values within the site, including any impacts to plant community types (PCTs) and threatened species habitat. Recommendations are provided to avoid, minimise and mitigate any impacts to biodiversity values.

### 1.3 Riparian Assessment

A Riparian Assessment was prepared by Eco Logical (2020b), as part of the submission. The report determines potential impacts on the riparian and aquatic ecology of the Project from the removal of Dam 1 to 8 and Dam 10 and makes recommendations to mitigate those impacts. This also includes impacts to mapped watercourse and riparian corridors within the site.

### 1.4 National Airports Safeguarding Framework (NASF)

NASF guidelines version 3.1.4 (2014) have been taken into consideration within this VMP. The existing bushland areas and watercourse already provide wildlife habitat. The proposed VMP works will enhance the existing habitat particularly around the riparian edge. Planning authorities may require a Wildlife Hazard Assessment be undertaken to alert airport operators of the proposed new land uses and any mitigation strategies.

## 2 Site description

### 2.1 Site location

The Project site is located at 200 Aldington Road, Kemps Creek, NSW. The site comprises seven (7) separate allotments with a total area of approximately 72 hectares (ha). The site is located approximately 5 kilometres (km) north-west of the future Western Sydney International (Nancy-Bird Walton) Airport (WSA), 13 km south-east of the Penrith CBD and 40 km west of the Sydney CBD (refer Figure 2.1).

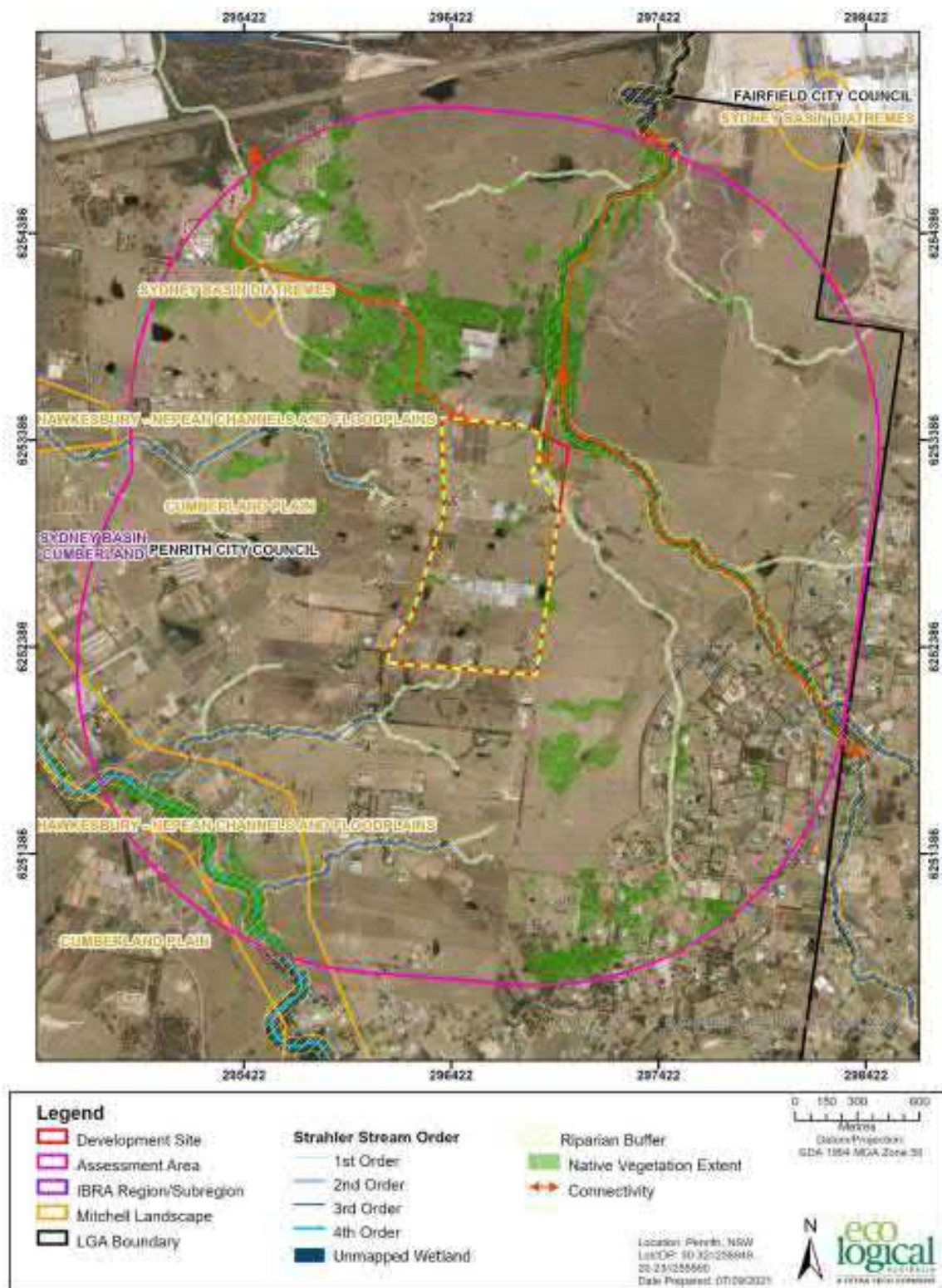
The site is located within the Mamre Road Precinct as identified by the State Environmental Planning Policy (Western Sydney Employment Area) 2009 (the SEPP). The Mamre Road Precinct will be a world-class industrial area, primarily catering for warehousing and logistics on larger consolidated land parcels close to the Western Sydney Airport. The Precinct will accommodate an intermodal terminal serviced by the planned Western Sydney Freight Line and a dedicated freight road network, and has convenient and quick access to the M12 and Elizabeth Drive. Connectivity to the broader Western Sydney Employment Area will be improved.

### 2.2 Construction staging and activities

A summary of construction staging, and associated activities is provided in Table 2.1.

**Table 2.1 Construction activities**

Stage	Summary of activities	Timing
Pre-construction activities	<ul style="list-style-type: none"><li>• Site establishment, including site boundary fencing, erection of signage and establishment of no-go areas.</li><li>• Establishment of site compound and stockpile sites.</li><li>• Establishment of site access points, traffic management measures.</li><li>• Installation of erosion and sediment controls.</li><li>• Pre-clearance surveys and marking fauna habitat trees prior to clearing works.</li><li>• Clearing of all existing vegetation, including grubbing activities and removal of vegetation off-site.</li></ul>	
Demolition	<ul style="list-style-type: none"><li>• Demolition and clearing of all existing built form structures.</li></ul>	
Drainage and earthworks	<ul style="list-style-type: none"><li>• Drainage and infill of existing farm dams and any ground dewatering.</li><li>• Subdivision of the site into 13 individual lots.</li><li>• Bulk earthworks including 'cut and fill' to create flat development platforms for the warehouse buildings, and site stabilisation works (if required).</li><li>• Stripping, stockpiling and management of topsoil and unsuitable materials.</li></ul>	
Construction	<ul style="list-style-type: none"><li>• Construction of warehouse building, including ancillary office and car parking spaces.</li><li>• Roadworks and access infrastructure.</li><li>• Stormwater and drainage works including stormwater basins, diversion of stormwater lines, gross pollutant traps and associated swale works.</li><li>• Sewer and potable water reticulation.</li><li>• Inter-allotment, road and boundary retaining walls.</li></ul>	
Post-construction	<ul style="list-style-type: none"><li>• Rehabilitation.</li><li>• Demobilisation of plant and equipment.</li><li>• Site clean-up.</li></ul>	



Source: Biodiversity Development Assessment Report, ecological, 22 September 2021

**Figure 2.1** Site location

### 2.2.1 Vegetation Management Area

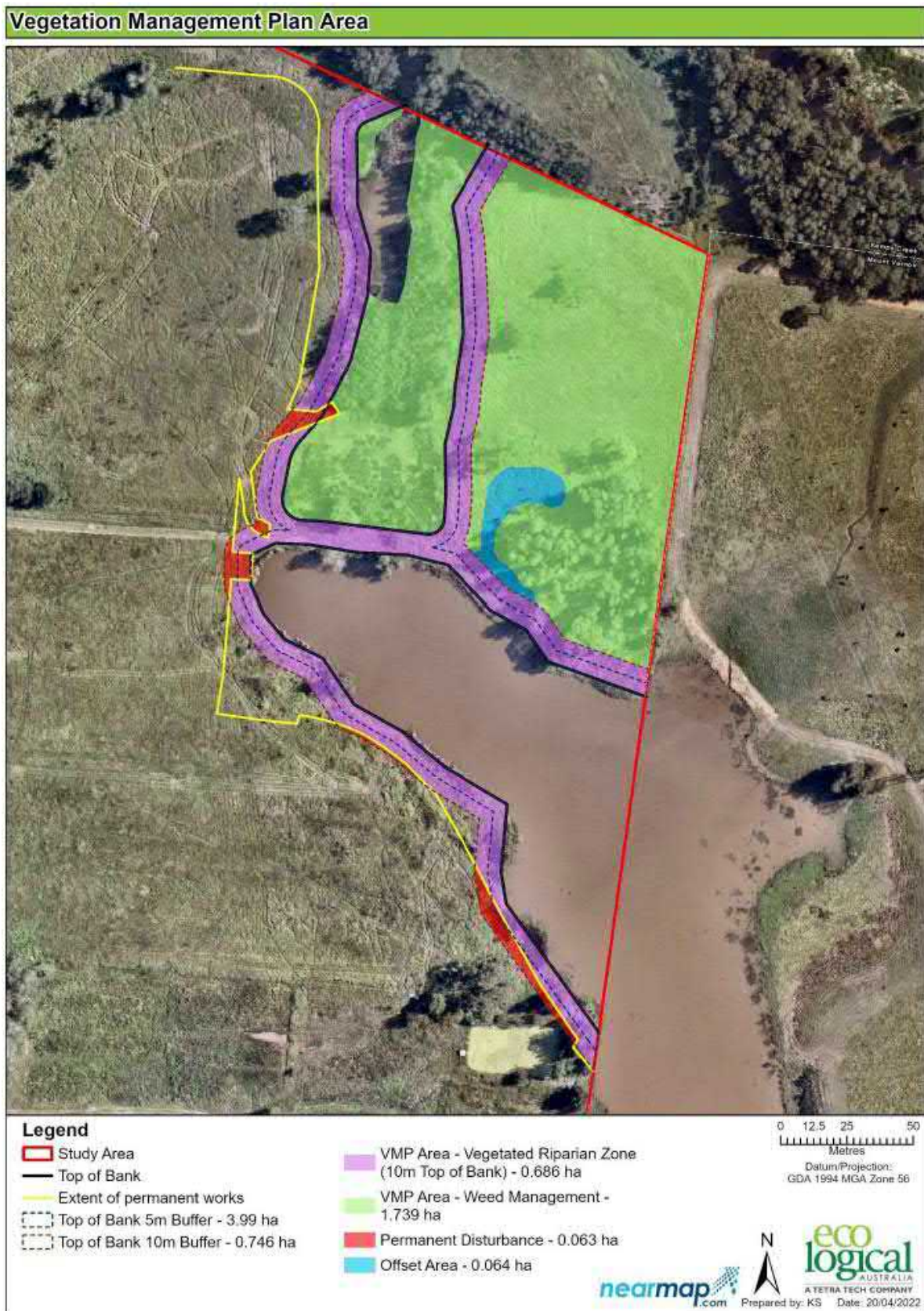
A vegetation management area will be retained in the north-east corner of the site (refer Figure 2.4). This area contains an existing wetland environment downstream of Dam 11, which experiences waterflow during high rainfall events. It also contains a damp area and small isolated pools which form during high rainfall events.

This area will facilitate the movement of fauna between the Ropes Creek riparian corridor and adjacent riparian corridors outside of the site boundary, which would otherwise be impacted by disturbance to the Ropes Creek riparian corridor. This will ensure connectivity between riparian corridors in addition to the genetic exchange of habitat amongst riparian corridors.

The following mitigation measures should be implemented when managing the vegetation management area:

- any disturbance to terrestrial or riparian vegetation in this area must be avoided;
- higher disturbance activities are to be located as far from the vegetation management area as possible to avoid disturbance to fauna which rely on the Ropes Creek riparian corridor for refuge, roosting, navigation, foraging and breeding;
- an 5 m construction buffer must be established around the vegetation management area prior to the commencement of the construction phase; and
- native species should be planted to provide habitat for fauna and provide stability to the outer banks of the 1st order waterbody which runs through the area.
- A Weed Eradication and Management Plan has been prepared (refer to Appendix C of the Flora and Fauna Management Plan) and outlines the weed control measures during and after construction for areas outside of the VMP works. Weed Eradication and Management Plans are to include specific measures to manage the spread of weeds on known populations of the following threatened flora species: *Acacia bynoeana*, *Cynanchum elegans*, *Dillwynia tenuifolia*, *Genoplesium baueri*, *Grevillea juniperina subsp. juniperina*, *Grevillea parviflora subsp. parviflora*, *Persoonia nutans* and *Pultenaea parviflora*. **Note** These species have not been identified within site.





**Figure 2.2** Project overview showing vegetation management area





## 3 Management Strategies

### 3.1 Proposed Works

The proposed works outlined by this document and the supporting planting plan incorporates the removal of existing noxious weeds, protection of existing vegetation and the control of erosion.

The intent is to retain the existing pasture grass and native vegetation over much of the site. Areas around the dam within the VMP area are to be mass planted with native grasses, groundcovers and shrubs and scattered trees as part of the VMP works.

The proposed works will ensure noxious weeds found within the VMP area are removed and prevented from spreading within the site and into neighbouring lots.

### 3.2 Objectives

- Maintain and manage the existing native trees,
- Provide supplementary tree planting, (Completed as part of VMP works)
- Mass plant areas disturbed by civil works, (Completed as part of VMP works)
- Remove noxious weeds,
- Ongoing control of noxious weeds,
- Stabilise areas where weeds have been removed and allow pasture grass to establish,
- Stabilise areas that have been eroded and allow pasture grass to establish,
- Maintain areas of archaeological significance.

### 3.3 Strategies

#### 3.3.1 Weed Removal

Weed species identified as occurring within the subject site are outlined in Table 4.1. The removal and monitoring of these species is essential to enable the long term viability of the existing vegetation and prevent of further infestation. Follow-up weed control will be required over the maintenance period to ensure the eradication of weed species and will occur at regular intervals as specified.

**Table 3.1 Weed Species Identified Onsite**

<b><i>Juncus acutus</i></b>	<b>Spiny Rush</b>
<b><i>Senecio madagascariensis</i></b>	<b>Fireweed</b>

Note: These species have been taken from plot/transect data plots 1 and 5 contained within the biodiversity report prepared by Ecological. There may be other threat weeds within the VMP area and will require further information

### 3.3.2 Tree protection

- Earthworks around subject trees are to be undertaken in the presence of a qualified arborist or ecologist who may provide additional on-site advice.
- Machine digging within the root mass of the subject tree be minimised and where possible hand digging be undertaken.
- Any exposed roots of the subject tree should be wrapped and protected during exposure and be replaced in a similar position prior to disturbance.
- Inspection of retained trees by a qualified person should be conducted at 6 and 12 months after development completion of works.

No earthworks are likely to be undertaken beneath existing trees, however should they occur, the Contractor shall fence off trees to be retained and protected where required prior to any construction work being undertaken. Protective fencing offsets shall be determined using AS 4970-2009 Protection of Trees on Development Sites. Generally fencing shall be offset the radial distance from the trunk calculated at 12 x the trunk diameter when measured at 1.4m high.

There shall be no stockpiling of materials or machinery entering identified vegetation protection zones.

### 3.3.3 Revegetation

Currently the site is mainly comprised of pasture grasses and two area of native vegetation. The areas of native vegetation and pasture areas noted as weed management areas are to be cleared of weed and maintained weed free over the maintenance period. The 10m wide riparian area is to be cleared of weeds shall be revegetated using native grasses, groundcovers shrubs and trees as listed on drawings Appendix 2 to maintain sufficient ground cover and aid in preventing the return and establishment of problem weed species seedlings. It is essential that weed control occurs throughout the maintenance period. Ensure where possible that revegetation work coincides with certain seasons to ensure a competitive advantage over weed species can be achieved.

## 4 Initial Works

### 4.1 Weed Removal

#### 4.1.1 Scope of Works

Weed removal and ongoing management in conjunction with erosion control is required throughout the area in order to ensure the success of revegetated areas. Upon inspection the most dominant and vigorous weed species identified on site was *Juncus acutus* and *Senecio madagascariensis*. Additional weed species may also be onsite (pending more detailed site analysis) and will require removal over the 5 year maintenance period.

The primary objective with respect to weed removal will be to target and remove the above mentioned weed species and other listed noxious weeds within the site as identified and will require rigorous management programmes to continue over a period of 5 years to ensure eradication

Pasture grass cover shall be retained to prevent erosion and limit the regrowth of target weed species. An integrated weed management approach utilising a variety of control methods is desirable to eradicate weed species.

#### 4.1.2 Management Activities

The primary focus shall be the removal of noxious weeds found on site. Weed control works shall be undertaken using a qualified bush regeneration team or approved weed control officers.

The below mentioned techniques have been selected for application in this situation due to suitability to this site. The below mentioned points shall be taken into consideration by the contractor at all times when undertaking weed removal:

1. Temporary fencing and signage to be installed at the edge of the VMP works areas to prevent entry.
2. Areas of native vegetation that are to be retained are to be clearly delineated as 'no go' areas, including the fencing and signage of these areas. This includes areas adjacent to isolated patches of PCT 835 which are required to be retained.
3. Other 'no-go areas' as identified in the EIS should be avoided during the construction phase, including areas that hold archaeological potential (refer page 79 of the EIS).
4. Install permanent sediment barriers and erosion control during and post construction to prevent runoff into adjacent creek lines and wetlands, maintain controls throughout construction and undertake regular inspections (weekly – or daily if raining).
5. Phytophthora control measures must be undertaken from the commencement of the project to minimise the risk of spread and to the site. The following guidelines should be followed: <https://www.rbgsyd.nsw.gov.au/science/plants/pestsdiseases/phytophthora-dieback/disinfection-procedures>. <http://www.environment.gov.au/biodiversity/invasivespecies/publications/management-phytophthora-cinnamomibiodiversity-conservation>.
6. There is potential for invasive exotic flora species to be spread within and outside of the site. This could occur from the movement of construction vehicles, plant and equipment through the site and onto adjoining land. The introduction of invasive species may result in the loss of biodiversity and habitat value, smothering of native juvenile plants, harbouring of feral animals and alteration of vegetation structure and riparian function. Mitigation measures should be implemented to reduce to spread of invasive

species across the site, including the washdown of vehicles, plant and equipment when entering and exiting the site.

7. Landscape maintenance works will be required through the construction and operational phases to ensure existing weed species growing on-site are controlled. This includes the ongoing maintenance and weeding of re-vegetated Protected areas
8. Vehicles, machinery and building refuse should remain only within the development site and disposed of at an appropriate waste management facility. Weed management to be undertaken where required. Vehicles should be washed down before entering and exiting the site to prevent the spread of weeds to or from the development site and adjacent vegetation. In particular, machinery work on or nearby dams are required to be washed down in order to prevent the spread of chytrid fungus into or from the development site. If water trucks are being used for dust control, implement procedures such as daily cleaning of the water truck and equipment.
9. Weed removal and associated techniques are undertaken at correct times of the year to ensure optimum results are achieved. Correct timing reduces cost and effort in the long term and improves eradication results dramatically.
10. The revegetation team shall take all due care to minimise disturbance to existing desirable vegetation and land surrounding.
11. The contractor shall keep records of all herbicide applications and use only registered and accepted herbicides. (Refer to appendix 3)
12. Appropriate herbicide training shall be undertaken ensuring all safety precautions are adhered to at all times.
13. The contractor shall ensure any spray drift is kept to an absolute minimum.
14. Herbicide control shall be undertaken when weeds are actively growing.
15. The contractor shall take all care not to poison existing desirable vegetation when undertaking herbicide control methods.
16. The correct herbicide shall be selected and used appropriately to ensure effective results on all weeds.
17. Do not undertake herbicide control when weed species are under stress. E.g. periods of extreme hot or cold weather.
18. All herbicide spraying is to be undertaken using only the Knap-Sack spray apparatus. All other methods of herbicide application are not to be used onsite unless discussed and approved in writing by the Landscape Architect.
19. Herbicide control is not to be used within or near water courses. The contractor shall obtain all required permits prior to use of herbicides near any water course.
20. Weed removal shall be carried out as described utilising weed removal techniques outlined in Appendix 1 of this report.
21. Should the contractor feel that techniques selected in this report will prove un-effective or inefficient; the contractor shall notify the landscape architect nominating alternative procedures for review and discussion.

### 4.1.3 Management

Bush regeneration teams shall begin treating smaller areas of moving through to more densely infested areas. Follow-up control shall be undertaken on a regular basis after primary control has been completed.

Acceptable weed removal techniques include:

- Cut and Paint
- The use of herbicides.
- Hand pulling
- Mechanical removal and clearing.

Should the contractor propose to remove weeds mechanically an access point is to be nominated. All disturbed ground is to be made good as soon as practicable after initial weed removal has been completed.

Once initial treatment has occurred follow up cut and paint will be required to ensure any remaining plants are treated. Should any plants be found that are small enough to pull out successfully by hand this is preferred. Ensure that all roots are removed. Hand pulling techniques are outlined below.

#### **Hand Pulling**

Hand removal will be required most probably after initial treatment and will be used in the event of new seedling emergence which will have recolonised after initial removal. Hand removal shall be employed ensuring that all roots are removed as described below.

- Hand pulling is best undertaken when the soil profile is moist to ensure full and ease of removal and reduced soil disturbance
- Apparent seeds and fruit are to be removed and placed in a bag for removal and disposal off site
- Firmly take hold of the seedling at ground level, pull and manipulate backwards and forwards until it releases cleanly. If the plant is held too high it may break resulting in root material left behind in the soil. Remaining plant material may re- establish in this instance.
- All roots remaining within the soil shall be removed
- Should the seedling have a spreading root system, roots will require individual removal
- All seedlings and hand pulled weeds are to be placed in a bag, removed from site and disposed of sensibly.

## 4.2 Planting Techniques

### 4.2.1 Scope of Works

Prior to re-vegetation, all initial weed removal and engineering activity such as erosion stabilisation must be undertaken and completed. Revegetation shall commence as soon as practicable and where applicable upon completion of initial weed removal.

#### 4.2.2 Management Activities

Site preparation shall include the removal and control of all problem weeds identified on-site, as discussed previously. Minor sediment and erosion control measures may be required on batters where large weed infestations are removed. Erosion and sediment control will be carried out in accordance with Managing Urban Stormwater: Soils and Construction commonly known as The Blue Book (Landcom 2006) and local council requirements.

Plants found to be dead or dying shall be replaced under general maintenance. Maintenance activities shall be continued throughout the 5 year period and include:

- Weeding,
- Spot spraying,
- Watering,
- Monitoring of losses from heat or other factors,
- Poor growth,
- Animal and construction damage.

### 4.3 Erosion and Sediment Control

#### 4.3.1 Scope of Works

Many factors that occur on site throughout construction phases have the potential to contribute to erosion and unnecessary damage to both the site itself and adjoining land. Factors that may cause adverse effects can include; storage of fill, removal of selected trees and surrounding grass cover in open areas and to a lesser extent, weed control and revegetation. It is important to understand the adverse effects caused due to erosion and sedimentation. In some cases areas some distance from the initial disturbance may be affected by actions else where on site.

Soil stabilisation works will be implemented as per the Managing Urban Stormwater: Soils and Construction commonly known as The Blue Book (Landcom 2006) and local council requirements.

#### 4.3.2 Management Activities

It is a standard requirement for construction activity to provide sediment control where required. Erosion zones, including newly exposed areas where weed removal has occurred, shall be turfed with kikuyu immediately to reduce the potential for any further erosion or weed infestation to occur. Establishment and maintenance of cover is essential to ensure erosion areas do not amplify in size.

Steep eroded areas will require soil to be placed over the eroded area with turf laid over to minimise further erosion. If erosion is persistent erosion control and grass establishment matting is to be placed over soil that has been seeded.

#### 4.4 Control of Access

All areas being re vegetated shall be fenced/marked off to ensure that machinery, stockpiling of materials, access tracks, service layouts and general construction activity is prevented from accessing these areas. Protective fencing shall remain erected until construction works are complete for that particular stage.

It is often difficult to enforce this over large sites with numerous parties working on the site, however with the proper fencing, site supervision and site meetings/induction will ensure the best method to ensure the protection of these areas.

# 5 Ongoing Maintenance

## 5.1 General

The time allocated to maintenance shall be varied according to the stage of the development. The Landscape Maintenance schedule includes but is not limited to the prescribed instructions. The maintenance contractor shall perform additional tasks should they be required.

## 5.2 Weed and Pest Control

### 5.2.1 Scope

Ongoing monitoring, maintenance and weed control shall be undertaken in accordance with this plan and as required to further reduce and eradicate weed populations throughout the site. All areas found to have weed infestations shall be monitored and treated thoroughly for a minimum of 5 years. Newly exposed or disturbed areas (due to initial weed removal) will be subject to new weed growth and shall require continued weed removal procedures, monitoring and maintenance throughout this period.

The contractor shall undertake weed removal as required on a regular basis in order to maintain a weed free environment.

### 5.2.2 Management Activities

Undertake adequate weed control measures on any non-desirable plants or weeds as required. Hand removal is required for weeds situated on or below the permanent water level whilst approved glyphosphate can be used on weed species situated above the permanent water level

Regularly remove, by hand, rubbish and weed growth that may occur throughout the basin area and dispose of in a suitable manner.

The maintenance contractor must keep records of each chemical application. Details are to include location, target identification, operators name, treatment date and time, risk assessment including prevailing conditions and product and equipment used and application rates.

## 5.3 Monitoring, Maintenance and Plant Establishment

### 5.3.1 Scope

On going monitoring and establishment is important to establish and retain high quality, successful vegetation cover and minimise weed re-infestation. The contract shall include an establishment and maintenance period to cover the full 5 year period. During this period Monitoring sessions would indicate the specific maintenance requirements for the site. Such maintenance is likely to involve (but not necessarily be restricted to):

- Control of noxious weeds,
- Watering as required,
- Control of pests or diseases,
- Fauna damage



- Correction of any significant nutrient deficiencies,
- Replacement of failed plantings,
- Correction of any bank/slope instability or erosion problems,
- General health and vigour, and
- Any other unanticipated problems.

Regular monitoring shall be undertaken for addressing the performance criteria as outlined. The sessions will need to be more frequent in the early stages following planting, the frequency decreasing with time.

- The developer shall submit annual reports detailing works undertaken, the results of that work, identifying future works programs and making and necessary recommendations to enhance the VMP.

The frequency and duration of monitoring should be flexible, and re-assessed following each session. However, as an initial guide, monitoring is likely to be required:

- Monthly for the first 6 months,
- Once every 3 months for the following 18 months,
- Once every 12 months for the following 36 months
- Subsequent years if required. Frequency to be discussed. At this time a decision could be made as to whether monitoring can be discontinued.

If it is necessary to increase or decrease monitoring at any given time the contractor shall discuss options with the landscape architect.

### 5.3.2 Management Activities

Vegetation maintenance activities shall include:

- Weeding, as per section 3.2
- Spot spraying,
- Watering,
- Monitoring of losses from heat or other factors,
- Poor growth,
- Animal and construction damage,
- Unsuitable species.
- Plants found to be dead or dying shall be replaced under general maintenance.
- Where erosion occurs, re-instate soil and stabilise with additional planting.

Upon completion of the 5 year landscape establishment contract a report is to be prepared by the contractor to record the results and actions identified throughout each monitoring and maintenance session. The report shall be submitted to the Landscape Architect.

The report is to be inclusive of but not be limited to; up to date photographs of areas treated, current progress or issues encountered, providing viable options for the remedy of any such issues, an outline of future maintenance and monitoring activities, any recommended amendments to the proposed program and reason for proposed amendments.

## 5.4 Checklists and Logs

### 5.4.1 Scope

A Landscape Maintenance Schedule is made part of this specification. The contractor shall review this schedule as required and complete all applicable items on the list in intervals as specified.

### 5.4.2 Management Activities

The contractor shall keep a log of all maintenance undertaken on site. Details included within the log shall include date, time, work undertaken and any relevant responses/recommendations with respect to work undertaken. Submit log records to the site superintendent within 24 hours of being requested to do so.

Task	Description
1	Remove litter and other refuse.
2	Correct and control erosion.
3	Replace lost, stolen or any dead plants.
4	Encourage native wildlife and control feral animals.
5	Remove undesirable species that produce excessive shade or dominate the plant mix.
6	Weed control and removal.
7	Maintain vegetation to comply with APZ requirements as nominated in the bushfire report.

# References

Ecological 2020a, *200 Aldington Road Industrial Estate – Biodiversity Development Assessment Report*, prepared by Eco Logical Australia Pty Ltd for Fife Kemps Creek Trust.

Ecological 2020b, *200 Aldington Road Industrial Estate – Riparian Assessment*, prepared by Eco Logical Australia Pty Ltd for Fife Kemps Creek Trust

## 6 Appendices

## A.1 Accepted Weed Removal Techniques

Weeds to be removed. The following techniques are recommended by the [NPWS] National Trust, NSW National Parks and Wildlife Service and Australian Association of Bush Regenerators.

### Woody Weed Removal Techniques

Removal Techniques:

- Cut and Paint (Woody weeds to 10 cm basal diameter)
- Stem Injection
- Frilling or Chipping

Notes

- Deciduous plants should be treated in spring and autumn when leaves are fully formed;
- For multi-stemmed plants, inject or chip below the lowest branch or treat each stem individually; and
- Herbicides must be injected immediately before plant cells close (within 30 seconds) and translocation of herbicide ceases.

### Small Hand-Pullable Plants

Removal Techniques:

- Hand removal

Notes

- Leave weeds so roots are not in contact with the soil e.g. hang in a tree, remove from site or leave on a rock.

### Vines And Scramblers

Removal Techniques:

- Hand removal

Notes

- Take hold of one runner and pull towards yourself;
- Check points of resistance where fibrous roots grow from the nodes;
- Cut roots with a knife or dig out with a trowel and continue to follow the runner;
- The major root systems need to be removed manually or scrape/cut and painted with herbicide;
- Any reproductive parts need to be bagged.

Removal Techniques:

- Stem Scraping

## Notes

- Scrape 15 to 30 cm of the stem with a knife to reach the layer below the bark/outer layer; and immediately apply herbicide along the length of the scrape.

## **Weeds With Underground Reproductive Structures**

### Removal Techniques:

#### Hand Removal Of Plants With A Taproot

- Remove and bag seeds or fruits;
- Push a narrow trowel or knife into the ground beside the tap root, carefully loosen the soil and repeat this step around the taproot;
- Grasp the stem at ground level, rock plant backwards and forwards and gently pull removing the plant; and
- Tap the roots to dislodge soil, replace disturbed soil and pat down.

#### Crowning

- Remove and bag stems with seed or fruit;
- Grasp the leaves or stems together so the base of the plant is visible;
- Insert the knife or lever at an angle close to the crown;
- Cut through all the roots around the crown; and
- Remove and bag the crown.

#### Stem Swiping

- Remove any seed or fruit and bag; and
- Using a herbicide applicator, swipe the stems/leaves.

#### Herbicide Treatment

- Isolated spray with 'Glyphosate'.

A.2 VMP Planting Plans

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Attachment B

# Dam Dewatering Plan

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## B.1 Dam Dewatering Plan

This Dam Dewatering Plan (DDP) has been prepared for implementation by Fife Kamps Creek Trust (FKC) (and its contractors) for the construction of the 200 Aldington Road Industrial Estate (the Project). The Project is located in Kamps Creek, New South Wales 2178, within the Penrith Local Government Area (LGA). This DDP outlines the management measures to be applied to the removal of Dam 1 to 8 and Dam 10 (refer **Error! Reference source not found.**).

The following documents have been reviewed and applicable information incorporated into this DDP:

- Environmental Impact Statement, prepared by Ethos Urban, dated 11 November 2020;
- SSDA 10479;
- Riparian Assessment, prepared by Eco Logical, dated 15 October 2020; and
- Mamre Road Precinct Development Control Plan 2021 (the DCP)

## B.2 Site assessment

### B.2.1 Method

As part of the Riparian Assessment (Eco Logical 2020), a literature review and field survey were completed by aquatic ecologists from Eco Logical as part of the Riparian Assessment (Eco Logical 2020). This included review of the following databases and guidelines:

- BioNet/Atlas of NSW Wildlife (DPIE 2020);
- Protected Matters Search Tool (DAWE 2020);
- Native Vegetation of the Sydney Metropolitan Area v.3 (OEH 2016);
- SIXMaps;
- hydroline spatial data from the Water Management (General) Regulation 2018;
- Policy and Guidelines for Fish Habitat Conservation and Management (DPI 2013); and
- Guidelines for Controlled Activities on Waterfront Land – Riparian Corridors (NRAR 2018).

The field survey was undertaken on 20 July 2020 by an aquatic ecologist from Eco Logical. The purpose of the field survey was to determine if watercourses on site met the definition of a river under the NSW *Water Management Act 2000* (WM Act), in addition to assessing the condition and extent of riparian and aquatic habitat.

### B.2.2 Results

In total, 11 dams were located within the site (refer **Error! Reference source not found.**). As summarised in **Error! Reference source not found.**, aquatic fauna and flora species were observed in several of the dams.

**Table B.1 Aquatic fauna and flora species within dams**

Dam number	Aquatic fauna	Aquatic flora	Removal (Y/N)
1	No aquatic fauna observed	Floating macrophytes ( <i>Azolla pinnata</i> )	Y
2	No aquatic fauna observed	Emergent <i>Typha orientalis</i> plus submerged macrophytes	Y
3	No aquatic fauna observed	<i>Typha orientalis</i>	Y
4	No aquatic fauna observed	Emergent macrophytes including <i>Ludwigia peploides</i> (Water Primrose) and <i>Persicaria decipiens</i> (Knotweed) and floating <i>Azolla pinnata</i>	Y
5	No aquatic fauna observed	Submerged macrophytes in the form of <i>Vallisneria australis</i> (Ribbonweed)	Y
6	Eurasian Coots and frogs could be heard calling	<i>Ludwigia peploides</i> and <i>Eleocharis sphacelata</i> within the dam	Y
7	Frogs heard calling.	<i>Persicaria decipiens</i>	Y
8	Pied cormorant	No aquatic flora observed	Y
9	No aquatic fauna observed	No aquatic flora observed	N
10	No aquatic fauna observed	<i>Typha orientalis</i> , <i>Lemna</i> sp. and <i>Ludwigia peploides</i> on the edges of the dam	Y
11	Long finned eel	<i>Typha orientalis</i> in the middle of the dam	N

The literature review identified two mapped watercourses within the site, including an unnamed first order tributary of Kemps Creek located near the southern boundary, and Ropes Creek located near the north-eastern boundary.

A defined channel was not present for either tributary of Kemps Creek or Ropes Creek along the mapped locations, and therefore the tributaries were assessed to not meet the definition of a river under the *Water Management Act 2000*.

In the north-east corner of the site, a wetland environment is present downstream of Dam 11. Waterflow is likely to only occur through this area during high flow events. A damp area is located upstream of Dam 11 which would be inundated following heavy rainfall. Small, isolated pools are also located within this area.

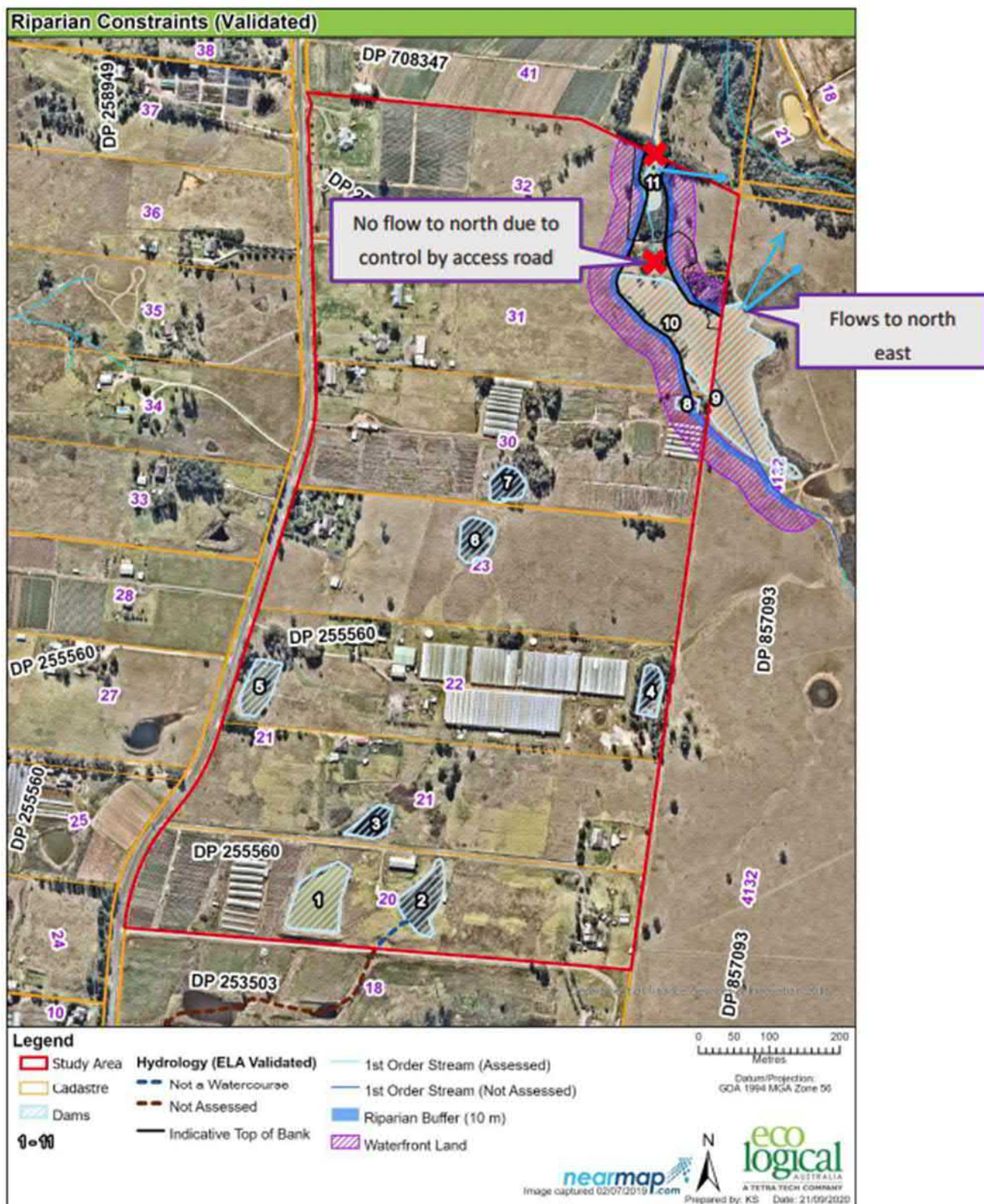


Figure B.1 Watercourses within the site

## B.3 Management measures

This section summarises the management measures provided in the Riparian Assessment (Eco Logical 2020) to mitigate impacts to riparian vegetation during stage 1 works. Management measures provided in the Riparian Assessment (Eco Logical 2020) have been summarised in **Error! Reference source not found.** below. The Project site is located within the Mamre Road Precinct, and therefore the relevant controls of the DCP have been considered in this Dam Dewatering Plan and must be applied to the construction phase of the Project. The applicable controls provided in the DCP have been summarised in **Error! Reference source not found.** below.

**Table B.2** Management measures

Action	Timing	Responsibility	Source
Higher disturbance activities (such as noisy machinery, flood lights, generators and compounds) should be located as far from the riparian buffer as practically possible.	Duration of project	Construction Manager	Section 6.2 of the Riparian Assessment
High-density planting may be required to provide bank stabilisation following construction of the batters around the basins.	Duration of project	Construction Manager	Section 6.3 of the Riparian Assessment
Water quality protection measures are recommended for adherence where the proposed development includes activities that require: <ul style="list-style-type: none"><li>• Clearing of groundcover (grasses, herbs and shrubs, including exotic species) to bare earth.</li><li>• Clearing of any native vegetation or mechanical weed removal within the riparian buffer zone.</li><li>• Construction of any permanent car parks and roads.</li><li>• Temporary staging areas, compounds and storage areas of oils and chemicals.</li><li>• Wastewater discharge points, including pumping of groundwater from any below-ground.</li><li>• Excavation and vehicle wash down bays.</li><li>• Construction and maintenance of sediment detention and water quality ponds vegetated with macrophytes help filter and uptake nutrients and pollutants bound to sediment. Ponds may need periodic cleaning to remove excessive sediment, especially in the early stages of development. Overflow points should lead through a secondary.</li></ul>	Duration of project	Construction Manager	Section 6.3 of the Riparian Assessment
Urban design should aim to reduce organic pollutants entering the waterway, such as: <ul style="list-style-type: none"><li>• Use native street trees where leaves may enter the stormwater system. Deciduous trees should only be used if leaf drop is contained within a parkland environment.</li><li>• Provide a small buffer between mown lawns in public space and stormwater drains. This aims to reduce grass clippings entering the creek.</li></ul>	Duration of project	Construction Manager	Section 6.3 of the Riparian Assessment

**Table B.2 Management measures**

Action	Timing	Responsibility	Source
<p>To ensure aquatic species are protected during the dam decommissioning process, the aquatic ecologist in charge of fauna relocation should possess the following licenses/permits:</p> <ul style="list-style-type: none"> <li>• Section 37 Fisheries Management Act 1994 (for fish), issued by NSW Department of Primary Industries - Fisheries</li> <li>• Animal Research Authority (for the welfare of all animals), issued by the Secretary's Animal Care &amp; Ethics Committee. This Authority describes permitted euthanasia techniques (e.g. for Redfin Perch and sick or diseased fauna).</li> </ul>	Duration of project	Construction Manager/ Aquatic ecologist	Section 6.4 of the Riparian Assessment
The aquatic ecologist is to notify NSW Fisheries of the activity 48 hours prior to fish relocation (unless an agreement is in place), including locations of dewatered and relocation sites.	Duration of project	Construction Manager/ Aquatic ecologist	Section 6.4 of the Riparian Assessment
The dewatering schedule should allow time for fish rescue, especially during the final 0.3 m water depth (to be advised by Aquatic Ecologist). Fauna should be captured in one day, so pumps need to be of adequate size and placed in an area free from mud and debris (e.g. inside excavator bucket or screened sump pit).	Duration of project	Construction Manager/ Aquatic ecologist	Section 6.4 of the Riparian Assessment
Native fish healthy enough for relocation are to be contained and transported in an aerated tub/bucket/tank to an appropriate dam/lake/waterhole/creek. It is recommended that native species are relocated to a nearby dam or creekline with landholder's permission. NSW Fisheries advise that the host location should be large enough to accommodate additional fish, especially predatory eels. If a large number of predatory fish such as <i>Anguilla reinhardtii</i> are captured during the aquatic fauna relocation process, an additional release point may be required.	Duration of project	Construction Manager/ Aquatic ecologist	Section 6.4 of the Riparian Assessment
Prior to any earthworks commencing on site, an Erosion and Sediment Control Plan would need to be developed and implemented, to ensure that there is no detrimental impact on environmental functions and processes within the site as well as downstream. This plan would outline where erosion and sediment control measures are to be constructed to prevent mobilisation of soil from the site, particularly within the watercourse, as sediment entering the watercourse (even when dry) has the potential to degrade water quality within the site and downstream.	Prior to works commencing/ duration of project	Construction Manager/ Environmental representative	Section 6.5 of the Riparian Assessment
Waterways of Strahler Order 2 and higher will be maintained in a natural state, including the maintenance and restoration of riparian area and habitat, such as fallen debris.	Duration of project	Construction Manager	Section 2.3 of the DCP



**Table B.2      Management measures**

Action	Timing	Responsibility	Source
Where a development is associated with or will affect a waterway of Strahler Order 2 or higher, rehabilitation shall return that waterway to a natural state.	Duration of project	Construction Manager	Section 2.3 of the DCP
The vegetated riparian zone shall be vegetated with fully structured native vegetation (trees, shrubs and groundcover species).	Duration of project	Construction Manager	Section 2.3 of the DCP
Riparian areas along Kemps Creek and Ropes Creek shall retain proteaceae shrubs providing habitat and connectivity for the Eastern Pygmy Possum <i>Cercartetus nanus</i> .	Duration of project	Construction Manager	Section 2.3 of the DCP
Private and public fencing should avoid intersecting across riparian corridors.	Duration of project	Construction Manager	Section 2.3 of the DCP
Appropriate widths for vegetated riparian zones are dependent on the stream order in accordance with the Strahler methodology. Stream width shall be measured either in accordance with the 'Waterfront Land Tool' as developed by the NRAR, or from the top of the highest bank on both sides of the channel/watercourse. Enhancement of riparian corridors should: respond to the hydrological regime of the drainage area for watercourse treatments; <ul style="list-style-type: none"> <li>• replicate the natural watercourse through creation of a meandering channel;</li> <li>• simulate natural stream bank and bed substrate having regard to riparian requirements and flow velocities to sustain vegetation groupings;</li> <li>• minimise ongoing maintenance through channel and stream bed design;</li> <li>• establish functional riparian zones and natural stream channels;</li> <li>• maintain or create a full assemblage of local indigenous vegetation with natural in-stream obstructions;</li> <li>• minimise damage to channel banks and vegetation from storm flow events; and</li> <li>• ensure that the channel has the capacity to support flood flows having regard to the steepness of the catchment and stream channel morphology.</li> </ul>	Prior to works commencing/ duration of project	Construction Manager	Section 2.3 of the DCP
Dams proposed for retention must be subject to a geotechnical investigation to determine the safety of the structure with respect to surrounding land uses.	Duration of project	Construction Manager	Section 2.3 of the DCP

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Attachment C

# Weed Eradication Management Plan

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# 200 Aldington Road Industrial Estate

State Significant Development (SSD-10479)

## Appendix C - Weed Eradication Management Plan

Prepared for Fife Kemps Creek Trust  
March 2022

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# 200 Aldington Road Industrial Estate

State Significant Development (SSD-10479)

## Weed Eradication Management Plan

### Report Number

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E210906 RP#9

### Client

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Fife Kemps Creek Trust

### Date

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17 March 2022

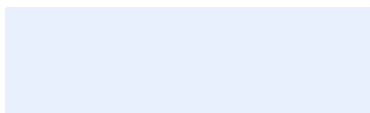
### Version

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v1 Draft

### Prepared by

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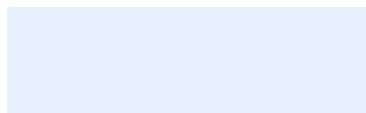
**David Bone**

Associate Director

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### Approved by

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**Lahnie Cooper**

Associate

d mmmm yyyy

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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Appendix B Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022 – Other Weeds of Regional Concern	B.1

# 1 Introduction

## 1.1 Purpose

Construction works have the potential to cause the spread or importation of weeds and pathogens. Activities including vegetation clearing, soil disturbance, erosion and sediment control, vehicle movements, inadequate rehabilitation/ revegetation of disturbed areas and inappropriate topsoil management have been identified as potential risks in weed and pathogen management.

This Weed Eradication Management Plan has been prepared to identify the presence of key weed species and pathogens across the project area, and to outline the processes required to control and prevent their potential spread. It has been prepared in accordance with the *Biosecurity Act 2015* and the *Greater Sydney Regional Strategic Weed Management Plan 2017 - 2022*. Priority weeds and other weeds of regional concern are also attached to this Plan (Appendix 1 and 2 respectively).

The purpose of this Plan is to:

- Identify the pathogens and key weed species and their distribution across the project area
- Prevent the introduction and spread of weeds and pathogens throughout construction works
- Establish an inspection and reporting framework for weeds and pathogens during construction
- Set out performance criteria for the management of weeds and pathogens.

It is noted, the following threatened flora species: *Acacia bynoeana*, *Cynanchum elegans*, *Dillwynia tenuifolia*, *Genoplesium baueri*, *Grevillea juniperina* subsp. *juniperina*, *Grevillea parviflora* subsp. *parviflora*, *Persoonia nutans* and *Pultenaea parviflora* were not confirmed within the Project area.

## 1.2 Scope

This plan details control measures to be implemented throughout the construction phases of the project. This plan focuses on weed control prior to vegetation clearance, weed management during clearing, and progressive weed control throughout construction.

Operational weed management will be incorporated into landscaping and facility maintenance plans.

## 1.3 Induction / training

All site personnel (including sub-contractors) will be inducted in this plan and the existence of priority and other weeds in the project area. Training will also include requirements to inspect machinery and clean footwear to prevent the spread of weeds, and measures to identify and prevent the introduction or spread of *Phytophthora cinnamomi* (Root Rot).

Training will include inductions, toolbox talks, pre-starts and targeted training sessions as required.

## 1.4 Roles and responsibilities

The Environmental Site Representative is responsible for ensuring the effective implementation of this Plan and for the training of site personnel in the requirements of this plan.

The Environmental Site Representative will advise and co-ordinate appropriate weed removal and control techniques for each weed species and for pathogens.

All persons entering the site are responsible for preventing the spread of weeds and pathogens within the project area.

## 1.5 Review

This Plan will be updated throughout construction to include any new weed or pathogen findings and subsequent management measures required. This plan will be reviewed in accordance with the continuous improvement process described in Section 8 of the CEMP.

## 2 Weeds and pathogens in the Early Works area

### 2.1 Weeds

The *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* identifies priority weeds and other regional weeds of concern for the Greater Sydney Region, including the Liverpool, Fairfield and Penrith Local Government Areas (LGAs). The WeedWise website and associated app (<https://weeds.dpi.nsw.gov.au/>) also provides details on weed identification, control options and biosecurity duty. This website and app will be utilised to inform the identification, status and management options required.

#### 2.1.1 Priority weeds in the Greater Sydney Region

State level determined priority weeds and regionally determined priority weeds, as identified in the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022*, are provided in Appendix 1 and 2 of this plan. Management requirements for weeds, whether that be specific regulatory measures (state level priorities) or outcomes to demonstrate compliance with the General Biosecurity Duty (regional priority weeds), are also detailed in Appendix 1 and 2.

The outcomes applied to a particular weed depend on factors such as the biology and ecology of the weed, the land use(s) in which it occurs, the distribution in the region and size of the infestation, potential pathways for infestation and others. These factors were taken into account in determining the suite of outcomes to demonstrate compliance with the General Biosecurity Duty and strategic responses. These obligations apply to all private and public landholders in the region.

#### 2.1.2 Other regional weeds of concern list

Attachment 2 of the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* (Appendix 2) outlines other priority weeds identified by the Greater Sydney Regional Weed Committee in consultation with the community. These are species for which a consistent and/or collaborative approach to management will provide the best outcome across the region. Weeds identified within Attachment 2 of the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* (Appendix 2) are also subject to the General Biosecurity Duty and may be a focus for local management plans and coordinated campaigns by the community and other stakeholder groups in the region.

#### 2.1.3 Weed identification and mapping

Detailed weed identification and mapping of project site and adjacent areas will be undertaken by the an Ecologist during pre-clearing surveys, prior to the commencement of construction.

The Ecologist will then update this Weed Eradication Management Plan with a detailed list of all weed species identified during the pre-clearing. The Ecologist will include details of the weed species including photographs, detailed descriptions and known locations. The detail to be provided will also include the weed status in accordance with Attachments 1 and 2 of the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022*.

This information will be disseminated to site personnel during training and induction.

## 2.2 Pathogens

Pathogens that have been identified to potentially occur in the Project area include:

- Soil-borne pathogen *Phytophthora cinnamomi* (Phytophthora)
- *Austropuccinia psidii* which causes the disease Myrtle rust
- *Batrochytridium dendrobatidis* (Chytrid (Frog) fungus)
- Psittacine beak and feather disease (PBFD).

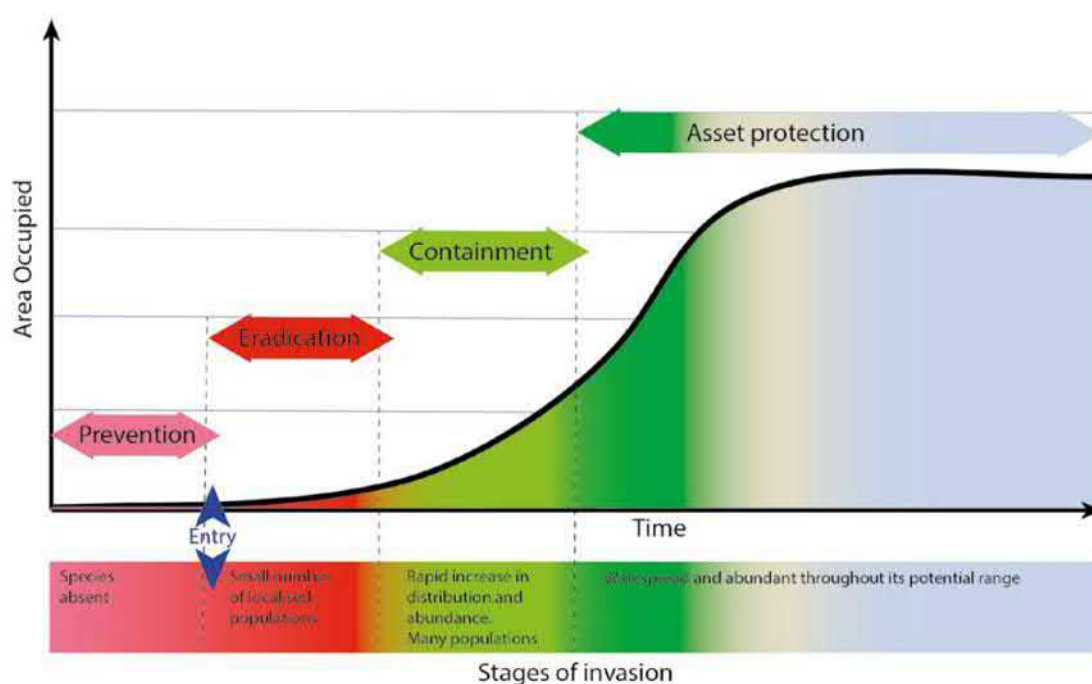
Identification and/or fact sheets on each pathogen identified as having the potential to occur within the project area or with the potential to be introduced to the area will be prepared for use in toolbox talks and pre-start meetings especially during the initial clearing and earthworks periods.

## 3 Weed management procedure

### 3.1 Approach to weed management

In NSW all plants are regulated with a general biosecurity duty under the *Biosecurity Act 2015* to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.

Figure 3-1, from the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022*, illustrates the invasion process for weeds from arrival to widespread establishment and shows that the effort and resources required to control a weed rise with time and area occupied. Managing weeds earlier rather than later is more effective. The asset protection phase shown in Figure 3-1 illustrates the shift in the focus from controlling a weed species to limiting the impact it may have on important assets.



Source: Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022

**Figure 3-1: Weed invasion curve**

Further detail of the management categories identified in Figure 3-1 is provided in Table 3-1.

**Table 3-1: Regional weed management categories**

Category	Objective	Weed Characteristics
Prevention	To prevent the weed species arriving and establishing in the region.	These species are not known to be present in the region. They have a high to very high weed risk (highly invasive and high threat) and have a high likelihood of arriving in the region due to potential distribution and/ or an existing high-risk pathway.
Eradication	To permanently remove the species and its propagules from the region OR to destroy infestations to reduce the extent of the weed in the region with the aim of local eradication.	These species are present in the region to a limited extent only and the risk of re-invasion is either minimal or can be easily managed. They have a high to very high weed risk and high feasibility of coordinated control.
Containment	To prevent the ongoing spread of the species in all or part of the region.	These species have a limited distribution in the region. Regional containment strategies aim to prevent spread of the weed from an invaded part of the region (core infestation), and/or exclude the weed from an uninvaded part of the region (exclusion zone).
Asset Protection	To prevent the spread of weeds to key sites/ assets of high economic, environmental and social value, or to reduce their impact on these sites if spread has already occurred.	These weed species are widespread and unlikely to be eradicated or contained within the wider regional context. Effort is focussed on reducing weed threats to protect priority high value assets.

### 3.2 Site weed assessment

The Ecologist will undertake an inspection of the site with the project to assess the area for weeds. Weed assessments will occur:

- As part of the pre-clearing survey
- Prior to drainage works
- During regular site inspections
- When a potential weed infestation has been identified.

The weed assessment will involve the following activities:

- Identify and describe or map weed infested areas
- Include photographic guide to identifying common weed species
- Identify surrounding land uses and sensitive environmental areas
- Determine weed management priorities and objectives in accordance with Attachments 1 and 2 of the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022*.



### 3.3 Establish weed control measures

#### 3.3.1 Prevention of weed spread / importation

Environmental controls will be implemented in consultation with the Ecologist to prevent the spread or introduction of weeds within the project footprint. Controls will include:

- Map and mark areas that are infested with weeds as an exclusion zone with fencing and signage to limit access by personnel and vehicles
- Install wheel wash and rumble grids
- Provide boot wash down facilities
- Program works from least to most weed infested areas, where possible.

#### 3.3.2 Determine weed control / removal methods

Weed control methods include mechanical, physical and chemical techniques. The suitability of control techniques will vary depending on the target weed species and the desired outcomes. The Ecologist will advise on the most appropriate weed treatment methodology and timing.

#### 3.3.3 Implement weed control / removal methods

Weed control methods will be implemented under guidance from the Ecologist. Methods will include:

- Use of mechanical weed control methods such as slashing or mowing
- Controlled use of herbicides to avoid the development of herbicide resistance
- Mowing/slashing of areas infested with weeds before they seed to reduce the propagation of new plants
- Separate weeds from native vegetation where native vegetation is to be used for mulch
- Topsoil recovered from areas of low weed infestation will be stockpiled separately
- Remove weeds immediately onto suitable trucks and dispose of without stockpiling
- Following weed removal, any exposed areas will be stabilised and/or rehabilitated to reduce erosion and minimise the potential for further weed invasion.

#### 3.3.4 Pesticide use

The use of pesticides must be in accordance with the NSW *Pesticides Act 1999*, other relevant legislation, label directions, any relevant industry codes of practice.

The Environmental Site Representatives will ensure that a Pesticide Application Record is completed and public notifications made in accordance with relevant legislation where required, such as where pesticides are to be used in areas that could be accessed by members of the public.

The notification does not need to be completed if all of the following are satisfied:

- The pesticide is, or is part of a product that is widely available to the general public at retail outlets

- The pesticide is only applied by hand or by using hand-held equipment
- If applied outdoors on any single occasion, in quantities of no more than 5 L/5 kg of concentrated product or 20 L/20 kg of the ready-to-use product or, if applied indoors, in quantities of no more than 1 L/1 kg of concentrated product or 5 L/5 kg of the ready-to-use product.

Public notification of pesticide use will be in accordance with guidelines whenever pesticides are used adjacent to, or across the road from a public place or private property. Appropriate environmental management measures will be implemented where pesticides are proposed to be used to avoid or minimise impacts on adjoining properties.

Any spraying of priority weeds must avoid damage to adjacent native vegetation and to prevent overspray entering waterways or adjoining properties. Only pesticides registered for use near water may be used near any waterways.

The following measures will be implemented whenever pesticides are to be used adjacent to, or across the road from, a “sensitive place”:

- Use of mechanical means of pest control (such as mowing or slashing) where feasible or
- Use of hand-held application of pesticides where mechanical means of pest control are not feasible.

Pesticide application will be appropriately scheduled. Pesticides will not be applied:

- On hot days when plants are stressed
- After seed has set
- Within 24 hours of rain or when rain is imminent
- When winds will cause drift of pesticides into non-target areas.

All personnel managing and using pesticides must receive appropriate training and hold an appropriate licence prior to commencing work.

### 3.3.5 Ongoing management of weeds

Measures for the ongoing management of weeds will be implemented, including the following:

- Minimise soil disturbance within weed infested areas
- Ensure topsoil imported onto site is free of weed propagules
- Regularly inspect and clean machinery, vehicles and footwear using installed facilities
- Wash down the wheels of all construction plant before transportation to the site
- Keep records of all screening checks and subsequent actions taken
- Securely cover loads of weed-contaminated material during transportation
- Avoid use of weeds as mulch
- Avoid re-use vegetation or topsoil containing weed material on site unless appropriately treated
- Monitor disturbed and rehabilitated sites for presence of weeds.

### 3.4 Weed disposal

Weeds and topsoil potentially containing weed propagules will be removed and disposed of at a suitable landfill location in accordance with the requirements of Penrith Council and the *Biosecurity Act 2015*. Exotic plant species will be removed, bagged (or appropriately segregated) and disposed offsite to a licensed landfill facility.

# 4 Pathogen management procedure

## 4.1 Site pathogen assessment

A site assessment for potential risk of pathogens in the project area will be undertaken by the Ecologist during pre-clearing surveys. The site assessment will identify and describe or map potential pathogen-containing vegetation areas. DPI guidelines will be referred to for the most up-to-date hygiene protocols for each pathogen and for the most recent locations of contamination.

Testing from a National Association of Testing Authorities (NATA) approved laboratory may be required where potential risk areas are identified to confirm the presence of pathogens in the soil and/or water.

## 4.2 Establish pathogen control measures

### 4.2.1 Prevention of introduction or spread of pathogens

Pathogens can be spread on footwear, vehicles and machinery, particularly during wet weather or in wet conditions. Controlling the introduction and spread of pathogens that have the potential to harm the environment is a high priority. Environmental controls will be implemented in consultation with the Ecologist to prevent the spread or introduction of pathogens to the project area. Controls will include:

- Map and mark areas that are infested with pathogens as an exclusion zone with fencing and signage to limit access by personnel and vehicles
- Install rumble grids
- Provide boot wash down facilities
- Program works from uninfected areas to infected areas, where possible.

### 4.2.2 Determine pathogen prevention / control methods

Management measures for pathogens can include planning or awareness measures, exclusion measures and containment measures. The suitability of control techniques will vary depending on the pathogen and will be determined on advice from the Ecologist and best practice guidelines. Best practice protocols include:

- Minimise work during excessively wet or muddy conditions
- Provide parking and turn-around points on hard, well-drained surfaces
- Restrict vehicles to designated tracks, trails and parking areas
- Restrict personnel to designated tracks and trails
- Personnel working in an infected site should shower and launder clothes before moving to another vegetated site
- Use disinfectant or gloves when handling frogs and only handle frogs when necessary
- Ensure vehicles and footwear are free of soil before entering or exiting the site (i.e. directed to wash down area before entering or exiting the site)

- Use a certified supply of plants and soil that is disease-free
- Hygiene protocols, such as use of disposable suits, will be used where site personnel are required to work in areas identified as containing pathogens that are located in the vicinity of threatened flora or fauna or Endangered Ecological Communities (EECs)
- Removed infected vegetation will be securely wrapped in bags prior to disposal.

### 4.3 Material disposal

Disposal of infected material will vary depending on the pathogen in the affected material.

Where materials are known or suspected to be affected by *Phytophthora*, the material will be retained within the contaminated area. Stockpiles of mulch, topsoil and fill material will be separated to avoid potential contamination and spread.

Plant material infected with Myrtle Rust will be buried on site if possible and will not be disposed of at another vegetated site. Buried material sites will be recorded on maps to prevent re-exposure. Where material is unable to be buried, advice will be sought from NSW Environment, Energy and Science (EES) or other agencies.

To avoid cross contamination of frogs with *Chytrid*, project personnel and contractors will avoid, where possible, transferring water between two or more separate waterbodies.

## 5 Inspection, monitoring and reporting

Monitoring of weed and/or pathogen infestations will occur as part of the routine weekly environmental inspections to determine the effectiveness of management controls. The identified presence of any weeds and/or pathogens and the necessary management actions will be noted on the Environmental Inspection Checklist.

A weed and pathogen monitoring program will be implemented as follows:

- Inspection of the general condition of the project area including identification of additional weeds and pathogens or reduction in the occurrence of weeds and pathogens
- Assessment of the effectiveness of weed and pathogen treatments, where implemented
- Suggest modifications to weed and pathogen treatments where they are noted to be ineffective
- Provide a schedule to re-apply treatments if previous treatments are not fully effective
- Conduct mapping and fixed point photographs of the active project area and adjoining impacted areas.

Dedicated inspections will be carried out on a monthly basis during clearing and earthworks phases and then at least every six months for the remainder of construction. The Environmental Site Representative will report the results of each monitoring inspection against the weed and pathogen management of this plan.

An action plan will be prepared, where required, to manage any ongoing weed and pathogen problems identified by inspections.

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Appendix A

# Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022 – Priority Weeds

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## A1.1 State level determined priority weeds

State Priority Weed Objective – PREVENTION: <i>The following weeds are currently not found in the state, pose significant biosecurity risk and prevention of the biosecurity risk is a reasonably practical objective.</i>	
Species	Biosecurity Act requirements & Strategic Response in the region
All species of vascular plant (Tracheophyta)	<p><b>Mandatory Measure (Division 8, Clause 34) Duty to notify on importation of plants into the State:</b></p> <p>(1) A person must not import a species of vascular plant (Tracheophyta) into the State if the species is not currently present in the State unless the person has, at least 20 working days before the plant is imported into the State, notified the species of plant and its proposed location within the State.</p> <p>(2) The notification is to be given to the Secretary and is to be given in accordance with Part 6.</p> <p>(3) A species of plant is taken not to be present in the State if the National Herbarium of New South Wales does not show it as being present in the State.</p> <p>Note. See <a href="http://plantnet.rbgsyd.nsw.gov.au/">http://plantnet.rbgsyd.nsw.gov.au/</a>.</p> <p><b>Regional Strategic Response:</b> Manage in accordance with the New Weed Incursion Plan.</p>
Gamba grass - <i>Andropogon gayanus</i> Pond apple - <i>Annona glabra</i> Bridal veil creeper - <i>Asparagus declinatus</i> Kochia - <i>Bassia scoparia</i> (excluding subsp. <i>trichophylla</i> ) Spotted knapweed - <i>Centaurea stoebe</i> subsp. <i>australis</i> Black knapweed - <i>Centaurea x moncktonii</i> Siam weed - <i>Chromolaena odorata</i> Koster's curse - <i>Clidemia hirta</i> Rubber vine - <i>Cryptostegia grandiflora</i> Anchored water hyacinth - <i>Eichhornia azurea</i> Hawkweed - <i>Hieracium</i> spp (all species) Hydrocotyl/Water pennywort - <i>Hydrocotyle ranunculoides</i> Lagarosiphon - <i>Lagarosiphon major</i> Frogbit / Spongeplant - <i>Limnobiium</i> spp. (all species) Yellow burrhead - <i>Limncharis flava</i> Miconia - <i>Miconia</i> spp. (all species) Mikania vine - <i>Mikania micrantha</i>	<p><b>Prohibited Matter (Part 4, Biosecurity Act, 2015):</b> A person who deals with any biosecurity matter that is Prohibited Matter throughout the State is guilty of an offence.</p> <p><b>Regional Strategic Response:</b> Manage in accordance with the New Weed Incursion Plan.</p>



### State Priority Weed Objective – PREVENTION:

The following weeds are currently not found in the state, pose significant biosecurity risk and prevention of the biosecurity risk is a reasonably practical objective.

Biosecurity Act 2015 requirements & Strategic Response in the region	
<b>Species</b>	
Mimosa - <i>Mimosa pigra</i>	
Eurasian water milfoil - <i>Myriophyllum spicatum</i>	
Mexican feather grass - <i>Nassella tenuissima</i> (syn. <i>Stipa tenuissima</i> )	
Broomrape - <i>Orobancha</i> spp. (all species except the native <i>O. cernua</i> var. <i>australiana</i> and <i>O. minor</i> )	<b>Prohibited Matter (Part 4, Biosecurity Act, 2015):</b> A person who deals with any biosecurity matter that is Prohibited Matter throughout the State is guilty of an offence.
Water soldier - <i>Stratiotes aloides</i>	
Witchweed - <i>Striga</i> spp. (except the native <i>S. parviflora</i> )	<b>Regional Strategic Response:</b> Manage in accordance with New Weed Incursion Plan.
Water caltrop - <i>Trapa</i> spp. (all species)	
Karoo acacia - <i>Vachellia karroo</i> (syn. <i>Acacia karroo</i> )	
Prickly acacia - <i>Vachellia nilotica</i> (syn. <i>Acacia nilotica</i> )	
Parthenium Weed - <i>Parthenium hysterophorus</i>	<p><b>Prohibited Matter (Part 4, Biosecurity Act, 2015):</b> A person who deals with any biosecurity matter that is Prohibited Matter throughout the State is guilty of an offence.</p> <p><b>Mandatory Measure (Division 8, Clause 35, Biosecurity Regulation, 2017) - Parthenium weed carriers – machinery and equipment</b></p> <p>(1) This clause applies to the following equipment:</p> <ul style="list-style-type: none"> <li>(a) grain harvesters (including the comb or front),</li> <li>(b) comb trailers (including the comb or front),</li> <li>(c) bins used for holding grain during harvest operations</li> <li>(d) augers or similar equipment used for moving grain</li> <li>(e) vehicles used for transporting grain harvesters</li> <li>(f) vehicles used as support vehicles with grain harvesters and that have been driven in paddocks during harvest operations, and</li> <li>(g) mineral exploration drilling rigs and vehicles used for transporting those rigs.</li> </ul> <p>(2) A person must not import into the State from Queensland any equipment to which this clause applies</p> <p><b>Regional Strategic Response:</b> Manage in accordance with the New Weed Incursion Plan.</p>

**State Priority Weed Objective – ERADICATION:**

*The following weeds are present in limited distribution and abundance in some parts of the state. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.*

Species	Biosecurity Act 2015 requirements & Strategic Response in the region
Boneseed <i>-Chrysanthemoides monilifera subsp. monilifera</i>	<p><b><u>Biosecurity (Boneseed) Control Order 2017</u></b></p> <p><b><u>6. Control measures for owners and occupiers of land</u></b></p> <p>Pursuant to section 62(1)(b) of the Act, an owner or occupier of land in the Boneseed Control Zone on which there is Boneseed must:</p> <p>(a) notify the local control authority for the area if the Boneseed is part of a new infestation on the land:</p> <ul style="list-style-type: none"> <li>i) as soon as practicable after becoming aware of the new infestation;</li> <li>ii) verbally or in writing;</li> <li>iii) giving the following:             <ul style="list-style-type: none"> <li>(1) the person's full name and contact number;</li> <li>(2) the location of the Boneseed, including the property identification code for the land (if this is known); and</li> <li>(3) any other information reasonably requested by the local control authority; and</li> </ul> </li> </ul> <p>(b) immediately destroy all Boneseed on the land;</p> <p>(c) ensure that subsequent generations of Boneseed are destroyed; and</p> <p>(d) the land is kept free of Boneseed.</p> <p>(e) The owner or occupier does not need to comply with (a) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</p> <p><b><u>7. Control measures for persons dealing with carriers</u></b></p> <p>Pursuant to section 62(1)(b) of the Act, a person who deals with a carrier of Boneseed in the Boneseed Control Zone, in circumstances where the person knows or ought reasonably to know of the presence of Boneseed on the land or in or on the carrier, must:</p> <ul style="list-style-type: none"> <li>(a) ensure that Boneseed (including any seed and propagules) is not moved from the land; and</li> <li>(b) immediately notify the local control authority for the area:             <ul style="list-style-type: none"> <li>i) as soon as practicable after becoming aware of the presence of Boneseed;</li> <li>ii) verbally or in writing;</li> <li>iii) giving the following:               <ul style="list-style-type: none"> <li>(1) the person's full name and contact number;</li> <li>(2) the location of the Boneseed, including the property identification code for the land (if this is known); and</li> <li>iv) any other information reasonably requested by the local control authority.</li> </ul> </li> </ul> </li> <li>(c) The person who deals with a carrier of Boneseed does not need to comply with (b) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</li> </ul> <p><b><u>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017):</u></b> A person must not move, import into the State or sell.</p> <p><b>Regional Strategic Response:</b></p> <ul style="list-style-type: none"> <li>• manage in accordance with New Weed Incursion Plan</li> <li>• detailed surveillance and mapping to locate infestations</li> <li>• high level analysis of pathways to identify potential introduction areas and prevention options</li> <li>• implement quarantine and/or hygiene protocols, and</li> <li>• monitor progress towards eradication</li> </ul>

## State Priority Weed Objective – ERADICATION:

*The following weeds are present in limited distribution and abundance in some parts of the state. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.*

Species	Biosecurity Act 2015 requirements & Strategic Response in the region
Chinese violet - Asystasia gangetica	<p><b>Biosecurity (Chinese violet) Control Order 2019</b></p> <p><b>6. Control measures for owners and occupiers of land</b></p> <p>Pursuant to section 62(1)(b) of the Act, an owner or occupier of land in the Chinese violet Control Zone on which there is Chinese violet must:</p> <p>(a) notify the local control authority for the area if the Chinese violet is part of a new infestation on the land:</p> <ol style="list-style-type: none"> <li>as soon as practicable after becoming aware of the new infestation;</li> <li>verbally or in writing;</li> <li>giving the following: <ol style="list-style-type: none"> <li>the person's full name and contact number;</li> <li>the location of the Chinese violet, including the property identification code for the land (if this is known); and</li> <li>any other information reasonably requested by the local control authority; and</li> </ol> </li> </ol> <p>(b) immediately destroy all Chinese violet on the land;</p> <p>(c) ensure that subsequent generations of Chinese violet are destroyed; and</p> <p>(d) the land is kept free of Chinese violet.</p> <p>(e) The owner or occupier does not need to comply with (a) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</p> <p><b>7. Control measures for persons dealing with carriers</b></p> <p>Pursuant to section 62(1)(b) of the Act, a person who deals with a carrier of Chinese violet in the Chinese violet Control Zone, in circumstances where the person knows or ought reasonably to know of the presence of Chinese violet on the land or in or on the carrier, must:</p> <p>(a) ensure that Chinese violet (including any seed and propagules) or matter suspected to be or contain Chinese Violet (including any suspected seeds and propagules) is not moved from the land; and</p> <p>(b) immediately notify the local control authority for the area:</p> <ol style="list-style-type: none"> <li>as soon as practicable after becoming aware of the presence of Chinese violet;</li> <li>verbally or in writing;</li> <li>giving the following: <ol style="list-style-type: none"> <li>the person's full name and contact number;</li> <li>the location of the Chinese violet, including the property identification code for the land (if this is known); and</li> <li>any other information reasonably requested by the local control authority.</li> </ol> </li> </ol> <p>(c) The person who deals with a carrier of Chinese violet does not need to comply with (b) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</p> <p><b>Regional Strategic Response:</b></p> <ul style="list-style-type: none"> <li>manage in accordance with New Weed Incursion Plan</li> </ul>

**State Priority Weed Objective – ERADICATION:**  
*The following weeds are present in limited distribution and abundance in some parts of the state. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.*

Species	Biosecurity Act 2015 requirements & Strategic Response in the region
Parkinsonia - <i>Parkinsonia aculeata</i>	<p><b>Biosecurity (Parkinsonia) Control Order 2017</b></p> <p><b>6. Control measures for owners and occupiers of land</b>  Pursuant to section 62(1)(b) of the Act, an owner or occupier of land in the Parkinsonia Control Zone on which there is Parkinsonia must:</p> <p>(a) notify the local control authority for the area if the Parkinsonia is part of a new infestation of Parkinsonia on the land:</p> <ul style="list-style-type: none"> <li>i) as soon as practicable after becoming aware of the new infestation;</li> <li>ii) verbally or in writing;</li> <li>iii) giving the following: <ul style="list-style-type: none"> <li>(1) the person's full name and contact number;</li> <li>(2) the location of the Parkinsonia, including the property identification code for the land (if this is known); and</li> <li>(3) any other information reasonably requested by the local control authority; and</li> </ul> </li> </ul> <p>(b) immediately destroy all Parkinsonia on the land; and</p> <p>(c) ensure that subsequent generations of Parkinsonia are destroyed; and</p> <p>(d) the land is kept free of Parkinsonia.</p> <p>(e) The owner or occupier does not need to comply with (a) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</p> <p><b>7. Control measures for persons dealing with carriers</b>  Pursuant to section 62(1)(b) of the Act, a person who deals with a carrier of Parkinsonia in the Parkinsonia Control Zone, in circumstances where the person knows or ought reasonably to know of the presence of Parkinsonia on the land or in or on the carrier, must:</p> <ul style="list-style-type: none"> <li>(a) ensure that Parkinsonia (including any seed and propagules) is not moved from the land; and</li> <li>(b) immediately notify the local control authority: <ul style="list-style-type: none"> <li>i) as soon as practicable after becoming aware of the presence of Parkinsonia;</li> <li>ii) verbally or in writing;</li> <li>iii) giving the following: <ul style="list-style-type: none"> <li>(1) the person's full name and contact number;</li> <li>(2) the location of the Parkinsonia, including the property identification code for the land (if this is known); and</li> <li>iv) any other information reasonably requested by the local control authority.</li> </ul> </li> </ul> </li> <li>(c) The person who deals with a carrier of Parkinsonia does not need to comply with (b) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</li> </ul> <p><b>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017):</b> A person must not move, import into the State or sell.</p> <p><b>Regional Strategic Response:</b> Manage in accordance with the New Weed Incursion Plan.</p>

## State Priority Weed Objective – ERADICATION:

*The following weeds are present in limited distribution and abundance in some parts of the state. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.*

Species	Biosecurity Act 2015 requirements & Strategic Response in the region
Tropical soda apple - <i>Solanum viarum</i>	<p><b>Biosecurity (Tropical Soda Apple) Control Order 2017</b></p> <p><b>6. Control measures for owners and occupiers of land</b></p> <p>Pursuant to section 62(1)(b) of the Act, an owner or occupier of land in the Tropical Soda Apple Control Zone on which there is Tropical Soda Apple must:</p> <p>(a) notify the local control authority for the area if the Tropical Soda Apple is part of a new infestation of Tropical Soda Apple on the land:</p> <ul style="list-style-type: none"> <li>i) as soon as practicable after becoming aware of the new infestation;</li> <li>ii) verbally or in writing;</li> <li>iii) giving the following: <ul style="list-style-type: none"> <li>(1) the person's full name and contact number;</li> <li>(2) the location of the Tropical Soda Apple, including the property identification code for the land (if this is known); and</li> <li>(3) any other information reasonably requested by the local control authority; and</li> </ul> </li> </ul> <p>(b) destroy all Tropical Soda Apple on the land, including fruit; and</p> <p>(c) ensure that subsequent generations of Tropical Soda Apple are destroyed; and</p> <p>(d) that the land is kept free of Tropical Soda Apple.</p> <p>(e) The owner or occupier does not need to comply with (a) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</p> <p><b>7. Control measures for persons dealing with carriers</b></p> <p>Pursuant to section 62(1)(b) of the Act, a person who deals with a carrier of Tropical Soda Apple in the Tropical Soda Apple Control Zone, in circumstances where the person knows or ought reasonably to know of the presence of Tropical Soda Apple on the land or in or on the carrier, must:</p> <ul style="list-style-type: none"> <li>(a) ensure that Tropical Soda Apple (including any seed and propagules) is not moved from the land; and</li> <li>(b) immediately notify the local control authority for the area: <ul style="list-style-type: none"> <li>i) as soon as practicable after becoming aware of the presence of Tropical Soda Apple;</li> <li>ii) verbally or in writing;</li> <li>iii) giving the following: <ul style="list-style-type: none"> <li>(1) the person's full name and contact number;</li> <li>(2) the location of the Tropical Soda Apple, including the property identification code for the land (if this is known); and</li> <li>iv) any other information reasonably requested by the local control authority.</li> </ul> </li> </ul> </li> <li>(c) The person who deals with a carrier of Tropical Soda Apple does not need to comply with (b) above if they know that notification of the infestation on the land has already been given to the local control authority for the area.</li> </ul> <p><b>Regional Strategic Response:</b> Manage in accordance with the New Weed Incursion Plan</p>



<b>State Priority Weed Objective – CONTAINMENT:</b> <i>These weeds are widely distributed in some parts of the state. While broad scale elimination is not practicable, minimisation of the biosecurity risk posed these weeds is reasonably practicable.</i>	
Land area where requirements apply	Biosecurity Act 2015 requirements & Strategic Response in the region
Alligator Weed - <i>Alternanthera philoxeroides</i>  A biosecurity zone, to be known as the alligator weed biosecurity zone, is established for all land within the State except land in the following regions: (a) Greater Sydney, (b) Hunter (but only in respect of land in the local government area of City of Lake Macquarie, City of Maitland, City of Newcastle or Port Stephens).	<p><b>Biosecurity Regulation 2017 - Part 5, Division 2 (Biosecurity Zone)</b>            An owner or occupier of land in the alligator weed biosecurity zone on which there is the weed <i>Alternanthera philoxeroides</i> (Alligator weed) must:</p> <p>(a) if the weed is part of a new infestation of the weed on the land, notify the local control authority for the land as soon as practicable in accordance with Part 6, and</p> <p>(b) eradicate the weed or, if that is not practicable, destroy as much of the weed as is practicable and suppress the spread of any remaining weed.</p> <p><b>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017):</b> A person must not move, import into the State or sell.</p> <p><b>Regional Strategic Response:</b> Refer Appendix 1.2 Containment.</p>
Bitou Bush - <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i>  A biosecurity zone, to be known as the bitou bush biosecurity zone, is established for all land within the State except land within 10 kilometres of the mean high water mark of the Pacific Ocean between Cape Byron in the north and Point Perpendicular in the South.	<p><b>Biosecurity Regulation 2017 - Part 5, Division 3 (Biosecurity Zone)</b>            An owner or occupier of land in the bitou bush biosecurity zone on which there is the weed <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> (Bitou bush) must:</p> <p>(a) if the weed is part of a new infestation of the weed on the land, notify the local control authority for the land as soon as practicable in accordance with Part 6, and</p> <p>(b) eradicate the weed or, if that is not practicable, destroy as much of the weed as is practicable and suppress the spread of any remaining weed.</p> <p><b>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017):</b> A person must not move, import into the State or sell.</p> <p><b>Regional Strategic Response:</b> Manage in accordance with NSW Threat Abatement Plan and Saving Our Species.</p>

<b>State Priority Weed Objective – CONTAINMENT:</b> <i>These weeds are widely distributed in some parts of the state. While broad scale elimination is not practicable, minimisation of the biosecurity risk posed these weeds is reasonably practicable.</i>	
Land area where requirements apply	Biosecurity Act 2015 requirements & Strategic Response in the region
Water Hyacinth <i>Eichhornia crassipes</i>	
<p>A biosecurity zone, to be known as the water hyacinth biosecurity zone, is established for all land within the State except land in the following regions:</p> <p>(a) Greater Sydney or North Coast, (b) North West (but only land in that region that is in the local government area of Moree Plains), (c) Hunter (but only land in that region that is in the local government area of City of Cessnock, City of Lake Macquarie, Mid-Coast, City of Maitland, City of Newcastle or Port Stephens), (d) South East (but only land in that region that is in the local government area of Eurobodalla, Kiama, City of Shellharbour, City of Shoalhaven or City of Wollongong).</p>	<p><b>Biosecurity Regulation 2017 - Part 5, Division 4 (Biosecurity Zone)</b></p> <p>An owner or occupier of land in the water hyacinth biosecurity zone on which there is the weed <i>Eichhornia crassipes</i> (Water hyacinth) must:</p> <p>(a) if the weed is part of a new infestation of the weed on the land, notify the local control authority for the land as soon as practicable in accordance with Part 6, and</p> <p>(b) eradicate the weed, or if that is not practicable, destroy as much of the weed as is practicable and suppress the spread of any remaining weed.</p> <p><b>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017):</b> A person must not move, import into the State or sell.</p> <p><b>Regional Strategic Response:</b> See Appendix 1.2 Containment.</p>

State Priority Weed Objective – ASSET PROTECTION (Whole of State): These weeds are widely distributed in some areas of the State. As Weeds of National Significance, their spread must be minimised to protect priority assets.	
Species	Biosecurity Act 2015 requirements & Strategic Response in the region
Madeira vine - <i>Anredera cordifolia</i>	<p><b>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation 2017):</b> A person must not import into the State or sell.</p> <p><b>Regional Strategic Response:</b> Identify priority assets for targeted management. # Refer Appendix 1.2 Prevention. † Refer Appendix 1.2 Eradication. †† Refer Appendix 1.2 Containment. ‡ Refer Appendix 1.2 Asset Protection.</p>
Asparagus weeds - <i>Asparagus aethiopicus</i> , † <i>A. africanus</i> , <i>A. asparagoides</i> including the Western Cape form*, <i>A. plumosus</i> , and <i>A. scandens</i>	
‡Cabomba - <i>Cabomba caroliniana</i>	
‡Scotch/English broom - <i>Cytisus scoparius</i> subsp. <i>scoparius</i>	
‡Cat's Claw Creeper - <i>Dolichandra unguis-cati</i>	
Cape/Montpellier broom - <i>Genista monspessulana</i>	
Flax-leaf broom - <i>Genista linifolia</i>	
#Hymenachne - <i>Hymenachne amplexicaulis</i>	
Bellyache bush - <i>Jatropha gossypifolia</i>	
Lantana - <i>Lantana camara</i>	
African boxthorn - <i>Lycium ferocissimum</i>	
Chilean needle grass - <i>Nassella neesiana</i>	
††Serrated tussock - <i>Nassella trichotoma</i>	
Opuntia- <i>Opuntia</i> spp., <i>Cylindropuntia</i> spp., <i>Austrocylindropuntia</i> spp. (Excludes <i>O. ficus-indica</i> )	
Mesquite - <i>Prosopis</i> spp.	
Blackberry - <i>Rubus fruticosus</i> agg. (Blackberry except the varieties <i>Chester Thornless</i> , <i>Dirksen Thornless</i> , <i>Loch Ness</i> , <i>Silvan</i> , <i>Black Satin</i> , <i>Murrindindi</i> , <i>Smooth Stem</i> , <i>Thornfree</i> and <i>Chehalem</i> )	
Sagittaria - <i>Sagittaria platyphylla</i>	
†Willows - <i>Salix</i> spp. (excludes <i>S. babylonica</i> , <i>S.X calodendron</i> & <i>S. x reichardtjii</i> )	
††Salvinia - <i>Salvinia molesta</i>	
Fireweed - <i>Senecio madagascariensis</i>	
Silver-leaf nightshade - <i>Solanum elaeagnifolium</i>	
Athel pine - <i>Tamarix aphylla</i>	
††Gorse - <i>Ulex europaeus</i>	



## A1.2 Regional priority weeds

<b>Regional Priority Weed Objective – PREVENTION:</b> <i>The following weeds are currently not found in the Greater Sydney region, pose significant biosecurity risk and prevention of the biosecurity risk posed by these weeds is a reasonably practical objective.</i>	
Coral creeper - <i>Barleria repens</i>	
East Indian hygrophila - <i>Hygrophila polysperma</i>	
Giant devil's fig - <i>Solanum chrysotrichum</i>	
Giant rats tail grass - <i>Sporobolus pyramidalis</i>	
Hymenachne - <i>Hymenachne amplexicaulis</i>	
Nodding thistle - <i>Carduus nutans</i>	
Spanish broom - <i>Spartium junceum</i>	
Water lettuce - <i>Pistia stratiotes</i>	
Water star grass - <i>Heteranthera zosterifolia</i>	
White blackberry / Mysore raspberry - <i>Rubus niveus</i>	
<b>Outcomes to demonstrate compliance with the GBD</b>	<b>Strategic response in the region</b>
<ul style="list-style-type: none"> <li>• The plant is eradicated from the land and the land is kept free of the plant.</li> <li>• Land managers mitigate the risk of the plant being introduced to their land.</li> <li>• The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> <li>• Local Control Authority is notified if the plant is found on the land</li> </ul>	<ul style="list-style-type: none"> <li>• Implement quarantine and/or hygiene protocols</li> <li>• Undertake high risk sites &amp; pathways analysis to identify potential introduction areas and preventative options</li> <li>• Have a collaborative rapid response protocol in place</li> </ul> <p><b>Supporting documents:</b>            New Weed Incursion Plan (includes rapid response protocol)            Look, Learn, Act Community awareness program</p>

Regional Priority Weed Objective – ERADICATION: The following weeds are present in limited distribution and abundance. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.		
Outcomes to demonstrate compliance with the GBD	Strategic response in the region	
Black willow - <i>Salix nigra</i>		
<ul style="list-style-type: none"><li>• The plant is eradicated from the land and the land is kept free of the plant.</li><li>• Local Control Authority is notified if the plant is found on the land.</li><li>• <b>The following legislative requirement also applies: <i>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation, 2017)</i>: A person must not move, import into the State or sell.</b></li></ul>	<ul style="list-style-type: none"><li>• Destruction of all infestations where feasible.</li><li>• Manage in accordance with New Weed Incursion Plan.</li><li>• Detailed surveillance and mapping to locate all infestations.</li></ul>	
Chinese knotweed - <i>Persicaria chinensis</i>		
<ul style="list-style-type: none"><li>• The plant is eradicated from the land and the land is kept free of the plant.</li><li>• Local Control Authority is notified if the plant is found on the land.</li><li>• The plant or parts of the plant are not traded, carried, grown or released into the environment.</li></ul>	<ul style="list-style-type: none"><li>• Destruction of all infestations where feasible.</li><li>• Manage in accordance with New Weed Incursion Plan.</li><li>• Detailed surveillance and mapping to locate all infestations.</li></ul>	
Climbing asparagus - <i>Asparagus africanus</i>		
<ul style="list-style-type: none"><li>• The plant is eradicated from the land and the land is kept free of the plant.</li><li>• Local Control Authority is notified if the plant is found on the land.</li><li>• <b>The following legislative requirement also applies: <i>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation, 2017)</i>: A person must not move, import into the State or sell.</b></li></ul>	<ul style="list-style-type: none"><li>• Destruction of all infestations where feasible.</li><li>• Manage in accordance with New Weed Incursion Plan.</li><li>• Detailed surveillance and mapping to locate all infestations.</li></ul>	
Glory lily – <i>Gloriosa superba</i>		
<ul style="list-style-type: none"><li>• The plant is eradicated from the land and the land is kept free of the plant.</li><li>• Local Control Authority is notified if the plant is found on the land.</li><li>• The plant or parts of the plant are not traded, carried, grown or released into the environment.</li></ul>	<ul style="list-style-type: none"><li>• Destruction of all infestations where feasible.</li><li>• Manage in accordance with New Weed Incursion Plan.</li><li>• Detailed surveillance and mapping to locate all infestations.</li></ul>	
Grey willow – <i>Salix cinerea</i>		
<ul style="list-style-type: none"><li>• The plant is eradicated from the land and the land is kept free of the plant.</li><li>• Local Control Authority is notified if the plant is found on the land.</li><li>• <b>The following legislative requirement also applies: <i>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation, 2017)</i>: A person must not move, import into the State or sell.</b></li></ul>	<ul style="list-style-type: none"><li>• Destruction of all infestations where feasible.</li><li>• Manage in accordance with New Weed Incursion Plan.</li><li>• Detailed surveillance and mapping to locate all infestations.</li></ul>	

## Regional Priority Weed Objective – ERADICATION:

*The following weeds are present in limited distribution and abundance. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.*

Outcomes to demonstrate compliance with the GBD		Strategic response in the region
<i>Groundsel bush - Baccharis halimifolia</i>		
<ul style="list-style-type: none"> <li>• The plant is eradicated from the land and the land is kept free of the plant.</li> <li>• Local Control Authority is notified if the plant is found on the land.</li> <li>• The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>		<ul style="list-style-type: none"> <li>• Destruction of all infestations where feasible.</li> <li>• Manage in accordance with New Weed Incursion Plan.</li> <li>• Detailed surveillance and mapping to locate all infestations.</li> <li>• Implement quarantine and/or hygiene controls</li> </ul>
<i>Hygrophila - Hygrophila costata</i>		
<ul style="list-style-type: none"> <li>• The plant is eradicated from the land and the land is kept free of the plant.</li> <li>• Local Control Authority is notified if the plant is found on the land.</li> <li>• The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>		<ul style="list-style-type: none"> <li>• Destruction of all infestations where feasible.</li> <li>• Manage in accordance with New Weed Incursion Plan.</li> <li>• Detailed surveillance and mapping to locate all infestations.</li> </ul>
<i>Kei apple - Doryalis caffra</i>		
<ul style="list-style-type: none"> <li>• The plant is eradicated from the land and the land is kept free of the plant.</li> <li>• Local Control Authority is notified if the plant is found on the land.</li> <li>• The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>		<ul style="list-style-type: none"> <li>• Destruction of all infestations where feasible.</li> <li>• Manage in accordance with New Weed Incursion Plan.</li> <li>• Detailed surveillance and mapping to locate all infestations.</li> </ul>
<i>Kidney leaf mud plantain - Heteranthera reniformis</i>		
<ul style="list-style-type: none"> <li>• The plant is eradicated from the land and the land is kept free of the plant.</li> <li>• Local Control Authority is notified if the plant is found on the land.</li> <li>• The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>		<ul style="list-style-type: none"> <li>• Destruction of all infestations where feasible.</li> <li>• Manage in accordance with New Weed Incursion Plan.</li> <li>• Detailed surveillance and mapping to locate all infestations.</li> <li>• Implement quarantine and/or hygiene protocols.</li> </ul>
<i>Kudzu - Pueraria lobata</i>		
<ul style="list-style-type: none"> <li>• The plant is eradicated from the land and the land is kept free of the plant.</li> <li>• Local Control Authority is notified if the plant is found on the land.</li> <li>• The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>		<ul style="list-style-type: none"> <li>• Destruction of all infestations where feasible.</li> <li>• Manage in accordance with New Weed Incursion Plan.</li> <li>• Detailed surveillance and mapping to locate all infestations.</li> <li>• Implement quarantine and/or hygiene protocols.</li> </ul>
<i>Leaf cactus - Pereskia aculeata</i>		
<ul style="list-style-type: none"> <li>• The plant is eradicated from the land and the land is kept free of the plant.</li> <li>• Local Control Authority is notified if the plant is found on the land.</li> <li>• The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>		<ul style="list-style-type: none"> <li>• Destruction of all infestations where feasible.</li> <li>• Manage in accordance with New Weed Incursion Plan.</li> <li>• Detailed surveillance and mapping to locate all infestations.</li> <li>• Implement quarantine and/or hygiene protocols.</li> </ul>

<b>Regional Priority Weed Objective – ERADICATION:</b> <i>The following weeds are present in limited distribution and abundance. Elimination of the biosecurity risk posed by these weeds is a reasonably practical objective.</i>	
<b>Outcomes to demonstrate compliance with the GBD</b>	<b>Strategic response in the region</b>
<i>Ming fern - Asparagus macowanii var. zuluensis</i>	
<ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>Local Control Authority is notified if the plant is found on the land.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>	<ul style="list-style-type: none"> <li>Destruction of all infestations where feasible.</li> <li>Detailed surveillance and mapping to locate all infestations.</li> <li>High level pathways analysis to identify potential introduction areas and preventative options.</li> <li>Implement quarantine and/or hygiene protocols.</li> <li>Monitor progress towards eradication.</li> </ul>
<i>Mysore thorn - Caesalpinia decapetala</i>	
<ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>	<ul style="list-style-type: none"> <li>Destruction of all infestations where feasible.</li> <li>Manage in accordance with New Weed Incursion Plan.</li> <li>Detailed surveillance and mapping to locate all infestations.</li> <li>Implement quarantine and/or hygiene protocols.</li> </ul>
<i>Sicilian sea lavender - Limonium hyblaenum</i>	
<ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> <li>Local Control Authority is notified if the plant is found on the land.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>	<ul style="list-style-type: none"> <li>Destruction of all infestations where feasible.</li> <li>Manage in accordance with New Weed Incursion Plan.</li> <li>Detailed surveillance and mapping to locate all infestations.</li> <li>Implement quarantine and/or hygiene protocols.</li> </ul>
<i>Sicklethorn - Asparagus falcatus</i>	
<ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> <li>Local Control Authority is notified if the plant is found on the land.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>	<ul style="list-style-type: none"> <li>Destruction of all infestations where feasible.</li> <li>Manage in accordance with New Weed Incursion Plan.</li> <li>Detailed surveillance and mapping to locate all infestations.</li> <li>Implement quarantine and/or hygiene protocols.</li> </ul>
<i>Skunk vine - Paederia foetida</i>	
<ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> <li>Local Control Authority is notified if the plant is found on the land.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>	<ul style="list-style-type: none"> <li>Destruction of all infestations where feasible.</li> <li>Manage in accordance with New Weed Incursion Plan.</li> <li>Detailed surveillance and mapping to locate all infestations.</li> <li>Implement quarantine and/or hygiene protocols.</li> </ul>

Regional Priority Weeds objective – CONTAINMENT: These weeds are widely distributed in the region. While broad scale elimination is not practicable, minimisation of the biosecurity risk posed by these weeds is reasonably practicable.		
Land area where requirements apply	Outcomes to demonstrate compliance with the GBD	Strategic response in the region
African olive - <i>Olea europaea</i> subsp. <i>cuspidata</i>		
An <b>exclusion zone</b> is established for all lands in the Blue Mountains local government area and lands to the west of the Nepean River in the Penrith local government area. The remainder of the region is classified as the <b>core infestation area</b> .	<p><b>Whole region:</b></p> <ul style="list-style-type: none"> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> </ul> <p><b>Within Core infestation:</b></p> <ul style="list-style-type: none"> <li>Land managers prevent spread from their land where feasible.</li> <li>Land managers reduce the impact on priority assets.</li> </ul>	<p><b>Whole region:</b></p> <ul style="list-style-type: none"> <li>Implement quarantine and/or hygiene protocols.</li> <li>Surveillance and mapping to locate all infested properties and maintain currency of exclusion zone and objectives.</li> <li>Monitor change in current distribution to ensure containment of spread.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>Destruction of all infestations, aiming at local eradication where feasible</li> </ul> <p><b>Within Core infestation:</b></p> <ul style="list-style-type: none"> <li>Identify priority assets for targeted management.</li> </ul>
Alligator weed - <i>Alternanthera philoxeroides</i>		
An <b>exclusion zone</b> is established for all lands in the Blue Mountains local government areas. The remainder of the region is classified as the <b>core infestation area</b> .	<p><b>Whole region:</b></p> <ul style="list-style-type: none"> <li>Land managers prevent spread from their land where feasible.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> </ul> <p><b>Within Core infestation:</b></p> <ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>Land managers reduce the impact on priority assets.</li> </ul> <p><b>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33):</b> A person must not move, import into the State or sell.</p> <p>Note a Biosecurity Zone applies to this species under Part 5 of Division 2 of the <i>Biosecurity Regulation 2017</i>. However this does not apply to the Greater Sydney region.</p>	<p><b>Blue Mountains LGA:</b></p> <ul style="list-style-type: none"> <li>Destruction of all infestations, where feasible.</li> <li>Implement quarantine and/or hygiene protocols.</li> </ul> <p><b>Remainder of region:</b></p> <ul style="list-style-type: none"> <li>Implement quarantine and/or hygiene protocols.</li> <li>Manage in accordance with the Priorities for the control of Alligator Weed in the Sydney Region.</li> </ul>

Regional Priority Weeds objective – CONTAINMENT:		
Land area where requirements apply	Outcomes to demonstrate compliance with the GBD	Strategic response in the region
Asparagus fern - <i>Asparagus virgatus</i>	<p><b>Whole region:</b></p> <ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> <li>Local Control Authority is notified if the plant is found on the land.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> </ul> <p><b>Within Core infestation:</b></p> <ul style="list-style-type: none"> <li>Land managers prevent spread from their land where feasible.</li> <li>Land managers reduce the impact on priority assets.</li> </ul>	<ul style="list-style-type: none"> <li>Destruction of all infestations where feasible.</li> <li>Monitor change in current distribution to ensure containment of spread.</li> </ul>
Gorse - <i>Ulex - europaeus</i>	<p><b>Whole region:</b></p> <ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> </ul> <p><b>Within Core infestation:</b></p> <ul style="list-style-type: none"> <li>Land managers prevent spread from their land where feasible.</li> </ul> <p><b>The following legislative requirement also applies: <i>Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation, 2017):</i></b> A person must not move, import into the State or sell.</p>	<ul style="list-style-type: none"> <li>Destruction of all infestations, aiming at local eradication where feasible.</li> <li>Detailed surveillance and mapping to locate all infestations.</li> <li>Implement quarantine and/or hygiene protocols.</li> <li>Monitor progress towards eradication.</li> </ul>

Regional Priority Weeds objective – CONTAINMENT:		
Land area where requirements apply	Outcomes to demonstrate compliance with the GBD	Strategic response in the region
<p>Holly-leaved senecio - <i>Senecio glastifolius</i></p> <p>An <b>exclusion zone</b> is established for the whole of the region except the Royal National Park. The Royal National Park is classified as the <b>core infestation area</b>.</p>	<p><b>Whole region:</b></p> <ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> <li>Local Control Authority is notified if the plant is found on the land.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> </ul> <p><b>Within Core infestation:</b></p> <ul style="list-style-type: none"> <li>Land managers prevent spread from their land where feasible.</li> <li>Land managers reduce the impact on priority assets.</li> </ul>	<ul style="list-style-type: none"> <li>The plant should be fully and continuously suppressed and destroyed</li> <li>Monitor change in current distribution to ensure containment of spread.</li> </ul>
<p>Horsetails - <i>Equisetum</i> spp.</p> <p>An <b>exclusion zone</b> is established for the whole of region except Northern Beaches local government area. The Northern Beaches local government area is classified as the <b>core infestation area</b>.</p>	<p><b>Whole region:</b></p> <ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>Local Control Authority is notified if the plant is found on the land.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> </ul> <p><b>Within Core infestation:</b></p> <ul style="list-style-type: none"> <li>Land managers prevent spread from their land where feasible.</li> </ul>	<ul style="list-style-type: none"> <li>Destruction of all infestations, where feasible.</li> <li>Monitor change in current distribution to ensure containment of spread.</li> </ul>



Regional Priority Weeds objective – CONTAINMENT:		
Land area where requirements apply	Outcomes to demonstrate compliance with the GBD	Strategic response in the region
Salvinia - <i>Salvinia molesta</i>	<p><b>Whole region:</b></p> <ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> <li>Local Control Authority is notified if the plant is found on the land.</li> </ul> <p><b>Within Core infestation:</b></p> <ul style="list-style-type: none"> <li>Land managers prevent spread from their land where feasible.</li> </ul> <p><b>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation, 2017):</b> A person must not move, import into the State or sell.</p>	<ul style="list-style-type: none"> <li>The plant should be fully and continuously suppressed and destroyed</li> <li>Monitor change in current distribution to ensure containment of spread.</li> </ul>
Sea spurge - <i>Euphorbia paralias</i>	<p><b>Whole region:</b></p> <ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> <li>Local Control Authority is notified if the plant is found on the land.</li> </ul> <p><b>Within Core infestation:</b></p> <ul style="list-style-type: none"> <li>Land managers prevent spread from their land where feasible.</li> </ul>	<ul style="list-style-type: none"> <li>Destruction of all infestations, where feasible.</li> <li>Detailed surveillance and mapping to locate all infestations.</li> <li>High level pathways analysis to identify potential introduction areas and preventative options.</li> <li>Implement quarantine and/or hygiene protocols.</li> <li>Monitor progress towards eradication.</li> </ul>



Regional Priority Weeds objective – CONTAINMENT:		
Land area where requirements apply	Outcomes to demonstrate compliance with the GBD	Strategic response in the region
Senegal tea - <i>Gymnocoronis spilanthoides</i>	<p><b>Whole region:</b></p> <ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> <li>Local Control Authority is notified if the plant is found on the land.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> </ul> <p><b>Within Core infestation:</b></p> <ul style="list-style-type: none"> <li>Land managers prevent spread from their land where feasible.</li> </ul>	<ul style="list-style-type: none"> <li>The plant should be fully and continuously suppressed and destroyed</li> <li>Monitor change in current distribution to ensure containment of spread.</li> </ul>
Serrated tussock - <i>Nassella trichotoma</i>	<p><b>Whole region:</b></p> <ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> <li>Local Control Authority is notified if the plant is found on the land.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> </ul> <p><b>Within Core infestation:</b></p> <ul style="list-style-type: none"> <li>Land managers prevent spread from their land where feasible.</li> </ul> <p><b>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33, Biosecurity Regulation, 2017):</b> A person must not move, import into the State or sell.</p>	<ul style="list-style-type: none"> <li>Monitor change in current distribution to ensure containment of spread.</li> <li>Promote best practice principles to landholders, including a range of control techniques for integrated weed management; maintaining competitive vegetation/crops/pastures, hygiene and property management plans.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>The plant should be fully and continuously suppressed and destroyed.</li> </ul>

Regional Priority Weed Objective – CONTAINMENT:		
Land area where requirements apply	Outcomes to demonstrate compliance with the GBD	Strategic response in the region
<p>Tiger pear - <i>Opuntia aurantiaca</i></p> <p>An exclusion zone is established for the whole of the region except Blacktown and Wollondilly local government areas. Blacktown and Wollondilly local government areas are classified as the core infestation area.</p>	<p><b>Whole region:</b></p> <ul style="list-style-type: none"> <li>Land managers prevent spread from their land where feasible.</li> <li>Local Control Authority is notified if the plant is found on the land.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>The plant is eradicated from the land and the land is kept free of the plant.</li> </ul> <p><b>Within Core infestation:</b></p> <ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land</li> <li>Land managers reduce the impact on priority assets.</li> </ul> <p><b>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33):</b> A person must not move, import into the State or sell.</p>	<ul style="list-style-type: none"> <li>Destruction of all infestations, where feasible.</li> <li>Monitor change in current distribution to ensure containment of spread.</li> </ul>
	<p>Water poppy - <i>Hydrocleys nymphoides</i></p> <p>An <b>exclusion zone</b> is established for all lands (and waters) in the region, excluding areas comprising the Hacking River Catchment, which will be known as the <b>core infestation area</b>.</p>	<ul style="list-style-type: none"> <li>Monitor change in current distribution to ensure containment of spread.</li> <li>Promote best practice principles to landholders, including a range of control techniques for integrated weed management; maintaining competitive vegetation/crops/pastures, hygiene and property management plans.</li> </ul> <p><b>Within Exclusion zone:</b></p> <ul style="list-style-type: none"> <li>The plant should be fully and continuously suppressed and destroyed.</li> </ul>

Regional Priority Weed Objective – ASSET PROTECTION:	
Outcomes to demonstrate compliance with the GBD	Strategic response in the region
Cat's claw creeper - <i>Dolichandra unguis-cati</i>	
<ul style="list-style-type: none"> <li>Land managers prevent spread from their land where feasible.</li> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>Land managers reduce the impact on priority assets.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>	<ul style="list-style-type: none"> <li>The plant should be fully and continuously suppressed and destroyed</li> <li>Identify priority assets for targeted management</li> <li>Promote best practice principles to landholders, including a range of control techniques for integrated weed management; maintaining competitive vegetation/crops/pastures, hygiene and property management plans.</li> </ul>
<b>The following legislative requirement also applies: <i>Mandatory Measure (Division 8, Clause 33)</i>: A person must not move, import into the State or sell.</b>	
Cabomba - <i>Cabomba caroliniana</i>	
<ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>	<ul style="list-style-type: none"> <li>The plant should be fully and continuously suppressed and destroyed</li> <li>Implement quarantine and/or hygiene protocols.</li> </ul>
<b>The following legislative requirement also applies: <i>Mandatory Measure (Division 8, Clause 33)</i>: A person must not move, import into the State or sell.</b>	
Giant reed – <i>Arundo donax</i>	
<ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>	<ul style="list-style-type: none"> <li>The plant should be fully and continuously suppressed and destroyed</li> <li>Implement quarantine and/or hygiene protocols.</li> </ul>
Green cestrum - <i>Cestrum parqui</i>	
<ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to land used for grazing of livestock.</li> <li>Land managers prevent spread from their land where feasible.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>	<ul style="list-style-type: none"> <li>The plant should be fully and continuously suppressed and destroyed on grazing land</li> <li>Implement quarantine and/or hygiene protocols.</li> </ul>
Ludwigia - <i>Ludwigia peruviana</i>	
<ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>Land managers prevent spread from their land where feasible.</li> <li>Land managers reduce the impact on priority assets.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> <li>Local Control Authority is notified if the plant is found on the land.</li> </ul>	<ul style="list-style-type: none"> <li>The plant should be fully and continuously suppressed and destroyed.</li> <li>Identify priority assets for targeted management.</li> </ul>

Regional Priority Weed Objective – ASSET PROTECTION:	
Outcomes to demonstrate compliance with the GBD	Strategic response in the region
<p>Pampas grass - <i>Cortaderia species</i></p> <ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>Land managers prevent spread from their land where feasible.</li> <li>Land managers reduce the impact on priority assets.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>	<ul style="list-style-type: none"> <li>The plant should be fully and continuously suppressed and destroyed.</li> <li>Identify priority assets for targeted management</li> </ul>
<p>Scotch/English Broom - <i>Cytisus scoparius</i></p> <ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>Land managers reduce the impact on priority assets.</li> </ul> <p><b>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33):</b> A person must not move, import into the State or sell.</p>	<ul style="list-style-type: none"> <li>The plant should be managed in accordance with a regional best practice guide identifying assets to be protected, including the Greater Blue Mountains World Heritage Area and Sydney water supply catchment lands.</li> </ul>
<p>Singapore daisy - <i>Sphagneticola trilobata</i></p> <ul style="list-style-type: none"> <li>Land managers mitigate the risk of the plant being introduced to their land.</li> <li>Land managers reduce the impact on priority assets.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul>	<ul style="list-style-type: none"> <li>Manage in accordance with New Weed Incursion Plan</li> <li>Implement quarantine and/or hygiene protocols.</li> <li>Identify priority assets</li> <li>Promote best practice principles to landholders, including a range of control techniques for integrated weed management; maintaining competitive vegetation/crops/pastures, hygiene and property management plans.</li> </ul>
<p>Water hyacinth - <i>Eichhornia crassipes</i></p> <ul style="list-style-type: none"> <li>Land managers prevent spread from their land where feasible.</li> <li>The plant or parts of the plant are not traded, carried, grown or released into the environment.</li> </ul> <p><b>The following legislative requirement also applies: Mandatory Measure (Division 8, Clause 33):</b> A person must not move, import into the State or sell.</p> <p>Note a Biosecurity Zone applies to this species under Part 5 of Division 2 of the <i>Biosecurity Regulation 2017</i>. However this does not apply to the Greater Sydney region.</p>	<ul style="list-style-type: none"> <li>Develop and implement Community Campaign</li> <li>Promote best practice principles to landholders, including a range of control techniques for integrated weed management; maintaining competitive vegetation/crops/pastures, hygiene and property management plans.</li> </ul>

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Appendix B

# Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022 – Other Weeds of Regional Concern

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## Appendix 2: Other weeds of regional concern

The following table recognises that whether a plant is a weed depends on the location, and that some plants grown as crops may function as weeds in other land uses. For example, kikuyu is a valuable pasture grass in grazing paddocks but is an invasive weed in the natural environment ie. bushland and National parks. Agapanthus are very popular garden plants, often used as border plants or to hold low banks. However, agapanthus are also known to invade roadsides, bushland and waterways.

Weeds listed in Appendix 2 include species known to occur in the Greater Sydney region as well as species not currently known to occur but at risk of moving into the region in the future. They have been identified as a potential risk in some (not all) situations. Many of the species pose potential risks to biodiversity (i.e. the environment), for example if they were to spread to or be found in a National Park. Some of the species pose potential risks to agriculture and some of the weeds pose potential risks to human health. In most situations this is when ingested but can also include risks associated with asthma and other allergic reactions.

This plan recognises that many weeds are already so well established that they can only be managed and will never be eradicated from the region. The species included in Appendix 2 may warrant resources for control or management programs, or occur in neighbouring regions and are a priority to keep out of the region. Inclusion on the list may assist Local Control Authorities and/or land managers prioritise action in certain circumstances where it can be demonstrated the weed poses a threat to the environment, agriculture and/or the community/human health.

The *Biosecurity Act 2015* provides powers to Local Control Authorities to take action in relation to these weeds in particular circumstances, for example where a weed threatens a high value asset and prevention, elimination or reduction of the risk is feasible and reasonable.

Common name	Scientific name	Asset/value at risk
Aaron's Beard, Rose-of-Sharon	<i>Hypericum calycinum</i>	Environment
African lovegrass	<i>Eragrostis curvula</i>	Environment
African marigold	<i>Cineraria lyratiformis</i>	Environment
Agapanthus	<i>Agapanthus praecox subsp. orientalis</i>	Environment
American Cotton Palm, Cotton Palm, California fan palm.	<i>Washingtonia filifera</i>	Environment
Apple of Sodom	<i>Solanum linnaeanum</i>	Environment, Agriculture, Community amenity
Arrowhead	<i>Sagittaria calycina</i> var. <i>calycina</i>	Environment, Agriculture, Community amenity
Arum lily	<i>Zantedeschia aethiopica</i>	Human health, Environment
Awabuki sweet viburnum	<i>Viburnum odoratissimum</i> var <i>awabuki</i>	Environment
Balloon vine	<i>Cardiospermum grandiflorum</i>	Environment
Banana passionfruit	<i>Passiflora tarminiana</i>	Environment
Beach daisy	<i>Arctotheca populifolia</i>	Environment, Community amenity

Common name	Scientific name	Asset/value at risk
Berberis, Barberry	<i>Berberis aristata</i> , <i>B. darwini</i> and <i>B. thunbergii</i>	Environment
Billardiera, Bluebell creeper	<i>Billardiera heterophylla</i>	Environment
Black cherry, Wild black cherry	<i>Prunus serotina</i>	Environment
Black locust	<i>Robinia pseudoacacia</i>	Environment, Human health
Blue heliotrope	<i>Heliotropium amplexicaule</i>	Agriculture
Blue hound's tongue	<i>Cynoglossum creticum</i>	Agriculture
Blue morning glory	<i>Ipomoea indica</i>	Environment, Human health
Blue stars	<i>Aristea ecklonii</i>	Environment
Bokhara	<i>Melilotus albus</i>	Environment
Box elder	<i>Acer negundo</i>	Environment
Brazilian button flower	<i>Centratherum punctatum</i>	Environment
Brazilian cherry	<i>Eugenia uniflora</i>	Environment
Broad leaf pepper	<i>Schinus terebinthifolius</i>	Environment
Buckthorn	<i>Rhamnus alaternus</i>	Environment
Buffel grass	<i>Cenchrus ciliaris</i>	Environment
Burr ragweed	<i>Ambrosia confertiflora</i>	Agriculture, human health
Bushman's Poison, Hottentot's-poison, Poison arrow plant, Wintersweet	<i>Acokanthera oblongifolia</i>	Agriculture
Camphor laurel	<i>Cinnamomum camphora</i>	Environment, Agriculture, Human health
Cane needle grass	<i>Nassella hyalina</i>	Agriculture
Cape honeysuckle	<i>Tecoma capensis</i>	Environment
Cape ivy	<i>Delairea odorata</i>	Environment
Cape tulip	<i>Moraea flaccida</i>	Environment, Agriculture
Cassia, Senna	<i>Senna pendula</i>	Environment
Cherry guava	<i>Psidium cattleianum</i>	Environment, Agriculture
Chinese celtis/ Chinese hackberry	<i>Celtis sinensis</i>	Environment, Agriculture
Chinese elm	<i>Ulmus parvifolia</i>	Environment
Chinese tallow	<i>Triadica sebifera</i>	Environment
Climbing nightshade, Brazilian nightshade	<i>Solanum seaforthianum</i>	Environment, Human health
Coastal morning glory	<i>Ipomoea cairica</i>	Environment
Cockspur coral tree	<i>Erthrina crista-galli</i>	Environment
Cocos palm	<i>Syagrus romanzoffiana</i>	Environment
Coffee bush, Leucaena	<i>Leucaena leucocephala</i>	Environment, Community amenity
Common morning glory	<i>Ipomoea purpurea</i>	Environment, Agriculture
Coolatai grass	<i>Hyparrhenia hirta</i>	Environment, Agriculture
Coral Berry	<i>Ardisia crenata</i>	Environment
Coral tree, Common coral tree	<i>Erythrina x sykesii</i>	Environment
Corky passionflower	<i>Passiflora suberosa</i>	Environment
Cotoneaster	<i>Cotoneaster</i> spp	Environment

Common name	Scientific name	Asset/value at risk
Creeping lantana, trailing lantana	<i>Lantana montevidensis</i>	Environment, Agriculture
Crofton weed	<i>Ageratina adenophora</i>	Environment, Agriculture
Cumbungi	<i>Typha latifolia</i>	Environment
Day-lily, Kwanso	<i>Heimerocallis fulva</i>	Environment
Dense waterweed, Leafy elodea, Egeria, Anacharis, Brazilian elodea	<i>Egeria densa</i>	Environment, Community amenity
Dipogon, Dolichos pea,	<i>Dipogon lignosus</i>	Environment
Dutchmans pipe	<i>Aristolochia elegans</i>	Environment
Espartillo, Broad-kernel espartillo	<i>Amelichloa caudata</i> (syn. <i>Achnatherum caudatum</i> )	Environment, Agriculture
Espartillo – narrow kernel	<i>Amelichloa brachychaeta</i>	Environment, Agriculture
European olive	<i>Olea europaea subsp. europaea</i>	Environment
Firethorn	<i>Pyracantha</i> spp.	Environment
Fishbone fern	<i>Nephrolepis cordifolia</i>	Environment
Formosa lily, Taiwan lily	<i>Lilium formosanum</i>	Environment
Fountain grass	<i>Pennisetum setaceum</i>	Environment
Foxglove tree, Empress tree	<i>Paulownia tomentosa</i>	Environment
Galenia	<i>Galenia pubescens</i>	Environment, Agriculture
Giant Parramatta grass (GPG)	<i>Sporobolus fertilis</i>	Environment, Agriculture
Ginger lily	<i>Hedychium gardnerianum</i>	Environment
Golden rain tree	<i>Koelreuteria elegans</i>	Environment
Golden wreath wattle	<i>Acacia saligna</i>	Environment
Harrisia cactus	<i>Harrisia</i> spp.	Environment
Himalayan honeysuckle	<i>Leycesteria formosa</i>	Environment
Holly, English holly	<i>Ilex aquifolium</i>	Environment
Honey locust	<i>Gleditsia triacanthos</i>	Environment, Agriculture
Indian hawthorn	<i>Rhaphiolepis indica</i>	Environment
Japanese climbing Fern	<i>Lygodium japonicum</i>	Environment
Japanese hawthorn, Yeddo hawthorn	<i>Rhaphiolepis umbellata</i>	Environment
Japanese honeysuckle	<i>Lonicera japonica</i>	Environment
Keriberry	<i>Rubus rugosus</i>	Environment
Kikuyu	<i>Pennisetum clandestinum</i>	Environment
Long leaf water primrose	<i>Ludwigia longifolia</i>	Environment, Agriculture, Community amenity
Lote tree, Nettle tree, Mediterranean hackberry	<i>Celtis australis</i>	Environment
Mahonia, Chinese Holly	<i>Berberis lomariifolia</i>	Environment
Mexican water lily, Yellow water lily	<i>Nymphaea mexicana</i>	Environment
Mimosa bush, Briar bush, Yellow mimosa	<i>Vachellia farnesiana</i>	Environment, Agriculture
Mirror bush, Mirror plant	<i>Coprosma repens</i>	Environment



Common name	Scientific name	Asset/value at risk
Mistflower	<i>Ageratina riparia</i>	Environment, Agriculture
Monkey's comb	<i>Pithecoctenium crucigerum</i>	Environment
Montbretia	<i>Crocasmia x crocosmiiflora</i>	Environment
Mossman river grass	<i>Cenchrus echinatus</i>	Environment
Moth vine, Moth plant	<i>Araujia sericifera</i>	Environment
Mother of millions	<i>Bryophyllum</i> spp.	Environment, Agriculture, Human health
New Zealand flax	<i>Phormium tenax</i>	Environment
Ochna	<i>Ochna serrulata</i>	Environment
Onion Grass	<i>Romulea rosea</i>	Environment, Agriculture
Orange jessamine, Murraya	<i>Murraya paniculata</i>	Environment
Osage orange	<i>Maclura pomifera</i>	Environment
Ox-eye daisy	<i>Leucanthemum vulgare</i>	Environment
Pampas lily of the valley	<i>Salpichroa organifolia</i>	Environment
Paper mulberry	<i>Broussonetia papyrifera</i>	Environment
Paterson's curse	<i>Echium plantagineum</i>	Environment, Agriculture, Human health
Patula pine, Mexican weeping pine	<i>Pinus patula</i>	Environment
Pellitory, Asthma weed	<i>Parietaria judaica</i>	Environment, Human health
Periwinkle, Blue periwinkle	<i>Vinca major</i>	Environment
Phoenix palm, Canary Island date palm	<i>Phoenix canariensis</i>	Environment
Pink trumpet vine	<i>Podranea ricasoliana</i>	Environment
Privet spp.	<i>Ligustrum sinense, Ligustrum lucidum, Ligustrum vulgare</i>	Environment, Human health
Radiata pine, Pine wildings	<i>Pinus radiata</i>	Environment
Rattleseed pod, Rattlepod	<i>Crotalaria lunata</i>	Environment
Red ludwigia	<i>Ludwigia repens</i>	Environment, Agriculture, Community amenity
Reed canary grass	<i>Phalaris arundinacea</i>	Environment
Reed sweet grass	<i>Glyceria maxima</i>	Environment
Rhizomatous bamboo, Black bamboo	<i>Phyllostachys nigra</i>	Environment
Rhizomatous bamboo, Fishpole bamboo, Yellow bamboo	<i>Phyllostachys aurea</i>	Environment
Rhodes grass	<i>Chloris gayana</i>	Environment
Rhus tree	<i>Toxicodendron succedaneum</i>	Human health
Rush	<i>Juncus articulatus</i>	Environment
Rush	<i>Juncus effusus</i>	Environment
Scotch, Illyrian thistles	<i>Onopordum acanthium, O. Illyricum</i> and <i>O. acaulon</i>	Agriculture
Sedge, Cyperus	<i>Cyperus teneristolon</i>	Environment, Agriculture
Spanish heath	<i>Erica lusitanica</i>	Environment
Spiderwort, Moss inch plant	<i>Tradescantia cerinthoides</i>	Environment

Common name	Scientific name	Asset/value at risk
Spiny burrgrass - longispinus	<i>Cenchrus longispinus</i>	Environment, Agriculture, Human health
Spiny rush, Spike rush, Sharp rush	<i>Juncus acutus</i>	Environment
St John's wort	<i>Hypericum perforatum</i>	Environment, Agriculture
Sweet briar	<i>Rosa rubiginosa</i>	Agriculture
Sweet vernal-grass	<i>Anthoxanthum odoratum</i>	Environment, Agriculture
Tall wheat grass	<i>Thinopyrum ponticum</i>	Environment
Tangier Pea	<i>Lathyrus tingitanus</i>	Environment
Telegraph Weed	<i>Heterotheca grandiflora</i>	Environment
Trad	<i>Tradescantia fluminensis</i>	Environment
Tree of heaven	<i>Ailanthus altissima</i>	Environment, Human health
Turkey rhubarb	<i>Acetosa sagittata</i>	Environment
Tussock paspalum, Blue grass	<i>Paspalum quadrifarium</i>	Environment
Tutsan	<i>Hypericum androsaemum</i>	Environment
Umbrella tree	<i>Schefflera actinophylla</i>	Environment
Viper's bugloss	<i>Echium vulgare</i>	Agriculture
Watsonia	<i>Watsonia meriana</i>	Environment
Whisky grass	<i>Andropogon virginicus</i>	Environment
White jasmine, Chinese jasmine	<i>Jasminum polyanthum</i>	Environment
Wild poinsettia	<i>Euphorbia cyathophora</i>	Environment
Wild tobacco bush	<i>Solanum mauritianum</i>	Environment, Agriculture
Yellow bells, Golden bells	<i>Tecoma stans</i>	Environment, Agriculture
Yorkshire fog	<i>Holcus lanatus</i>	Environment

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Attachment D

# Biodiversity Development Assessment Report

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A stylized topographic map with green contour lines is positioned on the left side of the page, extending from the top left towards the bottom left.

# 200 Aldington Road Industrial Estate Biodiversity Development Assessment Report

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**Fife Kemps Creek Pty Ltd**

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DOCUMENT TRACKING

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## Executive Summary

Eco Logical Australia Pty Ltd was engaged by Fife Kemps Creek to prepare a Biodiversity Development Assessment Report for a proposed development at 200 Aldington Road in the Penrith City Council local government area. The subject land is the assessable area which includes the area of land defined by land title boundaries of Lot 20 DP 255560; Lot 21 DP 255560; Lot 22 DP 255560; Lot 23 DP 255560 and Lot 30 DP 258949 between 144-228 Aldington Road, Kemps Creek. The proposed development is for the construction of an industrial estate and associated infrastructure on the site. The development is classified as a Part 4.1 State Significant Development under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report has followed the Biodiversity Assessment Method 2017 (BAM) established under Section 6.7 of the NSW *Biodiversity Conservation Act 2016* (BC Act) and responds to the following SEARs for project SSD-10479 issued July 2020:

- - *an assessment of the biodiversity impacts in accordance with the Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report (BDAR);*

This report describes the biodiversity values within the subject land and development site, describes the impacts and outlines the measures to be taken to avoid, minimise and mitigate impacts to the Plant Community Types and threatened species habitat present within the development footprint and development site.

The report provides the number of biodiversity credits that would need to be retired to offset the residual loss of biodiversity if the development proceeds as described.

The proposed development involves direct impacts to the biodiversity values within the development footprint, and indirect impacts within the development site. Following avoidance and mitigation, the residual direct impacts were calculated in accordance with the BAM by utilising the BAM Credit Calculator.

It is important to note that the entire development site is mapped as Urban Capable land in the Draft Cumberland Plain Conservation Plan 2020, and the site has been subject to biodiversity assessment under the Draft Cumberland Plain Assessment Report prepared by Biosis and Open Line in 2020.

The proposed development site is approximately 72.09 ha in size and consists largely of rural housing and market gardens, with low to moderate condition remnant vegetation. Three Plant Community Types (PCTs), comprising five vegetation zones, are present within the development site and development footprint. A summary of the areas of each zone within the development footprint is provided below.

Vegetation Zone	PCT ID	PCT Name	Condition	Direct impact (ha)
1	835	Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	Moderate	0.22
2	835	Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	Low Moderate	- 1.12
3	850	Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	low	0.12
4	1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	low	0.67
5	1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	moderate	0.67
<b>Total</b>				<b>2.80</b>

A total of 23 ecosystem credits will be required for the removal of vegetation within the development footprint.

Below are details how each of the three PCTs correspond to threatened ecological communities as listed under the BC Act and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It also provides a breakdown of the number of ecosystem credits required per PCT for the removal of vegetation within the development footprint.

PCT ID	PCT Name	BC Act listing	EPBC Act listing	Direct impact (ha)	Credits required
835	Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	Endangered	Not Listed	1.34	16
850	Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Critically Endangered	The community on site does not meet the condition thresholds for listing under the EPBC Act	0.12	0
1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	Endangered	The community on site does not meet the condition thresholds for listing under the EPBC Act	1.34	7

A total of 27 species credit species will be required for the removal of threatened species habitat within the development footprint. A summary of the species credits requirements is provided below.

Species	Common Name	Presence	Direct impact (ha)	Credits required
<i>Myotis macropus</i>	Southern Myotis	Assumed	2.73	27

Serious and Irreversible Impact (SII) values have also been considered in this assessment. *Cumberland Plain Woodland of the Sydney Basin Bioregion* is listed as a SII in the BioNet Threatened Biodiversity Data Collection. According to the Threatened Biodiversity Data Collection, the SII thresholds for this community are still under development.

Matters of National Environmental Significance (MNES) identified as having potential to be adversely affected by the proposed works include:

- *Anthochaera phrygia* (Regent Honeyeater)
- *Pteropus poliocephalus* (Grey-headed Flying-fox)
- *Lathamus discolor* (Swift Parrot)
- *Litoria aurea* (Green and Golden Bell Frog)
- *Phascolarctos cinereus* (Koala)
- *Gallinago hardwickii* (Latham's Snipe).

Assessments of the Commonwealth Significant Impact Criteria was undertaken for the above MNES and concluded that the project is unlikely to have a significant impact on any of the MNES.



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## Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method
BAMC	Biodiversity Assessment Method Credit Calculator
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report

Abbreviation	Description
BSSAR	Biodiversity Stewardship Site Assessment Report
CEEC	Critically Endangered Ecological Community
DAWE	Commonwealth Department of Agriculture, Water and Environment (formally Department of Environment and Energy (DoEE))
DNG	Derived Native Grassland
DPE	NSW Department of Planning and Environment
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
FM Act	NSW <i>Fisheries Management Act 1994</i>
GIS	Geographic Information System
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Area
LLS	Local Land Service
NSW	New South Wales
NOW	NSW Office of Water
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
PMST	Protected Matters Search Tool
SEPP	State Environmental Planning Policy
SSD	State Significant Development
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
VIS	Vegetation Information System
WM Act	NSW Water Management Act 2000

# 1. Introduction

Eco Logical Australia was engaged to provide a biodiversity assessment of the proposed Industrial Estate at 200 Aldington Road, Kemps Creek. This section of the report describes the project evolution from initial lodgement, through to the assessment of the final design.

## 1.1 Summary of project as lodged and publicly exhibited (October 2020)

As lodged and exhibited, the SSDA sought approval for the following development:

A concept masterplan with an indicative total building area of 375,755 sqm, comprising:

- 357,355 sqm of warehouse gross floor area (**GFA**)
- 18,200 sqm of ancillary office GFA
- 200 sqm of café GFA
- 13 individual development lots for warehouse buildings with associated hardstand areas and two lots for drainage infrastructure purposes
- Internal road layouts and road connections to Aldington Road
- Provision for 1700 car parking spaces
- Associated concept site landscaping.

Detailed consent for progressive delivery of site preparation, earthworks and infrastructure works (i.e., Stage 1 works) on the site, including:

- Demolition and clearing of all existing built form structures
- Drainage and infill of existing farm dams and any ground dewatering
- Clearing of all existing vegetation
- Subdivision of the site into 15 individual lots
- Construction of a warehouse building with a total of 50,930 sqm of GFA, including:
  - 48,430 sqm of warehouse GFA
  - 2,500 sqm of ancillary office GFA
- 231 car parking spaces
- Bulk earthworks including 'cut and fill' to create flat development platforms for the warehouse buildings, and site stabilisation works (if required)
- Roadworks and access infrastructure
- Stormwater and drainage works including stormwater basins, diversion of stormwater lines, gross pollutant traps and associated swale works
- Sewer and potable water reticulation
- Inter-allotment, road and boundary retaining walls.

## 1.2 Response to Submissions (March 2021)

Following the public exhibition of the Project, changes were undertaken in response to the issues raised during the public exhibition. This included a full assessment of the Project against the Draft Mamre Road

Precinct Development Control Plan (**draft MRP DCP**) which was released subsequent to lodgement of the SSDA.

The key changes and additional information on the Project included:

- A revised riparian solution in the north east corner of the site which relocated the existing first order water course and re-established the riparian corridor with a 10-metre buffer on each side in accordance with the Natural Resources Access Regulator (NRAR) guidelines.
- An evidence-based case for the proposed location of the high order road south of the site's northern boundary which was seen to provide a more logical and feasible road network outcome (for both FKC and its northern neighbour) compared to that envisioned under the draft MRP DCP.
- Revised technical inputs for the flood assessment to address the submissions raised, including revised flood modelling which addresses post development conditions in the 2-, 20- and 100-year ARI events, and providing further commentary on the flooding impacts of surrounding and downstream land.
- An integrated water management solution which can effectively allow the progressive redevelopment of the site to occur while still recognising and meeting stormwater runoff targets set out in the draft and eventual final MRP DCP.
- A revised Visual Impact Assessment showing the impact of proposed landscaping mitigation over time.
- Rationale for minor departures from the draft MRP DCP in relation to building design and sitting, pylon signage and retaining walls.

### 1.3 Request for Additional Information (April 2021)

Further changes to the Project (which are the subject of this RTS Report) are the result of further correspondence received by DPIE (dated 28 April 2021). The changes to the Project further align the proposed development with the relevant provisions of the draft MRP DCP (especially in relation to the proposed road network) and exclude prohibited components of development from the RE2 Private Recreation zone. The Summary of key changes to the project are:

Concept Master Plan:

- Reconfiguration of the internal road network and external road connections to be generally consistent with the draft Mamre Road Precinct DCP including:
  - Provision of a land reservation corridor along the northern boundary to facilitate half the required future DCP road and intersection with Aldington Road
  - Inclusion of the open space edge road in the north-east section of the site with connections through to the adjoining properties to the north and east
  - Intersections with Aldington Road; signalised south intersection and roundabout northern intersection
  - Amendments to road corridor widths.
- Reconfiguration of Lot G to facilitate the open space edge road to the adjoining eastern property and to locate the proposed warehouse footprint wholly within the IN1 zone

- Relocation of on-site detention basin within Lot D to be outside the RE2 Private Recreation zone in within the IN1 zone;
- Retention of existing farm dams within the RE2 zoned area in the north-east corner of the site;
- Consequential amendments to bulk earthwork pads, retaining walls, lot and future warehouse layout, car parking and landscaping.

Stage 1 works:

- Overall revisions to site preparation, earthworks and infrastructure consistent with the revised concept master plan.
- Inclusion of an interim access road and temporary junction connecting to Aldington Road in the northern portion of the site to facilitate site access prior to the implementation of the northern boundary road.
- Revision to the internal road network in line with the concept master plan revisions with the provision of temporary turning heads at the site boundary where those roads will connect to properties to the east and north in the future. The road levels at the boundary interface of the site will align with existing ground level (or as required to contain stormwater).

## 1.4 Description of Project, as amended, for which development consent is now sought:

The amended SSDA seeks approval for the following development:

A concept masterplan with an indicative total building area of 347,955 sqm comprising:

- 330,950 sqm of warehouse gross floor area (**GFA**)
- 17,005 sqm of ancillary office GFA
- 13 individual development lots for warehouse buildings with associated hardstand areas and two lots for drainage infrastructure purposes (each including a bio-retention basin)
- Roads, including:
  - Internal road layouts
  - Southern road connection to Aldington Road
  - Northern boundary road (half road corridor) connecting to Aldington Road
  - Road connections to adjoining landholdings to the north and east
- Provision for 1549 car parking spaces and
- Associated concept site landscaping

Detailed consent for progressive delivery of site preparation, earthworks and infrastructure works (i.e., Stage 1 works) on the site, including:

- Demolition and clearing of all existing built form structures
- Drainage and infill of existing farm dams and any ground dewatering
- Clearing of all existing vegetation
- Subdivision of the site into 15 individual lots
- Construction of a warehouse building with a total of 50,930 sqm of GFA, including:

- 48,430 sqm of warehouse GFA
- 2,500 sqm of ancillary office GFA and
- 219 car parking spaces
- Bulk earthworks including 'cut and fill' to create flat development platforms for the warehouse buildings, and site stabilisation works (if required)
- Roadworks and access infrastructure, including an interim access road and temporary junction with Aldington Road
- Stormwater and drainage works including stormwater basins, diversion of stormwater lines, gross pollutant traps and associated swale works
- Sewer and potable water reticulation and
- Inter-allotment, road and boundary retaining walls

This report addresses the amended project for which development consent is now sought. It is a stand-alone report and supersedes the previous reports and supplementary information prepared for the original development application and subsequent response to submissions.

## 1.5 Response to submissions

The following table responds to the issues raised by Penrith City Council and NSW EES in April 2021.

Agency	Comment	Response
Penrith City Council	It is recommended that further design refinement is undertaken which addresses the following:	Redesign has moved the basin such that it will not directly impact the existing watercourse.
	- The proposal should relocate the bio-retention basin outside both the E2 and RE2 land as zoned to meet the objectives and strategic intent of the SEPP instrument.	The E2 and RE2 land will be subject to a Vegetation Management Plan as per the Riparian Assessment.
	- The proposal should ensure that the entirety of land zoned E2 and RE2, and the required vegetated landscape buffers are considered within the Vegetation Management Plan	
	- The proposal should ensure the minimum distance of 10m VRZ from top of bank are maintained. An extended area at one location does not offset the requirement elsewhere	Addressed in the Riparian Assessment Report. A 10m vegetated riparian zone will be provided and rehabilitated in accordance with a Vegetation Management Plan.
	- Retention and protection of the dam identified as suitable Green and Golden Bell Frog habitat. While the Ecologists have assessed that one dam provides suitable habitat for this species, it is important to this species' persistence that their overall ecological requirements including options for colonisation are provided for. While the Ecologist assessed the habitat potential of the site and concluded that the potential habitat did not extend 200m from the dam, the buffer must still be applied and its protection and enhancement prioritised. It is recommended that expert consultation	See response to GGBF issue below.



Agency	Comment	Response
	<p>should be undertaken to inform the habitat requirements of this species, to be incorporated within the site plans and the VMP. Further, as a mitigation effort, the applicant could be encouraged to prepare/collaborate with experts to produce an insitu conservation plan for this species.</p>	
EES	<p><b>Biodiversity</b></p> <p>EES has reviewed the Response to Submissions (RTS) report prepared by Ethos Urban (23 March 2021), Revised Concept Masterplan (SBA Architects, 19 March 2021), and Biodiversity and Riparian Addendum (Eco Logical Australia, 22 March 2021). EES considers that the revised proposal and additional information do not address concerns raised, and that the proposal does not adequately assess the biodiversity impacts of the development.</p>	
	<p><i>Assessment of impacts</i></p> <p>EES previously advised that the proposal did not adequately assess impacts on biodiversity, and concerns were raised regarding encroachments of warehouse W6, carparking and a stormwater detention basin into the riparian area at the north eastern corner of the site. EES notes that the RTS proposes the following amendments to the design of the north eastern corner of the development:</p> <ul style="list-style-type: none"> <li>• ☐ riparian corridor recreated and first order stream redirected with a 10m buffer on each side (Figure 12, p14), and</li> <li>• ☐ the open space edge road deleted and landscaped edge solution proposed which “provides an acceptable buffer to the riparian corridor” (p22).</li> </ul> <p>It isn’t clear from Figure 12 of the RTS (below) if the alteration of the first order watercourse will impact River-flat Eucalypt Forest and Swamp Oak Floodplain Swamp Forest, and this has not been documented in the BDAR.</p>	<p>The amended project does not encroach on or alter the proposed first order watercourse. There are some negligible impacts to native vegetation in this area and are accounted for in the BDAR.</p>
	<p>Further, the BDAR states that vegetation on Lot D will be retained, restored and managed under a Vegetation Management Plan. However, the original Bushfire Protection Assessment (Appendix P of EIS) and Revised Concept Masterplan – Fire Protection Plan indicates that all of Lot D must be managed as a ‘defendable space’ or Asset Protection Zone (APZ). Vegetation management for an APZ involves the removal and trimming of vegetation, and can impact on biodiversity values.</p>	<p>As described in the Riparian Assessment Report, a Vegetation Management Plan is proposed to be prepared for this area. 10m from the top of bank will be revegetated. In the remaining areas of the VMP, native vegetation communities will be maintained with weed treatment, but re-establishment of native vegetation on grassland areas is not proposed.</p>
	<p>EES recommends the BDAR be revisited to ensure that the impacts of the proposed works within and adjacent to Lot D are accurately assessed and presented. The assessment must include:</p> <ul style="list-style-type: none"> <li>• realignment of the watercourse and recreation of the riparian corridor</li> <li>• construction of stormwater detention basin</li> <li>• retaining walls, and</li> <li>• APZs.</li> </ul>	<p>BDAR accurately describes the extent of works in this area.</p> <p>Due to redesign, the watercourse is not being realigned.</p> <p>The stormwater detention basin is located outside the Vegetated Riparian Zone</p> <p>Retaining walls will not impact on the watercourse</p>

Agency	Comment	Response
	<p>BAM-C to be finalised</p> <p>This has been addressed, with the exception of the following:</p> <ul style="list-style-type: none"> <li>The GIS shapefile for Myotis habitat has not been received by EES</li> <li>EES now has access to the calculator data and the Green and Golden Bell Frog (GGBF) habitat shapefile and notes that data in the BDAR is inconsistent with data in the GIS file and calculator, i.e:</li> <li>GGBF polygon is 0.598 ha but the BDAR says the impact is 0.342 ha and the calculator says 0.93 ha</li> <li>Data on the size of the Myotis polygon is not available (as above) but the BDAR says the impact is 2.975 ha and the calculator says 3.02 ha.</li> <li>However, it is acknowledged that the number of credits required for these species is consistent between the BDAR and the calculator (5 and 29 for GGBF and Myotis respectively).</li> </ul>	<p>GIS shapefile for Southern Myotis will be uploaded.</p> <p>The GGBF issue has been revised in the final BDAR. Reference is made to the Expert Report for GGBF prepared by Francis Lemckert for the Draft Cumberland Plain Conservation Plan Assessment Report. The Expert Report noted:</p> <p><i>It has been determined that there is not likely to be a population of the GGBF currently present within the WSAGA (Western Sydney Aerotropolis Growth Area). There are no records from within the GA, despite the presence of suitable habitat in rural areas in the form of a high density of water bodies. There is no evidence that it is currently present and the distance to the coast indicates it is unlikely that the GGBF would persist in this area. The two most closely associated records are single records not closely aligned with other records and so it is unlikely that a larger stable population has been or is present within the WSAGA</i></p> <p>The draft Cumberland Plain Conservation Plan acknowledges there may be a population of GGBF along Ropes Creek in the Greater Penrith to Eastern Creek Corridor. The proposed development is not within that area.</p> <p>The GGBF Expert Report did note that a future movement corridor (if the species is found in the GPEC) could cross the north east corner of the site. This area is being retained and not impacted by the development.</p> <p>Therefore, the GGBF has been excluded from further assessment and no credits required.</p>
	<p>Candidate species credit species assessment</p> <p>This has not been adequately addressed. For the reasons previously given, <i>Acacia pubescens</i>, <i>Grevillea juniperina</i> subsp. <i>Juniperina</i>, <i>Marsdenia viridiflora</i> subsp. <i>Viridiflora</i>, <i>Meridolum corneovirens</i>, and <i>Pimelea spicata</i> need to be assessed in accordance with Step 4 of section 6.4 of the BAM.</p>	<p>Survey for <i>Meridolum corneovirens</i> was undertaken in June 2021, with no individuals found.</p> <p>The BDAR provides additional information on the other species, including reference to the Expert Reports prepared for the draft Cumberland Plan Conservation Plan.</p>
	<p>Regarding the assertion that “the listed species are not cryptic”, <i>P. spicata</i> is cryptic and <i>M. corneovirens</i> may not be readily observed because:</p> <p>Bionet states for <i>P. spicata</i> “use flowers to locate and identify as species is inconspicuous”</p>	<p>As above</p>

Agency	Comment	Response
	<p><a href="https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM/ProfileEdit.aspx?pld=10632&amp;pType=SpeciesCode">https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM/ProfileEdit.aspx?pld=10632&amp;pType=SpeciesCode</a></p> <p>the environmental impact assessment guidelines for this species state “Pimelea spicata is cryptic and difficult to detect, particularly when not in flower, so surveys should not be relied upon unless undertaken whilst the species is flowering”</p> <p><a href="https://www.environment.nsw.gov.au/resources/nature/PimeleaSpicata0805EIA.pdf">https://www.environment.nsw.gov.au/resources/nature/PimeleaSpicata0805EIA.pdf</a></p> <p>for M. corneovirens, Bionet states “Identification of live specimens is required early morning or in the evening during or after rain, while the ground and vegetation surfaces are still wet from the rain” and “shelters in loose soil around grass clumps” and “can dig several centimetres into soil to escape drought”</p> <p><a href="https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM/ProfileEdit.aspx?pld=10526&amp;pType=SpeciesCode">https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM/ProfileEdit.aspx?pld=10526&amp;pType=SpeciesCode</a>.</p>	
	<p>Inconsistencies in the assessment for the Green and Golden Bell Frog</p> <p>This has not been adequately addressed. EES does not agree with the conclusion in the Biodiversity and Riparian Addendum that only one dam on the site provides suitable habitat for GGBF. Based on Table 6 of the Aldington Road Kemps Creek Riparian Assessment (Eco Logical Australia, 15 October 2020) (the riparian assessment), dams 2, 3, 4, 6, 7 and 10 provide potential habitat for this species. The information in the riparian assessment needs to be considered when determining the species polygon for GGBF, and when updating the BDAR. EES also recommends the BDAR be updated to report a consistent figure for direct impacts to GGBF habitat.</p> <p>Buffers for Green and Golden Bell Frog This has not been adequately addressed because it has not been explained why the ecologists concluded that potential habitat did not extend 200m from the dam. The photos in the BDAR and the riparian assessment, along with aerial imagery (Nearmap, dated Friday March 26 2021), show potential habitat in cleared areas, and:</p> <p>the environmental impact assessment guidelines state (page 2) “...drains, scrapes, depressions and farm dams along with the more natural coastal or floodplain wetland features...are all candidate sites for occupation by this species...Such sites are occupied and used mainly as breeding habitat. Foraging habitat requirements include tall, dense, grassy vegetation and tussock forming vegetation is known to be used for foraging and shelter...Over-wintering sites are another important habitat component that requires consideration in any site assessment...Such sites include the bases of dense vegetation tussocks, beneath rocks, timber, within logs or beneath ground debris including human refuse such as sheet iron etc.”,</p> <p><a href="https://www.environment.nsw.gov.au/resources/nature/GAndGbelIfrogEia0703.pdf">https://www.environment.nsw.gov.au/resources/nature/GAndGbelIfrogEia0703.pdf</a></p> <p>Bionet identifies habitat constraints to be within 1km of semi-permanent/ephemeral wet areas, swamps, and waterbodies</p> <p><a href="https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM/ProfileEdit.aspx?pld=10483&amp;pType=SpeciesCode">https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM/ProfileEdit.aspx?pld=10483&amp;pType=SpeciesCode</a></p> <p>This species is also known to occur in highly disturbed areas, particularly in Greater Sydney</p>	See response above in relation to GGBF.

Agency	Comment	Response
	<p><a href="https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM/LinksEdit.aspx?pld=104_83&amp;pType=Specie">https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM/LinksEdit.aspx?pld=104_83&amp;pType=Specie</a></p> <p>As such, EES' previous comment applies, and a 200m buffer should be applied around waterbodies.</p>	
	<p>Prescribed impacts</p> <p>This has not been adequately addressed because:</p> <ul style="list-style-type: none"> <li>fauna can use buildings and other human-made structures that are abandoned and in use, and in a range of conditions</li> <li>sections 6.7.1.3(b) and 9.2.1.3 of the BAM have not been applied</li> <li>section 9.3.1.1 of the BAM states "The proponent must identify measures to mitigate or manage impacts in accordance with the guidelines for mitigating and managing impacts on biodiversity values at Subsection 9.3.2 and Subsection 9.3.3", with subsection 9.3.3 being "mitigating prescribed biodiversity impacts"</li> <li>As such, EES' previous comment remains relevant and the following further assessment is required:</li> <li>application of sections 6.7.1.3(b) and 9.2.1.3 of the BAM, and</li> <li>reconsideration of the types of habitat available for microbats on the site.</li> </ul>	<p>The BDAR acknowledges that human made structures may provide habitat for species including microbats. The study area contains dwellings, sheds and shade structures as well as farm dams.</p> <p>The BDAR proposes a mitigation measure of preparing and implementing a Fauna Management Plan that would involve:</p> <ul style="list-style-type: none"> <li>Dam dewatering and relocation of native fauna</li> <li>Inspection of buildings prior to demolition to determine whether they contain microbats or other fauna. If microbats are found, an exclusion process would be followed.</li> </ul> <p>Microbats using human made structures can move their use of building. Therefore, rather than surveying now and having to re-survey again when it is time to demolish buildings, the practical approach is to survey for microbat use of structures prior to demolition and then implement exclusion techniques if required.</p>
	<p>Avoiding and minimising impacts on biodiversity</p> <p>This has not been adequately addressed. In accordance with section 8 of the BAM, more information is needed to document and justify the location and design of the project, particularly in relation to the location of the proposed bio-retention basin in the north eastern corner of the site. This basin will remove a portion of the endangered Swamp Oak floodplain swamp forest, which forms part of, and is contiguous with, the riparian vegetation in the proposed VMP area.</p>	<p>Redesign of the north east corner has resulted in all riparian zones being avoided</p> <p>The BDAR has included a 5m construction buffer</p>
	<p>Mitigation measures</p> <p>Comment: This has been partly addressed. Table 27 in the BDAR needs to be updated to cover:</p> <ul style="list-style-type: none"> <li>the construction buffer</li> <li>all of the vegetation to be included in the VMP area</li> <li>dam dewatering, and</li> </ul> <p>searching human-made structures for fauna before they are demolished.</p>	<p>Mitigation measures include proposed Fauna Management Plan that would include dam dewatering and pre-demolition survey of man-made structures. The Fauna Management Plan would be prepared post-approval but prior to any works taking place.</p> <p>The VMP can be prepared post-approval and will cover riparian areas in the north east corner of the site</p>

## 2. Stage 1: Biodiversity assessment

### 2.1 Introduction

This Biodiversity Development Assessment Report (BDAR) has been prepared by Kirsten Velthuis (BAAS 19048) who is an Accredited Person under the NSW *Biodiversity Conservation Act 2016* (BC Act). The report has been peer reviewed by Accredited Assessor Nicole McVicar (18077). The contents of this BDAR comply with the minimum requirements outlined in Table 25 of the Biodiversity Assessment Method (BAM) (Office of Environment and Heritage (OEH) 2020) and address the Secretary's Environmental Assessment Requirement for 'An assessment of the biodiversity impacts in accordance with the Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report'.

Definitions relevant to the report are provided in Appendix A.

#### 2.1.1 General description of the development site

The proposed development site, defined as the area of land that is subject to the proposed development application, is 72.09 ha and located within the Penrith City Council local government area (LGA). The development site is bordered by Aldington Road to the west, and rural, residential properties to the north, east and south. The development site currently contains market gardens, rural/residential properties, native vegetation and regenerating native vegetation. The development site consists of the following adjoining parcels of land:

Address	Title
106-124 Aldington Road, Kemps Creek	Lot 32 DP258949
126-142 Aldington Road, Kemps Creek	Lot 31 DP258949
144-160 Aldington Road, Kemps Creek	Lot 30 DP258949
162-178 Aldington Road, Kemps Creek	Lot 23 DP255560
180-196 Aldington Road, Kemps Creek	Lot 22 DP255560
198-212 Aldington Road, Kemps Creek	Lot 21 DP255560
214-228 Aldington Road, Kemps Creek	Lot 20 DP255560

The general description of the development site and development footprint is displayed on the following maps:

- Site Map (Figure 1)
- Location Map (Figure 2)
- Development footprint (Figure 3).

### 2.1.2 Sources of information used

The following data sources were reviewed as part of this report:

- BioNet Vegetation Classification (accessed between August 2019 and August 2020)
- BioNet / Atlas of NSW Wildlife 5 km database search (Department of Planning Industry and Environment (DPIE), August 2019 and August 2020)
- Commonwealth *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool 5 km database search (DAWE, accessed between August 2019 and August 2020). Likelihood of occurrence table has been provided in Appendix C.
- NSW Government Biodiversity Values Map and Threshold Tool (BV Map). The subject land is mapped on BV Map (accessed August 2020)
- CTENVIRONMENTAL (2020). Mamre Road Precinct Rezoning: Waterway Assessment– Kemps Creek and Mount Vernon. Prepared for Sydney Water.
- Waterway Assessment– Kemps Creek and Mount Vernon. Prepared for Sydney Water.
- Aerial mapping (SIXMaps and NearMaps) (accessed between August 2019 and August 2020)
- Additional geographic information system (GIS) datasets including soil, topography, geology and drainage
- Draft Cumberland Plain Conservation Plan 2020, Department of Planning, Industry and Environment
- Draft Cumberland Plain Assessment Report 2020, Biosis and Open Lines Environmental Consulting



# Site Map 200 Aldington Road Kemps Creek BDAR



Figure 1: Site Map



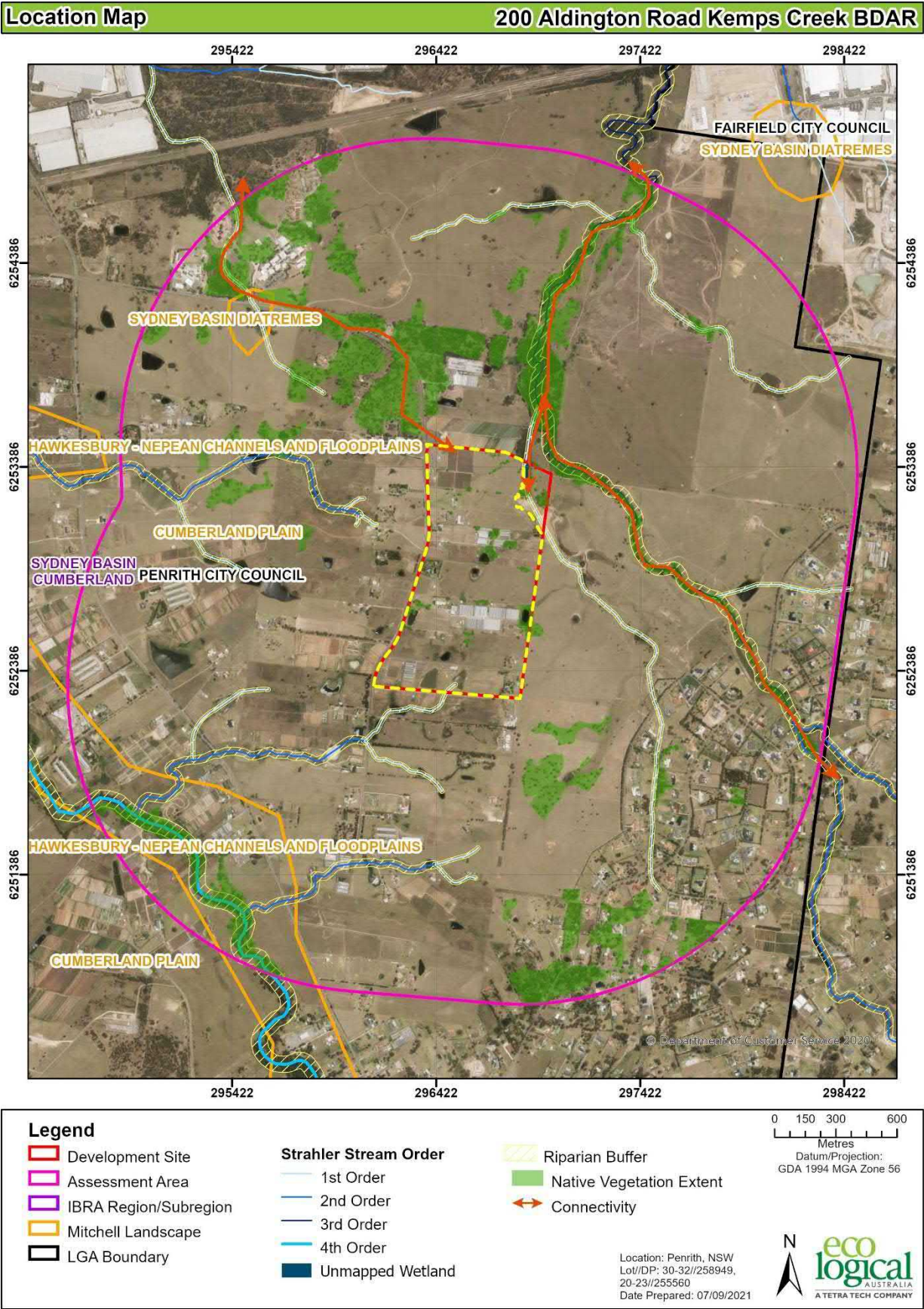


Figure 2: Location Map



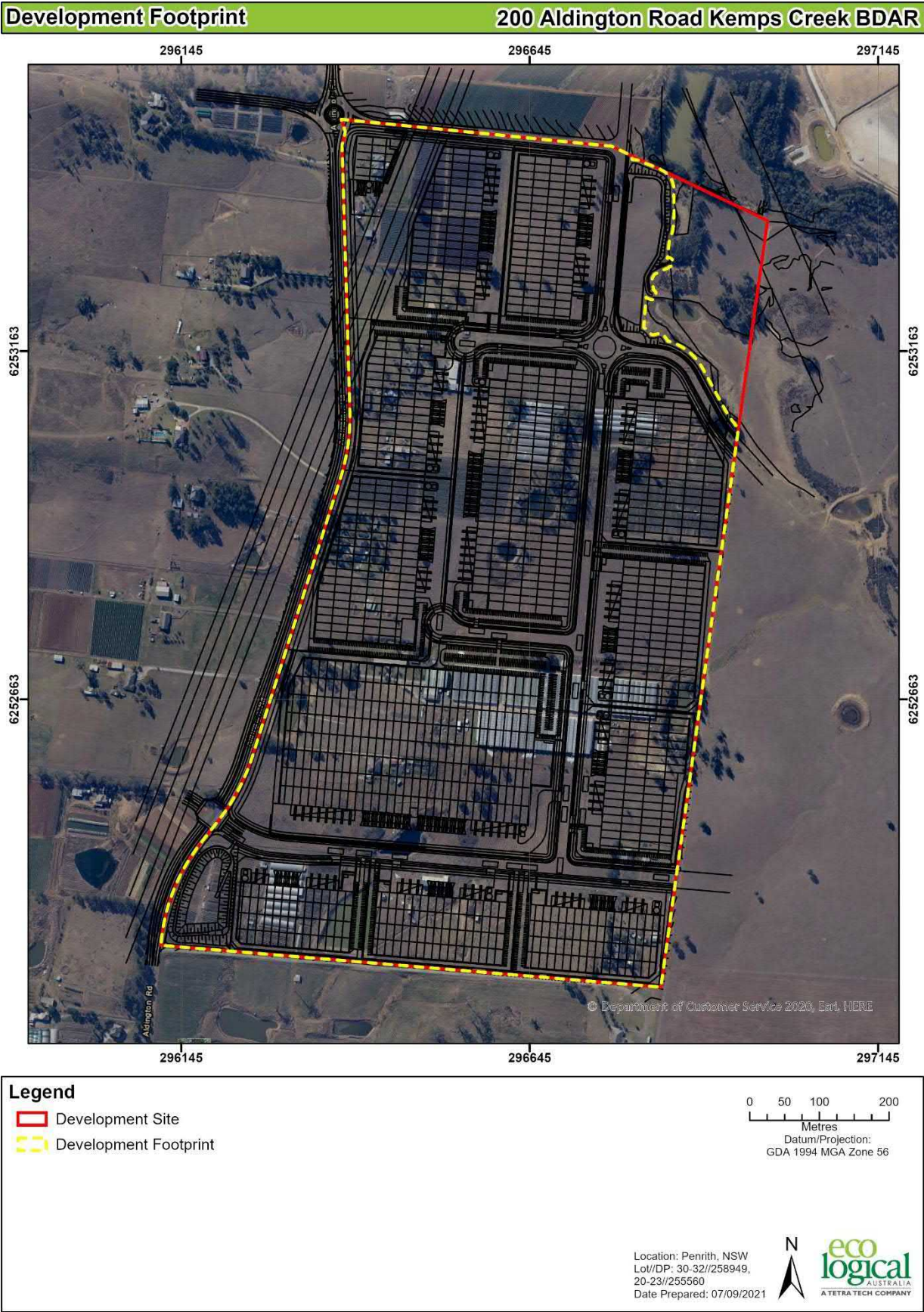


Figure 3: Development footprint

## 2.2 Legislative context

Table 1: Legislative context

Name	Relevance to the project
<b>Commonwealth</b>	
<i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)	Matters of National Environmental Significance (MNES) have been identified on or near the development site. This report assesses impacts to MNES and concludes that the development is not likely to have a significant impact on MNES.
<b>State</b>	
<i>Environmental Planning and Assessment Act 1979</i> (EP&A Act)	<p>The proposed development is State Significant Development (SSD) and is to be assessed under Part 4.1 of the EP&amp;A Act. Secretary's Environmental Assessment Requirements (SEARS) have been issued (SSD-10479 issued July 2020) and the relevant SEARs are as follows:</p> <p><i>The EIS must address the following specific matters:</i></p> <p><i>Biodiversity – including:</i></p> <ul style="list-style-type: none"> <li>• <i>the biodiversity impacts in accordance with the Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report (BDAR); and</i></li> <li>• <i>the development's impacts on the riparian corridor and wetland on site, including detailed interface management measures.</i></li> </ul>
<i>Biodiversity Conservation Act 2016</i> (BC Act)	The proposed development is SSD and thus requires the submission of a Biodiversity Development Assessment Report in accordance with Part 7 Division 2 Section 7.9 (2) of the BC Act: <i>Any such application is to be accompanied by a biodiversity development assessment report unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity values.</i>
<i>Fisheries Management Act 1994</i> (FM Act)	The development does not involve impacts to Key Fish Habitat, does not involve harm to marine vegetation, dredging, reclamation or obstruction of fish passage. A permit or consultation under the FM Act is not required.
<i>Local Land Services Amendment Act 2016</i> (LLS Act)	The LLS Act does not apply to areas of the state to which the Vegetation in Non Rural Area State Environmental Planning Policy 2017 (Vegetation SEPP) applies. The Vegetation SEPP applies to the City of Penrith local government area.
<i>Water Management Act 2000</i> (WM Act)	The WM Act is administered by Natural Resources Access Regulator (NRAR) and establishes an approval regime for activities within waterfront land, defined as the land 40 m from the highest bank of a river, lake or estuary. In accordance with Part 4, Division 4.7, Section 4.41 (1) (g) of the EP&A Act, a water use approval under Section 89, a water management work approval under Section 90 or an activity approval (other than an aquifer interference approval) under Section 91 of the WM Act is not required for SSD. However, the regulatory framework of the WM Act and associated guidelines should be used to guide assessments for these developments.
<b>Planning Instruments</b>	
Vegetation in Non Rural Area State Environmental Planning Policy 2017 (Vegetation SEPP)	The Vegetation SEPP applies to development in urban areas and environmental conservation zones that does not require consent. As this project requires consent under the EP&A Act, the Vegetation SEPP does not apply.

Name	Relevance to the project
SEPP (Koala Habitat Protection) 2021 (Koala Habitat Protection SEPP)	The SEPP does not apply to Penrith LGA.
Coastal Management 2018	SEPP Coastal Management 2018 consolidated SEPP 14 Coastal Wetlands, SEPP 26 Littoral Rainforests and SEPP 71 Coastal Protection.  The proposed development is not located on or adjacent to land subject to this SEPP therefore this SEPP is not applicable.
SEPP (Western Sydney Employment Area) 2009	The subject site is zoned IN1 General Industrial, RE2 Private Recreation and E2 Environmental Conservation under the SEPP.
Draft Mamre Road Precinct DCP (Nov 2020)	The DCP contains Precinct Planning outcomes for Environmental Conservation and Recreation Zones and Riparian Land.
Draft Cumberland Plain Conservation Plan 2020 (CPCP)	<p>The Draft Cumberland Plain Conservation Plan establishes long-term certainty for biodiversity conservation and development in Western Sydney. The Plan supports the delivery of infrastructure, housing and jobs for Western Sydney in a planned and strategic way that also protects and maintains key biodiversity values of Western Sydney.</p> <p>Urban capable lands are the areas directly impacted by the proposed strategic urban and agricultural development as covered in the Report. Urban capable lands refers to nominated areas where the NSW Government has streamlined the delivery of priority housing and infrastructure through the biodiversity certification process.</p> <p>The proposed development site is categorised as 'Urban Capable'.</p> <p>The draft CPCP was supported by a Cumberland Plain Assessment Report (Biosis and Open Lines, 2020). The Assessment Report includes Expert Reports for several species of relevance to this BDAR.</p>

## 2.3 Landscape features

### 2.3.1 Interim Biogeographic Regionalisation for Australia (IBRA) regions and subregions

The development site falls entirely within the Sydney Basin IBRA region and Cumberland subregion.

### 2.3.2 Mitchell Landscapes

The development site falls within the Cumberland Plain Mitchell Landscapes as outlined in Table 2.

**Table 2: Mitchell Landscapes**

Mitchell landscape	Description
Cumberland Plain	Low rolling hills and valleys in a rain shadow area between the Blue Mountains and the coast on horizontal Triassic shales and lithic sandstones forming a down-warped block on the coastal side of the Lapstone monocline. Intruded by a small number of volcanic vents and partly covered by Tertiary river gravels and sands (Hawkesbury-Nepean Terrace Gravels ecosystem). Quaternary alluvium along the main streams. General elevation 30 to 120m, local relief 50m and sometimes affected by salt in tributary valley floors. Pedal uniform red to brown clays on volcanic hills. Red and brown texture-contrast soils on crests grading to yellow harsh texture-contrast soils in valleys Woodlands and open forest of <i>Eucalyptus moluccana</i> (Grey Box), <i>Eucalyptus tereticornis</i> (Forest Red Gum), <i>Eucalyptus crebra</i> (Narrow-leaved Ironbark), <i>Eucalyptus eugenioides</i> (Thin-leaved Stringybark), <i>Eucalyptus amplifolia</i> (Cabbage Gum) and <i>Angophora subvelutina</i> (Broad-leaved Apple). Grassy to

Mitchell landscape	Description
	shrubby understorey often dominated by blackthorn, poorly drained valley floors, often salt affected with swamp oak and paperbark (Department of Environment and Climate Change (now DPIE) 2002).

### 2.3.3 Native vegetation extent

The current percent native vegetation cover in the landscape was assessed using a Geographic Information System (GIS) and aerial imagery sourced from NearMaps using increments of 5%. The extent of native vegetation within the development site and 1500 m buffer is outlined below in Table 3.

**Table 3: Native vegetation extent**

Area within the 1,500 m buffer area	Native vegetation within the 1,500 m buffer area	Area of native vegetation within the development site	Percent native vegetation within the 1,500 m buffer area (%)
1335 ha	130 ha	3.71 ha	10%

### 2.3.4 Rivers and streams

The development site contains rivers and streams as outlined in Table 4.

**Table 4: Rivers and streams**

River/stream	Order	Riparian buffer (m)
Unnamed	1 <sup>st</sup> order	10
Unnamed	1 <sup>st</sup> order	10
Ropes Creek	3 <sup>rd</sup> order	30

### 2.3.5 Wetlands

There were 11 farm dams identified within and adjacent to the study area, and the development site contains one unnamed local wetland. This is displayed on Figure 1.

### 2.3.6 Connectivity features

The development site contains limited connectivity features outlined in Table 5 and shown in Figure 1 and Figure 2.

A vegetated corridor exists along the Ropes Creek riparian corridor to the north west. This vegetation remains connected both north and south of the development site until it becomes fragmented by roads, namely Capitol Hill Drive and residential areas in the south-east. It is also fragmented by private roads and industrial areas in the suburb of Orchard Hills in the north-east. Patches of native vegetation to the north-west of the development site also provides connectivity for highly mobile species such as birds or bats moving through the landscape.

**Table 5 Connectivity features**

Connectivity feature name	Feature type
Ropes Creek riparian corridor to the north and south east	Connectivity links
Patches of native vegetation to the north-west	Connectivity links



### 2.3.7 Areas of geological significance and soil hazard features

The development site does not contain areas of geological significance and soil hazard features.

### 2.3.8 Site context

#### 2.3.8.1 Method applied

The site based method has been applied to this development.

#### 2.3.8.2 Patch size

Patch size was calculated using available vegetation mapping for all patches of intact native vegetation on and adjoining the development site. The patch size area was <5ha for each vegetation zone.

## 2.4 Native vegetation

### 2.4.1 Survey effort

Vegetation survey and BAM plots were undertaken within the development site by ELA ecologists Kirsten Velthuis, Stacey Wilson and Claire Wheeler on 21 July 2020. A total of six (6) full-floristic and vegetation integrity plots were undertaken in accordance with the BAM.

The site visit also included an assessment of habitat features within the development footprint but did not include targeted threatened species searches. All field data collected, and full-floristic and vegetation integrity plots are included in Appendix B and C. Plot photos are included in Table 9 -13.

### 2.4.2 Plant Community Types present

A total of three PCTs were identified on the development site (Table 6, Figure 4).

A total of six full-floristic and vegetation integrity plots were surveyed to identify vegetation zones, PCTs and TECs within the development site. Five vegetation zones were identified in the development site (Table 7, Figure 5).

All three PCTs are threatened ecological communities (TECs) listed under the BC Act.

Justification for the selection of PCTs occurring on the development site is based on a qualitative assessment and quantitative analysis of full-floristic plot data and is provided in Section 2.4.3.4.

**Table 6: Plant Community Types within the development footprint**

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Area within the development site (ha)	Percent cleared
835	Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	Coastal Floodplain Wetlands	Forested Wetlands	1.69	93
850	Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Coastal Valley Grassy Woodlands	Grassy Woodlands	0.12	88

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Area within the development site (ha)	Percent cleared
1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	Coastal Swamp Forests	Forested Wetlands	1.91	95

Table 7: Vegetation integrity plots

Veg Zone	PCT ID	PCT Name	Condition	Area with the development site (ha)	Plots required	Plots surveyed
1	835	Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	Moderate	0.54	1	1
2	835	Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion	Low - Moderate	1.15	1	2
3	850	Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	low	0.12	1	1
4	1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	low	1.24	1	1
5	1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	moderate	0.67	1	1
<b>Totals</b>				3.71	5	6

### 2.4.3 Threatened Ecological Communities

TECs present within the development site are summarised in Table 8 and display in Figure 6.

#### 2.4.3.1 River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

Through floristic analysis it was determined that PCT 835 (River- Flat Eucalypt Forest) does correspond to the NSW BC Act definition of *River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*.

*River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* is associated with silts, clay-loams and sandy loams, on periodically

inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains, below 50m elevation and is known to occur within the Penrith local government area. The best-fit PCT – PCT 835 was determined using a quantitative analysis of floristic plot data from three sample plots undertaken in the vegetation community, and a qualitative analysis of the site's characteristics (such as soil type, position in the landscape, and elevation). The quantitative analysis resulted in a very strong match to PCT 835 based purely on the species composition. This site's abiotic characteristics (soil type, landscape position etc.) also provide strong justification for assigning this vegetation to PCT 835.

#### 2.4.3.2 Cumberland Plain Woodland in the Sydney Basin Bioregion

The BioNet Vegetation Classification lists PCT 850 Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion as a component of *Cumberland Plain Woodland in the Sydney Basin Bioregion* which is listed as critically endangered under the BC Act and as critically endangered as part of *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest* under the Commonwealth EPBC Act.

The final determination for Cumberland Plain Woodland listed under the BC Act states:

*“Native grassland derived from clearing of the woodland and forest are also part of this community if they contain characteristic non-woody species listed in paragraph 3.”* (Scientific Committee 2009).

PCT 850 mapped in the development site contains native shrubs *Dillwynia retorta*, native grasses *Aristida ramosa*, *Themeda triandra* and native herbs. Therefore, it satisfies the criteria for listing as part of the Cumberland Plain Woodland under the BC Act.

PCT 850 may also correspond with *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest* listed as a critically endangered ecological community, provided it satisfied the listing criteria under the EPBC Act (Threatened Species Scientific Committee 2009) However, PCT 850 vegetation did not meet the threshold criteria for listing under the EPBC Act as the patch size is less than 0.5 ha and the ground cover comprised > 30% exotic species. Therefore it was determined that PCT 850 does not correspond with the Commonwealth definition of *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest*.

#### 2.4.3.3 Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregion

Through floristic analysis it was determined that PCT 1232 Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion does correspond to the NSW BC Act definition of the TEC *Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions*.

The PCT on the development site does not correspond to the Commonwealth definition of *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community*. The approved conservation and listing advice for the Commonwealth definition of the community was consulted to determine if PCT 1232 within the development site corresponds with the Commonwealth definition of Coastal Swamp Oak Forest. PCT 1232 identified on site occurs as two discrete patches: vegetation zone 5 and vegetation zone 6. The sizes of these patches are 1.26 and 0.68 respectively. While both patches meet the small patch criteria, non-native species comprise of over 20% of the total understorey vegetation cover within both patches. Further to this, neither patch is

connected to a larger area of contiguous native vegetation >5 ha. As such, it has been determined that PCT 1232 does not correspond with the Commonwealth definition of Coastal Swamp Oak Forest.

**Table 8: Threatened Ecological Communities**

PCT ID	BC Act			EPBC Act		
	Listing status	Name	Area (ha) within development site	Listing status	Name	Area (ha)
835	Endangered	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	1.69	Not listed	N/A	N/A
850	Critically Endangered	Cumberland Plain Woodland of the Sydney Basin Bioregion	0.12	The community on site does not meet the condition thresholds for listing under the EPBC Act	N/A	N/A
1232	Endangered	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	1.91	The community on site does not meet the condition thresholds for listing under the EPBC Act	N/A	N/A

#### 2.4.3.4 PCT Selection Justification and Vegetation Zone Description

Table 9 to Table 13 provide a detailed description and justification of the PCT assignment for each of the vegetation zones within the development site.



Table 9: PCT 835 Vegetation Zone 1

VEGETATION ZONE 1	
PCT	835
PCT Name	Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion
Condition	Moderate
Area	0.54 ha
TEC	NSW BC Act River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Plots	1
Vegetation Integrity Score	34.9
PCT Selection criteria	Soil type, dominant canopy, midstorey and groundcover species, vegetation formation and class, IBRA subregion, landscape position
Diagnostic tools	The Native Vegetation of Sydney Metropolitan Area 2016 V 3.1 diagnostic species list, BioNet Vegetation Classification
Description/ justification	<p>Open woodland structure comprising primarily regrowth canopy species <i>Casuarina glauca</i> (Swamp Oak) and <i>Angophora subvelutina</i> (Broad-leaved Apple).</p> <p>The native midstorey was absent from this zone and the native groundcover comprised a dense cover of <i>Einadia nutans</i> subsp. <i>nutans</i>.</p> <p>The remainder of the understorey cover comprised weeds and exotic species including <i>Bidens pilosa</i> var. <i>pilosa</i> (Cobbler's Peg), <i>Capsella bursa-pastoris</i> (Shepherd's Purse), <i>Setaria pumila</i> (Pale Pigeon Grass) and <i>Sida rhombifolia</i> (Paddy's Lucerne).</p>

Photo



Table 10: PCT 835 Vegetation Zone 2

VEGETATION ZONE 2	
PCT	835
PCT Name	Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion
Condition	Low - Moderate
Area	1.15 ha
TEC	NSW BC Act River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
Plots	2
Vegetation Integrity Score	21.3
PCT Selection criteria	Soil type, dominant canopy, midstorey and groundcover species, vegetation formation and class, IBRA subregion, landscape position
Diagnostic tools	The Native Vegetation of Sydney Metropolitan Area 2016 V 3.1 diagnostic species list, BioNet Vegetation Classification
Description/ justification	<p>Open woodland structure comprising <i>Eucalyptus tereticornis</i> (Forest Red Gum), <i>Corymbia intermedia</i> (Pink Bloodwood), <i>Eucalyptus amplifolia</i> (Cabbage Gum).</p> <p>A native midstorey was absent from this zone and native groundcover comprised <i>Dichondra repens</i> (Kidney Weed), <i>Glycine tabacina</i>, <i>Microlaena stipoides</i> var. <i>stipoides</i>, <i>Lomandra filiformis</i> subsp. <i>filiformis</i> (Wattle mat-rush).</p> <p>The remainder of the understorey cover comprised weeds and exotic species including <i>Sida rhombifolia</i>., <i>Oxalis</i> sp., <i>Solanum nigrum</i> (Blackberry Nightshade), <i>Phytolacca octandra</i> (Inkweed) and <i>Senecio madagascariensis</i> (Fireweed).</p>

Photo





Table 11: PCT 850 Vegetation Zone 3


VEGETATION ZONE 3	
PCT	850
PCT Name	Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion
Condition	Low
Area	0.12 ha
TEC	NSW BC Act Cumberland Plain Woodland of the Sydney Basin Bioregion
Plots	1
Vegetation Integrity Score	1.5
PCT Selection criteria	Soil type, dominant canopy, midstorey and groundcover species, vegetation formation and class, IBRA subregion, landscape position
Diagnostic tools	The Native Vegetation of Sydney Metropolitan Area 2016 V 3.1 diagnostic species list, BioNet Vegetation Classification
Description/ justification	<p>The native canopy was absent within this vegetation zone. The native midstorey contained <i>Acacia decurrens</i> (Black Wattle), <i>Acacia implexa</i> (Hickory Wattle) and native groundcover consisted of <i>Einadia polygonoides</i> (Knotweed Goosefoot).</p> <p>The groundcover was highly disturbed and contains exotic grasses including <i>Cenchrus clandestinus</i> (Kikuyu Grass), <i>Ehrharta erecta</i> (Panic Veldtgrass), <i>Eragrostis curvula</i> (African Lovegrass) and <i>Seteria pumila</i> (Pale Pigeon Grass), <i>Foeniculum vulgare</i> (Fennel), and <i>Anredera cordifolia</i> (Madeira vine).</p>
Photo	

Table 12: PCT 1232 Vegetation Zone 4

VEGETATION ZONE 4	
PCT	1232
PCT Name	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion
Condition	Low
Area	1.24 ha
TEC	NSW BC Act Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions
Plots	1
Vegetation Integrity Score	11
PCT Selection criteria	Soil type, dominant canopy, midstorey and groundcover species, vegetation formation and class, IBRA subregion, landscape position
Diagnostic tools	The Native Vegetation of Sydney Metropolitan Area 2016 V 3.1 diagnostic species list, BioNet Vegetation Classification.
Description/ justification	Canopy solely comprised <i>Casuarina glauca</i> (Swamp Oak). No midstorey was present. A highly disturbed groundcover with few native species was present including <i>Persicaria decipiens</i> (Slender Knotweed); <i>Digitaria parviflora</i> (Native Summer Grass) and <i>Cynodon dactylon</i> (Common Couch).

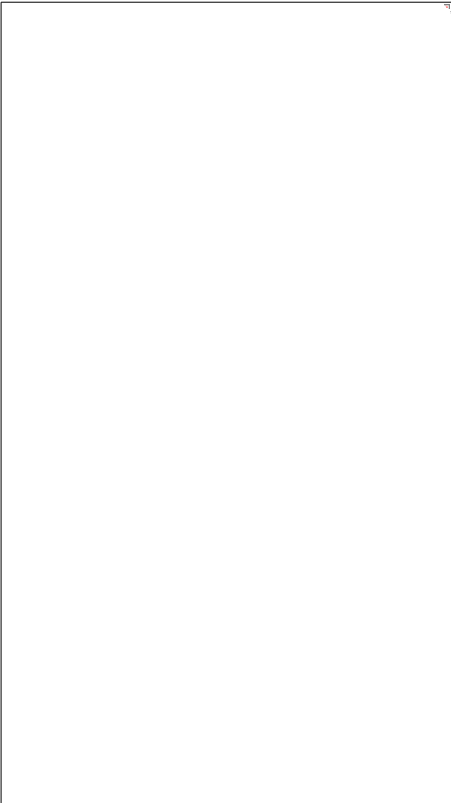
Photo



Table 13: PCT 1232 Vegetation Zone 5

VEGETATION ZONE 5	
PCT	1232
PCT Name	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion
Condition	Moderate
Area	0.67 ha
TEC	NSW BC Act Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner Bioregions
Plots	1
Vegetation Integrity Score	21.4
PCT Selection criteria	Soil type, dominant canopy, midstorey and groundcover species, vegetation formation and class, IBRA subregion, landscape position
Diagnostic tools	The Native Vegetation of Sydney Metropolitan Area 2016 V 3.1 diagnostic species list, BioNet Vegetation Classification.
Description/ justification	The canopy comprised <i>Casuarina glauca</i> (Swamp Sheoak). No midstorey was present. A moderately disturbed ground cover was present containing <i>Dichondra repens</i> (Kidney Weed), <i>Geranium homeanum</i> , <i>Alternanthera denticulata</i> (Lesser Joyweed) and <i>Persicaria decipiens</i> (Slender Knotweed).

Photo



#### 2.4.4 Vegetation integrity assessment

The vegetation integrity assessment using the Credit Calculator (BAMC) was undertaken and the results are outlined in Table 14.

**Table 14: Vegetation integrity**

Veg Zone	PCT ID	Condition	Composition Condition Score	Structure Condition Score	Function Condition Score	Current vegetation integrity score
1	835	Moderate	11.9	51.1	70.4	34.9
2	835	Low - Moderate	19.1	11.4	44.5	21.3
3	850	Low	3.6	1	0	1.5
4	1232	Low	19.6	2.4	28.8	11
5	1232	Moderate	16.9	12.7	45.9	21.4

#### Use of local data

The use of local data is not proposed as part of this assessment.



## Plant Community Types

## 200 Aldington Road Kemps Creek BDAR



## Legend

Development Site

Development Footprint

## Plant Community Types

PCT835: Forest Red Gum - Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion

PCT850: Grey Box - Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion

PCT1232: Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion

Exotic/cleared

Dam

Building

0 50 100 200  
Metres

Datum/Projection:  
GDA 1994 MGA Zone 56

Location: Penrith, NSW  
Lot/DP: 30-32//258949,  
20-23//255560  
Date Prepared: 07/09/2021



Figure 4: Plant Community Types within the development site



# Vegetation Zones and Survey Plots

# 200 Aldington Road Kemps Creek BDAR

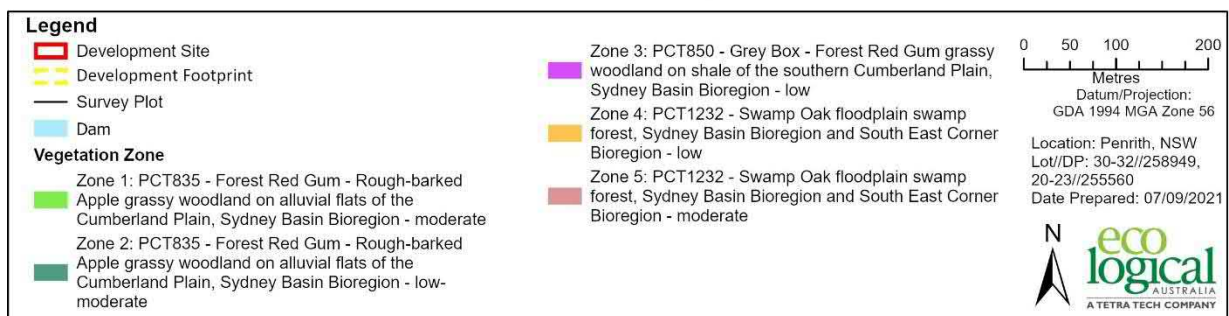


Figure 5: Vegetation zones and plot locations within the development site



Threatened Ecological Communities 200 Aldington Road Kemps Creek BDAR



Figure 6: Threatened Ecological Communities

## 2.5 Threatened species

Habitat assessments were undertaken during the field survey to determine the likelihood of threatened flora and fauna species occurring within the development site on an intermittent or permanent basis. Habitat assessments for fauna species involved a search for hollow-bearing trees within the development site, and a search for evidence of fauna foraging such as chewed cones, sap trees or roosting habitat in the form of whitewash/pellets.

It was found that hollow bearing trees were present within the development site. Multiple artificial structures such as houses and sheds (which may contain microbat habitat) were present within the development site. Additionally, the development site contained riparian areas and dams.

The development site contains habitat for threatened species as detailed in section 1.5.1 and 1.5.2 below.

### 2.5.1 Ecosystem credit species

Ecosystem credit species predicted to occur at the development site, their associated habitat constraints, geographic limitations and sensitivity to gain class is included in Table 15.

Ecosystem credit species which have been excluded from the assessment and relevant justification is also included in Table 15.

**Table 15: Justification for exclusion of predicted ecosystem credit species**

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
<i>Anthochaera phrygia</i>	Regent Honeyeater (Foraging)	N/A	High	CE	CE	<u>Included</u> Occasional seasonal foraging habitat features associated with this species were identified within the development site.
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	N/A	Moderate	V	Not Listed	<u>Included</u> Occasional foraging habitat features associated with this species were identified within the development site.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	N/A	Moderate	E	E	<u>Included</u> Habitat for this species was marginal and poor in condition in the development site
<i>Calyptorhynchus lathamii</i>	Glossy Black-Cockatoo (Foraging)	Other Presence of Casuarina species	High	V	Not Listed	<u>Included</u> The development site contains <i>Casuarina</i> species, which comprise suitable foraging habitat for this species.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
<i>Chthonicola sagittata</i>	Speckled Warbler	N/A	High	V	Not Listed	<u>Excluded</u> Large, relatively undisturbed remnants are absent within the development site.
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper	N/A	High	V	Not Listed	<u>Included</u> Foraging habitat features associated with this species were identified within the development site.
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	N/A	High	V	E	<u>Excluded</u> This species requires habitat features such as maternal den sites, an abundance of food (birds and small mammals) and large areas of relatively intact vegetation to forage in. While the development site has some connectivity to vegetation areas, habitat within the development site is minimal and vegetated areas it is connected to are small and not intact.
<i>Glossopsitta pusilla</i>	Little Lorikeet	N/A	High	V	Not Listed	<u>Included</u> The development site contains flowering eucalypts and riparian habitats which comprise suitable foraging habitat for this species.
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle (Foraging)	n/a	High	V	Not Listed	<u>Excluded</u> Large waterbodies which are habitat features associated with this species were not identified within the development site.
<i>Lathamus discolor</i>	Swift Parrot (Foraging)	N/A	Moderate	E	CE	<u>Included</u> Foraging habitat features associated with this species were identified within the development site.
<i>Melanodryas cucullate cucullate</i>	Hooded Robin (South-eastern form)	N/A	Moderate	V	Not Listed	<u>Included</u> Foraging habitat features associated with this species were identified within the development site.
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	N/A	High	V	Not Listed	<u>Included</u> Foraging features associated with this species were identified within the development site.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
<i>Miniopterus australis</i>	Little Bentwing-bat (Foraging)	N/A	High	V	Not Listed	<u>Included</u> Foraging habitat features associated with this species were identified within the development site.
<i>Miniopterus orianae oceanensis</i>	Large Bentwing-bat (Foraging)	N/A	High	V	Not Listed	<u>Included</u> Foraging habitat features associated with this species were identified within the development site.
<i>Pandion cristatus</i>	Eastern Osprey (Foraging)	N/A	Moderate	V	Not Listed	<u>Excluded</u> Habitat features for this species are not present within the development site.
<i>Petroica boodang</i>	Scarlet Robin	N/A	Moderate	V	Not Listed	<u>Included</u> Foraging habitat features associated with this species were identified within the development site.
<i>Petroica phoenicea</i>	Flame Robin	N/A	Moderate	V	Not Listed	<u>Included</u> Foraging habitat features associated with this species were identified within the development site.
<i>Phascolarctos cinereus</i>	Koala (Foraging)	N/A	High	V	V	<u>Included</u> The development site contains koala multiple feed tree species as identified in the Koala SEPP.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox (Foraging)	N/A	High	V	V	<u>Included</u> Seasonal foraging habitat was identified within the development site.
<i>Rostratula australis</i>	Australian Painted Snipe	N/A	Moderate	E	E	<u>Excluded</u> Habitat for this species was not considered suitable in the development site
<i>Stagonopleura guttata</i>	Diamond Firetail	N/A	Moderate	V	Not Listed	<u>Included</u> Foraging habitat features associated with this species were identified within the development site.
<i>Stictonetta naevosa</i>	Freckled Duck	N/A	Moderate	V	Not listed	<u>Included</u> Habitat for this species was marginal and in poor condition in the development site

### 2.5.2 Species credit species

Species credit species predicted to occur at the development site (i.e. candidate species), their associated habitat constraints, geographic limitations and sensitivity to gain class are included in Table 16.

Species credit species which have been excluded from the assessment and relevant justification are also included in Table 16.

Table 16: Candidate species credit species

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
<i>Acacia pubescens</i>	Downy Wattle	N/A	High	V	V	<u>Excluded</u> Suitable habitat was not present within the development site.
<i>Anthochaera phrygia</i>	Regent Honeyeater (Breeding)	N/A	High	CE	CE	<u>Excluded</u> This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The development site is not within an important breeding area for this species as per the BAM Important Areas map in BOAMS (date accessed 23 September 2020)
<i>Caladenia tessellata</i>	Thick Lip Spider Orchid	N/A	Moderate	E	V	<u>Excluded</u> Habitat for this species was not considered suitable in the development site due to the level of disturbance. Furthermore, this species is only known from old records in Sydney area.
<i>Callistemon linearifolius</i>	Netted Bottle Brush	N/A	Moderate	V	Not Listed	<u>Excluded</u> This species is only known in the Sydney area within the Hornsby Plateau area near the Hawkesbury River.
<i>Calyptrorhynchus lathamii</i>	Glossy Black-Cockatoo (Breeding)	Hollow bearing trees Living or dead tree with hollows greater than 15 cm diameter and greater than 5 m above ground	High	V	Not Listed	<u>Excluded</u> This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The presence of this species was not identified and it was determined that the habitat is substantially disturbed such that this species is unlikely to occur in the development site.
<i>Cynanchum elegans</i>	White-flowered Wax Plant	N/A	High	E	E	<u>Excluded</u>



Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
						No suitable habitat within the development site, no local records.
<i>Eucalyptus benthamii</i>	Camden White Gum	N/A	High	E	E	<u>Excluded</u>  The presence of this species was not identified and it was determined that the habitat is substantially disturbed such that this species is unlikely to occur in the development site.
<i>Grevillea juniperina subsp. juniperina</i>	Juniper-leaved Grevillea	N/A	Mod	V	Not Listed	<u>Excluded</u>  The presence of this species was not identified (conspicuous species) and it was determined that the habitat is substantially disturbed such that this species is unlikely to utilise the development site.
<i>Haliaeetus leucogaster (Breeding)</i>	White-bellied Sea-Eagle	Other.  Living or dead mature trees within suitable vegetation within 1km of rivers, lakes, large dams or creeks, wetlands and coastlines.	High	V	Not Listed	<u>Excluded</u>  This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. No presence of large stick nests within the development site.
<i>Hibbertia sp Bankstown</i>	-	N/A	High	CE	CE	<u>Excluded</u>  Known only from one population at Bankstown Airport in the Bankstown local government area.
<i>Lathamus discolor</i>	Swift Parrot (Breeding)	Other  As per mapped areas	Moderate	E	CE	<u>Excluded</u>  Seasonal foraging habitat features associated with this species were identified within the development site and has been included as an ecosystem credit species only. The development site is not within an important breeding area for this species as per the BAM Important Areas map in BOAMS (date accessed 23 September 2020)

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
<i>Litoria aurea</i>	Green and Golden Bell Frog (GGBF)	Semi-permanent/ephemeral wet areas Within 1km of wet areas/Swamps Within 1km of swamp/Waterbodies Within 1km of waterbody	High	E	V	<p><u>Excluded</u></p> <p>Habitat features documented in the Threatened Biodiversity Data Collection (TBDC) associated with this species were present within the development site. This included three dams containing <i>Typha</i> spp.</p> <p>The development site is located within the Western Sydney Aerotropolis Growth Area (WSAGA) under the Draft Cumberland Plain Conservation Plan 2020 (CPCP). Supporting the Draft CPCP is the Cumberland Plain Assessment Report prepared by Open Lines and Biosis in 2020. As part of this assessment, Expert Reports have been prepared for particular species credit species that are predicted to occur within the Growth Areas.</p> <p>The Expert Report for <i>Litoria aurea</i> (pg. 2007) prepared by Francis Lemckert, states that the Growth Areas <i>do contain suitable habitat in the form of rural areas with numerous waterbodies in close proximity (&lt; 500 m)</i>. Therefore the habitat identified within the development site is considered suitable habitat for GGBF. The development site has also been mapped as an indicative GGBF migratory corridor should the species return to the area in the future (Lemckert in Biosis and Open Lines 2020)</p> <p>In the Expert Report Section 4.4 Assessment of Species Presence (pg. 2035). it is stated:</p> <p><i>It has been determined that there is not likely to be a population of the GGBF currently present within the WSAGA. There are no records from within the GA, despite the presence of suitable habitat in rural areas in the form of a high density of water bodies. There is no</i></p>



Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
						<p>evidence that it is currently present and the distance to the coast indicates it is unlikely that the GGBF would persist in this area. The two most closely associated records are single records not closely aligned with other records and so it is unlikely that a larger stable population has been or is present within the WSAGA</p> <p>The development site has also been mapped as an indicative GGBF migratory corridor should the species return to the area in the future (Lemckert in Biosis and Open Lines 2020).. It should be noted that the area which is covered by this map is the retained vegetation in the north-east corner that will be managed under a Vegetation Management Plan.</p> <p>Based on this recently prepared Expert Report which covers the land at 200 Aldington Road, Kemps Creek, it has been determined that whilst suitable habitat may be present, and future migratory corridors may be reinstated in the north-east VMP area, expert advice has stated that GGBF is unlikely to be present in the development site.</p> <p>Therefore, GGBF has been excluded from further assessment under the BAM.</p>
<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i> - <i>endangered</i> population	Marsdenia viridiflora R. Br. subsp. viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd,	Blacktown, Camden, Campbelltown, Canterbury-Bankstown, Cumberland, Fairfield, Liverpool and Penrith LGAs (as amended from the Determination))	Moderate	EP	Not Listed	<p><u>Excluded</u></p> <p>Habitat features associated with this species were not present on the development site.</p>

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
	Liverpool and Penrith local government areas					
<i>Maundia triglochinosides</i>	-	Other.  Riparian areas/drainage lines, water ponding, man-made dams and drainage channels up to 1 m deep/Semi- permanent/ephemeral wet areas/Swamps  Shallow swamps up to 1 m deep/Waterbodies  Shallow waterbodies up to 1 m deep	High	V	Not Listed	<u>Excluded</u>  The presence of this species was not identified and it was determined that the habitat is substantially disturbed such that this species is unlikely to utilise the development site.
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	N/A	High	V	V	<u>Excluded</u>  The presence of this species was not identified (conspicuous species); known only from populations in Jervis Bay and Gosford-Wyong.
<i>Meridolum corneovirens</i>	Cumberland Plain Land Snail	N/A	High	E	Not Listed	<u>Excluded</u>  The Draft Cumberland Plain Assessment report mapped potential habitat within the vicinity of the development site (pg. 1971). Survey for Cumberland Land Snail was undertaken on 21 June 2021. No evidence of Cumberland Land Snail was detected. Habitat within the development site associated with this species is considered substantially disturbed such that this species was considered unlikely to occur within the development site. Therefore, Cumberland Plain Land Snail has been excluded from further assessment under the BAM.
<i>Miniopterus australis</i>	Little Bentwing-bat (Breeding)	Caves	Very High	V	Not Listed	<u>Excluded</u>

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
		Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave' Observation type code 'E nest-roost' With numbers of individuals >500 Or from the scientific literature				This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The development site does not contain breeding habitat for this species.
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat (Breeding)	Caves Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave' Observation type code 'E nest-roost' With numbers of individuals >500 Or from the scientific literature	Very High	V	Not Listed	<u>Excluded</u>  This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The development site does not contain breeding habitat for this species.
<i>Myotis macropus</i>	Southern Myotis	Hollow bearing trees within 200 m of riparian zone/Other Bridges, caves or artificial structures within 200 m of riparian zone	High	V	Not Listed	<u>Included</u>  This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The development site contains potential breeding habitat (hollow-bearing trees and structures) for this species along the riparian zone in the north-eastern corner of the site.
<i>Pandion cristatus</i>	Eastern Osprey (Breeding)	Other Presence of stick-nests in living and dead trees (>15m) or artificial structures within 100m of a floodplain for nesting	High	V	Not Listed	<u>Excluded</u>  This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The development site does not contain suitable breeding habitat.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
<i>Persicaria elatior</i>	Tall Knotweed	Semi-permanent/ephemeral wet areas or within 50m from swamps/ wetlands/ waterbodies	High	V	V	<u>Excluded</u>  Habitat features for this species were not present within the development site; known from records in northern and south eastern NSW only.
<i>Persoonia hirsuta</i>	Hairy Geebung	N/A	High	E	E	<u>Excluded</u>  Habitat features for this species were not present within the development site. The presence of this species was not identified and it was determined that the habitat is substantially disturbed such that this species is unlikely to occur within the development site.
<i>Petaurus norfolcensis</i>	Squirrel Glider	N/A	High	V	Not Listed	<u>Excluded</u>  It was determined that the habitat is substantially disturbed such that this species is unlikely to occur within the development site.
<i>Phascolarctos cinereus</i>	Koala (Breeding)	Other Areas identified via survey as important habitat (see comments)	High	V	V	<u>Excluded</u>  This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. It was determined that the habitat is substantially disturbed such that this species is unlikely to occur as breeding within the development site.
<i>Pilularia novae- hollandiae</i>	Austral Pillwort	N/A	High	E	Not Listed	<u>Excluded</u>  Habitat features associated with this species were not present on the development site
<i>Pimelea spicata</i>	-	N/A	High	E	E	<u>Excluded</u>  It was determined that the habitat (0.12 ha of cleared, fragmented PCT 850) is highly disturbed such that this species is unlikely to occur within the development site.  As stated in Table 11:

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
						<p>The groundcover was highly disturbed and contained exotic grasses including <i>Cenchrus clandestinus</i> (Kikuyu Grass), <i>Ehrharta erecta</i> (Panic Veldtgrass), <i>Eragrostis curvula</i> (African Lovegrass) and <i>Seteria pumila</i> (Pale Pigeon Grass), <i>Foeniculum vulgare</i> (Fennel), and <i>Anredera cordifolia</i> (Madeira vine).</p> <p>The plot data shown the vegetation zone contained one species of native tree, one native shrub, and one native forb. Whilst it is acknowledged that <i>Pimelea spicata</i> can occur in cleared or regrowth area areas of native vegetation, It is considered highly unlikely that <i>Pimelea spicata</i> would be present in this small, highly fragmented patch of cleared PCT 850 with no canopy, minimal midstorey and predominantly exotic pastures grasses and weeds in the groundcover.</p> <p>Further to this, the Expert Report for <i>Pimelea spicata</i> prepared by Teresa James in 2019 for the Draft Cumberland Plain Assessment Report did not map the subject site as potential habitat for <i>Pimelea spicata</i> (page 2951). One unconfirmed record was reported to the west of the site in the CPCP Expert Report, but no individuals were recorded in the BAM plots undertaken in the vicinity of the site, nor in the BAM plots undertaken by the Accredited Assessor for this BDAR.</p> <p>Therefore, <i>Pimelea spicata</i> has been excluded from further assessment under the BAM.</p>
<i>Pomaderris brunnea</i>	Brown Pomaderris	N/A	high	E	V	<p><u>Excluded</u></p> <p>It was determined that the habitat is substantially disturbed such that this species is unlikely to occur within the development site.</p>

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
<i>Pommerhelix duralensis</i>	Dural Woodland Snail	Other Leaf litter and shed bark or within 50m of litter or bark/Rocky areas Rocks or within 50m of rocks/Fallen/standing dead timber including logs Including logs and bark or within 50m of logs or bark	High	E	E	<u>Excluded</u> It was determined that the habitat is substantially disturbed such that this species is unlikely to occur within the development site
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox (Breeding)	Other Breeding camps	High	V	V	<u>Excluded</u> This is a dual credit species, and only a species credit species when specific habitat constraints are present for breeding. The development site does not contain suitable breeding habitat.
<i>Pultenaea pedunculata</i>	Matted Bush-pea	N/A	High	E	V	<u>Excluded</u> It was determined that the habitat is substantially disturbed such that this species is unlikely to utilise the development site.
<i>Thesium austral</i>	Austral Toadflax	N/A	Moderate	V	V	<u>Excluded</u> Known in the area only from old records. It was determined that the habitat is substantially disturbed such that this species is unlikely to utilise the development site.
<i>Wahlenbergia multicaulis-endangered population</i>	Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby,	N/A	High	EP	Not Listed	<u>Excluded</u> No known sites within the Kemps Creek area. It was determined that the habitat is substantially disturbed such that this species is unlikely to utilise the development site.

Species	Common Name	Habitat constraints/ Geographic limitations	Sensitivity to gain class	NSW listing status	EPBC Listing status	Justification if species excluded
	Parramatta and Strathfield					

### 2.5.3 Targeted surveys

Targeted survey was undertaken for *Meridolum corneovirens* (Cumberland Plain Land Snail) on 21 June 2021 by ecologist Melinda Westcook for a total of 3.25 person hours. Weather conditions were cool, with a range of 7.9 – 12.9 degrees and a maximum of 0.8 mm of rainfall. No Cumberland Plain Land Snail specimens were identified during the survey.

A map of survey effort is shown below in Figure 7.

No targeted surveys for any other species credit species were undertaken at the development site. Species credit species assumed present are outlined in Table 17.

**Table 17: Species credit species included in the assessment**

Species	Common Name	Species presence	Geographic limitations	Habitat (ha)	Biodiversity Risk Weighting
<i>Myotis macropus</i>	Southern Myotis	Assumed	Hollow bearing trees within 200 m of riparian zone.	2.73	2.00



Cumberland Land Plain Snail Survey 200 Aldington Road Kemps Creek BDAR



**Legend**

- Development Site
- Development Footprint
- Cumberland Plain Land Snail Survey Tracks

0 50 100 200  
Metres  
Datum/Projection:  
GDA 1994 MGA Zone 56

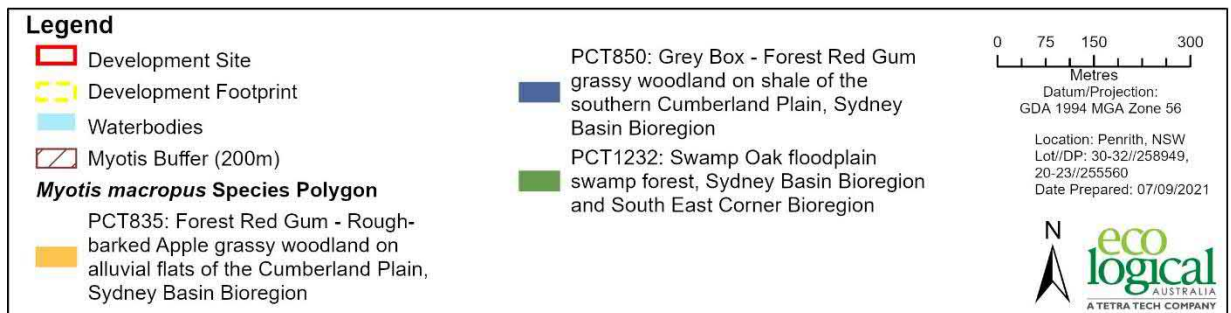
Location: Penrith, NSW  
Lot/DP: 30-32//258949,  
20-23//255560  
Date Prepared: 8/09/2021

A TETRA TECH COMPANY

Figure 7: Survey effort for Cumberland Plain Land Snail



**Myotis macropus Species Polygon** **200 Aldington Road Kemps Creek BDAR**



**Figure 8: Species polygon *Myotis macropus* (Southern Myotis)**

### 3. Stage 2: Impact assessment (biodiversity values)

#### 3.1 Avoiding impacts

##### 3.1.1 Locating and designing a project to avoid and minimise impacts on vegetation and habitat

The development has been located and designed in a way which avoids and minimises impacts as outlined in Table 18.

**Table 18: Locating and designing a project to avoid and minimise impacts on vegetation and habitat**

Approach	How addressed and justification
Locating and designing the project in areas where there are no biodiversity values.	The proposal is located within a rural landscape which consists largely of areas of non-native vegetation.
Locating and designing the project in areas where the native vegetation or threatened species habitat is in the poorest condition	Native vegetation to be impacted is generally disturbed and of low or moderate condition.
Designing the project to reduce the clearing footprint of the project	The impact of the proposal on native vegetation has been reduced by locating the sediment dam in a way that minimises impact to PCT 835.
Designing the project to locate ancillary facilities in areas where there are no biodiversity values.	Through a number of design changes, the vegetation management area in the north east has been increased in size, and the development footprint reduced by approximately 2 ha to avoid impacts to the existing vegetation and farm dams in this area. Riparian buffers around first order creeklines in this area have also been proposed as part of a Vegetation Management Plan. More detail is provided in the Riparian Assessment.
Designing the project to locate ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a lower vegetation integrity score)	
Locating and designing the project in areas that avoid habitat for species and vegetation in high threat categories (e.g. an EEC or CEEC), indicated by the biodiversity risk weighting for a species.	<p>The proposal is located within a rural landscape which consists largely of areas of non-native vegetation. TEC vegetation to be impacted is generally disturbed and of low or moderate condition. Impact to a CEEC is limited to 0.12 ha of a CEEC of a very low integrity score of 1.5.</p> <p>The TEC vegetation in the north east has been avoided in order to retain some habitat in the development site.</p>
Locating and designing the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained.	<p>Through a number of design changes, the vegetation management area in the north east has been increased in size, and the development footprint reduced by approximately 2 ha to avoid impacts to the existing farm dam and vegetation in the north-east of the development site.</p> <p>This design change also avoids any impacts to upstream water flow (refer to Riparian Assessment for details).</p> <p>The existing riparian corridor connectivity to nearby habitat along Ropes Creek riparian corridor to the north and south east of the development site will not be impacted by the development and therefore will not reduce movement of species to areas of nearby habitat.</p>

Approach	How addressed and justification
	<p>The retained area of vegetation and farm dams are proposed to be managed under a Vegetation Management Plan, and part of the vegetation management will include restoration of first order creekline riparian buffers. This will further improve connectivity within the corridor.</p> <p>Therefore, the vegetation management area in the north east (which has increased in size by 2 ha and will be subject to replanting and restoration of riparian buffers, plus upstream flows will not be impacted) will continue to facilitate movement, connectivity and genetic exchange between areas of adjacent habitat.</p>
Providing structures to enable species and genetic material to move across barriers or hostile gaps	Structures to enable species and genetic materials to move across barriers or hostile gaps have not been considered for this development.
Making provision for the demarcation, ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on the development site	As discussed It is recommended that a Vegetation Management Plan for all vegetation within the vegetation management zone is undertaken. This will include the restoration of riparian buffers.

### 3.1.2 Prescribed biodiversity impacts

The list of potential prescribed biodiversity impacts as per the BAM is provided below:

- Occurrences of karst, caves, crevices and cliffs - none occur within the development site
- Occurrences of rock - no rock outcrops or scattered rocks occur within the development site
- Occurrences of human made structures and non-native vegetation – **Yes, both are present, and impacts are detailed below.**
- Hydrological processes that sustain and interact with the rivers, streams and wetlands – **yes, removal of farm dams will occur.**

Table 19: Prescribed biodiversity impacts

Prescribed biodiversity impact	Description in relation to the development site	Threatened species or ecological communities effected
<p>Impacts of development on the habitat of threatened species or ecological communities associated with:</p> <ul style="list-style-type: none"> <li>• human made structures, or</li> <li>• non-native vegetation</li> </ul>	The development site contains human made structures and non-native vegetation which will be removed.	<p>Non-native vegetation (incl fruit trees and market gardens) provides potential habitat for Grey-headed Flying-fox.</p> <p>Human-made structures such as houses, sheds and shade structures may provide potential habitat for microbat species.</p>
Impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities	Farm dams will be removed by the proposed development, other than farm dams in the north east corner of the site.	Swamp Oak Floodplain Forest; River-Flat Eucalypt Forest, Southern Myotis.



### 3.1.2.1 Locating and designing a project to avoid and minimise prescribed biodiversity impacts

The development has been located and designed in a way which avoids and minimises prescribed biodiversity impacts as outlined in Table 20.

**Table 20: Locating and designing a project to avoid and minimise prescribed biodiversity impacts**

Approach	How addressed and justification
<b>Locating the envelope of surface works to avoid direct impacts on the habitat features</b>	<p>Due to the nature of the development, no human made structures will be retained.</p> <p>A small area of exotic grassland vegetation will be retained in the north-eastern section of the development site. The vegetation management area in the north east has not been impacted. This area has increased in size by 2 ha during design changes to avoid and minimise impacts. It will be subject to replanting and restoration of riparian buffers, plus upstream flows will not be impacted.</p>
<b>Locating the project to avoid direct impacts on water bodies.</b>  <b>Design of the project to maintain hydrological processes that sustain threatened species and TECs</b>	<p>There were 11 farm dams identified within and adjacent to the development site. Most of these had limited aquatic habitat and nine are to be removed as part of the proposed development. The dam in the northern-most section of the site had moderate levels of aquatic habitat and was representative of a wetland environment. This dam will be retained after development, and the surrounding vegetation managed to maintain habitat values. This area has increased in size by 2 ha during design changes to avoid and minimise impacts. It will be subject to replanting and restoration of riparian buffers, plus upstream flows will not be impacted.</p>
<b>Design of the project to avoid and minimise downstream impacts on rivers, wetlands and estuaries by control of the quality of water released from the site.</b>	<p>Through a number of design changes, the vegetation management area in the north east has been increased in size, and the development footprint reduced by approximately 2 ha to avoid and minimise impacts to the remaining farm dams.</p> <p>This design change also avoids and minimises impacts to upstream water flow (refer to Riparian Assessment for details).</p> <p>The existing riparian corridor will not be impacted by the development and therefore will not reduce movement of species to areas of nearby habitat.</p> <p>Permanent sediment and water quality control measures are to be implemented during and after construction to prevent offsite impacts to downstream waterways and water dependent communities. It is recommended to install stormwater quality improvement devices to prevent long-term impacts to downstream waterbodies.</p>

## 3.2 Assessment of Impacts

### 3.2.1 Direct impacts

The direct impacts of the development on:

- native vegetation are outlined in Table 21
- threatened ecological communities are outlined in Table 22

- threatened species and threatened species habitat is outlined in Table 23
- prescribed biodiversity impacts is outlined in Section 3.2.2

Direct impacts including the final project footprint (construction and operation) are shown on Figure 9.

**Table 21: Direct impacts to native vegetation**

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
835	Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Coastal Floodplain Wetlands	Forested Wetlands	1.33
850	Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Coastal Valley Grassy Woodlands	Grassy Woodlands	0.12
1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	Coastal Swamp Forests	Forested Wetlands	1.34

**Table 22: Direct impacts on threatened ecological communities**

PCT ID	BC Act			EPBC Act		
	Listing status	Name	Direct impact (ha)	Listing status	Direct impact (ha)	
835	Endangered	NSW BC Act River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	1.33	Not Listed	N/A	
850	Critically Endangered	Cumberland Plain Woodland of the Sydney Basin Bioregion	0.12	The community on site does not meet the condition thresholds for listing under the EPBC Act	N/A	
1232	Endangered	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	1.34	The community on site does not meet the condition thresholds for listing under the EPBC Act	N/A	

**Table 23: Direct impacts on threatened species and threatened species habitat**

Species	Common Name	Direct impact number of individuals / habitat (ha)	NSW listing status	EPBC Listing status
<i>Myotis Macropus</i>	Southern Myotis	2.73	V	Not Listed

### 3.2.2 Change in vegetation integrity

The change in vegetation integrity as a result of the development is outlined in Table 24.

**Table 24: Change in vegetation integrity**

Veg Zone	PCT ID	Condition	Area (ha)	Current vegetation integrity score	Future vegetation integrity score	Change in vegetation integrity
1	835	Moderate	0.22	34.9	0	-34.9
2	835	Low Moderate	- 1.12	21.3	0	-21.3
3	850	low	0.12	1.5	0	-1.5
4	1232	low	0.67	11	0	-11
5	1232	moderate	0.67	21.4	0	-21.4

### 3.2.3 Indirect impacts

The development site comprises the development footprint and additional areas subject to indirect impacts. Indirect impacts are described in the BAM Operational Manual Stage 2 (DPIE 2020) as *development related activities not associated with clearing for the development footprint. Examples include increased noise, dust, light spill, weeds and pathogens and edge effects that can be reasonably attributed to the development. Indirect impacts often occur beyond the development footprint or even the development site, have a lower or variable intensity of impact compared to direct impacts, may be harder to predict spatially and temporally, may have unclear boundaries of responsibility.*

The indirect impacts of the development are outlined in Table 25.

**Table 25: Indirect impacts**

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
Sedimentation and contaminated and/or nutrient rich run-off	Construction and operation	Runoff during construction and operation resulting in pollution and degradation of adjacent creeklines	Potential sedimentation and contaminated runoff into adjacent creeks	During rainfall events	During construction and operational phase of project	Potentially long-term impacts
Noise, dust or light spill	Construction and operation	Noise and dust from machinery, light spill during operational phase disturbing fauna activity in adjacent vegetation.	Adjacent vegetation	Daily, during construction works and operational phase	During construction and operational phase of project	Potentially long-term impacts
Inadvertent impacts on adjacent habitat or vegetation	Construction and operation	Damage to adjacent habitat and vegetation including riparian areas and TECs as a result of construction or	Adjacent vegetation	Daily, during construction works and operational phase	During construction and operational phase	Potentially long-term impacts

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
		operation of the development.			phase of project	
Transport of weeds and pathogens from the site to adjacent vegetation	Construction and operation	Spread of weed seed and pathogens from incoming machinery and equipment	Potential spread into nearby habitat	Daily, during construction and operational phases	During construction and operational phase of project	Potentially long-term impacts
Vehicle strike	Construction and operation	Potential for native fauna to be struck by working machinery and moving vehicles	Within construction and operational area	Daily, during construction and operational phases	During construction and operational phase of project	Potentially long-term impacts
Rubbish dumping	Construction and operation	Unauthorised rubbish dumping by workers and public leading to degradation of adjacent vegetation	Potential for rubbish to spread into adjacent vegetation in the indirect impact areas and outside development site	Daily, during construction and operational phases	During construction and operational phase of project	Potentially long-term impacts
Increase in predatory species populations	Construction and operation	Potential to increase if food scraps/rubbish is left on or adjacent to site. Potential to increase +/- decrease due to disturbance to existing vegetation resulting in increased predation on native fauna	Within the development and throughout indirect impact areas and adjacent vegetation	Potential to occur gradually after disturbance to habitat and vegetation takes place	During construction and operational phase of project	Potentially long-term impacts
Increase in pest animal populations	Construction and operation	Potential to increase if food scraps/rubbish is left on or adjacent to site. Potential to increase +/- decrease due to disturbance to existing vegetation.	Within the development and throughout indirect impact areas and adjacent vegetation	Potential to occur gradually after disturbance to habitat and vegetation takes place	During construction and operational phase of project	Potentially long-term impacts
Increased risk of fire	Construction and operation	Potential for fire to spark during construction and operation from any machinery or electrical works	Throughout adjacent vegetation	Potential to occur at any time throughout the operational or	During operating/ construction hours	Potentially long-term impacts



Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
				construction phases		

3.2.4 Prescribed biodiversity impacts

The development site has the prescribed biodiversity impacts as outlined in Table 26.

3.2.5 Mitigating and managing impacts

Measures proposed to mitigate and manage impacts at the development site before, during and after construction are outlined in Table 27.

**Table 26: Direct impacts on prescribed biodiversity impacts**

Prescribed biodiversity impact	Nature	Extent	Frequency	Duration	Timing
Impacts of development on the habitat of threatened species or ecological communities associated with removal of human made structures and non-native vegetation	Removal of human made structures and non-native vegetation	Removal of all buildings and majority of non-native vegetation onsite	Single event.	Permanent removal	Long term impacts
Impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	Reduced connectivity of vegetation and habitat for threatened species this reducing their ability to move across their range.	Removal of all buildings and majority of non-native vegetation onsite; removal of nine dams.	Single event	Permanent removal	Long term impacts
Impacts of development on movement of threatened species that maintains their lifecycle	Reduced connectivity of vegetation and habitat for threatened species thus reducing their ability to maintain their lifecycle.	Removal of all buildings and majority of non-native vegetation onsite; removal of nine dams.	Single event	Permanent removal of remnant, naturally occurring bushland and riparian habitat which provides habitat to maintain lifecycle of threatened species.	Long Term Impacts
Impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities	Reduction in water quality due to runoff. Clearing of native vegetation within riparian buffers.	Removal of nine dams.	Daily, during construction and operational phases. During heavy rainfall events	Single event during construction. During rainfall events.	Long-term impacts

**Table 27: Measures proposed to mitigate and manage impacts**

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Prepare and implement a Fauna Management Plan.	High	Medium	<p>Fauna Management Plan is to include measures for:</p> <ul style="list-style-type: none"> <li>dam dewatering and removal of native fauna</li> <li>pre-demolition inspection of human made structures for microbats. If microbats are detected, exclusion measures should be implemented prior to demolition.</li> </ul>	Successful identification and management of aquatic fauna and microbats prior to and during construction	Prior to the commencement of construction	Client
Timing works to avoid critical life cycle events such as breeding or nursing	High	Low	<p>Tree felling of hollow bearing trees should be undertaken outside of spring and summer (main breeding season for native birds and microbats). If this is not possible, strict pre-clearing protocols must be observed when removing tree hollows.</p> <p>The exclusion of microbats from roosting habitat must occur during non-breeding or maternity seasons or overwinter hibernation and extended torpor seasons for microbats. Suitable time periods are late March to end of May; as a less ideal timeframe in September.</p>	Prevent disturbance to fauna during breeding.	During tree felling and building demolition	Contractor, Project Ecologist
Instigating clearing protocols including pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecological or licensed wildlife handler during clearing events	High	Medium	<p>All hollow-bearing trees within the footprint will be removed. Pre-clearance and clearance survey to be undertaken by suitably qualified ecologists to relocate potential fauna inhabitants.</p> <p>Pre-clearance and clearance survey to be undertaken by suitably qualified ecologists to relocate potential fauna inhabitants. It is recommended that at a minimum, two ecologists are present at the clearing site at all times.</p> <p>The exclusion of microbats from roosting habitat, to be undertaken prior to construction, using roost exclusion methodology described in the MMP.</p>	Prevent injury or death to native fauna.	Prior to and during felling and building demolition.	Project Ecologists, Project Manager

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance	High	Low	Boundaries of the impact area to be clearly delineated with heavy duty fencing, retained areas marked with “No Go” signage, in particular in the areas adjacent to PCT 835 which is being retained.	Protection of retained vegetation with heavy duty fencing.	Throughout the life of the project	Project Manager in consultation with the ecologist
Sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment	High	Moderate	Install sediment barriers and erosion control during and post construction to prevent runoff into adjacent creeklines and wetlands, maintain controls throughout construction and undertake regular inspections (weekly – or daily if raining).	Control of erosion, sedimentation and runoff of contaminated substances into adjacent waterways	Throughout life of project	Project Manager
Noise barriers or daily/seasonal timing of construction and operational activities to reduce impacts of noise	Low	Very Low	Daily timing of construction activities is recommended in accordance with Table 1 of Interim Noise Guidelines (2009).	Noise impacts associated with the development will be managed in accordance with guidelines.	Throughout life of project	Project Manager
Light shields or daily/seasonal timing of construction and operational activities to reduce impacts of light spill	Low	Very Low	Conduct works during daylight hours.	Avoid light disturbance to native fauna during construction	Throughout life of project	Project Manager
Adaptive dust monitoring programs to control air quality	High	Moderate	Dust management controls to be implemented during construction and operations. If water is being used to manage dust, ensure contaminated water is managed appropriately on and off site in accordance with a water management plan or similar.	Control dust and maintain air quality during construction.	During construction and operations.	Project Manager, Contractor.
On site water management	High	Moderate	All water being used onsite (e.g. dust management, cleaning, processes) is to be managed appropriately on site in accordance with a water management plan or similar.	Control contaminated water on site and prevent from leaving the site.	Throughout life of the project	Project Manager, Contractor

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Programming construction activities to avoid impacts; for example, timing construction activities for when migratory species are absent from the site, or when particular species known to or likely to use the habitat on the site are not breeding or nesting	Medium	Low	Impacts to vegetation during the Spring Summer breeding period should be minimised to avoid disrupting the breeding cycles of threatened species.	Avoid disruption of breeding cycle of threatened species.	During construction	Project Manager
Temporary fencing to protect significant environmental features such as riparian zones	High	Low	Temporary fencing and signage to be installed at the edge of the development site to prevent entry into the adjacent retained vegetation.	No unintended clearing or trampling of adjacent vegetation to be retained.	During construction	Project Manager
Hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas	Medium	Low	<p>Phytophthora control measures must be undertaken from the commencement of the project to minimise the risk of spread and to the site. The following guidelines should be followed:</p> <p><a href="https://www.rbgsyd.nsw.gov.au/science/plants/pests-diseases/phytophthora-dieback/disinfection-procedures">https://www.rbgsyd.nsw.gov.au/science/plants/pests-diseases/phytophthora-dieback/disinfection-procedures</a></p> <p><a href="http://www.environment.gov.au/biodiversity/invasive-species/publications/management-phytophthora-cinnamomi-biodiversity-conservation">http://www.environment.gov.au/biodiversity/invasive-species/publications/management-phytophthora-cinnamomi-biodiversity-conservation</a></p> <p>Vehicles, machinery and building refuse should remain only within the development site and disposed of at an appropriate waste management facility.</p> <p>Weed management to be undertaken where required. Vehicles should be washed down before entering and exiting the site to prevent the spread of weeds to or from the development site and adjacent vegetation. In particular, machinery work on or nearby dams are required to be washed down in order to</p>	Spread of weeds /pathogens between unaffected areas prevented.	During construction	Project Manager / Contractors

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
			<p>prevent the spread of chytrid fungus into or from the development site.</p> <p>If water trucks are being used for dust control, implement procedures such as daily cleaning of the water truck and equipment.</p>			
Staff training and site briefing to communicate environmental features to be protected and measures to be implemented	Medium	Low	<p>All staff working on the project will undertake an environmental induction as part of their site familiarisation. Site briefings should be updated based on phase of the work. This induction will include items such as:</p> <ul style="list-style-type: none"> <li>• Site environmental procedures (vegetation management, sediment and erosion control, exclusion fencing)</li> <li>• Threatened species habitat and TECs</li> <li>• What to do in case of environmental emergency (chemical spills, fire, injured fauna)</li> <li>• Key contacts in case of environmental emergency</li> <li>• What to do in the case of finding a threatened species</li> <li>• What to do in the case of finding fauna on the site</li> </ul>	All staff entering the site are fully aware of all environmental aspects relating to the development and know what to do in case of any environmental emergencies	To occur for all staff entering / working at the site and when environmental issues become apparent	Project Manager, all staff
Making provision for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on or adjacent to the development site	High	Medium	<p>A Vegetation Management Plan should be prepared which covers the retained bushland in the north east corner of the development site.</p> <p>The development site is partially mapped within the 8-13 Km Wildlife Buffer Zone Map of the Aerotropolis SEPP for the Western Sydney International (Nancy- Bird Walton) Airport. Careful consideration of plant species must be given for any proposed landscaping or revegetation. These items will be considered and assessed when preparing the VMP for the north-east corner.</p>	Protection of flora and fauna outside of the development footprint	Prior to the commencement of construction	Client

### 3.2.6 Serious and Irreversible Impacts (SAII)

The development has candidate Serious and Irreversible Impacts (SAII) values as outlined in Table 28. Detailed consideration of whether impacts on candidate species are serious and irreversible is included in Table 31 and on TECs is included in Table 30.

**Table 28: Candidate Serious and Irreversible Impacts**

Species / Community		Common Name		Principle	Direct impact individuals / area (ha)	Threshold
Cumberland Woodland Sydney Bioregion	Plain of the Basin	Cumberland Woodland	Plain	1	0.12	Under development

**Table 29: Determining whether impacts are serious and irreversible**

Determining whether impacts are serious and irreversible	Assessment
<b>Principle 1</b>	
Does the proposal impact on a species, population or ecological community that is a candidate entity because it is in a rapid rate of decline?	Yes
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible? Note: where candidate entities have no listed threshold, any impact is considered likely to be serious and irreversible	The thresholds for this TEC have not been published yet according to the Threatened Biodiversity Data Collection provided in DPIE BioNet.
<b>Principle 2</b>	
Does the proposal impact on a species that is a candidate entity because it has been identified as having a very small population size?	Yes
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible? Note: where candidate entities have no listed threshold, any impact is considered likely to be serious and irreversible	The thresholds for this TEC have not been published yet according to the Threatened Biodiversity Data Collection provided in DPIE BioNet
<b>Principle 3</b>	
Does the proposal impact on the habitat of a species or an area of an ecological community that is a candidate entity because it has a very limited geographic distribution?	No
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible? Note: where candidate entities have no listed threshold, any impact is considered likely to be serious and irreversible.	N/A
<b>Principle 4</b>	
	No
Does the proposal impact on a species, a component of species habitat or an ecological community that is a candidate entity because it is irreplaceable?	
b. If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible? Note: where candidate entities have no listed threshold, any impact is considered likely to be serious and irreversible.	N/A

Table 30: Evaluation of an impact on a TEC

Impact Assessment Provisions	Assessment
<b>1. The area and condition of the TEC to be impacted directly and indirectly by the proposed development</b>	The proposed development will remove 0.12 ha of this TEC which is in a low condition with a vegetation integrity score of 1.5. The TEC affected within the development site is present as lacking a canopy, containing two native midstorey species and a highly disturbed groundcover.
<b>2. The extent and overall condition of the TEC within an area of 1500 metres, and then 5000 metres, surrounding the proposed development footprint. In the case of strategic biodiversity certification projects, the extent and overall condition of the TEC may be assessed across the IBRA sub region</b>	There is an estimated 33.9 ha of this TEC within a 1,500m radius of the development site (mapped by OEH 2016). There is an estimated 285.8 ha of this TEC within a 5000m radius of the development site (mapped by OEH 2016).
<b>3. An estimate of the extant area and overall condition of the TEC remaining before and after the impact of the proposed development has been taken into consideration</b>	The removal of 0.12 ha of this TEC within the development site represents 0.34% of the mapped TEC extent within the 1,500 m radius and 0.04% of the mapped TEC extent within the 5,000 m radius.  The development will not result in the overall decline of the condition of the TEC remaining in the locality after development.
<b>4. The development proposal's impact on:</b>	
<b>a. Abiotic factors critical to the long-term survival of the TEC; for example, will the impact lead to a reduction of groundwater levels or substantial alteration of surface water patterns; will it alter natural disturbance regimes that the TEC depends upon, e.g. fire, flooding etc.?</b>	The development will not affect abiotic factors critical to the long-term survival of the TEC. The proposal will not result in a reduction in ground water levels or substantial alteration of surface water patterns or natural disturbance regimes of which the TEC depends upon outside of the development site.
<b>b. Characteristic and functionally important species through impacts such as, but not limited to, inappropriate fire/flooding regimes, removal of under-storey species or harvesting of plants</b>	The proposed development will not affect characteristic and functionally important species outside of the proposed impact area.
<b>c. The quality and integrity of an occurrence of the TEC through threats and indirect impacts including, but not limited to, assisting invasive flora and fauna species to become established or causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants which may harm or inhibit growth of species in the TEC</b>	The development site is located within a modified rural area with areas affected by weeds which will be removed during the proposed works. The proposed development has the potential to result in the introduction of new weed plumes into and adjacent to the development site. These potential impacts will be controlled during the construction phase of the proposed development.
<b>5. Direct or indirect fragmentation and isolation of an area of the TEC</b>	The development will result in a very minor increase in the direct or indirect fragmentation or isolation of areas of the TEC
<b>6. The measures proposed to contribute to the recovery of the TEC in the IBRA subregion.</b>	In its current form, the proposed development does not contribute to the recovery of this TEC in the IBRA subregion.



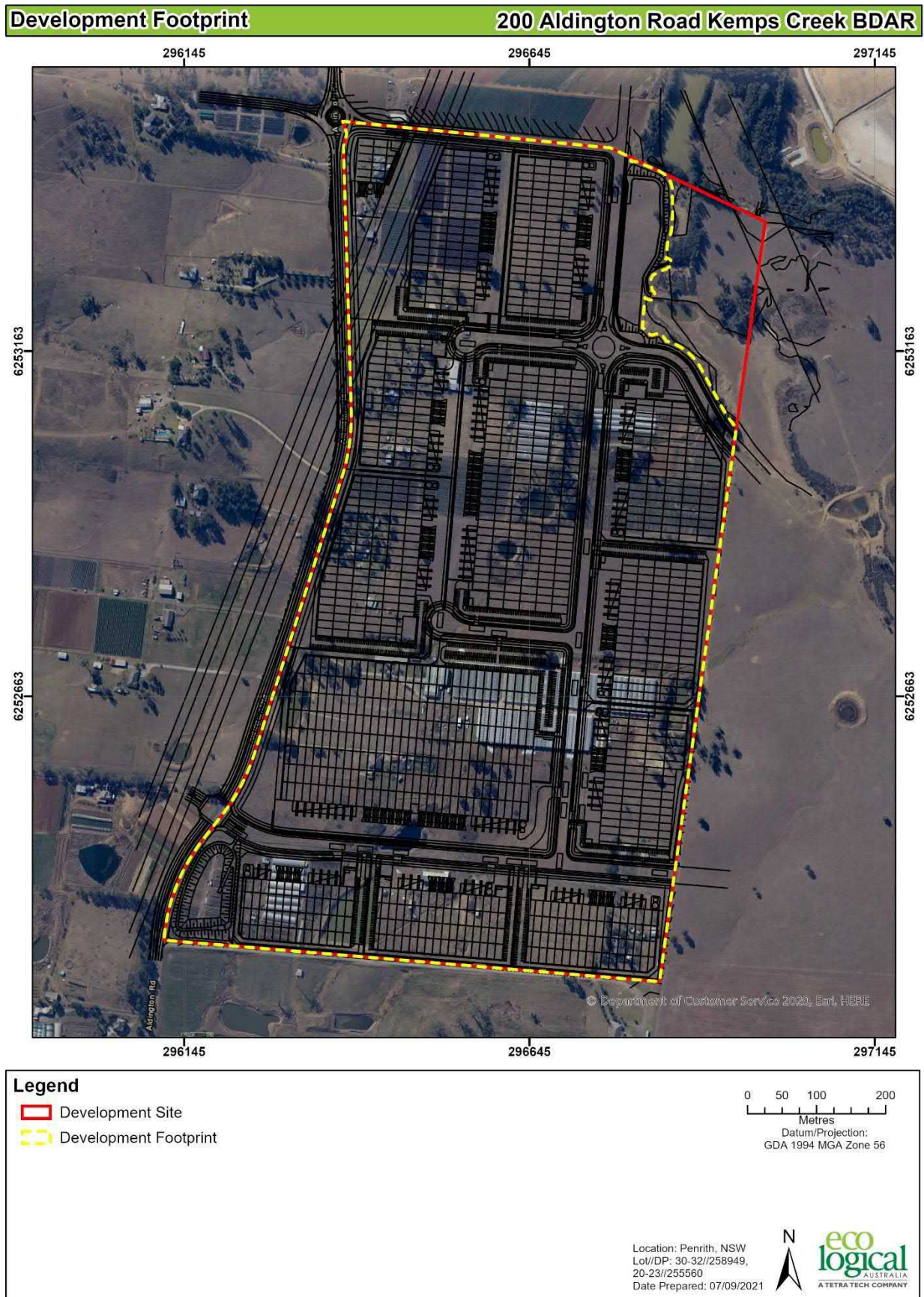


Figure 9: Final project footprint including construction and operation

### 3.3 Impact summary

Following implementation of the BAM and the BAMC, the following impacts have been determined.

#### 3.3.1 Serious and Irreversible Impacts (SAII)

The development has candidate Serious and Irreversible Impacts (SAII) values as outlined in Table 28, 29, 30 and 31 and shown on Figure 10.

**Table 31: Serious and Irreversible Impacts Summary**

Species / Community	Common Name	Principle	Direct impact (ha)
Cumberland Plain Woodland of the Sydney Basin Bioregion	Cumberland Plain Woodland	1	0.12

#### 3.3.2 Impacts requiring offsets

The impacts of the development requiring offset for native vegetation are outlined in Table 32 and shown on Figure 11. The impacts of the development requiring offset for threatened species and threatened species habitat are outlined in Table 33 and on Figure 11.

#### 3.3.3 Credit summary

The number of ecosystem credits required for the development are outlined in Table 34. The number of species credits required for the development are outlined in Table 35. A biodiversity credit report is included in Appendix D:.

**Table 32: Impacts to native vegetation that require offsets**

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)	Credits required
835	Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Coastal Floodplain Wetlands	Forested Wetlands	1.33	16
1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	Coastal Swamp Forests	Forested Wetlands	0.67	7

**Table 33: Impacts on threatened species and threatened species habitat that require offsets**

Species	Common Name	Direct impact (ha)	NSW listing status	EPBC Listing status	Credits required
<i>Myotis Macropus</i>	Southern Myotis	2.73	V	Not Listed	29

#### 3.3.4 Impacts not requiring offsets

The impacts of the development not requiring offset for native vegetation are outlined in Table 34 and shown on Figure 12.

**Table 34: Impacts to native vegetation that do not require offsets**

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
850	Grey Box – Forest Red Gum grassy woodland on shale of the southern Cumberland Plain, Sydney Basin Bioregion	Coastal Valley Grassy Woodlands	Grassy Woodlands	0.12
1232	Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	Coastal Swamp Forests	Forested Wetlands	0.67

### 3.3.5 Areas not requiring assessment

Areas not requiring assessment are shown on Figure 13.



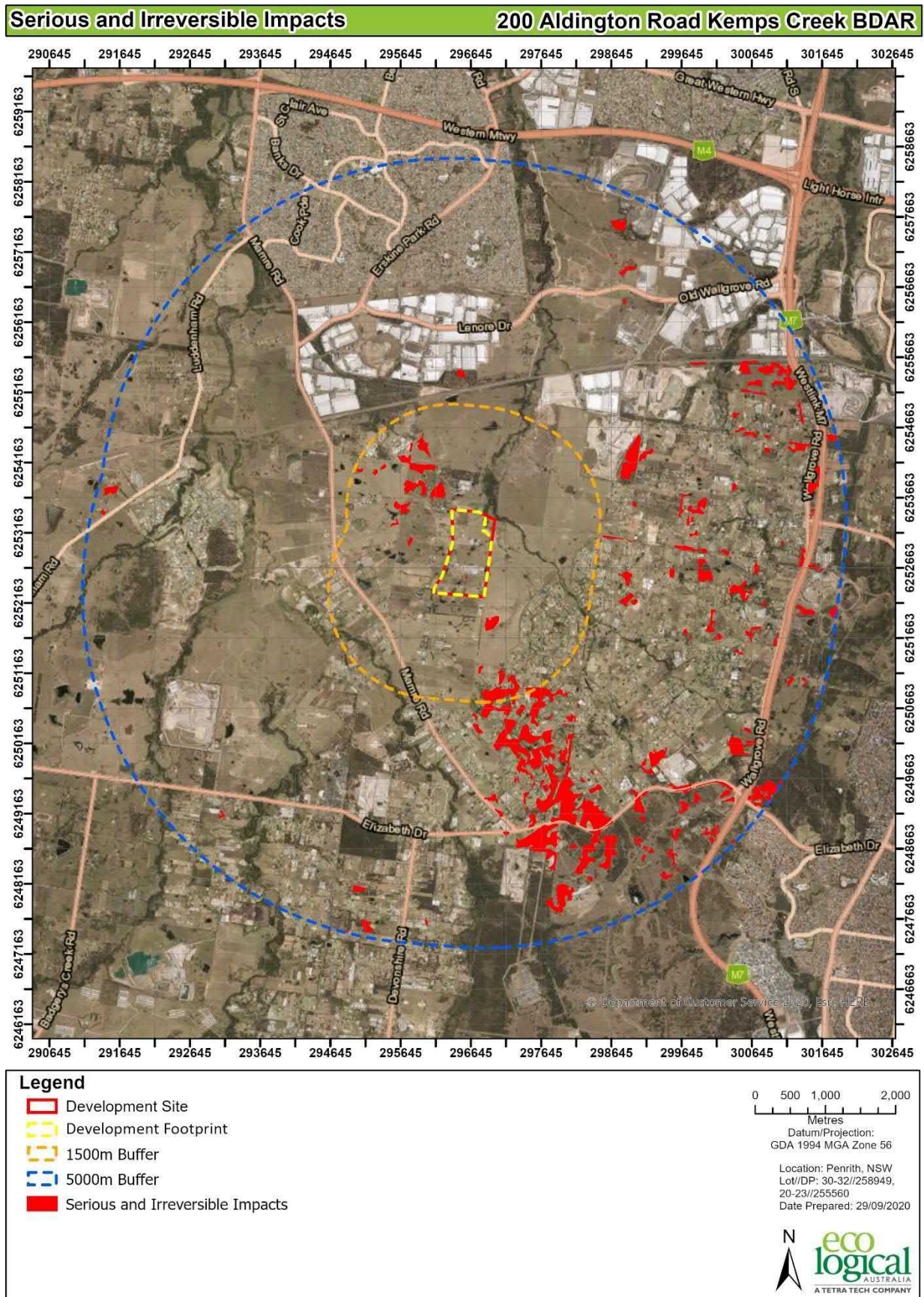
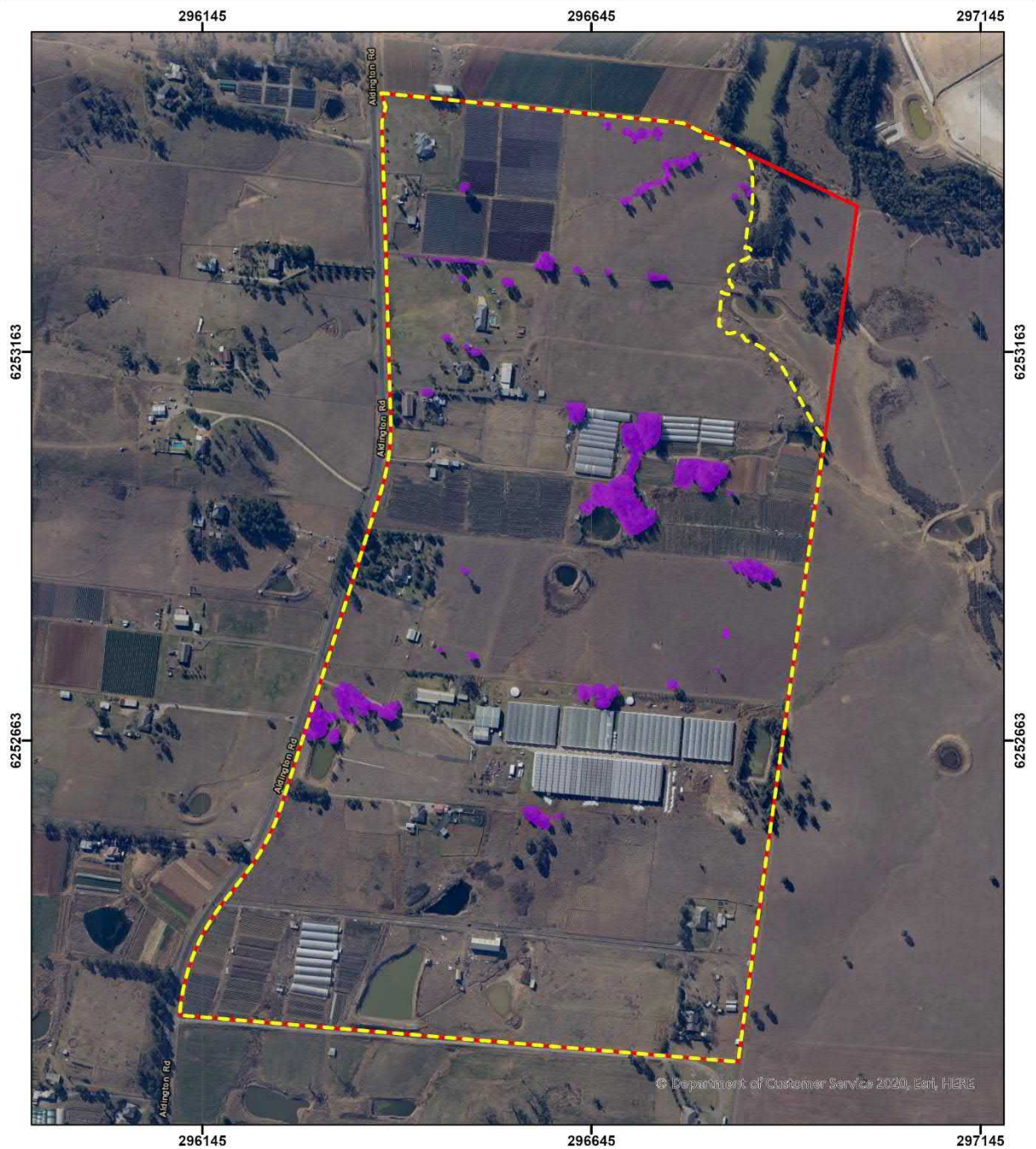


Figure 10: Serious and Irreversible Impacts



**Impacts Requiring Offset** **200 Aldington Road Kemps Creek BDAR**



**Legend**

- Development Site
- - - Development Footprint
- Impacts Requiring Offset

0 50 100 200  
Metres  
Datum/Projection:  
GDA 1994 MGA Zone 56

Location: Penrith, NSW  
Lot/DP: 30-32/258949,  
20-23/255560  
Date Prepared: 07/09/2021



**eco**  
**logical**  
AUSTRALIA  
A TETRA TECH COMPANY

**Figure 11: Impacts requiring offset**



## Impacts Not Requiring Offset 200 Aldington Road Kemps Creek BDAR



Figure 12: Impacts not requiring offset



**Areas Not Requiring Assessment** **200 Aldington Road Kemps Creek BDAR**



**Figure 13: Areas not requiring assessment**

### 3.4 Consistency with legislation and policy

Additional matters relating to impacts on flora and fauna which are not covered by the BC Act must also be addressed for the proposed development. Potential MNES in accordance with the Commonwealth EPBC Act have been addressed in Section 3.4.1.

#### 3.4.1 Commonwealth *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act)

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where MNES may be affected. Under the Act, any action which “has, will have, or is likely to have a significant impact on MNES” is defined as a “controlled action”, and requires approval from the Commonwealth Department of Agriculture, Water and the Environment (DAWE), which is responsible for administering the EPBC Act.

A habitat assessment and Likelihood of Occurrence was completed for listed threatened species that represent MNES (Appendix F). The following MNES were assessed as either having the potential to occur within the development site, likely to occur or known from the development site:

- *Anthochaera phrygia* (Regent Honeyeater)
- *Pteropus poliocephalus* (Grey-headed Flying-fox)
- *Lathamus discolor* (Swift Parrot)
- *Litoria aurea* (Green and Golden Bell Frog)
- *Phascolarctos cinereus* (Koala)
- *Gallinago hardwickii* (Latham’s Snipe).

The assessments in this section were prepared in accordance with the EPBC Act Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (Department of Environment 2009). These guidelines were established to assist proponents to determine whether a proposed action is likely to result in a significant impact on a matter of national environmental significance.

It was determined that the action will not have or is unlikely to have a significant impact on the above MNES.



### 3.4.1.1 Forest birds (*Anthochaera phrygia* (Regent Honeyeater) and *Lathamus discolor* (Swift Parrot))

The Regent Honeyeater and Swift Parrot are both listed as critically endangered under the EPBC Act. The distribution and habitat associations of this threatened species are presented in Appendix C:. Due to similar habitat requirements of these species, a single test was undertaken for both. These species were not recorded within the development site during survey. The proposed action will impact 2.8 ha of potential foraging habitat for both the Regent Honeyeater and Swift Parrot. The development site is not included within the DPIE mapped breeding areas for the threatened species (as accessed on BOAMS on 6 July and 23 September 2020).

Criterion	Question	Response
	An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility of the following:	
1)	will the action lead to a long-term decrease in the size of a population <i>Note: A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area.</i>	The Regent Honeyeater and Swift Parrot comprise single populations of each respective species (DAWE 2020c). The proposed action will not affect breeding habitat for either threatened species but will remove 2.8 ha of vegetation, including potential foraging habitat. Given the proximity of suitable habitat in connective vegetation within the assessment area and beyond, the removal of this potential foraging habitat would not lead to the long-term decrease in the size of a population of either species.
2)	will the action reduce the area of occupancy of the species	The proposed action would reduce the amount of potential foraging habitat for these species by up to 2.8 ha. Neither species are known to occupy the development site, but the Regent Honeyeater and Swift Parrot may occasionally forage within the development site. Both the Regent Honeyeater and Swift Parrot are recorded as travelling long distances and would likely utilise the potential foraging habitat outside of the development site on feeding forays.
3)	will the action fragment an existing population into two or more populations	The proposed action will not fragment an existing population into two or more populations.
4)	will the action adversely affect habitat critical to the survival of a species	The National Recovery Plan for the Regent Honeyeater lists habitat critical to the survival of the species as: "any breeding or foraging areas where the species is likely to occur. Any newly discovered breeding or foraging locations". The National Recovery Plan for the Swift Parrot 2011 lists priority habitats as those which are used for nesting, by large proportions of the population, repeatedly between seasons or for prolonged periods of time. Based on the records of these species observed within 5 km of the development site (2 Regent Honeyeater, 0 Swift Parrot), the development site is not considered habitat critical to the survival of either species. Furthermore, similar foraging habitat is available directly adjacent to the development site.
5)	will the action disrupt the breeding cycle of a population	The proposed action will not disrupt the breeding cycle of either threatened species given that no breeding habitat will be affected by the proposed action and suitable

Criterion	Question	Response
		foraging habitat is available adjacent to the development site.
6) i	will the action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed action will remove 2.8 ha of vegetation, including foraging habitat for the Regent Honeyeater and Swift Parrot. It is unlikely that the extent of this vegetation removal will cause either species to decline because suitable habitat is available adjacent to the development site.
6) ii	will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	The proposed action is unlikely to result in the establishment of an invasive species that is harmful to either threatened species.
7)	will the action introduce disease that may cause the species to decline	The proposed action is unlikely to introduce disease that may cause either threatened species to decline.
8)	will the action interfere with the recovery of the species	The proposed action will remove suitable foraging habitat for these species; however this will not interfere substantially with recovery objectives listed in their National Recovery Plans. The proposed action will not affect any breeding habitat and suitable foraging habitat is available adjacent to the development site.
Conclusion	Is there likely to be a significant impact?	<p>No. The proposed action is unlikely to have a significant impact on the Regent Honeyeater or Swift Parrot for the following reasons:</p> <ul style="list-style-type: none"> <li>• No known breeding habitat will be removed by the proposed action.</li> <li>• Extensive areas of more suitable foraging habitat for these highly mobile species is available adjacent to the development site.</li> </ul>

### 3.4.1.2 *Pteropus poliocephalus* (Grey-headed Flying-fox)

The Grey-headed Flying-fox is listed as vulnerable under the EPBC Act. The distribution and habitat associations of this threatened species are presented in Appendix C:. This species was not identified within the development site during survey. The proposed action will impact 2.8 ha of native vegetation, some of which comprises suitable foraging habitat for this species. No camps were identified within the development site, the nearest Grey-headed Flying-fox camp is located approximately 11 km east of the development site at Wetherill Park and has a count of 500-2,499 individuals. No camps will be affected by the proposed action.

Criterion	Question	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1)	lead to a long-term decrease in the size of an important population of a species <i>Note: An 'important population' is a population that is necessary for a species' long-term survival and recovery.</i>	No roosting habitat (camps) will be affected by the proposed action. The proposed action will affect 2.8 ha of native vegetation, some of which comprises suitable foraging habitat for the Grey-headed Flying-fox. The Grey-headed Flying-fox is recorded as travelling long distances (up to 50 km) on feeding forays. Given the proximity of more suitable habitat in connective vegetation within the assessment area, the removal of this potential foraging habitat would not lead to the long-term decrease in the size of an important population of Grey-headed Flying-fox.
2)	reduce the area of occupancy of an important population	The proposed action would affect 2.8 ha of potential foraging habitat for this species. The Grey-headed Flying-fox is not known to occupy the development site in the form of a camp but may occasionally forage within the development site. The Grey-headed Flying-fox is recorded as travelling long distances on feeding forays and would likely utilise the potential foraging habitat outside of the development site.
3)	fragment an existing important population into two or more populations	According to the Draft Recovery Plan for the Grey-headed Flying-fox 2017, "the Grey-headed Flying-fox is considered to be a single, mobile population with individuals distributed across Queensland, New South Wales, Victoria, South Australia, Tasmania and the ACT." The proposed action will not fragment an existing important population into two or more populations. No camps will be affected by the proposed action and other areas of foraging habitat are available for this highly mobile species within the region.
4)	adversely affect habitat critical to the survival of a species <i>Note: 'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:</i> <ul style="list-style-type: none"> <li>for activities such as foraging, breeding, roosting, or dispersal</li> <li>for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of</li> </ul>	The Draft Recovery Plan for the Grey-headed Flying-fox 2017 identifies 'a continuous temporal sequence of productive foraging habitats, linked by migration corridors or stopover habitats, and suitable roosting habitat within nightly commuting distance of foraging areas' as habitat critical to the survival of the species. The proposed action will affect 2.8 ha of native vegetation, some of which may represent habitat critical survival to this species. However, this impact is considered unlikely to have an adverse effect given that the species is recorded as travelling long distances (50 km) on feeding forays and similar habitat is available adjacent to the development site.

Criterion	Question	Response
	<p><i>the species or ecological community, such as pollinators)</i></p> <ul style="list-style-type: none"> <li><i>to maintain genetic diversity and long term evolutionary development, or</i></li> <li><i>for the reintroduction of populations or recovery of the species or ecological community.</i></li> </ul>	
5)	disrupt the breeding cycle of an important population	The proposed action will not disrupt the breeding cycle of the Grey-headed Flying-fox given that no camps will be affected by the proposed action and suitable foraging habitat is available adjacent to the development site.
6)	modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed action will affect 2.8 ha of vegetation, including foraging habitat for the Grey-headed Flying-fox. It is unlikely that the extent of this vegetation removal will cause the species to decline because suitable habitat is available adjacent to the development site.
7)	result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed action is unlikely to result in the establishment of an invasive species that is harmful to the Grey-headed Flying-fox.
8)	introduce disease that may cause the species to decline, or	Grey-headed Flying-fox are reservoirs for the Australian bat lyssavirus, Hendra Virus and Menangle virus, and can cause clinical disease and mortality in Grey-headed Flying-fox. The proposed action would not increase the incidence of this disease.
9)	interfere substantially with the recovery of the species.	The proposed action will remove suitable foraging habitat for this species; however this will not interfere substantially with recovery objectives listed in the Draft National Recovery Plan for the Grey-headed Flying-fox 2017. The proposed action will not affect any camps and suitable foraging habitat is available adjacent to the development site.
Conclusion	Is there likely to be a significant impact?	<p>No. The proposed action is unlikely to have a significant impact on the Grey-headed Flying-fox for the following reasons:</p> <ul style="list-style-type: none"> <li>No camps will be removed by the proposed action.</li> <li>More suitable foraging habitat for this highly mobile species is available adjacent to the development site.</li> </ul>

### 3.4.1.3 *Litoria aurea* (Green and Golden Bell Frog)

The Green and Golden Bell Frog is listed as vulnerable under the EPBC Act. The distribution and habitat associations for this threatened species are presented in Table 16. Targeted survey was not undertaken for this species, however the development site contains 0.34 ha of potential habitat for this species, associated with dams with *Typha* sp.

Criterion	Question	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1)	Lead to a long-term decrease in the size of an important population of a species <i>Note: An 'important population' is a population that is necessary for a species' long-term survival and recovery.</i>	The proposed action will impact up to 0.34 ha of potential habitat for the Green and Golden Bell Frog in the form of farm dams and associated vegetation. Based on the records of this species observed within 5 km of the development site (1 record), the proposed action would not lead to the long-term decrease in the size of an important population of Green and Golden bell Frog.
2)	Reduce the area of occupancy of an important population	The action would reduce the potential area of occupancy available for this species by removing up to 0.34 ha of potential habitat. However, given the number of records and marginal quality of potential habitat, it is considered unlikely that an important population would occupy this area.
3)	Fragment an existing important population into two or more populations	The proposed action will not fragment an existing population into two or more populations.
4)	Adversely affect habitat critical to the survival of a species <i>Note: 'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:</i> <ul style="list-style-type: none"> <li>• <i>for activities such as foraging, breeding, roosting, or dispersal</i></li> <li>• <i>for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)</i></li> <li>• <i>to maintain genetic diversity and long-term evolutionary development, or</i></li> <li>• <i>for the reintroduction of populations or recovery of the species or ecological community.</i></li> </ul>	The proposed action would impact 0.34 ha of native vegetation and associated dams that represent potential habitat. The area of potential habitat to be impacted is of marginal quality and only one individual has been recorded within 1 km of the development site. Therefore, it is unlikely that the proposed action will adversely affect potential habitat to the detriment of the survival of the species.
5)	Disrupt the breeding cycle of an important population	The proposed action is unlikely to result in the loss of a large number of individuals that would disrupt the life cycle of this species.
6)	Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed action will decrease the availability of habitat for the species within the development site by 0.34 ha. However, it is unlikely that the extent of this habitat removal will cause the species to decline because similar habitat is

Criterion	Question	Response
		available within the assessment area and only one individual is known from the region.
7)	Result in an invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	A number of invasive fish species, especially <i>Gambusia holbrooki</i> (Eastern Mosquitofish), have been identified as main threats to the Green and Golden Bell Frog. The proposed action is unlikely to result in harmful invasive species becoming established in existing habitat for the Green and Golden Bell Frog.
8)	Introduce disease that may cause the species to decline	Infection with <i>Batrachochytrium dendrobatidis</i> (Chytrid Fungus) is listed as a main threat to the Green and Golden Bell Frog. The proposed action is unlikely to introduce the Chytrid Fungus.
9)	Interfere substantially with the recovery of the species	The proposed action will remove potential habitat for this species. However, the action will not interfere substantially with the recovery of the species.
Conclusion	Is there likely to be a significant impact?	<p>No. The proposed action is unlikely to have a significant impact on the Green and Golden Bell Frog for the following reasons:</p> <ul style="list-style-type: none"> <li>• The 0.34 ha of potential Green and Golden Bell Frog habitat to be removed is considered marginal in quality.</li> <li>• Similar habitat is available within the assessment area.</li> </ul>

### 3.4.1.4 *Phascolarctos cinereus* (Koala)

The Koala is listed as vulnerable under the EPBC Act. The distribution and habitat associations of this threatened species are presented in Table 16. This species was not identified within the development site during survey. The proposed action will affect 2.8 ha of native vegetation, some of which comprises suitable foraging habitat for this species. No breeding habitat will be affected by the proposed action.

Criterion	Question	Response
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>		
1)	lead to a long-term decrease in the size of an important population of a species <i>Note: An 'important population' is a population that is necessary for a species' long-term survival and recovery.</i>	The proposed action will affect 2.8 ha of native vegetation, some of which contains potential foraging habitat for the Koala. No evidence of breeding habitat was detected within the development site during survey. This impact would not lead to a long-term decrease in the size of a population of the species, given the proximity of similar habitat adjacent to the development site.
2)	reduce the area of occupancy of an important population	The proposed action would affect up to 2.8 ha of native vegetation, some of which represents potential foraging habitat for this species. The Koala is not known to occupy the development site but may occasionally forage within the development site.
3)	fragment an existing important population into two or more populations	The proposed action will not fragment an existing important population into two or more populations.
4)	adversely affect habitat critical to the survival of a species <i>Note: 'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:</i> <ul style="list-style-type: none"> <li><i>for activities such as foraging, breeding, roosting, or dispersal</i></li> <li><i>for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)</i></li> <li><i>to maintain genetic diversity and long term evolutionary development, or</i></li> <li><i>for the reintroduction of populations or recovery of the species or ecological community.</i></li> </ul>	No habitat critical to the survival has been identified for this species. The development site contains feed trees considered foraging habitat for this species, however this habitat is not considered critical to the survival of the species. Furthermore, the development site is not mapped under the Koala Habitat Protection SEPP 2019. The proposed action may affect up to 2.8 ha of native vegetation, some of which represents potential foraging habitat for this species, however similar habitat is available adjacent to the development site.
5)	disrupt the breeding cycle of an important population	The proposed action will not disrupt the breeding cycle of the Koala given that no breeding habitat will be affected by the proposed action and suitable foraging habitat is available adjacent to the development site.

Criterion	Question	Response
6)	modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed action will affect up to 2.8 ha of native vegetation, including foraging habitat for the Koala. It is unlikely that the extent of this vegetation removal will cause the species to decline because suitable, more extensive habitat is available adjacent to the development site.
7)	result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed works are unlikely to result in the establishment of an invasive species in the habitat of the Koala.
8)	introduce disease that may cause the species to decline, or	The action is unlikely to introduce disease that would cause this species to decline.
9)	interfere substantially with the recovery of the species.	The Approved Conservation Advice for this species identifies the following main threats: loss and fragmentation of habitat, vehicle strike, disease and predation by dogs. The proposed action will impact foraging habitat; however the action is unlikely to exacerbate these threats to the extent that it would interfere substantially with the recovery of the species.
<b>Conclusion</b>	Is there likely to be a significant impact?	<p>No. The proposed action is unlikely to have a significant impact on the Koala for the following reasons:</p> <ul style="list-style-type: none"> <li>• No breeding habitat will be impacted by the action.</li> <li>• More suitable habitat for this species is available adjacent to the development site.</li> </ul>



### 3.4.1.5 *Gallinago hardwickii* (Latham's Snipe)

Latham's Snipe is listed as a migratory species under the EPBC Act. The distribution and habitat associations for this threatened species are presented in Table 16. This species was not identified within the development site during survey, however the proposed development will remove farm dams which represent foraging and roosting habitat for this species. Latham's Snipe does not breed in Australia.

Criterion	Question	Response
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:		
1)	<p>Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species</p> <p><i>Note: An area of 'important habitat' for a migratory species is:</i></p> <ul style="list-style-type: none"> <li>• <i>habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or</i></li> <li>• <i>habitat that is of critical importance to the species at particular life-cycle stages, and/or</i></li> <li>• <i>habitat utilised by a migratory species which is at the limit of the species range, and/or</i></li> <li>• <i>habitat within an area where the species is declining.</i></li> </ul>	<p>The proposed action will affect dams considered potential foraging and roosting habitat for Latham's Snipe. The species does not breed in Australia. Latham's Snipe prefers bodies of fresh water that contain low, dense vegetation which provides shelter for roosting purposes. The structure and composition of the fringing vegetation is a high determinant in the suitability of the habitat for foraging and roosting purposes. The dams within the development site are only considered marginal habitat for this species.</p>
2)	<p>Result in invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species</p>	<p>Predation by <i>Vulpes</i> (European Red Fox) is considered a threat to Latham's Snipe. The proposed action is unlikely to exacerbate predation of Latham's Snipe by the European Red Fox.</p>
3)	<p>Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species</p> <p><i>Note: Listed migratory species cover a broad range of species with different life cycles and population sizes. Therefore, what is an 'ecologically significant proportion' of the population varies with the species (each circumstance will need to be evaluated). Some factors that should be considered include the species' population status, genetic</i></p>	<p>The global population of Latham's Snipe is estimated to be between 25,000 and 100,000 individuals (DAWE 2020c). The species' extent of occurrence is estimated at 300,000 km<sup>2</sup> and the area of occupancy at 3000 km<sup>2</sup>. An area of habitat is considered important if it supports &gt;1% of the current population. Given only four individuals have been recorded within 5 km of the development site, the development site is not considered important habitat or likely to support a significant proportion of the population.</p> <p>Latham's Snipe does not breed in Australia but migrates after the breeding season anywhere between July – November, leaving by February. The species migrates to Australia for foraging and roosting purposes and would rely on the resources in the development site only occasionally.</p>

Criterion	Question	Response
	<p><i>distinctiveness and species specific behavioural patterns (for example, site fidelity and dispersal rates).</i></p> <p><i>‘Population’, in relation to migratory species, means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries including Australia.</i></p>	
Conclusion	Is there likely to be a significant impact?	<p>No. The proposed action is unlikely to have a significant impact on Latham’s Snipe for the following reasons:</p> <ul style="list-style-type: none"> <li>• The action will not affect breeding habitat for the species</li> <li>• The habitat in the development site is considered marginal and would only be used occasionally in a transient manner by species</li> <li>• The species is highly mobile and will readily move roosting locations as habitat becomes less / more suitable</li> <li>• The species’ range is widespread and the proposed action would not impact the species at the extent of its range.</li> </ul>

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## Appendix A: Definitions

Terminology	Definition
<b>Biodiversity credit report</b>	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site.
<b>BioNet Atlas</b>	The BioNet Atlas (formerly known as the NSW Wildlife Atlas) is the OEH database of flora and fauna records. The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails) and some fish
<b>Broad condition state:</b>	Areas of the same PCT that are in relatively homogenous condition. Broad condition is used for stratifying areas of the same PCT into a vegetation zone for the purpose of determining the vegetation integrity score.
<b>Connectivity</b>	The measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.
<b>Credit Calculator</b>	The computer program that provides decision support to assessors and proponents by applying the BAM, and which calculates the number and class of biodiversity credits required to offset the impacts of a development or created at a biodiversity stewardship site.
<b>Development</b>	Has the same meaning as development at section 4 of the EP&A Act, or an activity in Part 5 of the EP&A Act. It also includes development as defined in section 115T of the EP&A Act.
<b>Development footprint</b>	The area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials.
<b>Development site</b>	An area of land that is subject to a proposed development that is under the EP&A Act.
<b>Ecosystem credits</b>	A measurement of the value of EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur with a PCT. Ecosystem credits measure the loss in biodiversity values at a development site and the gain in biodiversity values at a biodiversity stewardship site.
<b>High threat exotic plant cover</b>	Plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species.
<b>Hollow bearing tree</b>	A living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the minimum entrance width is at least 5 cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1 m above the ground. Trees must be examined from all angles.
<b>Important wetland</b>	A wetland that is listed in the Directory of Important Wetlands of Australia (DIWA) and SEPP 14 Coastal Wetlands
<b>Linear shaped development</b>	Development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length
<b>Local population</b>	The population that occurs in the study area. In cases where multiple populations occur in the study area or a population occupies part of the study area, impacts on each subpopulation must be assessed separately.
<b>Local wetland</b>	Any wetland that is not identified as an important wetland (refer to definition of Important wetland).
<b>Mitchell landscape</b>	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.

Terminology	Definition
<b>Multiple fragmentation impact development</b>	Developments such as wind farms and coal seam gas extraction that require multiple extraction points (wells) or turbines and a network of associated development including roads, tracks, gathering systems/flow lines, transmission lines
<b>Operational Manual</b>	The Operational Manual published from time to time by OEH, which is a guide to assist assessors when using the BAM
<b>Patch size</b>	An area of intact native vegetation that: a) occurs on the development site or biodiversity stewardship site, and b) includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or $\leq 30$ m for non-woody ecosystems). Patch size may extend onto adjoining land that is not part of the development site or stewardship site..
<b>Proponent</b>	A person who intends to apply for consent to carry out development or for approval for an activity.
<b>Reference sites</b>	The relatively unmodified sites that are assessed to obtain local benchmark information when benchmarks in the Vegetation Benchmarks Database are too broad or otherwise incorrect for the PCT and/or local situation. Benchmarks can also be obtained from published sources.
<b>Regeneration</b>	The proportion of over-storey species characteristic of the PCT that are naturally regenerating and have a diameter at breast height $< 5$ cm within a vegetation zone.
<b>Remaining impact</b>	An impact on biodiversity values after all reasonable measures have been taken to avoid and minimise the impacts of development. Under the BAM, an offset requirement is calculated for the remaining impacts on biodiversity values.
<b>Retirement of credits</b>	The purchase and retirement of biodiversity credits from an already-established biobank site or a biodiversity stewardship site secured by a biodiversity stewardship agreement.
<b>Riparian buffer</b>	Riparian buffers applied to water bodies in accordance with the BAM
<b>Sensitive biodiversity values land map</b>	Development within an area identified on the map requires assessment using the BAM.
<b>Site attributes</b>	The matters assessed to determine vegetation integrity. They include: native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.
<b>Site-based development</b>	a development other than a linear shaped development, or a multiple fragmentation impact development
<b>Species credits</b>	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
<b>Subject land</b>	Is land to which the BAM is applied in Stage 1 to assess the biodiversity values of the land. It includes land that may be a development site, clearing site, proposed for biodiversity certification or land that is proposed for a biodiversity stewardship agreement.
<b>Threatened Biodiversity Data Collection</b>	Part of the BioNet database, published by OEH and accessible from the BioNet website.
<b>Threatened species</b>	Critically Endangered, Endangered or Vulnerable threatened species as defined by Schedule 1 of the BC Act, or any additional threatened species listed under Part 13 of the EPBC Act as Critically Endangered, Endangered or Vulnerable.

Terminology	Definition
<b>Vegetation Benchmarks Database</b>	A database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by OEH and is part of the BioNet Vegetation Classification.
<b>Vegetation zone</b>	A relatively homogenous area of native vegetation on a development site, land to be biodiversity certified or a biodiversity stewardship site that is the same PCT and broad condition state.
<b>Wetland</b>	An area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle. Wetlands may exhibit wet and dry phases and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water
<b>Woody native vegetation</b>	Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs

## Appendix B: Vegetation plot data

**Table 35: Species matrix (species recorded by plot)**

Stratum	Form	Scientific name	Exotic (*)	High Threat Weed (*)	Cover (%)					
					Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6
U	TG	<i>Acacia decurrens</i>			0	0	0	0.2	0	0
M	SG	<i>Acacia implexa</i>			0	0	0	0.5	0	0
G	FG	<i>Alternanthera denticulata</i>			0	0	0	0	0	0.1
G		<i>Lysimachia arvensis.</i>	*		0	0	0.1	0	0.1	0
U	TG	<i>Angophora subvelutina</i>			8	0	0	0	0	0
G		<i>Anredera cordifolia</i>	*	*	0	0	0	0.1	0	0
G		<i>Araujia sericifera</i>	*	*	0	0	0	0.1	0	0.1
G	GG	<i>Aristida</i> spp.			0	0	0.1	0	0	0
G		<i>Bidens pilosa</i> var. <i>pilosa</i>			5	0	0	0	0	10
G		<i>Briza subaristata</i>	*	*	0	0	0	0	0.1	0
G		<i>Capsella bursa-pastoris</i>	*		0.1	0	30	0	0	0
U	TG	<i>Casuarina glauca</i>			20	0	0	0	5	10
G		<i>Cenchrus clandestinus</i>	*	*	0	0	0	50	0	0
G	FG	<i>Centella asiatica</i>			0	0.1	0	0	0	0
G		<i>Cerastium vulgare</i>	*		0	0	0	0	0	1
G		<i>Cestrum parqui</i>	*	*	0	0	0	0.1	0	1
G		<i>Chenopodium album</i>	*		0	0	0	0	0	0.5
G		<i>Chloris gayana</i>	*	*	0	0	0	0.1	0	0
G		<i>Conyza bonariensis</i>	*		1	0	0	0	0.1	2
U	TG	<i>Corymbia intermedia</i>			0	1	0	0	0	0
G		<i>Cotula coronopifolia</i>	*		0	0	0	0	0.2	0
G	GG	<i>Cynodon dactylon</i>			15	0	5	0	2	3
G		<i>Cyperus eragrostis</i>	*	*	0	0	0	0	0	0.5
G		<i>Daucus carota</i>	*		0	0	0	0	0	2
G	FG	<i>Daucus</i> spp.			0	0	0	0	0.1	0
G	FG	<i>Dichondra repens</i>			0	1	0	0	0	5
G	GG	<i>Digitaria parviflora</i>			0	0	0	0	0.1	0
M	SG	<i>Dillwynia retorta</i>			0	0	1	0	0	0
G		<i>Ehrharta erecta</i>	*	*	20	0	0	1	0	25
M	FG	<i>Einadia nutans</i> subsp. <i>nutans</i>			0.1	0	0	0	0	0



Stratum	Form	Scientific name	Exotic (*)	High Threat Weed (*)	Cover (%)					
					Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6
G	FG	<i>Einadia polygonoides</i>			0	0	0	0.3	0	0
G		<i>Eragrostis curvula</i>	*	*	0	0	0	0.2	0	0
U	TG	<i>Eucalyptus amplifolia</i> subsp. <i>amplifolia</i>			0	8	0	0	0	0
U	TG	<i>Eucalyptus tereticornis</i>			0	1	0	0	0	0
G		<i>Foeniculum vulgare</i>	*		0	0	0	1	0	0
G	FG	Forb			0	0	0	0	0.2	0
G	FG	<i>Geranium homeanum</i>			0	0	0	0	0	0.1
G	OG	<i>Glycine tabacina</i>			0	0.5	0	0	0	0
G		<i>Gomphocarpus fruticosus</i>	*		0	0	0	0.1	0	0
G		<i>Juncus acutus</i> subsp. <i>acutus</i>	*	*	0	0	0	0	30	0
G	GG	<i>Lomandra filiformis</i> subsp. <i>filiformis</i>			0	0.1	1	0	0	0
G	GG	<i>Microlaena stipoides</i> var. <i>stipoides</i>			0	0.1	0	0	0	0
G		<i>Modiola caroliniana</i>	*		0.1	0.1	0.1	0	0	0
G		<i>Onopordum</i> spp.	*		0	0	0	0.1	0	0.5
G		<i>Opuntia stricta</i> var. <i>stricta</i>	*	*	0	0.1	0.1	0	0	0
G	FG	<i>Oxalis</i> spp.			0	0.1	0	0	0.1	0
G	GG	<i>Paspalidium distans</i>			0	0.1	0	0	0	0
G		<i>Paspalum dilatatum</i>	*	*	0	0	30	0.1	0	0.5
G	GG	<i>Pennisetum</i> spp.			20	0	0	0	0	0
G	FG	<i>Persicaria decipiens</i>			0	0	0	0	0.1	25
G		<i>Phytolacca octandra</i>	*		0	0.1	0	0	0	0.1
G		<i>Plantago lanceolata</i>	*		0	0.1	0.2	0.1	0.1	0
G	SG	<i>Rubus</i> spp.			0	0	0	3	0	0.1
G		<i>Senecio madagascariensis</i>	*	*	0	0.5	0.1	0	0.1	1
G		<i>Setaria pumila</i>	*		2	0	5	0.2	0.1	0
G		<i>Sida rhombifolia</i>	*		15	10	0	0.2	0.1	0.5
G		<i>Solanum linnaeanum</i>	*		0.1	3	0.1	0.1	0	0
G		<i>Solanum nigrum</i>	*		0.2	0.1	0	0.1	0	0.1
G		<i>Sonchus oleraceus</i>	*		0	0	0.1	0.1	0	0.1
G	GG	<i>Themeda triandra</i>			0	0	30	0	0	0
G		<i>Vicia sativa</i> subsp. <i>nigra</i>	*		0	0	0.2	0.1	0	0

Key: U = Upper, M= Middle, G = Ground. EG = Fern, FG = Forb, GG = Grass & grasslike, OG = Other, SG = Shrub, TG = Tree.

**Table 36: Plot location data**

Plot no.	PCT	Vegetation Zone	Condition	Zone	Easting	Northing	Bearing (°)
1	835	1	Moderate	56	296956	6253275	183
2	835	2	Low-Moderate	56	296308	6252714	84
3	835	2	Low-Moderate	56	296803	6252798	85
4	850	3	Low	56	296539	6252465	72
5	1232	4	Low	56	296866	6253285	8
6	1232	5	Moderate	56	296679	6252962	33

**Table 37: Vegetation integrity data (Composition, Structure and function)**



Composition (number of species)						
Plot no.	Tree	Shrub	Grass	Forb	Fern	Other
1	2	0	2	1	0	0
2	3	0	3	3	0	1
3	0	1	4	0	0	0
4	1	2	0	1	0	0
5	1	0	2	4	0	0
6	1	1	1	4	0	0

Structure (Total cover %)						
Plot no.	Tree	Shrub	Grass	Forb	Fern	Other
1	28.0	0.0	35.0	0.1	0.0	0.0
2	10.0	0.0	0.3	1.2	0.0	0.5
3	0.0	1.0	36.1	0.0	0.0	0.0
4	0.2	3.5	0.0	0.3	0.0	0.0
5	5.0	0.0	2.1	0.5	0.0	0.0
6	10.0	0.1	3.0	30.2	0.0	0.0

Function											
Plot no.	Large Trees (DBH > 50 cm)	Hollow trees	Litter Cover (%)	Length Fallen Logs (m)	Tree Stem 5-9 cm	Tree Stem 10-19 cm	Tree Stem 20-29 cm	Tree Stem 30-49 cm	Tree Stem 50-79 cm	Tree Regen	High Threat Weed Cover (%)
1	2	1	5	50	1	1	1	1	1	0	20.0
2	1	3	39	0	1	1	1	1	0	1	0.6
3	0	0	44	0	0	0	0	0	0	0	30.2

Function											
4	0	0	0	0	0	0	0	0	0	0	51.7
5	0	0	56	0	1	1	1	0	0	0	30.2
6	0	0	27	13	1	1	1	1	0	1	28.1

Note: For stem size classes: 0 = Absence, 1 = Presence.

Plot number	Photo
Plot 1	
2	

Plot number	Photo
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3




4



5





Plot number	Photo
6	 A photograph of a forest plot. The image shows several tall, slender trees with dark trunks and dense foliage. The ground is covered in a thick layer of green and brown vegetation, including grasses and shrubs. A white vertical marker is visible in the foreground, and a white horizontal line runs across the bottom of the image.

## Appendix C: EPBC Act Likelihood of Occurrence

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. Only species listed under the EPBC Act were included in the assessment. Species listed only under the BC Act were assessed as part of determining credit species included in the BAMC. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the site inspection and professional judgement. Some Migratory or Marine species identified from the Commonwealth database search have been excluded from the assessment, due to lack of habitat. The terms for likelihood of occurrence are defined below:

- “known” = the species was or has been observed on the site
- “likely” = a medium to high probability that a species uses the site
- “potential” = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- “unlikely” = a very low to low probability that a species uses the site
- “no” = habitat on site and in the vicinity is unsuitable for the species.

A test of significance was conducted for threatened species that were recorded within the study area or had a higher likelihood of occurring and were not recorded during the site visit. It is noted that some threatened fauna species that are highly mobile, wide ranging and vagrant may use portions of the study area intermittently for foraging. For these fauna species, the habitat present and likely to be impacted is not considered to be important to the threatened species, particularly in relation to the amount of similar habitat remaining in the surrounding landscape. As such, a test of significance in reference to Commonwealth legislation was not considered necessary.

The records column refers to the number of records occurring within 5 km of the study area, as provided by the Atlas of NSW Wildlife (BioNet) and Protected Matters Search Tool database search.

Information provided in the habitat associations’ column has primarily been extracted (and modified) from the Commonwealth Species Profile and Threats Database and the NSW Threatened Species Profiles.

Table 38: Likelihood of occurrence assessment for threatened flora and fauna species

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	BioNet Records within 5 km	Likelihood of occurrence on site	Habitat on site directly or indirectly impacted	Impact assessment required
<b>FLORA</b>							
<i>Acacia bynoeana</i>	Bynoe's Wattle	V	Found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains. Found in heath or dry sclerophyll forest on sandy soils.	0	No – lack of suitable habitat recorded within the development site, species not observed during surveys, no local records.	N/A	No
<i>Acacia pubescens</i>	Downy Wattle	V	<i>Acacia pubescens</i> occurs on the NSW Central Coast in Western Sydney, mainly in the Bankstown-Fairfield-Rookwood area and the Pitt Town area, with outliers occurring at Barden Ridge, Oakdale and Mountain Lagoon. It is associated with Cumberland Plains Woodlands, Shale / Gravel Forest and Shale / Sandstone Transition Forest growing on clay soils, often with ironstone gravel.	7	No – lack of suitable habitat recorded within the development site, species not observed during surveys.	N/A	No
<i>Allocasuarina glareicola</i>	-	E	Primarily restricted to the Richmond (NW Cumberland Plain) district, but with an outlier population found at Voyager Point, Liverpool.	0	No – lack of suitable habitat recorded within the development site, species not observed during surveys, no local records.	N/A	No
<i>Cynanchum elegans</i>	White-flowered Wax Plant	E	Restricted to eastern NSW, from Brunswick Heads on the north coast to Gerroa in the Illawarra region, and as far west as Merriwa in the upper Hunter River valley. Dry rainforest; littoral rainforest; <i>Leptospermum laevigatum</i> - <i>Banksia integrifolia</i> subsp. <i>integrifolia</i> (Coastal	0	No - suitable habitat not recorded within the development site, species not observed during surveys, no local records.	N/A	No

Scientific Name	Common Name		EPBC Act Status	Distribution and Habitat	BioNet Records within 5 km	Likelihood of occurrence on site	Habitat on site directly or indirectly impacted	Impact assessment required
				Tea-tree– Coastal Banksia) coastal scrub; <i>Eucalyptus tereticornis</i> (Forest Red Gum) or <i>Corymbia maculata</i> (Spotted Gum) open forest and woodland; and <i>Melaleuca armillaris</i> (Bracelet Honeymyrtle) scrub.				
<i>Genoplesium baueri</i>	Bauer's Orchid	Midge	E	Has been recorded from locations between Nowra and Pittwater and may occur as far north as Port Stephens. Dry sclerophyll forest and moss gardens over sandstone.	0	No – potential habitat available within development site, however species not observed during survey and no local records present.	Yes	No
<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Small-flower Grevillea		V	Heath and shrubby woodland to open forest on sandy or light clay soils usually over thin shales.	14	No – lack of suitable habitat recorded within the development site, species not observed during surveys.	N/A	No
<i>Haloragis exalata</i> subsp. <i>exalata</i>	Square Raspwort		V	Disjunct distribution in the Central Coast, South Coast and North Western Slopes botanical subdivisions of NSW. Protected and shaded damp situations in riparian habitats.	0	No - suitable habitat not recorded within the development site, species not observed during surveys, no local records.	N/A	No
<i>Isotoma fluviatilis</i> subsp. <i>fluviatilis</i>	-		X	Damp places on the Cumberland Plain, including freshwater wetland, grassland/alluvial woodland, and alluvial woodland/shale plains woodland.	7	No – lack of suitable habitat recorded within the development site, species not observed during surveys.	N/A	No
<i>Persicaria elatior</i>	Tall Knotweed		V	In south-eastern NSW recorded from Mt Dromedary, Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry	0	No - suitable habitat not recorded within the development site, species not observed during surveys, no local records.	N/A	No



Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	BioNet Records within 5 km	Likelihood of occurrence on site	Habitat on site directly or indirectly impacted	Impact assessment required
			Tree and Gibberagee State Forests). Beside streams and lakes, swamp forest or disturbed areas.				
<i>Persoonia hirsuta</i>	Hairy Geebung	E	Scattered distribution around Sydney, from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west. Sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	0	No - suitable habitat not recorded within the development site, species not observed during surveys, no local records.	N/A	No
<i>Persoonia nutans</i>	Nodding Geebung	E	Northern populations: sclerophyll forest and woodland (Agnes Banks Woodland, Castlereagh Scribbly Gum Woodland and Cooks River / Castlereagh Ironbark Forest) on aeolian and alluvial sediments. Southern populations: tertiary alluvium, shale sandstone transition communities and Cooks River / Castlereagh Ironbark Forest.	13	No – lack of suitable habitat recorded within the development site, species not observed during surveys.	N/A	No
<i>Pimelea curviflora</i> - var. <i>curviflora</i>		V	Confined to the coastal area of the Sydney and Illawarra regions between northern Sydney and Maroota in the north-west and Croom Reserve near Albion Park in the south. Woodland, mostly on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes.	0	No - suitable habitat not recorded within the development site, species not observed during surveys, no local records.	N/A	No
<i>Pimelea spicata</i>	Spiked Rice-flower	E	In western Sydney, <i>Pimelea spicata</i> occurs on an undulating topography of well-structured clay soils, derived from Wianamatta shale. It is associated with Cumberland Plains Woodland, in open woodland and grassland often in moist depressions or near creek lines. Has been located	20	No – lack of suitable habitat recorded within the development site, species not observed during surveys.	N/A	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	BioNet Records within 5 km	Likelihood of occurrence on site	Habitat on site directly or indirectly impacted	Impact assessment required
			in disturbed areas that would have previously supported.				
<i>Pomaderris brunnea</i>	Brown Pomaderris	V	Moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	0	No - suitable habitat not recorded within the development site, species not observed during surveys, no local records.	N/A	No
<i>Pterostylis gibbosa</i>	Illawarra Greenhood	E	Known from a small number of populations in the Hunter region (Milbrodale), the Illawarra region (Albion Park and Yallah) and the Shoalhaven region (near Nowra). Open forest or woodland, on flat or gently sloping land with poor drainage.	0	No - suitable habitat not recorded within the development site, species not observed during surveys, no local records.	N/A	No
<i>Pterostylis saxicola</i>	Sydney Plains Greenhood	E	Restricted to western Sydney between Freemans Reach in the north and Picton in the south. Small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines, adjacent to sclerophyll forest or woodland on shale/sandstone transition soils or shale soils.	0	No – potential habitat recorded within the development site, however species not observed during surveys and no local records.	N/A	No
<i>Pultenaea parviflora</i>	-	V	Dry sclerophyll forest, especially Castlereagh Ironbark Forest, Shale Gravel Transition Forest and transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland.	97	No – lack of suitable habitat recorded within the development site, species not observed during surveys.	N/A	No
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	V	Only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. Subtropical and littoral rainforest on gravels, sands, silts and clays.	0	No - suitable habitat (rainforest) not recorded within the development site, species not observed during surveys, no local records.	N/A	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	BioNet Records within 5 km	Likelihood of occurrence on site	Habitat on site directly or indirectly impacted	Impact assessment required
<i>Thesium australe</i>	Austral Toadflax	V	In eastern NSW it is found in very small populations scattered along the coast, and from the Northern to Southern Tablelands. Grassland on coastal headlands or grassland and grassy woodland away from the coast.	0	No - suitable habitat not recorded within the development site, species not observed during surveys, no local records.	N/A	No
<i>Thesium australe</i>	Austral Toadflax	V	This species occupies a narrow coastal area between Bulahdelah and Conjola State Forests in NSW. On the Central Coast, it occurs on Quaternary gravels, sands, silts and clays, in riparian gallery rainforests and remnant littoral rainforest communities. In the Ourimbah Creek valley, <i>S. paniculatum</i> occurs within gallery rainforest with <i>Alphitonia excelsa</i> , <i>Acmena smithii</i> , <i>Cryptocarya glaucescens</i> , <i>Toona ciliata</i> , <i>Syzygium oleosum</i> with emergent <i>Eucalyptus saligna</i> . At Wyrribalong NP, <i>S. paniculatum</i> occurs in littoral rainforest as a co-dominant with <i>Ficus fraseri</i> , <i>Syzygium oleosum</i> , <i>Acmena smithii</i> , <i>Cassine australe</i> , and <i>Endiandra sieberi</i> .	0	No - suitable habitat not recorded within the development site, species not observed during surveys, no local records.	N/A	No

## FAUNA

### Amphibians

<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	South eastern NSW and Victoria, in two distinct populations: a northern population in the sandstone geology of the Sydney Basin as far south as Ulladulla, and a southern population occurring from north of Narooma through to Walhalla, Victoria. Heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based.	0	No – suitable habitat not present within the development site, no local records.	N/A	No
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Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	BioNet Records within 5 km	Likelihood of occurrence on site	Habitat on site directly or indirectly impacted	Impact assessment required
<i>Litoria aurea</i>	Green and Golden Bell Frog	V	Since 1990, recorded from about 50 scattered sites within its former range in NSW, from the north coast near Brunswick Heads, south along the coast to Victoria. Records exist west to Bathurst, Tumut and the ACT region. Marshes, dams and stream-sides, particularly those containing <i>Typha</i> sp. (bullrushes) or <i>Eleocharis</i> sp. (spikerushes). Some populations occur in highly disturbed areas.	1	Potential, farm dams may provide potential habitat for this species.	Yes	Yes
<i>Litoria raniformis</i>	Growling Grass Frog	V	Permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. Also found in irrigated rice crops.	0	No – suitable habitat not present within the development site, no local records.	N/A	No
<b>Aves</b>							
<i>Actitis hypoleucos</i>	Common Sandpiper	M	Summer migrant. In NSW, widespread along coastline and also occurs in many areas inland. Coastal wetlands and some inland wetlands, especially muddy margins or rocky shores. Also estuaries and deltas, lakes, pools, billabongs, reservoirs, dams and claypans, mangroves.	0	Unlikely – potential habitat present within the development site, no local records	Yes	No
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	Inland slopes of south-east Australia, and less frequently in coastal areas. In NSW, most records are from the North-West Plains, North-West and South-West Slopes, Northern Tablelands, Central Tablelands and Southern Tablelands regions; also recorded in the Central Coast and Hunter Valley regions. Eucalypt woodland and open forest, wooded farmland	2	Likely – suitable foraging habitat detected within the development site. Development site not within DPIE mapped areas (as accessed on BOAMS on 6 July 2020).	Yes (foraging only)	Yes

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	BioNet Records within 5 km	Likelihood of occurrence on site	Habitat on site directly or indirectly impacted	Impact assessment required
			and urban areas with mature eucalypts, and riparian forests of <i>Casuarina cunninghamiana</i> (River Oak).				
<i>Apus pacificus</i>	Fork-tailed Swift	M	Recorded in all regions of NSW. Riparian woodland, swamps, low scrub, heathland, saltmarsh, grassland, Spinifex sandplains, open farmland and inland and coastal sand-dunes.	1	Unlikely – suitable habitat not present within the development site.	N/A	No
<i>Apus pacificus</i>	Fork-tailed Swift	C, J, K	Sometimes travels with Needletails. Varied habitat with a possible tendency to more arid areas but also over coasts and urban areas.	2	Unlikely – suitable habitat not present within the development site.	N/A	No
<i>Ardea ibis</i>	Cattle Egret	Mar	Grasslands, wooded lands and terrestrial wetlands.	29	Potential – suitable habitat present within the development site.	Yes	No – not required of Marine listed species
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	Found over most of NSW except for the far north-west. Permanent freshwater wetlands with tall, dense vegetation, particularly <i>Typha</i> sp. (bullrushes) and <i>Eleocharis</i> sp. (spikerushes).	0	Unlikely – suitable habitat not present within the development site, no local records.	N/A	No
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	M	Summer migrant. Widespread in most regions of NSW, especially in coastal areas, but sparse in the south-central Western Plain and east Lower Western Regions. Shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	1	Unlikely – suitable habitat not present within the development site.	N/A	No
<i>Calidris ferruginea</i>	Curlew Sandpiper	CE, M	Occurs along the entire coast of NSW, and sometimes in freshwater wetlands in the Murray-Darling Basin. Littoral and estuarine habitats, including intertidal mudflats, non-tidal	0	Unlikely – suitable habitat not present within the development site, no local records.	N/A	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	BioNet Records within 5 km	Likelihood of occurrence on site	Habitat on site directly or indirectly impacted	Impact assessment required
			swamps, lakes and lagoons on the coast and sometimes inland. Littoral and estuarine habitats, including intertidal mudflats, non-tidal swamps, lakes and lagoons on the coast and sometimes inland.				
<i>Calidris melanotos</i>	Pectoral Sandpiper	M	Summer migrant to Australia. Widespread but scattered in NSW. East of the Great Divide, recorded from Casino and Ballina, south to Ulladulla. West of the Great Divide, widespread in the Riverina and Lower Western regions. Shallow fresh to saline wetlands, including coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	0	Unlikely – suitable habitat not present within the development site, no local records.	N/A	No
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	E	Central and southern populations inhabit heath and open woodland with a heathy understorey. In northern NSW, habitat comprises open forest with dense tussocky grass understorey.	0	Unlikely – suitable habitat not present within the development site, no local records.	N/A	No
<i>Gallinago hardwickii</i>	Latham's Snipe	C, J, K	A variety of permanent and ephemeral wetlands, preferring open freshwater wetlands with nearby cover. Occupies a variety of vegetation around wetlands including wetland grasses and open wooded swamps. Can occur in habitats that have saline or brackish water, such as saltmarsh, mangrove creeks, around bays and beaches, and at tidal rivers. They are regularly recorded in or around modified or artificial habitats including pasture, ploughed paddocks, irrigation channels and drainage ditches and sewage and dairy farms. They can also occur in	4	Likely – suitable habitat present within the development site.	Yes	yes

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	BioNet Records within 5 km	Likelihood of occurrence on site	Habitat on site directly or indirectly impacted	Impact assessment required
			various sites close to humans or human activity (e.g. near roads, railways, airfields, commercial or industrial complexes).				
<i>Grantiella picta</i>	Painted Honeyeater	V	Widely distributed in NSW, predominantly on the inland side of the Great Dividing Range but avoiding arid areas. Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	0	No – suitable habitat not present within the development site, no local records.	N/A	No
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	C	Freshwater swamps, rivers, lakes, reservoirs, billabongs, saltmarsh and sewage ponds and coastal waters. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest and urban areas.	6	Unlikely – suitable habitat not present within the development site.	N/A	No
<i>Hirundapus caudacutus</i>	White-throated Needletail	C, J, K	All coastal regions of NSW, inland to the western slopes and inland plains of the Great Divide. Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	0	Unlikely – potential habitat present within the development site, no local records	Yes	No
<i>Lathamus discolor</i>	Swift Parrot	CE	Migrates from Tasmania to mainland in Autumn-Winter. In NSW, the species mostly occurs on the coast and south west slopes. Box-ironbark forests and woodlands.	0	Likely – suitable foraging habitat detected within the development site. Development site not within DPIE mapped breeding areas (as confirmed by the DPIE BAM support 23 July 2020).	Yes (foraging only)	Yes
<i>Monarcha melanopsis</i>	Black-faced Monarch	M	In NSW, occurs around the eastern slopes and tablelands of the Great Divide, inland to Coutts Crossing, Armidale, Widden Valley, Wollemi National Park and Wombeyan Caves. It is rarely recorded farther inland. Rainforest, open	0	Unlikely – potential habitat present within the development site, no local records	Yes	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	BioNet Records within 5 km	Likelihood of occurrence on site	Habitat on site directly or indirectly impacted	Impact assessment required
			eucalypt forests, dry sclerophyll forests and woodlands, gullies in mountain areas or coastal foothills, Brigalow scrub, coastal scrub, mangroves, parks and gardens.				
<i>Motacilla flava</i>	Yellow Wagtail	M	Regular summer migrant to mostly coastal Australia. In NSW recorded Sydney to Newcastle, the Hawkesbury and inland in the Bogan LGA. Swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land, lawns.	0	Unlikely – potential habitat present within the development site, no local records	Yes	No
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	M	In NSW, widespread on and east of the Great Divide and sparsely scattered on the western slopes, with very occasional records on the western plains. Eucalypt-dominated forests, especially near wetlands, watercourses, and heavily-vegetated gullies.	0	Unlikely – potential habitat present within the development site, no local records	Yes	No
<i>Numenius madagascariensis</i>	Eastern Curlew	CE, M	Summer migrant to Australia. Primarily coastal distribution in NSW, with some scattered inland records. Estuaries, bays, harbours, inlets and coastal lagoons, intertidal mudflats or sandflats, ocean beaches, coral reefs, rock platforms, saltmarsh, mangroves, freshwater/brackish lakes, saltworks and sewage farms.	0	Unlikely – potential habitat present within the development site, no local records	Yes	No
<i>Rostratula australis</i>	Australian Painted Snipe	E	In NSW most records are from the Murray-Darling Basin. Other recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys.	1	Unlikely -limited habitat present within the development site, limited local records	Yes	No
<i>Rhipidura rufifrons</i>	Rufous Fantail	M	Wet sclerophyll forests, subtropical and temperate rainforests. Sometimes drier sclerophyll forests and woodlands.	0	Unlikely – suitable habitat not present within the development site, no local records.	N/A	No



Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	BioNet Records within 5 km	Likelihood of occurrence on site	Habitat on site directly or indirectly impacted	Impact assessment required
<i>Tringa nebularia</i>	Common Greenshank	M	Summer migrant to Australia. Recorded in most coastal regions of NSW; also widespread west of the Great Dividing Range. Found in terrestrial wetlands and sheltered coastal habitats.	0	Unlikely – suitable habitat not present within the development site, no local records.	N/A	No
<b>Insects</b>							
<i>Synemon plana</i>	Golden Sun Moth	CE	NSW populations are found in the area between Queanbeyan, Gunning, Young and Tumut. Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by <i>Austrodanthonia</i> spp. (wallaby grasses).	0	Unlikely – suitable habitat not present within the development site, no local records.	N/A	No
<b>Mammals</b>							
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	Recorded from Rockhampton in Qld south to Ulladulla in NSW. Largest concentrations of populations occur in the sandstone escarpments of the Sydney basin and the NSW north-west slopes. Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.	0	Unlikely – suitable habitat not present within the development site, no local records.	N/A	No
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Qld. Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	0	Unlikely – suitable habitat not present within the development site, no local records.	N/A	No
<i>Petauroides volans</i>	Greater Glider	V	Eastern Australia, from the Windsor Tableland in north Queensland through to central Victoria (Wombat State Forest). Eucalypt forests and woodlands. It is typically found in highest	0	No – preferred habitat not present within the development site, no local records.	N/A	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	BioNet Records within 5 km	Likelihood of occurrence on site	Habitat on site directly or indirectly impacted	Impact assessment required
			abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.				
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	V	In NSW they occur from the Qld border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges.	0	No – preferred habitat not present within the development site, no local records.	N/A	No
<i>Phascolarctos cinereus</i>	Koala	V	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. There are sparse and possibly disjunct populations in the Bega District, and at several sites on the southern tablelands. Eucalypt woodlands and forests.	3	Unlikely – potential habitat & feed trees present within the development site, but site is within largely cleared & disturbed rural/ semi industrial area	Yes (foraging only)	Yes
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	V	Fragmented distribution across eastern NSW. Open heathlands, woodlands and forests with a heathland understorey, vegetated sand dunes.	0	Unlikely – suitable habitat not present within the development site, no local records.	N/A	No
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	Along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria. Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	31	Seasonal foraging habitat available within the site. No camps observed within study area.	Yes (foraging only)	Yes

## Appendix D: Biodiversity credit report



## BAM Biodiversity Credit Report (Like for like)

### Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00021253/BAAS18077/20/00021831	200 Aldington Road Kemps Creek	24/11/2021
Assessor Name	Assessor Number	BAM Data version *
Nicole McVicar	BAAS18077	50
Proponent Names	Report Created	BAM Case Status
David Pintos-Oliver	25/11/2021	Finalised
Assessment Revision	Assessment Type	Date Finalised
2	Part 4 Developments (General)	25/11/2021
BOS entry trigger	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	

### Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Cumberland Plain Woodland in the Sydney Basin Bioregion	Critically Endangered Ecological Community	850-Cumberland shale hills woodland
Species		
Nil		

### Additional Information for Approval

Assessment Id	Proposal Name	Page 1 of 6
00021253/BAAS18077/20/00021831	200 Aldington Road Kemps Creek	



## BAM Biodiversity Credit Report (Like for like)

### PCTs With Customized Benchmarks

PCT

No Changes

### Predicted Threatened Species Not On Site

Name

**Dasyurus maculatus** / Spotted-tailed Quoll

**Haliaeetus leucogaster** / White-bellied Sea-Eagle

**Pandion cristatus** / Eastern Osprey

**Chthonicola sagittata** / Speckled Warbler

### Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
835-Cumberland riverflat forest	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	1.3	16	0	16
850-Cumberland shale hills woodland	Cumberland Plain Woodland in the Sydney Basin Bioregion	0.1	0	0	0
1232-Coastal freshwater swamp forest	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	1.3	0	7	7

Assessment Id

00021253/BAAS18077/20/00021831

Proposal Name

200 Aldington Road Kemps Creek

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## BAM Biodiversity Credit Report (Like for like)

<b>835-Cumberland riverflat forest</b>	<b>Like-for-like credit retirement options</b>					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 686, 828, 835, 941, 1108, 1109, 1212, 1228, 1293, 1318, 1326, 1386, 1504, 1556, 1594, 1618, 1720, 1794	-	835_Moderate	Yes	4	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

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Proposal Name

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## BAM Biodiversity Credit Report (Like for like)

	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 686, 828, 835, 941, 1108, 1109, 1212, 1228, 1293, 1318, 1326, 1386, 1504, 1556, 1594, 1618, 1720, 1794	-	835_Low_mod	Yes	12	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
850-Cumberland shale hills woodland	<b>Like-for-like credit retirement options</b>					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Cumberland Plain Woodland in the Sydney Basin Bioregion This includes PCT's: 849, 850	-	850_Low	No	0	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Assessment Id

00021253/BAAS18077/20/00021831

Proposal Name

200 Aldington Road Kemps Creek

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## BAM Biodiversity Credit Report (Like for like)

1232-Coastal freshwater swamp forest	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 915, 916, 917, 918, 919, 1125, 1230, 1232, 1234, 1235, 1236, 1726, 1727, 1728, 1729, 1731, 1800, 1808	-	1232_Low	No	0	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 915, 916, 917, 918, 919, 1125, 1230, 1232, 1234, 1235, 1236, 1726, 1727, 1728, 1729, 1731, 1800, 1808	-	1232_Moderate	No	7	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Assessment Id

00021253/BAAS18077/20/00021831

Proposal Name

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## BAM Biodiversity Credit Report (Like for like)

1232-Coastal freshwater  
swamp forest

### Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
<b>Myotis macropus</b> / Southern Myotis	<b>835_Moderate, 835_Low_mod, 850_Low, 1232_Low, 1232_Moderate</b>	2.7	27.00

### Credit Retirement Options

Like-for-like credit retirement options

<b>Myotis macropus</b> / Southern Myotis	Spp	IBRA subregion
	<b>Myotis macropus</b> / Southern Myotis	Any in NSW

Assessment Id

00021253/BAAS18077/20/00021831

Proposal Name

200 Aldington Road Kemps Creek

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Attachment E

# Riparian Assessment

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A stylized topographic map with green contour lines is positioned on the left side of the page, extending from the top left towards the bottom left.

## 200 Aldington Road Industrial Estate - Riparian Assessment

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**Fife Kemps Creek Trust**

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## DOCUMENT TRACKING

<b>Project Name</b>	200 Aldington Road Kemps Creek Riparian Assessment
<b>Project Number</b>	20SYD-16452
<b>Project Manager</b>	David Bonjer
<b>Prepared by</b>	Claire Wheeler and David Bonjer
<b>Reviewed by</b>	Peter Hancock
<b>Approved by</b>	David Bonjer
<b>Status</b>	Final
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<b>Last saved on</b>	20 April 2022

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Template 2.8.1

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## Abbreviations

Abbreviation	Description
CBD	Central Business District
CEMP	Construction Environmental Management Plan
ELA	Eco Logical Australia Pty Ltd
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
FM Act	<i>Fisheries Management Act 1994</i>
GFA	Gross Floor Area
Hawkesbury Nepean SREP	<i>Sydney Regional Environmental Plan No. 20 – Hawkesbury Nepean River</i>
NRAR	Natural Resources Access Regulator
Penrith LEP	<i>Penrith Local Environmental Plan 2010</i>
RC	Riparian corridor
SEARs	Secretary's Environmental Assessment Requirements
SEPP WSEA	<i>State Environmental Planning Policy (Western Sydney Employment Area) 2009</i>
SSDA	State Significant Development Application
ToB	Top of Bank
VMP	Vegetation Management Plan
VRZ	Vegetated Riparian Zone
WM Act	<i>Water Management Act 2000</i>



## Executive Summary

This Riparian Assessment is required to support a State Significant Development Application (SSDA) for Aldington Road Industrial Estate, located at 106-228 Aldington Road, Kemps Creek. This report determines potential impacts on the riparian and aquatic ecology from the proposed development and makes recommendations to mitigate those impacts.

This Riparian Assessment has been prepared to assess the development's impact on the mapped watercourses and riparian corridors on site, as per the Secretary's Environmental Assessment Requirements (SEARs) issued in July 2020 which require *'an assessment of the development's impacts on the riparian corridor and wetland on site, including detailed interface management measures'*.

Two mapped watercourses are located in the development area. The site survey identified that the 1<sup>st</sup> order watercourse at the south of the site did not meet the definition of a 'river' under the *Water Management Act 2000* (WM Act). The 1<sup>st</sup> order watercourse in the north east of the site was likely to meet the definition of a 'river' under the WM Act due to the defined nature of the watercourse upstream of the study area, however the flow path does not follow that of the mapped hydroline.

There were 11 farm dams identified within and adjacent to the study area. Most of these had limited aquatic habitat and eight are to be removed as part of the proposed development. The dam in the northern-most section of the site had moderate levels of aquatic habitat and was representative of a wetland environment. This dam will be retained after development, and the surrounding vegetation managed to maintain habitat values.

# 1. Introduction

## 1.1 Background / context

This Riparian Assessment forms a Request for Additional Information for the proposed Concept State Significant Development Application for a new industrial estate on land at 106 – 228 Aldington Road, Kemps Creek.

The EIS for the project was placed on public exhibition between 18 November 2020 and 15 December 2020. During this period, a total of 18 submissions were received. These submissions were addressed and subsequent amendments to the project were made, as outlined in the Response to Submissions Report (dated 23 March 2021) prepared by Ethos Urban.

In written correspondence dated 28 April 2021, it was requested that FKC provide a further response to additional commentary raised by DPE, as well as additional comments raised by public authorities in their review of the first Response to Submissions Report. This was responded to via a second a Response to Submissions Report outlined by Ethos Urban (dated 22 September 2021).

Additional correspondence was received from DPE dated 15 November 2021 which has necessitated updates and additional information, as contained within this report.

## 1.2 Summary of the project for which development consent is now sought

Consent is sought for the following development. It represents minor amendments and does not represent a significant material change to what was previously proposed under the second RTS Report (22 September 2021).

- A concept masterplan with an indicative total building area of 342,865 sqm, comprising:
  - 325,865 sqm of warehouse gross floor area (GFA);
  - 17,010 sqm of ancillary office GFA;
  - 13 individual development lots for warehouse buildings with associated hardstand areas and two lots for water management infrastructure purposes (each including a bio-retention basin);
  - Roads, including:
    - Internal road layouts;
    - Southern road connection to Aldington Road;
    - Northern boundary road (half road corridor) connecting to Aldington Road;
    - Road connections to adjoining landholdings to the north and east;
  - Provision for 1,517 car parking spaces; and
  - Associated concept site landscaping.
- Detailed consent for progressive delivery of site preparation, earthworks and infrastructure works (i.e., Stage 1 works) on the site, including:
  - Demolition and clearing of all existing built form structures;
  - Drainage and infill of existing farm dams and any ground dewatering;

- Clearing of existing vegetation;
- Subdivision of the site into 15 individual lots;
- Construction of a warehouse building with a total of 50,300 sqm of GFA, including:
  - 47,800 sqm of warehouse GFA;
  - 2,500 sqm of ancillary office GFA; and
  - 222 car parking spaces.
- Bulk earthworks including 'cut and fill' to create level development platforms for the warehouse buildings, and site stabilisation works (if required);
- Roadworks and access infrastructure, including an interim access road and a temporary junction with Aldington Road;
- Stormwater works including stormwater basins, diversion of stormwater;
- Utilities services including sewer and potable water reticulation
- Road and boundary retaining walls.



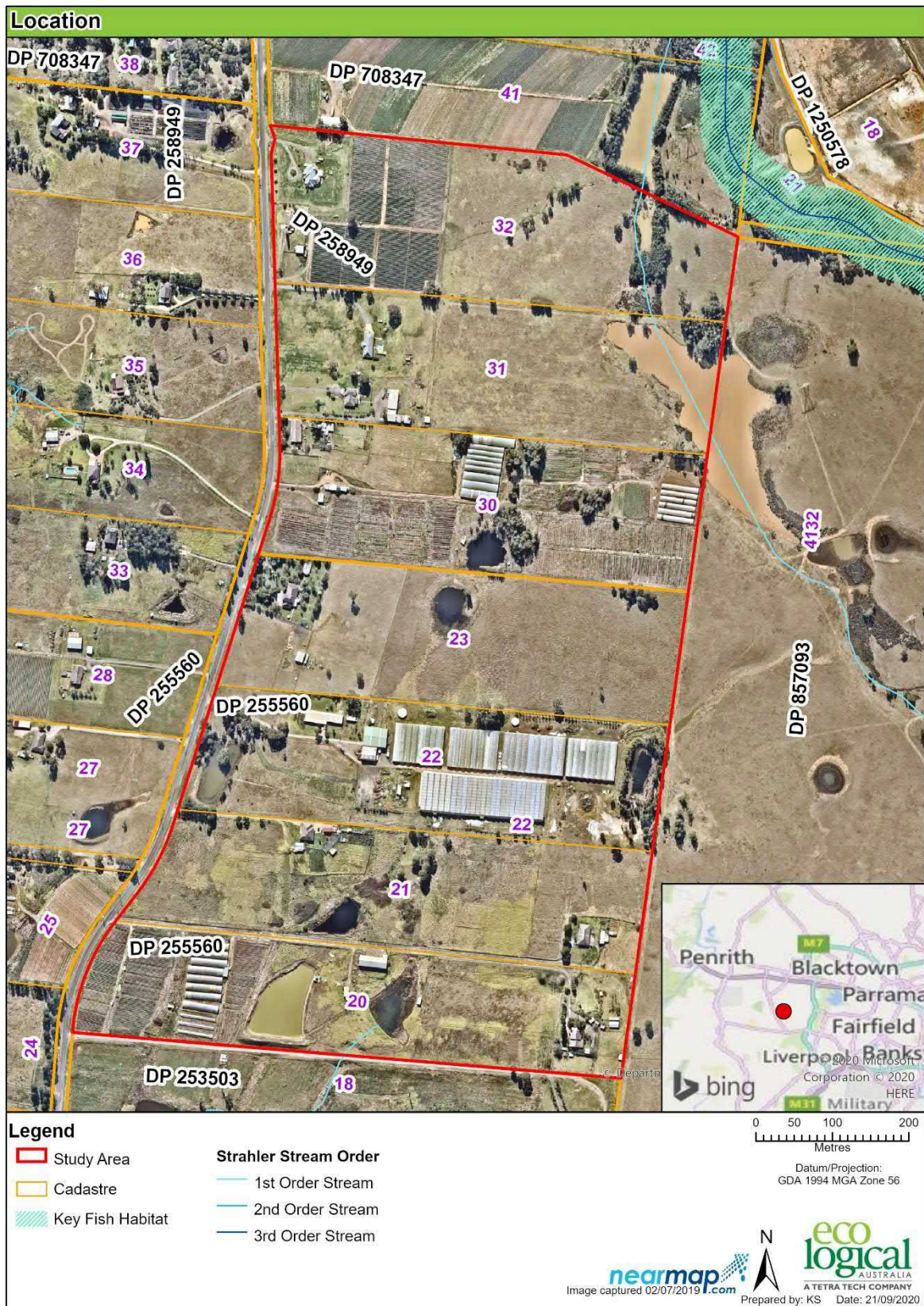


Figure 1: Location map with hydroline and Strahler stream order

## 2. Legislative Context

The specific riparian and aquatic regulatory requirements and policies were reviewed to determine their application to the proposed development.

- *Fisheries Management Act 1994*
- Policy and Guidelines for Fish Habitat Conservation and Management (2013 update) (Fairfull, 2013)
- NSW *Water Management Act 2000* (WM Act) and Guidelines for controlled activities on waterfront land – Riparian corridors (NRAR, 2018)
- *Water Management Act 2000*
- *Water Management (General) Regulation 2018*
- *State Environmental Planning Policy (Western Sydney Employment Area) 2009*.

### 2.1 Fisheries Management Act 1994

The *Fisheries Management Act 1994* (FM Act) governs the management of fish and their habitat in NSW. The FM Act applies to waterways defined as ‘key fish habitat’ and threatened fish species, and therefore requires a separate assessment from the NSW *Biodiversity Conservation Act 2016* (BC Act). The objectives of the FM Act are to conserve fish stocks and key fish habitats, conserve threatened species, populations and ecological communities of fish and marine vegetation and to promote ecologically sustainable development. The FM Act also regulates activities involving dredging and / or reclamation of aquatic habitats, obstruction of fish passage, harming marine vegetation and use of explosives within a waterway.

In accordance with Part 4, Division 1.7, Section 4.41 (b) of the EP&A Act, applications for separate permits under Sections 201, 205 or 219 of the FM Act are not required for SSD, but the offset policy relating to loss of key fish habitat still applies under the FM Act. In order to inform a comparative and acceptable assessment of impacts to aquatic habitat, the regulatory framework of the FM Act and associated guidelines have been adopted for this assessment.

### 2.2 Policy and guidelines for fish habitat conservation and management

The Policy and guidelines for fish habitat conservation and management (Fairfull, 2013) (herein referred to as the ‘Policy’) is a supplementary document that outlines the requirements and obligations under the FM Act and the *Fisheries Management (General) Regulation 2010* and was developed to maintain and enhance fish habitat and assist in the protection of threatened species. The Policy provides a definition of key fish habitat (KFH) and guidance for assigning a classification of waterways for fish passage (Table 1). It also guides sensitivity ratings of the KFH types present, which determines the potential disturbance and offsetting required for development (Table 2) and informs the types of crossing infrastructure suitable for the creek line (Table 3).

The Policy classifies waterways into three types of key fish habitat. While the tributary of Ropes Creek within the SSD area is likely to be considered a Type 3 KFH habitat using the descriptions outlined in Table 3, the guidelines note that 1<sup>st</sup> and 2<sup>nd</sup> order streams on gaining streams are not considered key



fish habitat unless they are known habitat for threatened aquatic species. The main drainage line of Ropes Creek, approximately 270 m downstream of the site, is mapped as key fish habitat.

**Table 1: Key Fish Habitat and associated sensitivity classification scheme (Fairfull, 2013)**

Key fish habitat and associated sensitivity classification scheme (for assessing potential impacts of certain activities and developments on key fish habitat types)	
TYPE 1 – Highly sensitive key fish habitat:	TYPE 2 – Moderately sensitive key fish habitat:
<i>Posidonia australis</i> (strapweed)	<i>Zostera</i> , <i>Heterozostera</i> , <i>Halophila</i> and <i>Ruppia</i> species of seagrass beds <5 m <sup>2</sup> in area
<i>Zostera</i> , <i>Heterozostera</i> , <i>Halophila</i> and <i>Ruppia</i> species of seagrass beds >5 m <sup>2</sup> in area	Mangroves
Coastal saltmarsh >5 m <sup>2</sup> in area	Coastal saltmarsh <5 m <sup>2</sup> in area
Coral communities	Marine macroalgae such as <i>Ecklonia</i> and <i>Sargassum</i> species
Coastal lakes and lagoons that have a natural opening and closing regime (i.e. are not permanently open or artificially opened or are subject to one off unauthorised openings)	Estuarine and marine rocky reefs
Marine park, an aquatic reserve or intertidal protected area	Coastal lakes and lagoons that are permanently open or subject to artificial opening via agreed management arrangements (e.g. managed in line with an entrance management program)
SEPP 14 coastal wetlands, wetlands recognised under international agreements (e.g. Ramsar, JAMBA, CAMBA, ROKAMBA wetlands), wetlands listed in the Directory of Important Wetlands of Australia	Aquatic habitat within 100 m of a marine park, an aquatic reserve or intertidal protected area
Freshwater habitats that contain in-stream gravel beds, rocks greater than 500 mm in two dimensions, snags greater than 300 mm in diameter or 3 metres in length, or native aquatic plants	Stable intertidal sand/mud flats, coastal and estuarine sandy beaches with large populations of in-fauna
Any known or expected protected or threatened species habitat or area of declared 'critical habitat' under the FM Act	Freshwater habitats and brackish wetlands, lakes and lagoons other than those defined in TYPE 1
Mound springs	Weir pools and dams up to full supply level where the weir or dam is across a natural waterway
	<b>TYPE 3 – Minimally sensitive key fish habitat may include:</b>
	Unstable or unvegetated sand or mud substrate, coastal and estuarine sandy beaches with minimal or no in-fauna
	Coastal and freshwater habitats not included in TYPES 1 or 2
	Ephemeral aquatic habitat not supporting native aquatic or wetland vegetation

Table 2 Classifications and characteristics of waterway class

Classification	Characteristics of waterway class
<b>CLASS 1</b> <b>Major key fish habitat</b>	Marine or estuarine waterway or permanently flowing or flooded freshwater waterway (e.g. river or major creek), habitat of a threatened or protected fish species or 'critical habitat'.
<b>CLASS 2</b> <b>Moderate key fish habitat</b>	Non-permanently flowing (intermittent) stream, creek or waterway (generally named) with clearly defined bed and banks with semi-permanent to permanent waters in pool or in connected wetland areas. Freshwater aquatic vegetation is present. TYPE 1 and 2 habitats present.
<b>CLASS 3</b> <b>Minimal key fish habitat</b>	Named or unnamed waterway with intermittent flow and sporadic refuge, breeding or feeding areas for aquatic fauna (e.g. fish, yabbies). Semi-permanent pools form within the waterway or adjacent wetlands after a rain event. Otherwise, any minor waterway that interconnects with wetlands or other CLASS 1-3 fish habitats.
<b>CLASS 4</b> <b>Unlikely key fish habitat</b>	Waterway (generally unnamed) with intermittent flow following rain events only, little or no defined drainage channel, little or no flow or free-standing water or pools post rain events (e.g. dry gullies or shallow floodplain depressions with no aquatic flora present).

Table 3: Watercourse crossings (Fairfull, 2013).

Preferred waterway crossing type in relation to waterway class				
Waterway classification	Minimum Type	Recommended Crossing	Additional Design Information	
<b>CLASS 1</b> <b>Major key fish habitat</b>	Bridge, arch structure or tunnel		Bridges are preferred to arch structures.	
<b>CLASS 2</b> <b>Moderate key fish habitat</b>	Bridge, arch structure, culvert <sup>1</sup> or ford		Bridges are preferred to arch structures, box culverts and fords (in that order).	
<b>CLASS 3</b> <b>Minimal key fish habitat</b>	Culvert <sup>2</sup> or ford		Box culverts are preferred to fords and pipe culverts (in that order).	
<b>CLASS 4</b> <b>Unlikely key fish habitat</b>	Culvert <sup>3</sup> , causeway or ford		Culverts and fords are preferred to causeways (in that order).	

<sup>1</sup> High priority given to the 'High Flow Design' procedures presented for the design of these culverts—refer to the "Design Considerations" section of Fairfull and Witheridge (2003).

<sup>2</sup> Minimum culvert design using the 'Low Flow Design' procedures; however, 'High Flow Design' and 'Medium Flow Design' should be given priority where affordable—refer to the "Design Considerations" section of Fairfull and Witheridge (2003).

<sup>3</sup> Fish friendly waterway crossing designs possibly unwarranted. Fish passage requirements should be confirmed with NSW DPI.

## 2.3 Water Management Act 2000

The main objective of the WM Act is to manage NSW water in a sustainable and integrated manner that will benefit current generations without compromising future generations' ability to meet their needs. The WM Act is administered by the Natural Resources Access Regulator (NRAR) and establishes an approval regime for activities within waterfront land, defined as the land 40 m from the highest bank of a river, lake or estuary.

The WM Act defines a river as:

- a. *any watercourse, whether perennial or intermittent and whether comprising a natural channel or a natural channel artificially improved, and*
- b. *any tributary, branch or other watercourse into or from which a watercourse referred to in paragraph (a) flows, and*
- c. *anything declared by the regulations to be a river.*

For the purposes of paragraph (c) of the definition of 'river' in the Dictionary to the Act, the following are declared to be a river as per the *Water Management (General) Regulation 2018* (WM Regulation):

*any watercourse, whether perennial or intermittent, comprising an artificial channel that has changed the course of the watercourse, any tributary, branch or other watercourse into or from which a watercourse referred to in paragraph (a) flows.*

In accordance with Part 4, Division 1.7, Section 4.41 (g) of the EP&A Act, a water use approval under Section 89, a water management work approval under Section 90 or an activity approval (other than an aquifer interference approval) under Section 91 of the WM Act is not required for SSD.

However, in order to inform a comparative and acceptable assessment of riparian impacts, the regulatory framework of the WM Act and associated guidelines have been adopted for this assessment.

NRAR's *Guidelines for Controlled Activities on waterfront land—Riparian corridors* (NRAR, 2018) outline 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 2). NRAR recommends a VRZ width based on watercourse order as classified under the Strahler System of ordering watercourses and using Hydroline Spatial Data which is published on the department's website (Table 4).



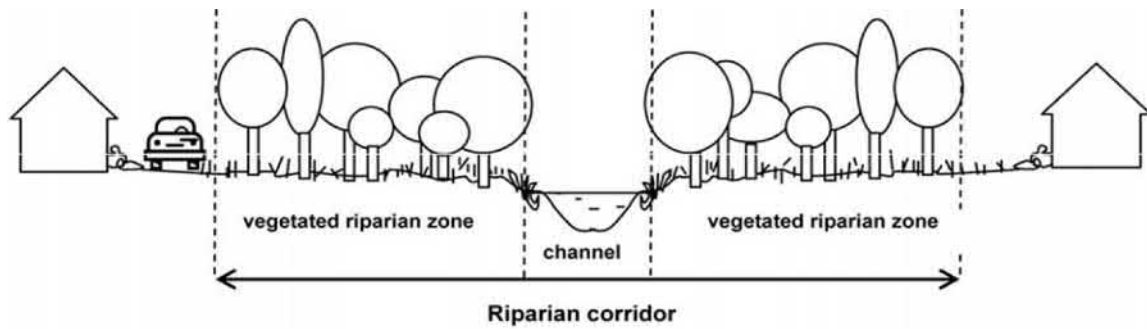


Figure 2: Vegetated Riparian Zone and watercourse channel comprising the riparian corridor (NRAR, 2018).

Table 4: Recommended riparian corridor widths relative to Strahler Order (NRAR 2018)

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 (Table 5). Non-riparian uses are consistent with NRAR's guidelines in the outer 50% of the VRZ as long as compensation (1:1 offset) is achieved within the site. The outer VRZ that is impacted must be offset elsewhere on site using the 'averaging rule' (Figure 3).

Table 5: Riparian corridor (RC) matrix of permissible use (NRAR 2018)

Stream order	Vegetated Riparian Zone (VRZ)	RC off-setting 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>	10m	•	•	•	•	•	•	•		
2 <sup>nd</sup>	20m	•	•	•	•	•		•		
3 <sup>rd</sup>	30m	•	•	•		•			•	•
4 <sup>th</sup> +	40m	•	•	•		•			•	•

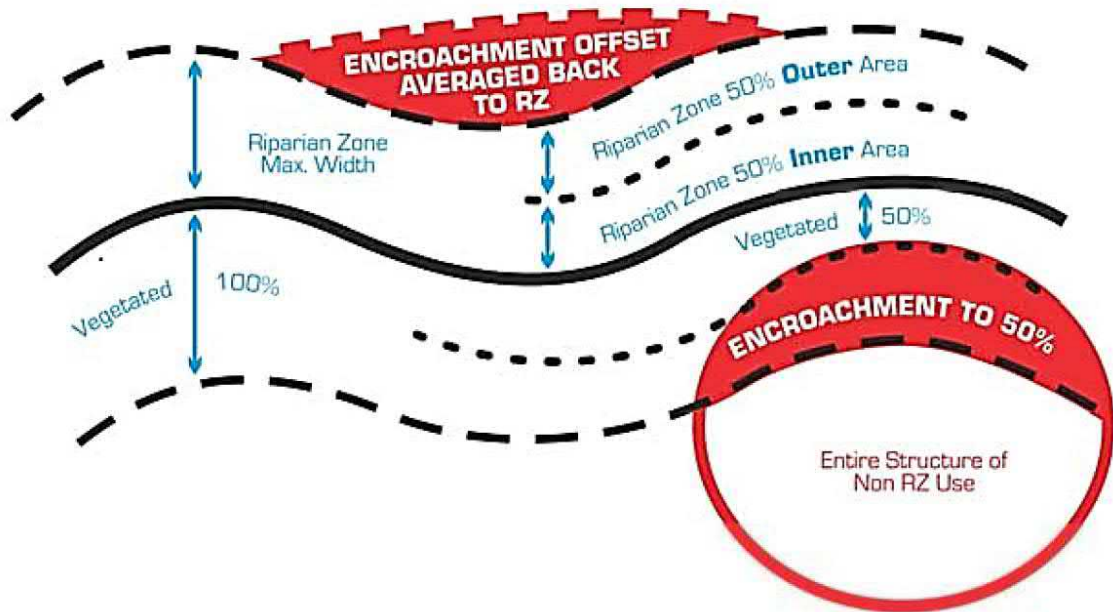


Figure 3: Riparian 'averaging rule' for offsetting encroachment into the outer 50% of the VRZ (NRAR 2018).

Furthermore, NRAR's *Guidelines for Controlled Activities on waterfront land—Riparian corridors* (NRAR 2018) provides for a streamlined assessment for development that meets pre-determined criteria.

## 2.4 NSW Wetlands Policy

The NSW Wetlands 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. For the sustainable management of wetlands, the NSW Government adopts 12 principles to guide decision-making. The themes of these 12 principles include:

- Catchment scale
- Water regimes
- Floodplain connectivity
- Wetlands of significance
- Land management practices
- Cultural values
- Rehabilitation
- Climate change
- Research
- Protection and offsetting
- Cooperation and incentives
- Monitoring and reporting.

Mitigation measures outlined in Section 5.2 of this impact assessment are in line with the policy's guiding principles.

## 2.5 State Environmental Planning Policy (Western Sydney Employment Area) 2009

The *State Environmental Planning Policy (Western Sydney Employment Area) 2009* (SEPP WSEA) was amended following the adoption of the Mamre Road Precinct Plan. A number of clauses within the SEPP WSEA are applicable to the proposed development of the Aldington Road development, including Part 6 Clauses 33H, 33I and 33L.

The impacts of the proposed development relevant to these clauses of the SEPP WSEA are discussed in Section 5.3.4.

## 2.6 Draft Mamre Road Development Control Plan

The draft DCP contains controls specific to riparian zone protection and management. An assessment of the consistency of the proposed development with the DCP is provided in chapter 5.

## 3. Methods

### 3.1 Literature and data reviews

The following literature and data sources were reviewed prior to undertaking the field survey:

- BioNet/Atlas of NSW Wildlife database search for a 10 km radius (DPIE, 2020)
- EPBC Act Protected Matters Search Tool 5 km database search (DAWE 2020)
- The Native Vegetation of the Sydney Metropolitan Area v.3 (OEH 2016)
- Aerial mapping (SIXMaps)
- Water Management (General) Regulation 2018 hydroline spatial data 1.0
- Fisheries NSW Policy and Guidelines for Fish Habitat Conservation and Management (2013 update) (Fairfull 2013)
- Guidelines for controlled activities on waterfront land – Riparian corridors (NRAR, 2018).

### 3.2 Field survey methods

The Strahler stream order classification was extracted from the DPI Hydroline Spatial Data. A field survey was conducted by ELA Aquatic Ecologist Claire Wheeler on 20 July 2020 to determine if the watercourses on site met the definition of a 'river' under the WM Act and determine the current condition and extent of riparian and aquatic habitat:

**1. Definition of a 'river' under the WM Act** – Waterways within the SSDA boundary were assessed to determine if they met the definition of a 'river' using definitions outlined in section 2.3 of this report.

**2. Riparian habitat assessment** - An assessment of riparian condition and recovery potential was conducted for the waterways. This assessment considered native vegetation cover, connectivity and quality, bed and bank stability and habitat diversity.

**3. Aquatic habitat assessment** - The quality of aquatic habitat was examined, including vegetation structure and regeneration, weed infestation, woody debris, fish habitat, patch size and connectivity potential.

## 4. Existing Environmental Conditions

Within and adjacent to the development area were eleven farm dams, most of which had limited riparian and/or fringing vegetation surrounding them and poor aquatic habitat values. These dams have been numbered in Figure 4 and are described in Table 6. Dams 9 and 10 are connected following heavy rain and high flow, however are two separate dams in low flow and dry conditions. Examination of aerial photos and overland flow paths identified that these two dams are quite likely fed by two different catchments – Dam 9 from flow to the south east of the study area and Dam 10 from overland flow from the west within the study area. It is important to note that this environment is highly modified and the waterbodies and watercourses in the north east of the site are not representative of their original flow paths.

The study area had been the subject of significant disturbance in the past, with a number of small irrigation channels constructed across various lots to service the market gardens within the properties.

DPI mapping showed two unnamed watercourses within the study area (Figure 1); a 1<sup>st</sup> order tributary of Kemps Creek in the south of the site and a 1<sup>st</sup> order tributary of Ropes Creek in the north east of the site.

The 1<sup>st</sup> order watercourse mapped within the south of the development area had no indicative features of a waterway (such as defined bed and banks or geomorphic features such as erosion and deposition) observed along the length of this mapped watercourse within the SSD boundary.

The mapped 1<sup>st</sup> order watercourse in the north east corner originated upstream of the development area and flowed in a roughly northerly direction.



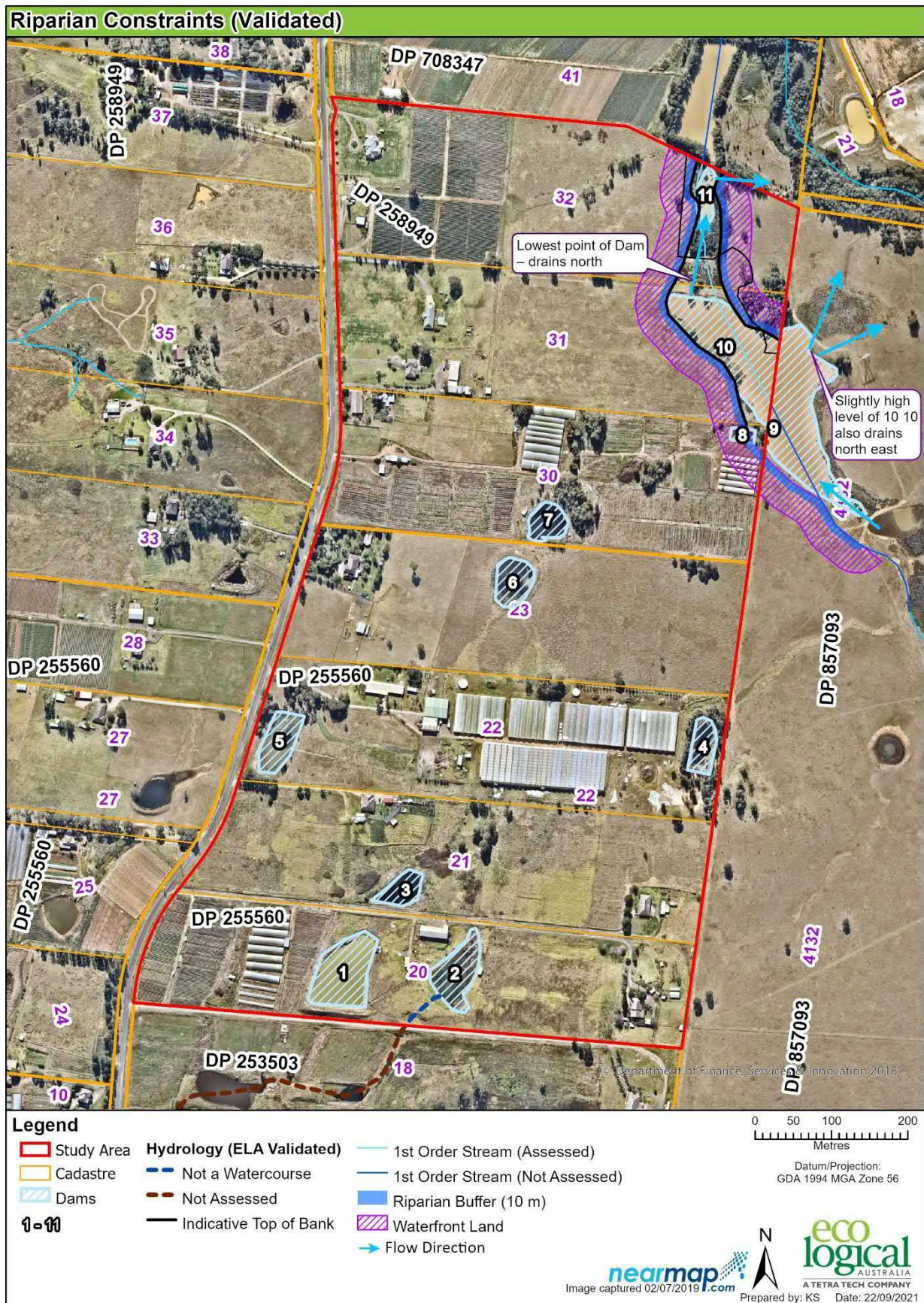








Figure 4: Validated watercourses within study area







Table 6: Dams within and adjacent to study area

Dam number	Description	Aquatic fauna observed	Aquatic flora observed	Representative photo
1	Dam 1 covered an area of approximately 5,600 m <sup>2</sup> and was surrounded by pasture grasses. There was no fringing vegetation surrounding the dam and the banks of the dam was relatively steep.	No aquatic fauna observed.	Floating macrophytes ( <i>Azolla pinnata</i> ).	
2	Dam 2 covered an area of approximately 2,300 m <sup>2</sup> . No grease, oil or sheen was observed on the water's surface. On the northern and southern sides of the dam, it was fringed with dense <i>Typha orientalis</i> (Cumbungi).	No aquatic fauna observed.	Emergent <i>Typha orientalis</i> plus submerged macrophytes.	
3	Dam 3 covered an area of approximately 1,700 m <sup>2</sup> . Two thirds of the edge of the dam were covered in dense <i>Typha orientalis</i> with exotic species such as <i>Rubus fruticosus</i> (Blackberry), <i>Cestrum parqui</i> (Green Cestrum) and pasture grasses growing alongside the remaining edge of the dam	No aquatic fauna observed.	<i>Typha orientalis</i> .	

Dam number	Description	Aquatic fauna observed	Aquatic flora observed	Representative photo
4	Dam 4 covered an area of approximately 1,800 m <sup>2</sup> and was actively used for irrigation of nearby vegetable crops. The dam was surrounded on all sides by <i>Casuarina</i> sp. and had some areas of dense <i>Typha orientalis</i> on the southern side of the dam.	No fauna observed.	Emergent macrophytes including <i>Ludwigia peploides</i> (Water Primrose) and <i>Persicaria decipiens</i> (Knotweed) and floating <i>Azolla pinnata</i> .	
5	Dam 5 covered an area of approximately 1,700 m <sup>2</sup> and was partially surrounded by <i>Casuarina</i> sp. Evidence of soil pugging by stock was seen on the northern side of the dam.	No fauna observed.	Submerged macrophytes in the form of <i>Vallisneria australis</i> (Ribbonweed).	
6	Dam 6 covered an area of approximately 875 m <sup>2</sup> and on the southern side of the dam there was a large area of <i>Juncus</i> sp. where it appeared that the area was constantly damp and supported the growth of these species.	Eurasian Coots and frogs could be heard calling.	<i>Ludwigia peploides</i> and <i>Eleocharis sphacelata</i> within the dam.	



Dam number	Description	Aquatic fauna observed	Aquatic flora observed	Representative photo
7	Dam 7 covered an area of approximately 1,700 m <sup>2</sup> . The dam was located approximately 100 m downstream of dam 6, however there was no defined channel observed between these two dams.	Frogs heard calling.	<i>Persicaria decipiens</i> .	
8	Dam 8 covered an area of approximately 650 m <sup>2</sup> . There were a few <i>Eucalyptus</i> sp. on the edge of the dam however it was predominantly surrounded by exotic vegetation including <i>Rubus fruticosus</i> , <i>Senecio madagascariensis</i> and pasture grasses.	Pied cormorant.	No aquatic flora observed.	
9	Dam 9 was on the adjacent lot outside of the study area but is in the flow path of the mapped 1 <sup>st</sup> order watercourse. This dam is connected to dam 10 when full.	No aquatic fauna observed.	No aquatic flora observed.	Not available

Dam number	Description	Aquatic fauna observed	Aquatic flora observed	Representative photo
10	Dam 10 covered an area of approximately 7,800 m <sup>2</sup> . Erosion was observed on some parts of the bank of the north western side of the dam and there was little shrub or canopy vegetation surrounding the dam that would provide bank stability.	No aquatic fauna observed	<i>Typha orientalis</i> , <i>Lemna</i> sp. and <i>Ludwigia peploides</i> on the edges of the dam.	
11	Dam 11 covered an area of approximately 3,750 m <sup>2</sup> . The dam was surrounded by a narrow-vegetated buffer of <i>Casuarina</i> sp., with <i>Juncus acutus</i> and <i>Typha orientalis</i> . Woody debris within the waterbody was present and some of the <i>Casuarina</i> sp. on the edge of the waterbody had roots exposed above the water level and undercut in some areas, which would provide good refuge for aquatic fauna.	Long finned eel.	<i>Typha orientalis</i> in the middle of the dam	

## 4.1 Mapped watercourses

### 4.1.1 Kemps Creek tributary

DPI mapping showed an unnamed first order tributary of Kemps Creek within the study area at the southern boundary of Lot 20 DP 255560.

The site inspection identified that there was no defined channel downstream of Dam 2 in the location where a watercourse was mapped on the hydroline dataset. There was an overland flow path that had been channelled towards Dam 1 through a section of concrete pipe. Downstream of the dam there was dense pasture grasses but no defined bed or bank or evidence of geomorphic processes such as erosion and deposition (Figure 5 to Figure 8). A pipe was observed at the southern boundary of the SSD area (Figure 8) to channel the flow into the property to the south. The mapped watercourse within the south of the site does not meet the definition of a 'river' under the WM Act.



**Figure 5: Upstream extent of mapped Kemps Creek tributary, looking north east**



**Figure 6: Upstream extent of mapped Kemps Creek tributary, looking south west**



**Figure 7: Downstream extent of mapped Kemps Creek tributary, looking north east**



**Figure 8: Downstream extent of mapped Kemps Creek tributary, looking south west.**

### 4.1.2 Ropes Creek tributary

The mapped watercourse within the north east area of the site is located through Dams 10 and 11. Although this is a highly modified system, water flowing out of Dam 10 would flow to Dam 11. This area is shown in Figure 9 to Figure 15.





**Figure 9: Dam 10, looking south east**



**Figure 10: Dam 10, looking south**



**Figure 11: Boundary fence in between Dams 9 and 10, looking south east**



**Figure 12: Top of dam wall on northern side of Dam 10, looking west.**



**Figure 13: No defined channel between Dam 9 and 10, looking north.**

On the downstream side of Dam 11, it was evident that a channel had been blocked at some point to create a dam, however the dam now resembled a wetland environment. There is unlikely to be any low flows moving through this section of watercourse other than in high flow events. Immediately upstream of Dam 11 was a damp area that would be inundated following heavy rain. There were small isolated

pools of water within this area in amongst the dense *Juncus acutus* (Figure 14 and Figure 15) and evidence of pugging from cattle.



**Figure 14:** Area between upstream of Dam 11 and northern side of Dam 10, looking north



**Figure 15:** Isolated pools of water between Dams 10 and Dam 11, looking south

## 5. Impact assessment

The proposed development at Aldington Road will involve the establishment of an industrial precinct, including two on-site detention and water quality improvement basins. The FKC Estate Master Plan (SBA Architects, 1/9/2021, Issue N (Appendix A)) has been used to identify potential impacts to the riparian and aquatic habitat and water quality as a result of the proposed development. The development will require removal of Dams 1-8, construction of two water quality basins and the establishment of a managed vegetated zone to maintain aquatic and terrestrial habitat within the north east corner of the site (see Figure 16).

This section describes:

- potential impacts.
- mitigation measures to ensure potential impacts are avoided or minimised.
- Consistency with legislation and policy.



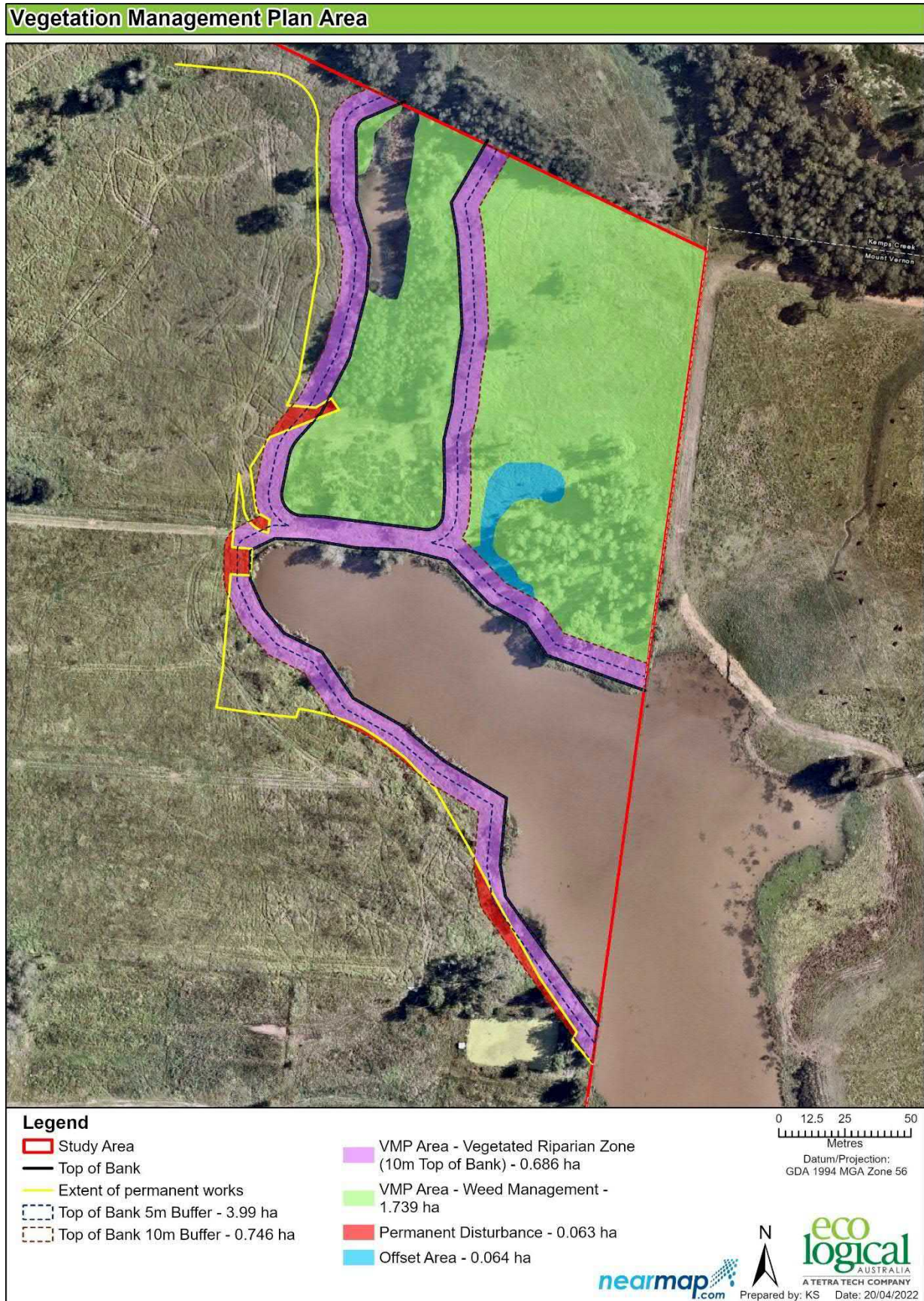


Figure 16: Proposed development extent in relation to riparian zone

## 5.1 Potential Impacts

### 5.1.1 Removal of farm dams

As outlined in section 4 of this report, Dams 1 -8 are not connected to any watercourses that meet the definition of a 'river' under the WM Act, nor do they appear to be providing good habitat for aquatic fauna due to the lack of instream and fringing vegetation and woody debris. Mitigation measures provided in section 5.2 of this report outline the process for decommissioning these dams to ensure that there is little, if any, impact to aquatic fauna currently residing in these dams.

Dams 9, 10 and 11 are all retained as part of the proposed development (Figure 16).

### 5.1.2 Surface erosion and sedimentation

Any clearing of vegetation or earthworks within the existing riparian zone of the 1<sup>st</sup> order tributary of Ropes Creek could result in lack of soil stability. This may cause surface erosion (sheet and gully erosion) and transportation of sediment overland into the downstream waterway of Ropes Creek. Impacts may include increased water turbidity, which could harm fish, and disrupt light penetration through the water column and impact on primary (plant) production, with flow on effects through the food web. Increased sediment loads may settle in downstream pools, causing a loss of deep habitat, promotion of dense reeds and changes to hydrologic connectivity. Sediment could also smother naturally rocky areas, resulting in a loss of habitat where macroinvertebrates shelter in the spaces between rocks.

### 5.1.3 Weed Invasion

Where disturbance from construction associated with the proposed development results in bare ground or increased sunlight penetration into currently-vegetated riparian areas, there is the potential for invasion of exotic flora species. The movement of construction vehicles in and around the riparian area can also act as a vector for weed propagules. Impacts include introduction of new weeds to the area and extended penetration of weeds into native plant communities. This may result in a loss of biodiversity and habitat value, smothering of native juvenile plants, harbouring of feral animals and alteration of vegetation structure and riparian function.

### 5.1.4 Increase velocity of surface water runoff

The construction and ongoing use of impervious surfaces can impact on the velocity of water entering the creekline where impermeable surfaces are constructed over existing vegetation (e.g. proposed car parks). Impacts may include changes to instream flow velocity which can change the aquatic habitat for macroinvertebrates and other small aquatic fauna (e.g. some macroinvertebrates and macrophytes prefer slow water), increased bank erosion from fast discharge resulting in bed and bank erosion, loss of riparian vegetation, loss of edge habitat and sedimentation of downstream environments.

## 5.2 Mitigation measures

### 5.2.1 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) has been prepared to minimise impacts on the environment. This CEMP includes an Erosion and Sediment Control Plan, prepared in accordance with *The Blue Book – Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) and will be implemented prior to works, with the aim of achieving an outcome of 'no visible turbid plumes migrating



through the waterway'. The Plan must include, as a minimum, the locations and type of erosion and sediment controls to be erected.

### 5.2.2 Vegetation Management Plan

A Vegetation Management Plan (VMP) has been prepared and includes methods for establishment and maintenance of the Vegetation Management Area. Initial weed control would be required to limit the impact of the widespread weed species that are currently growing onsite. The revegetated areas will then require ongoing maintenance to ensure areas remain relatively weed free.

The VMP is to specify high-density planting to provide bank stabilisation following construction of the batters around the basins.

The VMP is to provide for management actions over an initial 5 years with review and evaluation to inform management of the subsequent five years. Annual reports are to be prepared for the first five years and submitted to the consent authority.

The proposed VMP area is shown in Figure 16. And is consistent with the NRAR Guidelines.

### 5.2.3 Dam Dewatering Plan

A Dam Dewatering Plan (DDP) has been prepared. Implementation of the Dam Dewatering Plan is to minimise harm to native aquatic fauna during decommissioning of the farm dams. The DDP will specify how different species likely to be encountered will be handled and where native species are to be relocated to. To ensure aquatic species are protected during the dam decommissioning process, the aquatic ecologist in charge of fauna relocation should possess the following licenses/permits:

- Section 37 *Fisheries Management Act 1994* (for fish), issued by NSW Department of Primary Industries - Fisheries
- Animal Research Authority (for the welfare of all animals), issued by the Secretary's Animal Care & Ethics Committee. This Authority describes permitted euthanasia techniques (e.g. for Redfin Perch and sick or diseased fauna).

The aquatic ecologist is to notify NSW Fisheries of the activity 48 hours prior to fish relocation (unless an agreement is in place), including locations of dewatered and relocation sites.

The dewatering schedule should allow time for fish rescue, especially during the final 0.3 m water depth (to be advised by Aquatic Ecologist). Fauna should be captured in one day, so pumps need to be of adequate size and placed in an area free from mud and debris (e.g. inside excavator bucket or screened sump pit).

Native fish healthy enough for relocation are to be contained and transported in an aerated tub/bucket/tank to an appropriate dam/lake/waterhole/creek. It is recommended that native species are relocated to a nearby dam or creekline with landholder's permission. NSW Fisheries advise that the host location should be large enough to accommodate additional fish, especially predatory eels. If a large number of predatory fish such as *Anguilla reinhardtii* are captured during the aquatic fauna relocation process, an additional release point may be required.

## 5.3 Consistency with planning framework

### 5.3.1 Water Management Act 2000

The principle legislation relevant to watercourses and riparian corridors discussed in Section 2.3 is the WM Act, which has the objective to provide sustainable and integrated management of the waterways of the state. The field visit concluded that the southern-most first order watercourse did not meet the definition of a 'river' under the WM Act, as there was no defined channel, evidence of bed and banks or geomorphic processes.

The mapped watercourse within the north of the site is considered a river for the purposes of the WM Act due to connected nature of Dam 9 to upstream waterbodies, however this is a highly modified environment.

The revised design maintains the existing watercourse through the north east corner of the site. The existing unvegetated 'riparian zone' has an area of 0.74 ha. A minor incursion of 0.063 ha will occur but will be offset through the rehabilitation of 0.064 ha of vegetation and in addition to the revegetation of 0.68 ha of riparian zone and weed management over 1.73 ha.

As shown in Figure 17, a portion of Dam 10's catchment will re-directed to Stormwater Basin B and then into Dam 11. The total catchment area of Dam 10 is currently around 255.9 ha and the area of the catchment to be redirected is 28.3 ha. This equates to approximately 11% of the total catchment area of Dam 10. It is not anticipated that this will have a significant impact on downstream environments and both dams eventually drain to Ropes Creek.

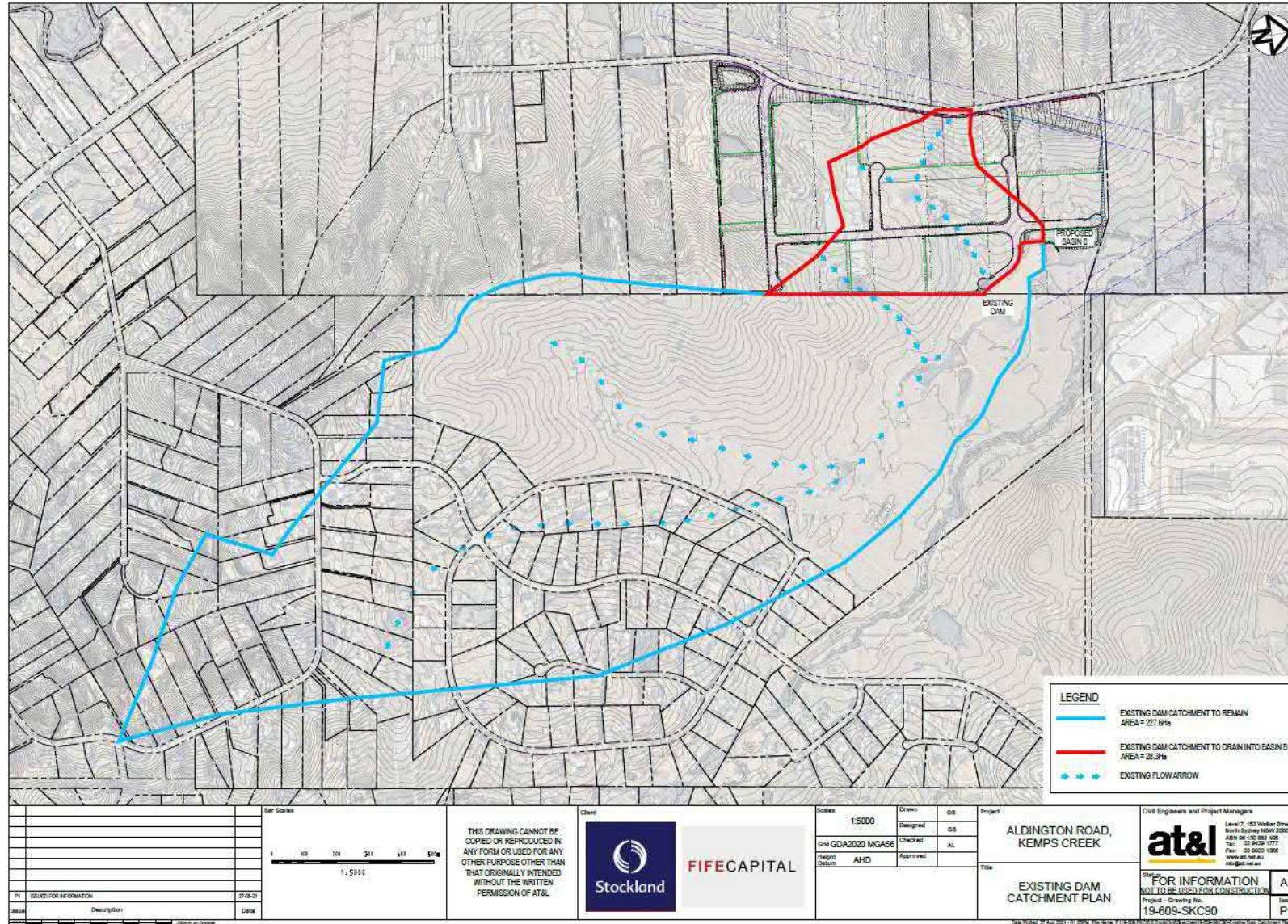


Figure 17: Portion of Dam 10 catchment (red outline) that will be directed through Dam 11 prior to draining to Ropes Creek.



### 5.3.2 Fisheries Management Act 1994

A review of the NSW Fisheries Spatial Portal found that there was no Freshwater Fish Community Status assigned to the tributary of Ropes Creek within the site, however the main reach of Ropes Creek adjacent and downstream of the development site was rated as 'fair'.

A search of the Commonwealth Protected Matters database, Department of Planning, Industry and Environment (DPIE) BioNet database, NSW Department of Primary Industries Primefacts and Fisheries Threatened Species distribution maps (Riches et al, 2016) identified three species of aquatic fauna with potential to be found within the study area (Table 7). As there are no records within the Ropes Creek catchment and a lack of suitable habitat on site, it is unlikely that these species would be found within the proposed development area.

**Table 7: Likelihood of occurrence table for aquatic species**

Scientific Name	Common Name	FM Act	EPBC Act	Habitat Associations	Records within 5 km and catchment	Likelihood of occurrence
<i>Archaeophya adamsi</i>	Adams Emerald Dragonfly	E		Adam's Emerald Dragonfly 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.  Adult dragonflies generally fly away from the water to mature before returning to breed. Males fly actively at breeding sites and often guard a territory. Females probably lay their eggs into the water.	0	No, no suitable habitat within development area.
<i>Maccullochella peellii</i>	Murray Cod		V	The Murray Cod occurs naturally in waterways of Murray-Darling Basin in warm water habitats from clear, rocky streams to slow flowing turbid rivers and billabongs. They prefer habitats with submerged woody debris that provide protected spawning areas.	0	No, no suitable habitat and no records within 5 km of site.
<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 and no records within 5 km of site.
<i>Prototroctes maraena</i>	Australian Grayling	E	V	Historically, this species inhabited coastal streams from the Grose River southwards through NSW, VIC and TAS. On the mainland, this species has been recorded from rivers flowing east and south of the main dividing range. This species spends only part of its	0	No, no suitable habitat and no records within 5 km of site.

Scientific Name	Common Name	FM Act	EPBC Act	Habitat Associations	Records within 5 km and catchment	Likelihood of occurrence
				lifecycle in freshwater, mainly inhabiting clear, gravel-bottomed streams with alternating pools and riffles, and granite outcrops. Grayling migrate between freshwater streams and the ocean and as such it is generally accepted to be a diadromous species (migratory between fresh and saltwaters).		

Note: E = Endangered, V= Vulnerable.

### 5.3.3 Environment Protection and Biodiversity Conservation Act 1999

The Protected Matters search (DAWE, 2020) identified that there are no Wetlands of International Importance or Nationally Important Wetlands within 5 km of the study area.

### 5.3.4 Draft Mamre Road DCP – Riparian Provisions

The following table describes the consistency of the proposed development with the riparian corridor provisions of the draft Mamre Road Precinct DCP.

**Table 8 Draft Mamre Road DCP Consistency**

Control	Proposed Plan
Mapped Riparian Corridors (Field-Validated)	
1) Within a riparian corridor, as indicatively identified in Figure 2 and Figure 3: <ul style="list-style-type: none"> <li>o All existing native vegetation is to be retained and rehabilitated, except where clearing is required for essential infrastructure such as roads.</li> <li>o Native vegetation is to be conserved and managed in accordance with the controls below.</li> </ul>	Design retains the watercourse and riparian zone of watercourses shown in Figures 2 and 3 of the draft DCP.
Avoiding Modifications to Natural Waterbodies	
2) There should be no modifications to a natural (or historic) waterbody in its dimensions, depth or bank height unless the approval of Natural Resources and Assessment Regulator is obtained, including the enhancement of the ecological outcomes of the watercourse, hydrological benefits and ensure the long-term geomorphic stability of the watercourse.	There are no natural watercourses on site as all have been highly modified. Historic waterbodies (ie farm dams) in the north east have been retained in their current form. Other farm dams are proposed to be removed.
3) Watercourses should not be modified to maximise flood conveyance unless there are no other means to avoid damage to existing dwellings or infrastructure that cannot be relocated.	Watercourse running through the north east corner of the site will not be modified other than to re-direct a portion of flow from Dam 10 to Dam 11. Water will still drain to Ropes Creek.

Control	Proposed Plan
4) Natural hydrological processes are to be maintained where possible, including natural vegetation and the flow regimes to maintain creek line stability and the health of terrestrial and aquatic plant communities.	As above
5) Existing flows of surface and ground water should not be altered through construction of channelled flows or the redirection or interruption of flows.	As above
Protection and Enhancement of Riparian Corridors	
6) Waterways of Strahler Order 2 and higher will be maintained in a natural state, including the maintenance and restoration of riparian area and habitat such as fallen debris.	There are no Strahler 2 watercourses on site.
7) 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.	There are no Strahler 2 watercourses on site.
8) Waterway crossings such as bridges are to be maintained to retain ecological connectivity and water quality.	No new waterway crossings are proposed.
9) Road crossings across a waterway of Strahler Order 2 or higher are to be designed to minimise impacts to vegetated riparian area and species movements in accordance with NSW Department of Primary Industries requirements to maintain fish passage	No new waterway crossings are proposed. An existing dam wall controls flow from Dam 10 to Dam 11. This dam wall is retained as it provides access to the north east corner of the property.
10) Development within a riparian corridor should be avoided where possible to retain its ecological processes. Where development is unavoidable within the riparian areas, it will be demonstrated in the development application that potential impacts on water quality, aquatic habitat, and riparian vegetation will be negligible or offset in accordance with the vegetated riparian zone and offsetting requirements as specified Natural Resources Access Regulator (NRAR) Guidelines for Controlled activities on waterfront land - riparian corridors.	Development is avoided within riparian corridors other than some very minor incursions into the vegetated riparian zone. The incursion has been more than adequately offset via implementation of a VMP in the north east corner of the site.
11) All riparian corridors should comprise a vegetated riparian zone along each side of the watercourse/channel.	A VMP provides for this outcome.
12) The vegetated riparian zone should retain or be vegetated with fully structured native vegetation (trees, shrubs and groundcover species).	The VMP provides for the structure of vegetation in the riparian zone.
13) In relation to activities within the vegetated riparian zone, such as cycleways and paths, detention basins, stormwater management devices and essential services, compliance is required with the 'riparian corridor matrix' in the NRAR controlled activities on waterfront land – Riparian corridors (May 2018).	The proposed stormwater basin B adjoins a first order watercourse, but is not on-line. This is allowable under the NRAR Guidelines.
14) The number of vehicular and pedestrian watercourse crossings should be minimised and designed in accordance with the NRAR Guidelines to allow for riparian connectivity and flows.	No new crossings are proposed.

Control	Proposed Plan
15) Private and public fencing should be located on the perimeter of the riparian corridor and avoid intersecting across watercourse channels or riparian corridors.	No fences are proposed across the waterway.
16) A managed buffer zone outside the vegetated riparian zone should be provided (where possible), to provide an additional buffer between development and the vegetated riparian zone. Land uses within the managed buffer zone could include roads, paths, playgrounds and stormwater management devices	The VMP in the north east corner will provide a managed vegetation zone.
17) Bushfire asset protection zones should be located outside the vegetated riparian zones.	Yes. See Bushfire Assessment.
18) Appropriate widths for vegetated riparian zones are dependent on the Order of Stream in accordance with the Strahler methodology. The width should be measured from the top of the highest bank on both sides of the stream/watercourse, excluding any managed buffer zone, and shall comply with the requirements outlined in Table 4. Riparian corridors will be assessed by Council and NRAR on merit.	The proposed VMP will provide a VRZ of 10m measured from the top of bank. Where works extend into the 10m VRZ, riparian offsets are provided as per NRAR Guidelines.
19) Enhancement of riparian corridors should, where possible: <ul style="list-style-type: none"> <li>o Mimic natural hydrological regimes for watercourse treatments;</li> <li>o Replicate the natural watercourse through creation of a meandering channel, rather than straight channels;</li> <li>o Simulate natural roughness having regard to riparian requirements and flow velocities to sustain vegetation groupings. A watercourse's shape, smoothness of its channel and amount of vegetation in the channel all affect the 'roughness' of that watercourse and the speed of water conveyed in the channel;</li> <li>o Minimise ongoing maintenance requirements through channel design;</li> <li>o Establish a functional riparian zone and natural channel section;</li> <li>o Maintain or create a full assemblage of vegetation with likely natural obstructions;</li> <li>o Minimise likely damage to channel banks and vegetation from storm flow through channel design; and</li> <li>o Ensure that the channel has the capacity for appropriate flood flows having regard to the steepness of the catchment; channel modifications and future liability for landowners, Council and government agencies.</li> </ul>	Noted
20) Where a development proposal would significantly affect Key Fish Habitat and/or threatened fish (as defined under the Fisheries Management Act 1994), applicants must include an aquatic ecological environmental assessment in accordance with the Fisheries Management Act 1994.	No Key Fish Habitat will be impacted.
21) Water holding structures (e.g. farm dams) that are more than 0.1 ha in area or more than 3 ML in volume within 3 km of the approach boundary to Western Sydney Airport are to be avoided to ensure there is no attraction for water-favouring fowl.	See Stormwater Assessment
Development Adjacent Riparian Corridors	
22) Development adjacent riparian corridors is to be managed in accordance with the controls in Section 4 and the controls below.	See Landscape Plan
23) 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	No proteaceae shrubs were recorded on site.

Control	Proposed Plan
24) Where a development adjoins riparian corridors, Council may require bank stabilisation works, measures to minimise pollution and sedimentation. Reference should be made to the requirements of the Fisheries Management Act 1994.	Noted
25) Where industrial land immediately abuts a riparian corridor, development shall be located and designed to achieve a satisfactory interface with the riparian corridor. Consideration must be given to issues such as surveillance of the riparian corridor, built form and design, landscaping, opportunity for public interfaces, where appropriate, and protection from bushfire threat.	See Landscape Plan



## 6. Conclusions

This Riparian Assessment has been prepared to assess the development's impact on the mapped watercourses and riparian corridors on site, as per the Secretary's Environmental Assessment Requirements (SEARs) issued in July 2020 which require *'an assessment of the development's impacts on the riparian corridor and wetland on site, including detailed interface management measures'*.

Following re-design of the development in the north eastern corner of the site, existing farm dams and the watercourse identified in the draft Mamre Road DCP are being retained and will have vegetated riparian zones in accordance with a proposed Vegetation Management Plan. The redesign ensures the riparian outcomes of the development are consistent with the structure plan in the draft DCP and the Precinct Plan.

Eight farm dams will be removed in accordance with a proposed Dam Dewatering Plan to be prepared prior to commencement of construction.

## 7. References

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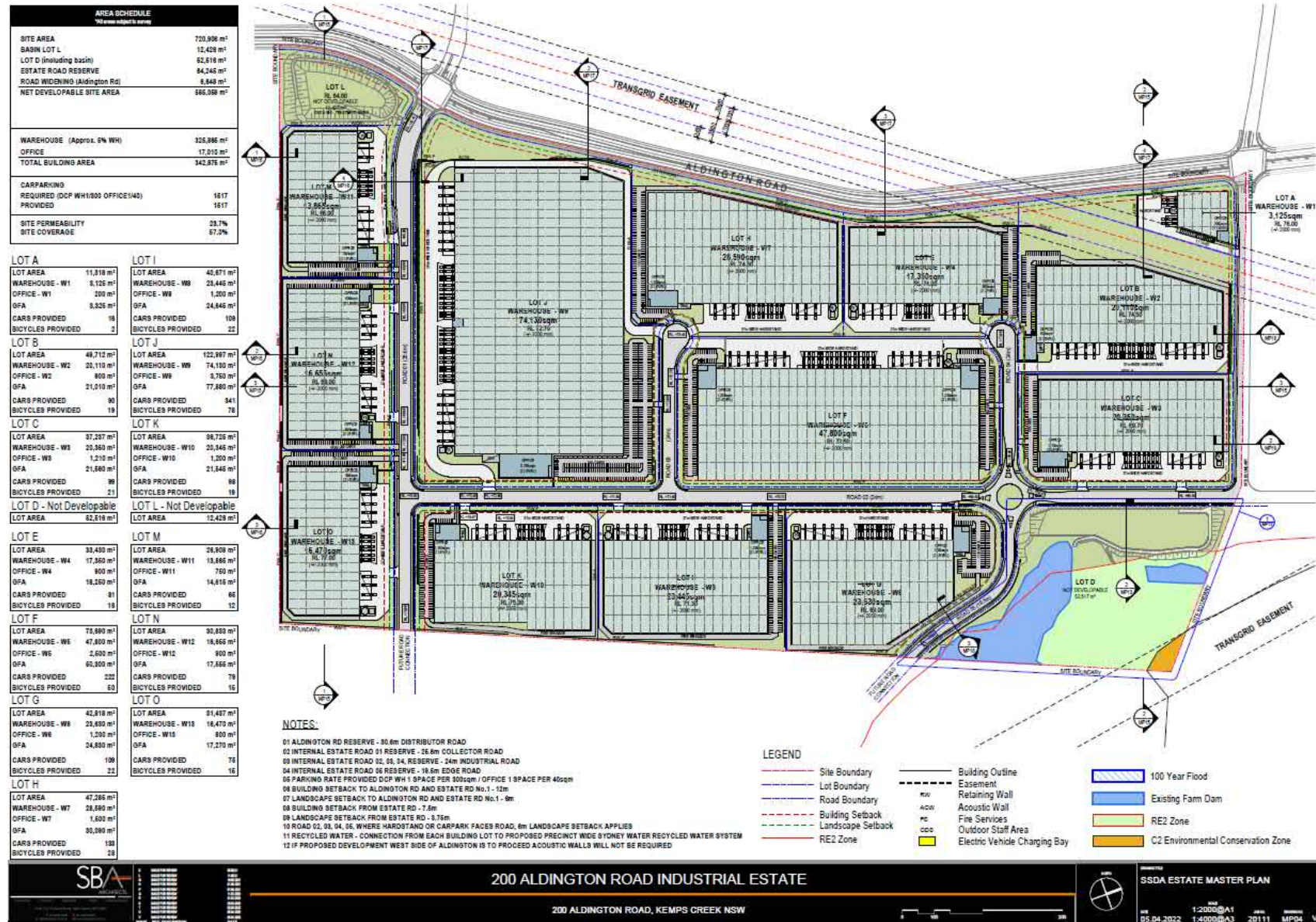
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## Appendix A Master Plan





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Appendix E

# Construction Aboriginal Cultural Heritage Management Plan

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# 200 Aldington Road Industrial Estate

## Aboriginal Cultural Heritage Management Plan

Prepared for Fife Kemps Creek Trust  
April 2022

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# 200 Aldington Road Industrial Estate

## Aboriginal Cultural Heritage Management Plan

### Report Number

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E210906 RP#5

### Client

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Fife Kemps Creek Trust

### Date

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7 April 2022

### Version

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v1 Final

### Prepared by

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**Lia Zwolinski**

Senior Consultant

7 April 2022

### Approved by

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**Lahnne Cooper**

Associate

7 April 2022

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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# Acronyms and abbreviations

Acronym	Description
ACHA	Aboriginal Cultural Heritage Assessment
ACHMP	Aboriginal Cultural Heritage Management Plan
CEMP	Construction Environmental Management Plan
CCS	Community Communication Strategy
CNVMP	Construction Noise and Vibration Management Plan
CTMP	Construction Traffic Management Plan
EIS	Environmental Impact Statement
ESCP	Erosion and Sediment Control Plan
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	Environmental Protection Agency
ER	Environmental Representative
FKC	Fife Kemps Creek Trust
GFA	Gross Floor Area
HHA	Historical Heritage Assessment
LGA	Local Government Area

# 1 Introduction

This Aboriginal Cultural Heritage Management Plan (ACHMP) has been prepared for implementation by Fife Kemps Creek Trust (FKC) (and its contractors) for the construction of Stage 1 of the 200 Aldington Road Industrial Estate (the Project). The Project is located in Kemps Creek, New South Wales 2178, within the Penrith Local Government Area (LGA).

The following documents have been reviewed and applicable information incorporated into this ASCHMP:

- Environmental Impact Statement (the EIS), prepared by Ethos Urban, dated 11 November 2020;
- SSDA-10479;
- Aboriginal Cultural Heritage Assessment (ACHA), prepared by Biosis, dated 20 September 2021;
- Archaeological Report, prepared by Biosis, dated 20 September 2021;
- Historical Heritage Assessment (HHA), prepared by Biosis, dated 20 September 2021; and
- Mamre Road Precinct Development Control Plan 2011 (the DCP)

## 1.1 Project overview

### 1.1.1 Background / context

This ACHMP forms a Request for Additional Information for the proposed Concept State Significant Development Application for a new industrial estate on land 106 – 228 Aldington Road, Kemps Creek.

The EIS for the project was placed on public exhibition between 18 November 2020 and 15 December 2020. During this period, a total of 18 submissions were received. These submissions were addressed and subsequent amendments to the project were made, as outlined in the Response to Submissions Report (dated 23 March 2021) prepared by Ethos Urban.

In written correspondence dated 28 April 2021, it was requested that FKC provide a further response to additional commentary raised by DPE, as well as additional comments raised by public authorities in their review of the first Response to Submissions Report. This was responded to via a second a Response to Submissions Report outlined by Ethos Urban (dated 22 September 2021).

Additional correspondence was received from DPE dated 15 November 2021 which has necessitated updates and additional information, as contained within this report.

### 1.1.2 Summary of the project for which development consent is now sought

Consent is sought for the following development. It represents minor amendments and does not represent a significant material change to what was previously proposed under the second RTS Report (22 September 2021)

- A concept masterplan with an indicative total building area of 342,865 sqm, comprising:
  - 325,865 sqm of warehouse gross floor area (GFA);
  - 17,010 sqm of ancillary office GFA;
  - 13 individual development lots for warehouse buildings with associated hardstand areas and two lots for water management infrastructure purposes (each including a bio retention basin);

- Roads, including:
  - Internal road layouts;
  - Southern road connection to Aldington Road;
  - Northern boundary road (half road corridor) connecting to Aldington Road;
  - Road connections to adjoining landholdings to the north and east;
- Provision for 1,516 car parking spaces; and
- Associated concept site landscaping.
- Detailed consent for progressive delivery of site preparation, earthworks and infrastructure works (i.e., Stage 1 works) on the site, including:
  - Demolition and clearing of all existing built form structures;
  - Drainage and infill of existing farm dams and any ground dewatering;
  - Clearing of existing vegetation;
  - Subdivision of the site into 15 individual lots;
  - Construction of a warehouse building with a total of 50,300 sqm of GFA, including:
    - 47,800 sqm of warehouse GFA; 2,500 sqm of ancillary office GFA; and
    - 221 car parking spaces.
  - Bulk earthworks including 'cut and fill' to create level development platforms for the warehouse buildings, and site stabilisation works (if required);
  - Roadworks and access infrastructure, including an interim access road and a temporary junction with Aldington Road;
  - Stormwater works including stormwater basins, diversion of stormwater;
  - Utilities services including sewer and potable water reticulation; and
  - Road and boundary retaining walls.

## 1.2 Background

As part of the EIS, an Aboriginal Cultural Heritage Assessment (ACHA), Archaeological Report and Historical Heritage Assessment (HHA) were prepared by Biosis (2020) as part of the EIS approval process.

The ACHA was conducted in accordance with Part 6 of the NSW *National Parks and Wildlife Act 1974* and *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010a) (the Code). A search of the Aboriginal Heritage Information Management System (AHIMS) register conducted on 27 May 2020, identified 102 Aboriginal sites within 4 by 4 km search area centred over the study area. None of these registered sites were located within the study area.

An archaeological survey was conducted on 11 July 2020 whereby three areas of moderate archaeological potential were identified. The overall effectiveness of the survey for examining the ground for Aboriginal sites was deemed low. This was attributed to vegetation cover restricting ground surface visibility (GSV) combined with a low amount of exposures. No previously unrecorded Aboriginal cultural heritage sites were identified during the archaeological survey. Three areas of moderate archaeological potential (including Area 1, Area 2 and Area 3) were recorded.

A desktop assessment and field investigation were conducted as part of the HHA to provide an assessment of impacts to historical heritage values within the study area. The potential archaeological remains in the study area are associated with agriculture and domestic themes. There are no recorded items of heritage significance in or adjacent to the study area.

## 1.3 Consultation

The Aboriginal community was consulted regarding the heritage management of the project throughout its lifespan. Consultation has been undertaken as per the process outlined in the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010b). The appropriate government bodies were notified and advertisements placed in the Western Weekender newspaper (22 May 2020), which resulted in the following Aboriginal organisations registering their interest (refer Table 1.1). Two groups did not want their details disclosed and are referred to as Confidential Group 1 and Confidential Group 2.

A search conducted by the Office of the Registrar, Aboriginal Land Rights Act 1983, listed no Aboriginal Owners with land within the study area and a search of the National Native Title Tribunal listed Registered Native Title Claims, Unregistered Claimant Applications or Registered Indigenous Land Use Agreements within the study area. The outcome of the consultation process was that the Registered Aboriginal Parties considered the study area to have high cultural significance.

Upon registration, the Aboriginal parties were invited to provide their knowledge on the study area and on the proposal provided in the Methodology. There were no responses which identified any areas of significance within the study area at this stage, however, Darug Custodian Aboriginal Corporation did provide a statement that the study area possessed high cultural significance.

**Table 1.1** List of Registered Aboriginal Parties

No.	Organisation	Contact Person
1	Confidential Group 1	N/A
2	Didge Ngunawal Clan	Lillie Carroll and Paul Boy
3	Waawaar Awaab Aboriginal Corporation	Rodney Gunther
4	Galamaay Cultural Consultants (GCC)	Robert Slater
5	Darug Custodian Aboriginal Corporation	Justine Coplin

**Table 1.1**      **List of Registered Aboriginal Parties**

No.	Organisation	Contact Person
6	Wailwan Aboriginal Group	Philip Boney
7	Butucarbin Aboriginal Corporation	Jennifer Beale
8	Tocomwall	Danny Franks
9	Warragil Cultural Services	Warragil Cultural Services
10	Kamilaroi Yankuntjatjara Working Group	Phil Khan
11	Barraby Cultural Services	Lee Field
12	Yurrandaali Pty Ltd	Bo Field
13	Widescope Indigenous Group	Steven and Donna Hickey
14	Dhinawan Culture & Heritage Pty Ltd	Stephen Fields
15	A1 Indigenous Services	Carolyn Hickey
16	Confidential Group 2	N/A
17	Yulay Cultural Services	Arika Jalomaki
18	Goodradigbee Cultural & Heritage Aboriginal Corporation	Caine Carroll
19	Dharug	Andrew Bond
20	Deerubbin Local Aboriginal Land Council (LALC)	Steven Randall

## 2 Assessment

A desktop assessment and field investigation were conducted as part of the ACHA. Each component is described further below.

### 2.1 Desktop Assessment

A desktop assessment identified the following:

- The study area is comprised of three soil landscapes (Blacktown, South Creek and Luddenham soil landscapes), with the Blacktown soil landscape and South Creek soil landscapes having an increased likelihood to contain archaeological sites.
- 102 AHIMS sites are located in the vicinity of the study area.
- Many of these sites are located close to Ropes Creek and Kemps Creek. A tributary of Ropes Creek traverses the north of the study area.
- Previous archaeological research within 10 km of the study area suggest that distance to water sources is important in predicting Aboriginal sites.
- There are two creek lines within the study area. The first is an unnamed first order tributary of Ropes Creek that transects the north-east corner of the study area. The second is in the south of the study area and is a first order tributary of Kemps Creek, which is located 1.2 km to the south-east. These water bodies are located approximately 400 m to the west for Ropes Creek and 3 km east for Kemps Creek. Ropes Creek, a third order creek, is located 70 m from the north-east corner of the study area.

### 2.2 Field Investigation

A field investigation was conducted in July 2020 and identified three areas of moderate archaeological potential. Test excavations within Area 1, Area 2 and Area 3 recovered a total of 248 artefacts from Area 1 (n=19), Area 2 (n=28), and Area 3 (n=201). Area 1 and Area 2 consists of low density subsurface archaeological deposits, located upon gentle slopes. The presence of artefacts within spits 1 to 4 (0-400 millimetres) suggests that Area 3 consists of a high-density concentration in the northern portion of Area 3 which indicates that the area was utilised heavily for artefact reduction purposes.

The three areas are described as:

- Area 1 is located on a crest/ gentle slope landform in the eastern part of the study area within Lot 23 DP 255560. It consists of an elevated landform located approximately 300 metres west from a tributary of Ropes Creek. Area 1 consists of a low density sub surface artefact scatter. This site consists of 19 artefacts and is a common site type in the region. This site has been assessed as moderate scientific significance.
- Area 2 is located on a gentle slope landform adjacent to a tributary of Ropes Creek in the north-east part of the study area within Lot 32 DP 255560. Area 2 was identified due to its location adjacent to a creek line, which would have provided ample resources for Aboriginal people. In addition, a number of AHIMS sites are located one kilometre north on the bank of Ropes creek and may extend further south into the study area. Area 2 consists of a low density sub surface artefact scatter. This site consists of 28 artefacts and is a common site type in the region. This site has been assessed as moderate scientific significance.

- Area 3 is located upon a creek flat between two tributaries of Ropes Creek in the north-east part of the study area within Lot 32 DP 255560. The area was identified as an area of moderate archaeological potential due to its elevated landform beside a resource zone, which may have been utilised by Aboriginal people in the past. A total of 202 artefacts were recovered from 21 test pits in an area measuring approximately 105 by 120 metres during test excavations. Soil deposits are considered to have remained intact as impacts from previous disturbances (including ploughing and grazing and vegetation clearance) do not extend further than approximately 200 millimetres in depth. The presence of artefacts within spits 1 to 4 suggests that Area 3 demonstrates ongoing periodic occupation of the study area by Aboriginal people.

A representative from Deerubbin Local Aboriginal Land Council (LALC) (Steven Randall, Senior Aboriginal Cultural Heritage Officer) participated in the field investigation and test excavations were attended by representatives from the Deerubbin LALC, Darug Custodian Aboriginal Corporation and Kamilaroi Yankuntjatjara Working Group.

## 2.3 Assessments Locations



[illegible]

# 3 Conditions of approval

This ACHMP forms part of the CEMP and has been prepared in accordance with condition XXX of the development consent for SSD XXX. The condition requirements and where they have been addressed in this plan are summarised in Table 3.1.

Table 3.1 Conditions of Approval

Conditions of Approval (CoA)	Condition	Where addressed in

## 4 Management measures

This section outlines the management measures provided in the ACHA (Biosis 2020) to mitigate impacts to Aboriginal cultural heritage values during the construction phase of the project. These management measures are summarised in Table 4.1.

The Project site is located within the Mamre Road Precinct, and therefore the relevant controls of the DCP have been considered in this ACHMP and must be applied to the construction phase of the Project. The applicable controls provided in the DCP have also been summarised in Table 4.1.

**Table 4.1** Management measures

Control	Timing	Responsibility	Source
<b>General</b>			
In order to ensure that a person undertaking any development or activities on land does not harm Aboriginal objects, development applications must identify any areas of Aboriginal heritage value that are within or adjoining the area of the proposed development, including any areas within the development site that are to be retained and protected (and identify the management protocols for these).	Pre-construction and construction	Project Manger	Section 2.6 of the DCP
<b>Staff training</b>			
All staff and contractors must undergo induction training which outlines the obligations of staff and contractors under the NPW Act, consent of approval and this ACHMP.	Pre-construction and construction	All site personnel	ACHAR
<b>Test excavations and salvaging of Area 3</b>			
Area 3 has been identified as having moderate archaeological potential should be avoided wherever possible. If impact to this area cannot be avoided, subsurface investigations (test excavations) will be required prior to the commencement of impacts.	Construction	Contractor Project Manager	Section 7 of the ACHAR
Where impacts can't be avoided to the portion of Area 3, where high density intact archaeological deposits have been identified, salvage excavations must be undertaken in accordance with methodology agreed with the registered aboriginal parties (RAP).	Construction	Contractor Project Manager	Section 7 of the ACHAR
In the event that salvage excavation of Area 3 is required the following measures will be undertaken:			

**Table 4.1**      **Management measures**

Control	Timing	Responsibility	Source
<ul style="list-style-type: none"> <li>– Prior to commencement of works, the portion of Area 3 recommended for salvage should be clearly fenced.</li> </ul>	Pre-construction	Contractor Project Manager	Section 7 of the ACHAR
<ul style="list-style-type: none"> <li>– Salvage excavations should focus on the areas of highest artefact density (artefact densities &gt;25 artefacts per square metre) within the recommended salvage area. An area of up to 100 square metres be salvaged to adequately investigate the extent of the high density deposit</li> </ul> <p>The portion of Area 3 for salvage is outlined in Figure 4.1, salvage of this area will only be undertaken if required. Salvage excavations are not proposed as part of the project if the area is successfully avoided.</p>	Construction	Contractor Project Manager	Section 7 of the ACHAR
<b>Unexpected finds</b>			
<p>All Aboriginal objects and Places are protected under the NPW Act. It is an offence to disturb an Aboriginal object or site without a consent permit issued by Heritage NSW or DPIE.</p> <p>Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the Heritage NSW and Aboriginal stakeholders.</p>	Construction	All site personnel	Section 7 of the ACHAR
<p>Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity, the following steps must occur:</p> <ul style="list-style-type: none"> <li>• immediately cease all work at that location and not further move or disturb the remains;</li> <li>• notify the NSW Police and Heritage NSW's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location; and</li> <li>• not recommence work at that location unless authorised in writing by Heritage NSW.</li> </ul>	Construction	All site personnel	Section 7 of the ACHAR



Figure 4.1 Portion of area 3 for salvage



## 5 Unexpected Finds Protocol

This section outlines the unexpected finds protocol to be applied during the construction phase of the Project. The unexpected finds protocol should be applied to the discovery of previously unidentified items or objects of Aboriginal or archaeological significance found within the project area, in addition to human remains.

### 5.1 Aboriginal or Archaeological Finds

If any item or object of Aboriginal or archaeological significance are found, the following steps must be undertaken:

1. **STOP WORKS** – immediately cease all works and do not move or disturb the find.
2. **NOTIFY** – notify the Project Manager and Heritage NSW immediately to arrange for representatives to inspect the site. If human remains are found, the NSW Police must also be notified.
3. **MANAGE** – management may involve securing the find by erecting a no-go zone e.g a 10 m buffer area around the suspected item or object.
4. **ASSESS** – finds must not be moved until they are assessed by a qualified archaeologist.
5. **REPORT** – the Environmental Representative or Project Manager will be responsible for completing any reporting requirements including those required by Heritage NSW.

### 5.2 Human Remains

In the event human remains are found, the following steps must be undertaken:

1. **STOP WORKS** – immediately cease all works and do not move or disturb the remains.
2. **NOTIFY** - notify the NSW Police on 000 as soon as practicable and provide details of the remains and the location. The NSW Heritage Environmental Line on 131 555 should also be notified in the event the remains are Aboriginal Ancestral.
3. **RECOMMENCEMENT** – works are not to recommence unless authorised in writing by Heritage NSW.

---

Attachment A

# Aboriginal Cultural Heritage Assessment Report (ACHAR) – Biosis (Final 02 May 2021)



# 200 Aldington Road Industrial Estate, Kemps Creek: Historical Heritage Assessment

FINAL REPORT

Prepared for Fife Kemps Creek Pty Ltd

20 September 2021



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- Fife Kemps Creek Pty Limited: Chris Demertze.
- Ethos Urban: Gareth Bird.

Biosis staff involved in this project were:

- Ashleigh Keevers-Eastman (Project Management).
- Lucy Wilson (mapping).

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## Glossary

<b>BP</b>	Before present
<b>Biosis</b>	Biosis Pty Ltd
<b>c.</b>	circa
<b>PDCP</b>	<i>Penrith Development Control Plan 2014</i>
<b>CHL</b>	Commonwealth Heritage List
<b>DEE</b>	Department of the Environment and Energy
<b>DP</b>	Deposited Plan
<b>EP&amp;A Act</b>	<i>Environmental Planning and Assessment Act 1979</i>
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
<b>GFA</b>	Gross Floor Area
<b>Heritage Act</b>	<i>Heritage Act 1977</i>
<b>Heritage NSW</b>	Heritage NSW, Department of Premier and Cabinet
<b>HHA</b>	Historical Heritage Assessment
<b>LEP</b>	<i>Penrith Local Environmental Plan 2010</i>
<b>NHL</b>	National Heritage List
<b>NSW</b>	New South Wales
<b>SEARs</b>	Secretary's Environmental Assessment Requirements
<b>SEPP</b>	<i>State Environmental Planning Policy 2009</i>
<b>SHR</b>	State Heritage Register
<b>Study area</b>	The area of impact for the proposed works
<b>SSD</b>	State Significant Development
<b>SSDA</b>	State Significant Development Application
<b>WSSEPP</b>	<i>State Environmental Planning Policy (Western Sydney Employment Area) 2009</i>

## Summary

---

Biosis Pty Ltd (Biosis) was commissioned by Stockland and Fife Capital to undertake a Historical Heritage Assessment (HHA) for the proposed development of 106-228 Aldington Road, Kemps Creek NSW (the study area). The project is to be assessed as a State Significant Development (SSD) (SSD-10479) under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Secretary's Environmental Assessment Requirements (SEARs) were issued for the proposed development in July 2020. The SEARs requested that an assessment of historical heritage values be undertaken for the study area. This document presents the findings of the desktop assessment and field investigation conducted as part of the HHA and provides an assessment of impacts to historical heritage values within the study area.

A search of heritage databases was conducted to identify any heritage listings within the study area. This included a search of the State Heritage Register (SHR), Commonwealth Heritage List (CHL), National Heritage List (NHL), Section 170 heritage registers and the *Penrith Local Environmental Plan 2010* (LEP). These searches revealed that no heritage listed items were present in the study area.

As part of the HHA, background research was undertaken to identify the previous land use of the study area to determine whether items of historical significance have the potential to be impacted by the proposed works.

The study area formed a part of an initial land grant to Nicolas Bayly in 1810, which was then acquired by Richard Jones in 1826 following Bayly's death. The land was subsequently subdivided in 1891 but sales did not commence until the 1930s. The land was likely used for pastoral and agricultural uses during this time, but no residential structures appear to have been constructed in the study area until after the 1970s. Following the residential development of the study area, intense orcharding and market gardening has occurred resulting in the disturbance of large portions of the study area.

The potential archaeological remains in the study area are associated with agriculture and domestic themes. Archaeological evidence associated with this theme within the study area may include agricultural marks and post holes; although, the high levels of disturbance from the continuous use of the study area since the 1970s for market gardening makes it unlikely for these remains to still be present in the study area.

The archaeological evidence associated with domestic themes include current residential and rural structures such as sheds and houses. Historical research and a field survey have identified that these structures have been constructed post 1970s and are a common element still present throughout the Western Sydney region. They would not contribute information that is not already available and are of low significance.

## Recommendations

### **Recommendation 1: The proposed works may proceed with caution**

There are no recorded items of heritage significance in or adjacent to the study area. Works can proceed in the study area with caution as it has been assessed as possessing low archaeological potential. Should unexpected archaeological remains be uncovered during the course of the proposed works, Recommendation 2 should be implemented.

---

**Recommendation 2: Discovery of unanticipated historical relics**

Relics are historical archaeological resources of local or State significance and are protected in NSW under the *Heritage Act 1977* (Heritage Act). Relics cannot be disturbed except with a permit or exception/exemption notification. Should unanticipated historical archaeology be discovered during the course of the project, work in the vicinity must cease and an archaeologist contacted to make a preliminary assessment of the find. The Heritage Council will require notification if the find is assessed as a relic.

# 1 Introduction

---

## 1.1 Project background

Biosis was commissioned by Stockland and Fife Capital to undertake a HHA for the proposed development of 106-228 Aldington Road, Kemps Creek NSW (the study area) (Figure 1 and Figure 2). The project is to be assessed as a SSD (SSD-10479) under Part 4 of the EP&A Act.

SEARs were issued July 2020 for the proposed development (SSD-10497) requesting that a HHA be undertaken to identify and describe historical heritage values within the study area and surrounding area. This HHA documents the findings of the desktop assessment and field investigation conducted as part of the assessment and provides an assessment of impacts to historical heritage values identified by the assessment and mitigation measures.

The HHA will accompany an Environmental Impact Statement to be assessed by the minister for planning under the NSW Department of Planning, Industry and Environment, to help them determine if the proposed development is likely to have a significant effect on the environment, including historical heritage.

## 1.2 Location of the study area

The study area is located approximately 12 kilometres south-east of Penrith and approximately 40 kilometres west of the Sydney central business district (Figure 1). It encompasses 72.08 hectares of private land and consists of Lots 20, 21, 22 and 23 DP 255560 and Lots 30, 31, and 32 DP 258949.

The study area is within the:

- City of Penrith Local Government Area (LGA).
- Parish of Melville.
- County of Cumberland.

The study area is bound by Aldington Road to the west and pastoral properties to the north, east and south (Figure 2).

## 1.3 Project summary and chronology

This section provides a summary of the project description as lodged (11 November 2020) and publicly exhibited and subsequent amendments to the project to address issues raised by the DPIE and in submissions from agencies, Penrith City Council and the public.

The section concludes with a description of the State Significant Development Application (SSDA) for which development consent is now sought.

### 1.3.1 Summary of project as lodged and publicly exhibited (October 2020)

As lodged and exhibited, the SSDA sought approval for the following development:

- A concept masterplan with an indicative total building area of 375,755 sqm, comprising:
  - 357,355 sqm of warehouse gross floor area (GFA);
  - 18,200 sqm of ancillary office GFA;



- 200 sqm of café GFA;
- 13 individual development lots for warehouse buildings with associated hardstand areas and two lots for drainage infrastructure purposes;
- Internal road layouts and road connections to Aldington Road;
- Provision for 1,700 car parking spaces; and
- Associated concept site landscaping.
- Detailed consent for progressive delivery of site preparation, earthworks and infrastructure works (i.e., Stage 1 works) on the site, including:
  - Demolition and clearing of all existing built form structures;
  - Drainage and infill of existing farm dams and any ground dewatering;
  - Clearing of all existing vegetation;
  - Subdivision of the site into 15 individual lots;
  - Construction of a warehouse building with a total of 50,930 sqm of GFA, including:
    - 48,430 sqm of warehouse GFA;
    - 2,500 sqm of ancillary office GFA; and
    - 231 car parking spaces.
  - Bulk earthworks including 'cut and fill' to create flat development platforms for the warehouse buildings, and site stabilisation works (if required);
  - Roadworks and access infrastructure;
  - Stormwater and drainage works including stormwater basins, diversion of stormwater lines, gross pollutant traps and associated swale works;
  - Sewer and potable water reticulation; and
  - Inter-allotment, road and boundary retaining walls.

### 1.3.2 Response to Submissions (March 2021)

Following the public exhibition of the Project, changes were undertaken in response to the issues raised during the public exhibition. This included a full assessment of the Project against the Draft Mamre Road Precinct Development Control Plan (**draft MRP DCP**) which was released subsequent to lodgement of the SSDA.

The key changes and additional information on the Project included:

- A revised riparian solution in the north east corner of the site which relocated the existing first order water course and re-established the riparian corridor with a 10-metre buffer on each side in accordance with the Natural Resources Access Regulator (NRAR) guidelines;
- An evidence-based case for the proposed location of the high order road south of the site's northern boundary which was seen to provide a more logical and feasible road network outcome (for both FKC and its northern neighbour) compared to that envisioned under the draft MRP DCP;

- Revised technical inputs for the flood assessment to address the submissions raised, including revised flood modelling which addresses post development conditions in the 2-, 20- and 100-year ARI events, and providing further commentary on the flooding impacts of surrounding and downstream land;
- An integrated water management solution which can effectively allow the progressive redevelopment of the site to occur while still recognising and meeting stormwater runoff targets set out in the draft and eventual final MRP DCP;
- A revised Visual Impact Assessment showing the impact of proposed landscaping mitigation over time; and
- Rationale for minor departures from the draft MRP DCP in relation to building design and sitting, pylon signage and retaining walls.

### 1.3.3 Request for Additional Information (April 2021)

Further changes to the Project (which are the subject of this RTS Report) are the result of further correspondence received by DPIE (dated 28 April 2021). The changes to the Project further align the proposed development with the relevant provisions of the draft MRP DCP (especially in relation to the proposed road network) and exclude prohibited components of development from the RE2 Private Recreation zone. The Summary of key changes to the project are:

- Concept Master Plan:
  - Reconfiguration of the internal road network and external road connections to be generally consistent with the draft Mamre Road Precinct DCP including:
    - Provision of a land reservation corridor along the northern boundary to facilitate half the required future DCP road and intersection with Aldington Road
    - Inclusion of the open space edge road in the north-east section of the site with connections through to the adjoining properties to the north and east
    - Intersections with Aldington Road; signalised south intersection and roundabout northern intersection
    - Amendments to road corridor widths.
  - Reconfiguration of Lot G to facilitate the open space edge road to the adjoining eastern property and to locate the proposed warehouse footprint wholly within the IN1 zone
  - Relocation of on-site detention basin within Lot D to be outside the RE2 Private Recreation zone in within the IN1 zone;
  - Retention of existing farm dams within the RE2 zoned area in the north-east corner of the site;
  - Consequential amendments to bulk earthwork pads, retaining walls, lot and future warehouse layout, car parking and landscaping.
- Stage 1 works:
  - Overall revisions to site preparation, earthworks and infrastructure consistent with the revised concept master plan.

- Inclusion of an interim access road and temporary junction connecting to Aldington Road in the northern portion of the site to facilitate site access prior to the implementation of the northern boundary road;
- Revision to the internal road network in line with the concept master plan revisions with the provision of temporary turning heads at the site boundary where those roads will connect to properties to the east and north in the future. The road levels at the boundary interface of the site will align with existing ground level (or as required to contain stormwater).

#### **1.3.4 Description of Project, as amended, for which development consent is now sought:**

The amended SSDA seeks approval for the following development (Figure 3):

- A concept masterplan with an indicative total building area of 346,580 sqm, comprising:
  - 329,575 sqm of warehouse GFA;
  - 17,000 sqm of ancillary office GFA;
  - 13 individual development lots for warehouse buildings with associated hardstand areas and two lots for drainage infrastructure purposes (each including a bio-retention basin);
  - Roads, including:
    - Internal road layouts;
    - Southern road connection to Aldington Road
    - Northern boundary road (half road corridor) connecting to Aldington Road
    - Road connections to adjoining landholdings to the north and east;
  - Provision for 1,546 car parking spaces; and
  - Associated concept site landscaping.
- Detailed consent for progressive delivery of site preparation, earthworks and infrastructure works (i.e., Stage 1 works) on the site, including:
  - Demolition and clearing of all existing built form structures;
  - Drainage and infill of existing farm dams and any ground dewatering;
  - Clearing of all existing vegetation;
  - Subdivision of the site into 15 individual lots;
  - Construction of a warehouse building with a total of 50,930 sqm of GFA, including:
    - 48,430 sqm of warehouse GFA;
    - 2,500 sqm of ancillary office GFA; and
    - 222 car parking spaces.
  - Bulk earthworks including 'cut and fill' to create flat development platforms for the warehouse buildings, and site stabilisation works (if required);
  - Roadworks and access infrastructure, including an interim access road and temporary junction with Aldington Road ;

- Stormwater and drainage works including stormwater basins, diversion of stormwater lines, gross pollutant traps and associated swale works;
- Sewer and potable water reticulation; and
- Inter-allotment, road and boundary retaining walls.

This report addresses the amended project for which development consent is now sought. It is a stand-alone report and supersedes the previous reports and supplementary information prepared for the original development application and subsequent response to submissions.

## 1.4 Scope of assessment

This report was prepared in accordance with current heritage guidelines including *Assessing Heritage Significance*, *Assessing Significance for Historical Archaeological Sites and 'Relics'*<sup>1</sup> and the *Burra Charter*.<sup>2</sup> This report provides a heritage assessment to identify if any heritage items or relics exist within or in the vicinity of the study area. The heritage significance of these heritage items has been investigated and assessed in order to determine the most appropriate management strategy.

The following is a summary of the major objectives of the assessment:

- Identify and assess the heritage values associated with the study area. The assessment aims to achieve this objective through providing a brief summary of the principle historical influences that have contributed to creating the present – day built environment of the study area using resources already available and some limited new research.
- Identifying sites and features within the study area which are already recognised for their heritage value through statutory and non – statutory heritage listings.
- Assess the impact of the proposed works on the heritage significance of the study area.
- Recommend measures to avoid or mitigate any negative impacts on the heritage significance of the study area.

## 1.5 Limitations

This report is based on historical research and a field inspection of the study area. It is possible that further historical research or the emergence of new historical sources may support different interpretations of the evidence in this report.

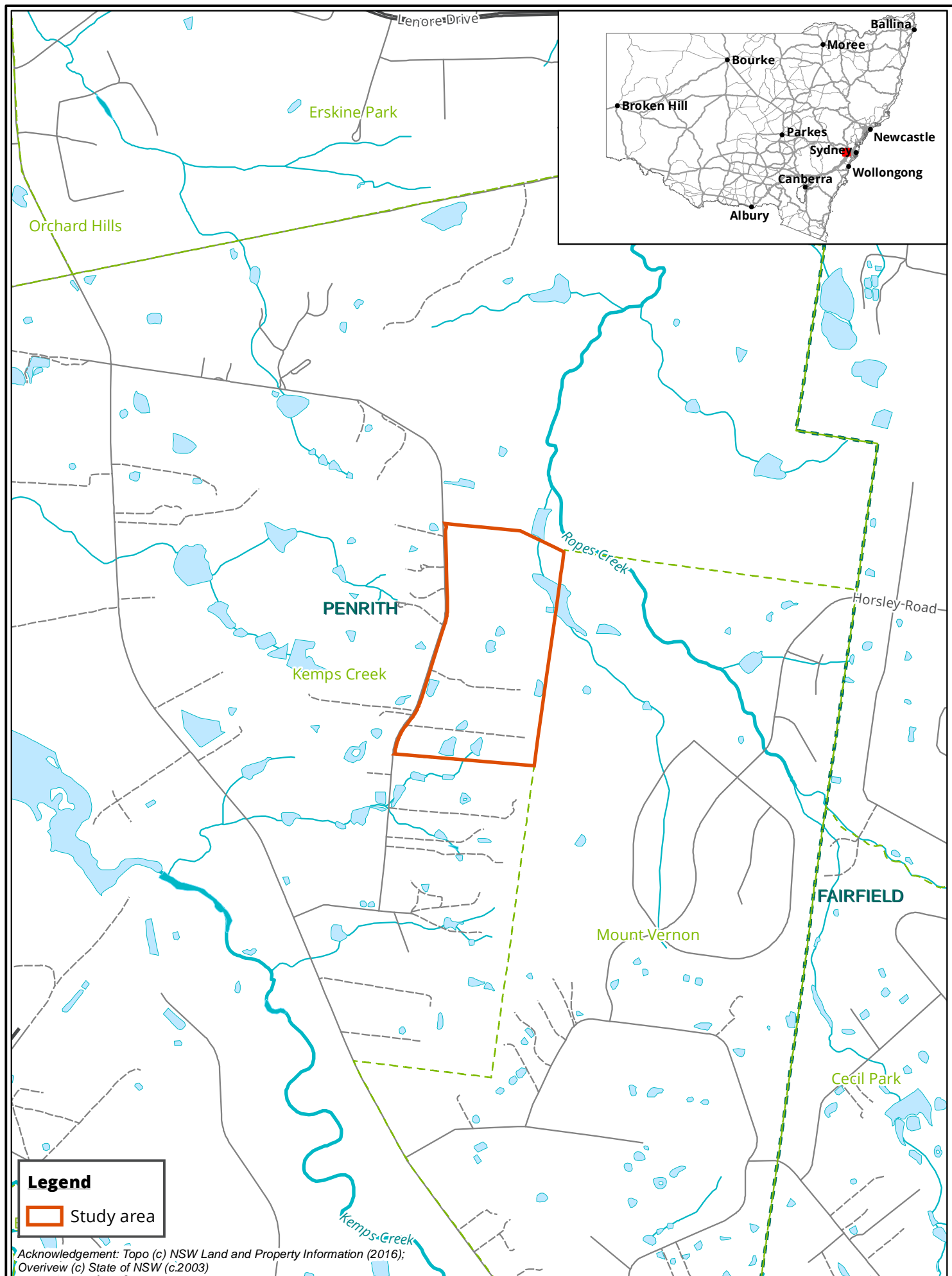
Although this report was undertaken to best archaeological practice and its conclusions are based on professional opinion, it does not warrant that there is no possibility that additional archaeological material will be located in subsequent works on the site. This is because limitations in historical documentation and archaeological methods make it difficult to accurately predict what is under the ground.

The significance assessment made in this report is a combination of both facts and interpretation of those facts in accordance with a standard set of assessment criteria. It is possible that another professional may interpret the historical facts and physical evidence in a different way.

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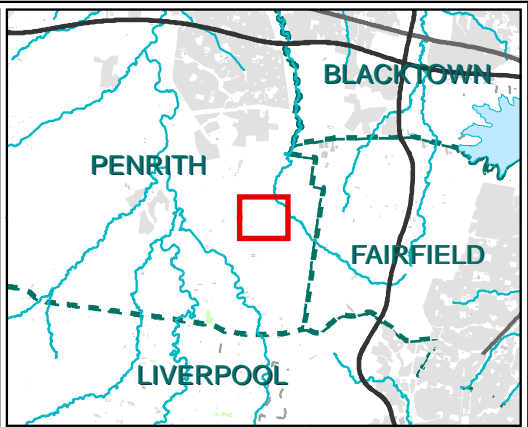
<sup>1</sup> Heritage Office 2001

<sup>2</sup> Australia ICOMOS 2013



**Figure 1 Location of the study area**

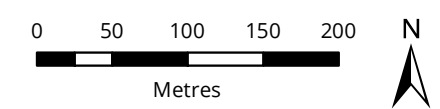




**Legend**

- Study area
- Lot

**Figure 2 Study area detail**

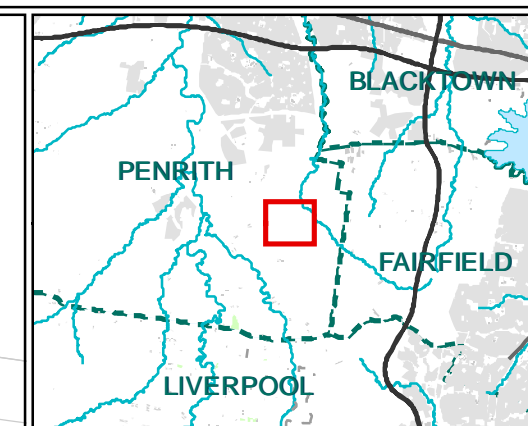
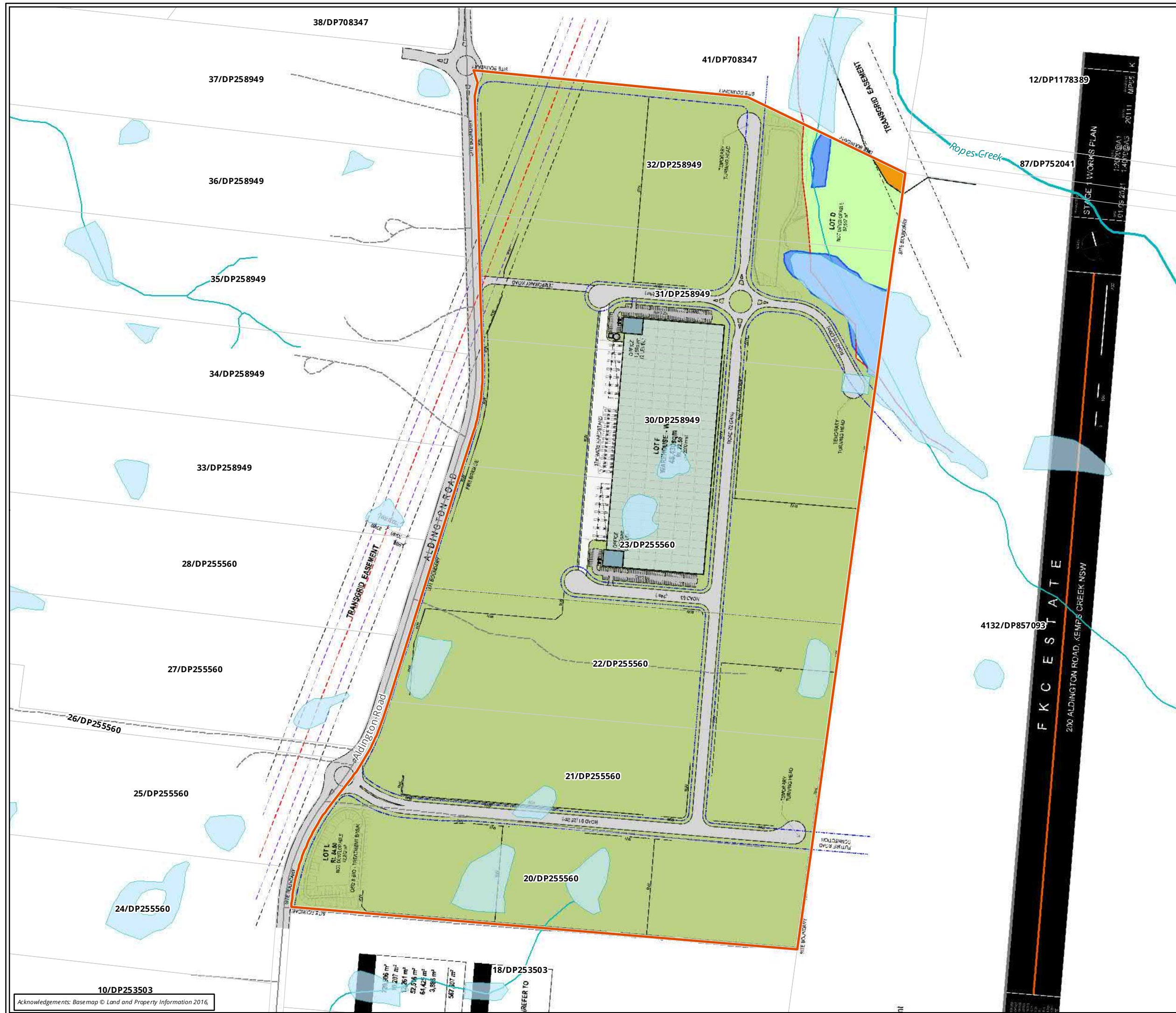


Scale: 1:5,000 @ A3  
Coordinate System: GDA 1994 MGA Zone 56



Matter: 31837,  
Date: 23 March 2021,  
Checked by: SJK, Drawn by: AEDM, Last edited by: jturner  
Location: P:\31800s\31837\Mapping\31837\_ACHA\_F2\_StudyArea.mxd





### Legend

- Study area
- Lot

**Figure 3 Proposed development, Stage 1 Works Plan**

0 50 100 150 200  
Metres

Scale: 1:5,000 @ A3  
Coordinate System: GDA 1994 MGA Zone 56



Matter: 31837,  
Date: 10 September 2021,  
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## 2 Statutory framework

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In NSW, cultural heritage is managed in a three-tiered system: national, state and local. Certain sites and items may require management under all three systems or only under one or two. The following discussion aims to outline the various levels of protection and approvals required to make changes to cultural heritage in the state.

### 2.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Act 1999* (EPBC Act) is the national Act protecting the natural and cultural environment. The EPBC Act is administered by the Department of the Environment and Energy (DEE). The EPBC Act establishes two heritage lists for the management of the natural and cultural environment:

- The NHL contains items which have been assessed to be of outstanding significance and define 'critical moments in our development as a nation'.<sup>3</sup>
- The CHL contains items which are natural and cultural heritage places that are on Commonwealth land, in Commonwealth waters or are owned or managed by the Commonwealth. A place or item on the CHL has been assessed as possessing 'significant' heritage value.<sup>4</sup>

A search of the NHL and CHL did not yield results associated with the study area.

### 2.2 NSW Heritage Act 1977

Heritage in NSW is principally protected by the Heritage Act (as amended) which was passed for the purpose of conserving items of environmental heritage of NSW. Environmental heritage is broadly defined under Section 4 of the Heritage Act as consisting of the following items: 'those places, buildings, works, relics, moveable objects, and precincts, of State or Local heritage significance'. The Heritage Act is administered by the Heritage Council, under delegation by the Heritage Division, Heritage NSW. The Heritage Act is designed to protect both known heritage items (such as standing structures) and items that may not be immediately obvious (such as potential archaeological remains or 'relics'). Different parts of the Heritage Act deal with different situations and types of heritage and the Heritage Act provides a number of mechanisms by which items and places of heritage significance may be protected.

#### 2.2.1 State Heritage Register

Protection of items of State significance is by nomination and listing on the SHR created under Part 3A of the Heritage Act. The Register came into effect on 2 April 1999. The Register was established under the *Heritage Amendment Act 1998*. It replaces the earlier system of Permanent Conservation Orders as a means for protecting items with State significance.

A permit under Section 60 of the Heritage Act is required for works on a site listed on the SHR, except for that work which complies with the conditions for exemptions to the requirement for obtaining a permit. Details of which minor works are exempted from the requirements to submit a Section 60 Application can be found in

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<sup>3</sup> 'About National Heritage' <http://www.environment.gov.au/heritage/about/national/index.html>

<sup>4</sup> 'Commonwealth Heritage List Criteria' <http://www.environment.gov.au/heritage/about/commonwealth/criteria.html>

the Guideline 'Standard Exemptions for Works requiring Heritage Council Approval'. These exemptions came into force on 5 September 2008 and replace all previous exemptions.

There are no items listed on the SHR within or adjacent to the study area.

### 2.2.2 Archaeological relics

Section 139 of the Heritage Act protects archaeological 'relics' from being 'exposed, moved, damaged or destroyed' by the disturbance or excavation of land. This protection extends to the situation where a person has 'reasonable cause to suspect' that archaeological remains may be affected by the disturbance or excavation of the land. This section applies to all land in NSW that is not included on the SHR.

Amendments to the Heritage Act made in 2009 changed the definition of an archaeological 'relic' under the Act. A 'relic' is defined by the Heritage Act as:

*'Any deposit, object or material evidence:*

*(a) Which relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and*

*(b) Which is of State or Local significance'.*

It should be noted that not all remains that would be considered archaeological are relics under the NSW Heritage Act. Advice given in the Archaeological Significance Assessment Guidelines is that a 'relic' would be viewed as a chattel and it is stated that,

*'In practice, an important historical archaeological site will be likely to contain a range of different elements as vestiges and remnants of the past. Such sites will include 'relics' of significance in the form of deposits, artefacts, objects and usually also other material evidence from demolished buildings, works or former structures which provide evidence of prior occupations but may not be "relics".<sup>5</sup>*

Section 139 of the Heritage Act requires any person who knows or has reasonable cause to suspect that their proposed works will expose or disturb a 'relic' to first obtain an Excavation Permit from the Heritage Council of NSW (pursuant to Section 140 of the Act), unless there is an applicable exception (pursuant to Section 139(4)). Excavation permits are issued by the Heritage Council of NSW in accordance with Sections 60 or 140 of the Heritage Act. It is an offence to disturb or excavate land to discover, expose or move a relic without obtaining a permit. Excavation permits are usually issued subject to a range of conditions. These conditions will relate to matters such as reporting requirements and artefact cataloguing, storage and curation.

Exceptions under Section 139(4) to the standard Section 140 process exist for applications that meet the appropriate criterion. An application is still required to be made. The Section 139(4) permit is an exception from the requirement to obtain a Section 140 permit and reflects the nature of the impact and the significance of the relics or potential relics being impacted upon.

If an exception has been granted and, during the course of the development, substantial intact archaeological relics of state or local significance, not identified in the archaeological assessment or statement required by this exception, are unexpectedly discovered during excavation, work must cease in the affected area and the Heritage Office must be notified in writing in accordance with Section 146 of the Heritage Act. Depending on the nature of the discovery, additional assessment and, possibly, an excavation permit may be required prior to the recommencement of excavation in the affected area.

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<sup>5</sup> NSW Heritage Branch, Department of Planning 2009, p.7

### 2.2.3 Section 170 Heritage and Conservation Registers

Section 170 of the Heritage Act requires that culturally significant items or places managed or owned by Government agencies are listed on departmental Heritage and Conservation Register. Information on these registers has been prepared in accordance with Heritage Division guidelines.

Statutory obligations for archaeological sites that are listed on a Section 170 Register include notification to the Heritage Council in addition to relic's provision obligations. There are no items within or adjacent to the study area that are entered on a State government instrumentality Section 170 Register.

## 2.3 Environmental Planning and Assessment Act 1979

### 2.3.1 Local Environmental Plan

The Penrith LEP 2010 contains schedules of heritage items that are managed by the controls in the instrument. Heritage items in the vicinity of the study area are identified in Figure 4.

There are no heritage items listed in the Penrith LEP 2010 Schedule 5 located within or adjacent to the study area. The study area is situated within the local vicinity of the following heritage item of local significance:

- The Fleurs Radio Telescope site (Item No. 832), located at 885 (a) Mamre Road, Kemps Creek, Lot 21 DP 258414. Heritage item of local significance located approximately 1.6 kilometres south west of the study area.

### 2.3.2 State Environmental Planning Policy

The WSSEPP contains schedules of heritage items by the controls in the instrument. These items contain state or regional environmental planning significance. Heritage items in the vicinity of the study area are identified within Figure 4.

There are no heritage items listed in the WSSEPP 2009 Schedule 5 located within or adjacent to the study area.

The study area is situated within the local vicinity of the following heritage listed items of local significance:

- Brick Farmhouse (Item No. I4), 282 Aldington Road, Kemps Creek, Lot 142 and DP 1033636. Heritage item of local significance located approximately 500 metres south of the study area.
- Gateposts to Colesbrook (Item No. I3), 269 – 285 Mamre Road, Kemps Creek, Lot 8 DP 253503. Heritage item of local significance located approximately 430 metres south of the study area.
- Bayley Park, house (Item No. I2), 919 – 929 Mamre Road, Kemps Creek, Lot 35 DP 258414. Heritage item of local significance located approximately 970 metres west of the study area.

### 2.3.3 Penrith Development Control Plan 2014

The *Penrith Development Control Plan 2014* (PDCP) outlines built form controls to guide development. The PDCP supplements the provisions of the Penrith LEP. The PDCP outlines the following controls for the development of heritage items:

- Be consistent with an appropriate SoHI and information of the SHR.
- Protect the setting of the heritage item.
- Retain significant internal and external fabric and building elements, and spaces.
- Remove unsympathetic material.

- Reinstate missing detail and building elements.
- Use materials, finishes and colours that are appropriate to significant periods of development or architectural character.

Controls are also provided for development within the vicinity of a heritage item:

- A Heritage Impact Statement must be lodged with the development application if it may impact heritage setting, undermine or cause physical damage, or any adverse impact to the item.

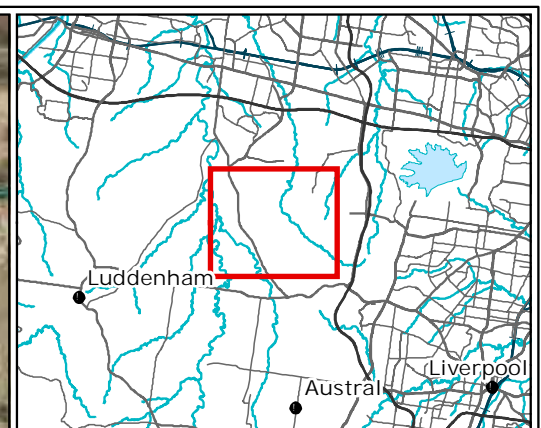
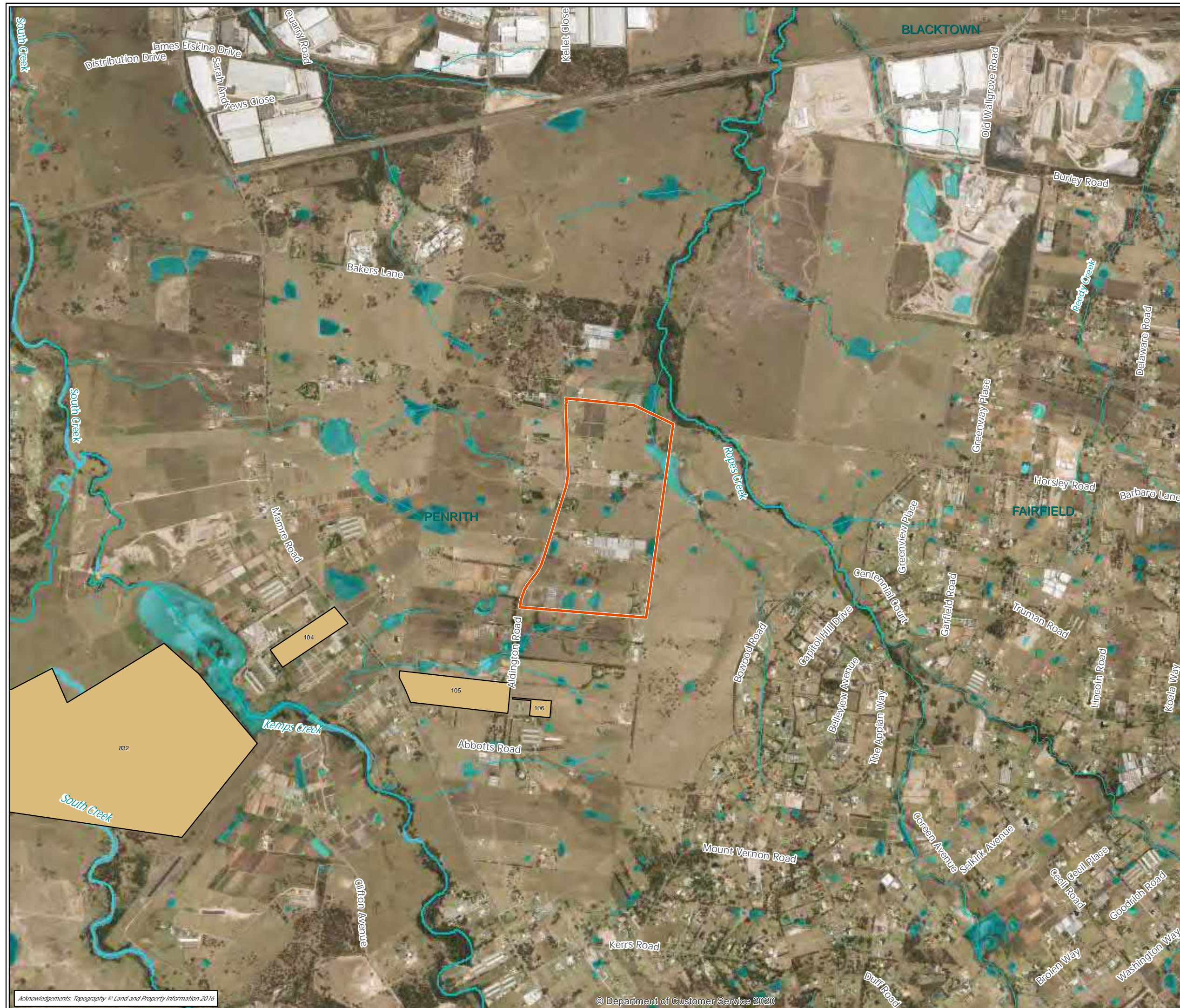
## **2.4 Summary of heritage listings**

A summary of heritage listings within the locality of the study area is presented in Table 1 and Figure 4.

**Table 1 Summary of heritage listings within and adjacent to the study area**

Site number	Site name	Address / Property description	Listings		Significance
			Individual item	As a Conservation Area	
<b>832</b>	The Fleurs Radio Telescope site	885 (a) Mamre Road, Kemps Creek, Lot 21 DP 258414	LEP		Local
<b>I4</b>	Brick farmhouse	282 Aldington Road, Kemps Creek, Lot 142 and DP 1033636	SEPP		Local
<b>I3</b>	Gateposts to Colesbrook	269 – 285 Mamre Road, Kemps Creek, Lot 8 DP 253503	SEPP		Local
<b>I2</b>	Bayley Park, house	919 – 929 Mamre Road, Kemps Creek, Lot 35 DP 258414	SEPP		Local





#### Legend

- Study area
- Item - General

Figure 4 Location of the heritage items in the vicinity of the study area

0 200 400 600 800 1,000  
Metres

Scale: 1:20,000 @ A3  
Coordinate System: GDA 1994 MGA Zone 56



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Date: 11 August 2020,  
Checked by: ML, Drawn by: LW, Last edited by: lwilson  
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## 3 Historical context

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Historical research has been undertaken to identify the land use history of the study area, to isolate key phases in its history and to identify the location of any built heritage or archaeological resources which may be associated with the study area. The historical research places the history of the study area into the broader context of Kemps Creek.

### 3.1 Topography and resources

The study area is located within the Cumberland Lowlands physiographic region that consists of low lying, gently undulating plains and low hills, with a dense drainage net of predominantly northward flowing channels.<sup>6</sup> The study area itself is a series of undulating moderately inclined slopes and crests which gradually descends towards unnamed tributaries of Ropes Creek in the north-east and Kemps Creek in the south. This landscape is situated on the Bringelly Shale formation which is part of the Wianamatta group. Bringelly shale consists of shale, carbonaceous claystone, laminate, lithic sandstone and rare coal.

There are two creek lines within the study area. The first is an unnamed first order tributary of Ropes Creek that transects the north-east corner of the study area. Ropes Creek, a third order creek, is located 70 metres from the north-east corner of the study area. The second is in the south of the study area and is a first order tributary of Kemps Creek, which is located 1.2 kilometres to the south east.

The study area is located partly within the Blacktown soil landscape, the Luddenham soil landscape and the South Creek soil landscape. These soil landscapes support a range of flora and fauna species. Plant species likely to be available within the landscape include, Forest Red Gum *Eucalyptus tereticornis*, Narrow-leaved Ironbark *Eucalyptus crebra*, and Grey Box *Eucalyptus moluccana*. Spotted Gum *Corymbia maculata* are present on shale hills. Hard-leaved Scribbly Gum *Eucalyptus sclerophylla*, Rough-Barked Apple *Angophora floribunda*, and Old-man Banksia *Banksia serrata* are identified on alluvial sands and gravels. Broad-leaved apple *Angophora subvelutina*, Cabbage Gum *Eucalyptus amplifolia*, Forest Red Gum *Eucalyptus tereticornis*, and Swamp Oak *Casuarina glauca* are present on river flats. Tall Spike Rush *Eleocharis sphacelata* and Juncus *Juncus effuses* with Parramatta Red Gum *Eucalyptus parramattensis* are noted around lagoons and swamps.<sup>7</sup>

This would have supported a range of animal species such as, Australian Wood Duck *Chenonetta jubata*, White-Faced Heron *Egretta novaehollandiae*, Eastern Long-Necked Tortoise *Chelodina longicollis*, Eastern Water Skink *Eulamprus quoyii*, Garden Skink *Lampropholis guichenoti*, Welcome Swallow *Hirundo neoxena*, Western Swampphen *Porphyrio porphyrio*, as well as arboreal fauna including owls Strigiformes, Ringtailed Possum *Pseudocheirus peregrinus* and Brushtailed Possums *Trichosrus vulpecula*, and gliders *Petauridae*.

### 3.2 Aboriginal past

It is generally accepted that Aboriginal people have inhabited the Australian landmass for the last 65,000 years.<sup>8</sup> Dates of the earliest occupation of the continent by Aboriginal people are subject to continued revision as more research is undertaken. The timing for the human occupation of the Sydney Basin is still uncertain. While there is some possible evidence for occupation of the region around 40,000 years ago, the earliest known radiocarbon date for the Aboriginal occupation of the Sydney Basin is associated with a

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<sup>6</sup> Clarkson et al. 2017

<sup>7</sup> NPWS 2003, p.193

<sup>8</sup> Allen & O'Connell 2003

cultural archaeological deposit at Parramatta, which was dated to  $30,735 \pm 407$  Before Present (BP).<sup>9</sup>

Archaeological evidence of Aboriginal occupation of the Cumberland Plains indicates that the area was intensively occupied from approximately 4,000 years BP.<sup>10</sup> Such 'young' dates are probably more a reflection of the conditions associated with the preservation of this evidence and the areas that have been subject to surface and sub-surface archaeological investigations, rather than actual evidence of Aboriginal occupation prior to this time.

Our knowledge of Aboriginal people and their land-use patterns and lifestyles prior to European contact is mainly reliant on documents written by non-Aboriginal people. These documents are affected by the inherent bias of the class and cultures of their authors, who were also often describing a culture that they did not fully understand - a culture that was in a heightened state of disruption given the arrival of settlers and disease. Early written records can however be used in conjunction with archaeological information and surviving oral histories from members of the Aboriginal community in order to gain a picture of Aboriginal life in the region.

Despite a proliferation of Aboriginal heritage sites there is considerable ongoing debate about the nature, territory and range of pre-contact Aboriginal language groups in the greater Sydney region. These debates have arisen largely because, by the time colonial diarists, missionaries and proto-anthropologists began making detailed records of Aboriginal people in the late 19th century, pre-European Aboriginal groups had been broken up and reconfigured by European settlement activity. The following information relating to Aboriginal people on the Cumberland Plains is based on such early records.

There is some confusion relating to group names, which can be explained by the use of differing terminologies in early historical references. Language groups were not the main political or social units in Aboriginal life. Instead, land custodianship and ownership centred on the smaller named groups that comprised the broader language grouping. There is some variation in the terminology used to categorise these smaller groups; the terms used by Attenbrow will be used here.<sup>11</sup>

The study area is in the vicinity of three language groups, Dharawal, Gundungurra and the hinterland Darug. Attenbrow suggests:

- The Gundungurra covered "the southern rim of the Cumberland Plain west of the Georges River, as well as the southern Blue Mountains".
- The Dharawal covered "the south side of Botany Bay, extending as far as the Shoalhaven River; from the coast to the Georges River and Appin, possibly as far west as Camden".
- The hinterland Darug covered the area "from Appin in the south to the Hawkesbury River in the north; west of the Georges River, Parramatta, the Lane Cove River and Berowra Creek".<sup>12</sup>

These areas are considered to be indicative only and would have changed through time.

After the arrival of European settlers the movement of Aboriginal people became increasingly restricted. European expansion along the Cumberland Plain was swift and soon there had been considerable loss of land to agriculture. At the same time diseases such as small pox were having a devastating effect on the Aboriginal population. Death, starvation and disease were some of the disrupting factors that led to a reorganisation of the social practices of Aboriginal communities after European contact. The formation of

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<sup>9</sup> Jo McDonald Cultural Heritage Management Pty Ltd 2005a, Jo McDonald Cultural Heritage Management Pty Ltd 2005b

<sup>10</sup> Dallas 1982

<sup>11</sup> Attenbrow 2010

<sup>12</sup> Attenbrow 2010, p.34



new social groups and alliances were made as Aboriginal people sought to retain some semblance of their previous lifestyle.

### 3.3 Kemps Creek – historical development

#### 3.3.1 Exploration (1789 to 1830)

The earliest exploration of the Penrith region was led by Captain Watkin Tench, an officer in the Marine Corps, accompanied by Mr Lowe (surgeon's mate of the *Sirius*), Mr Arndell (assistant surgeon to the Colony), two other marines, and a convict, in 1789. The group reached the Nepean River on 28 June.<sup>13</sup> Later that year, the Penrith Ford was crossed, and in 1791 the course of the Nepean had been explored from the ford to Grose River. By 1791, it had been confirmed that the Hawkesbury and Nepean rivers were the same watercourse; however, each of the names were kept, transitioning from one to the other at the junction with the Grose River.<sup>14</sup> From 1803, Charles Grimes and James Meehan surveyed areas of the eastern bank of the Nepean River following the sanctioning of settlement in this area by Governor Philip Gidley King, likely in part for the fertile soils associated with the Nepean River floodplain. The portions of land ranged from 40 to 200 acres (approximately 16.2 to 81 hectares), with several of 1,000 acres (404.6 hectares) and above. These were granted to officials, free settlers and military staff.<sup>15</sup> Over time, around 1,699 Europeans had settled in the Nepean region, most of whom were of Irish and English heritage and were emancipists or convicts assigned to free settlers or those associated with the government or military.<sup>16</sup> Until the establishment of the Great Western Road around 1815, there was no official passage to the Nepean area. In the same year, Governor Lachlan Macquarie conducted his inspection tour of the region.<sup>17</sup> The Great Western Road had developed into a main route for travel and communication for the Nepean region by 1817, and in this year the government town of Penrith was also established. Penrith remained a small, roadside settlement into the 1830s.<sup>18</sup>

#### 3.3.2 Early development and land grants within the study area (1810 to 1900)

A review of Melville Parish maps and Crown plans for Aldington Road indicates that the study area was previously part of a 1070 acre plot of land granted to Nicholas Bayly in 1810, known as Macquarie Place (Photo 1).<sup>19</sup> Bayly was the son of a British politician and arrived in Australia as and ensign in the NSW Corps in 1798.<sup>20</sup> Bayly had originally been granted a 330 acre portion of land to the west of the study area that he called King Down in 1805.<sup>21</sup> Following his resignation from the Corps, he was appointed Naval Officer in 1809 by Lieutenant-Governor William Paterson, and granted himself the 1070 acre grant within the study area called Macquarie Place and a 550 acre portion of land called Bayly Park, located to the west of the study area in 1810.<sup>22</sup> Prior to his death in 1823, Bayly was cashier and secretary of the Banks of NSW.

<sup>13</sup> Oehm, A. 2006, Paul Davies Pty Ltd 2007a, pp. 11

<sup>14</sup> Thorpe 1986, pp. 12

<sup>15</sup> Paul Davies Pty Ltd 2007a, pp. 11, Thorpe 1986, pp. 12

<sup>16</sup> Paul Davies Pty Ltd 2007b

<sup>17</sup> Thorpe 1986, pp. 12

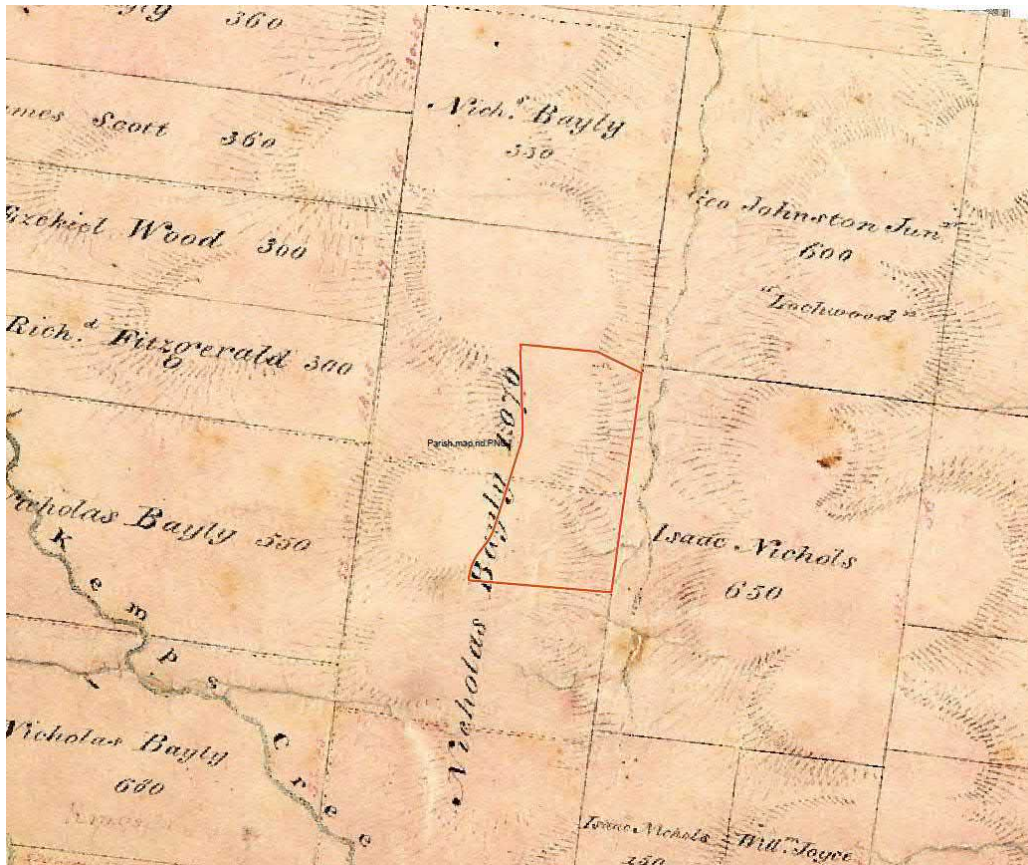
<sup>18</sup> Thorpe 1986, pp. 12

<sup>19</sup> Paul Davies Pty Ltd 2007a, pp. 112–113

<sup>20</sup> Fletcher 1966

<sup>21</sup> Paul Davies Pty Ltd 2007a, p.112

<sup>22</sup> Fletcher 1966



**Photo 1 Parish map of Mellville n.d., with the study area outlined in red (Source: NSW Land Registry Services, Parish Map of Mellville)**

According to Paul Davies, a house was built by 1814 which was surrounded by gardens and cultivated grounds and in 1823 Bayly engaged government road gangs to undertake extensive clearing across his estate.<sup>23</sup> The location of this house is within the Bayly Park Estate, to the west of the study area. It was also noted that Bayly has 2630 acres, with only 40 cleared for growing wheat and 34 cattle and eight sheep. It is unclear if the land within the study area was cleared at this point in time. In 1819, 1050 acres of the original 1070 acre grant, containing the study area was purchased by Henry Brooks.<sup>24</sup> Little information is available for Brooks, however the land was likely used for pastoral purposes as this was the primary occupation of the area at the time.

Following Nicholas Bayly's death in 1823, Bayly Park was then acquired by Richard Jones in 1826, and became known as Fleurs Estate.<sup>25</sup> Only a small portion of what was originally part of Bayly's 1070 acre portion, not containing the study area, was a part of this Estate transfer. In 1891, Fleurs Estate was subdivided into smaller 20 acre farms, however little land was sold, with over 2000 acres placed on the market again in the 1930s (Photo 2).<sup>26</sup> The auction advertisement describes the land as suitable for farms, orchards and dairies; but no structures were recorded on the plan.<sup>27</sup> The sale of land was likely hampered by the depression within the 1890s caused by drought.

<sup>23</sup> Paul Davies Pty Ltd 2007b, pp. 114

<sup>24</sup> NSW Land Registry Services, Primary Application Number 48377

<sup>25</sup> Paul Davies Pty Ltd 2007b, pp. 114

<sup>26</sup> NSW Land Registry Services, Certificate of Title Volume 912 Folio 55

<sup>27</sup> Richardson & Wrench & McCarron, Stewart & Co & Chatfield & Brown 1895

The land containing the study area remained within the Brookes family until 1890 when it was transferred to number of people, notably Alfred Stanley Marks in 1893.<sup>28</sup> The land within the study area was renamed Littleham, which was used to run cattle by the Marks family.<sup>29</sup> No plans of the study area are available to identify if any structures were developed within the area.

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### 3.3.3 Modern development within the study area (1900 to current)

The World War I and World War II saw a military presence within the area, developing a Royal Australian Air Force base within a portion of Fleurs Estate. In addition to this, industrial development began to rise, farmland was repurposed into housing estates, turf farming, vegetable growing, vineyards and some specialty crops.<sup>31</sup>

The land within the study area remained within the Marks family for much of the early 1900s, then transferred through a series of companies from 1944. Littleham Pty Ltd obtained the land in 1949 and was the occupier of the land in 1953 when Aldington Road was proposed for development.<sup>32</sup> This company was recorded to have run sheep on the land, continuing its primary use of pastoral grazing seen within the previous century.<sup>33</sup>

In 1960, Mainline Enterprises Pty Ltd obtained the land within the study area. A crown plan dated to 1963 records a transmission line [1] transecting the study area (Photo 3). Mamre Road is recorded to the south, while no other structures are recorded within the study area. In 1971, Mainline Enterprises Pty Ltd changed their name to LC O'Neil Enterprises Pty Ltd, after the O'Neil family who owned the business.<sup>34</sup> It is unclear how the company used the land, however they later co-signed a mortgage with Unit Construction Pty Ltd in 1971 indicating intentions for development.<sup>35</sup>

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<sup>31</sup> Thorpe 1986

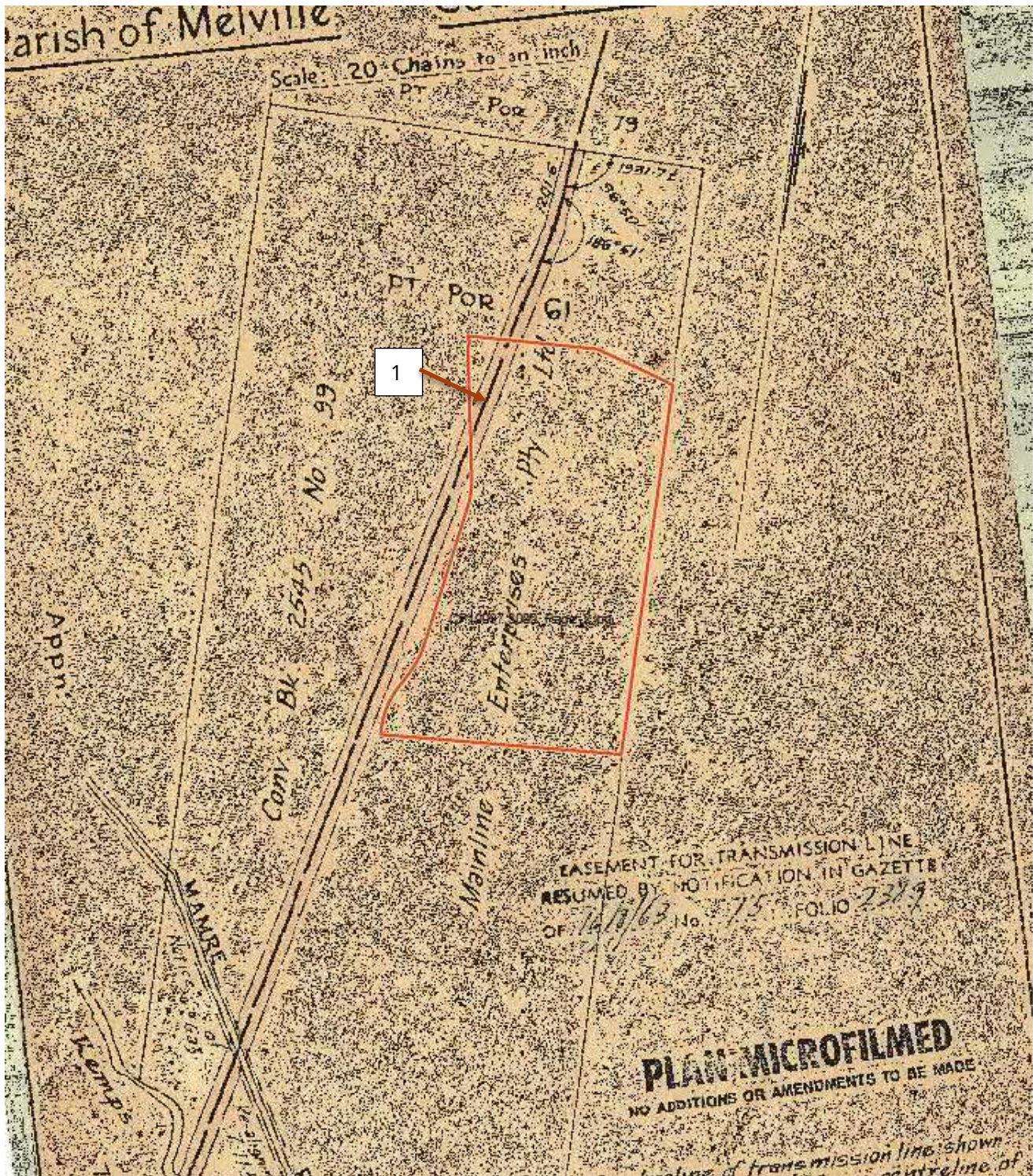
<sup>32</sup> 'Notification of Proposed Opening of Road' 1953

<sup>33</sup> 'Sheep Prices Down 5/- A Head At Homebush' 1954

<sup>34</sup> NSW Land Registry Services, Primary Application 48377

<sup>35</sup> NSW Land Registry Services, Primary Application 48377



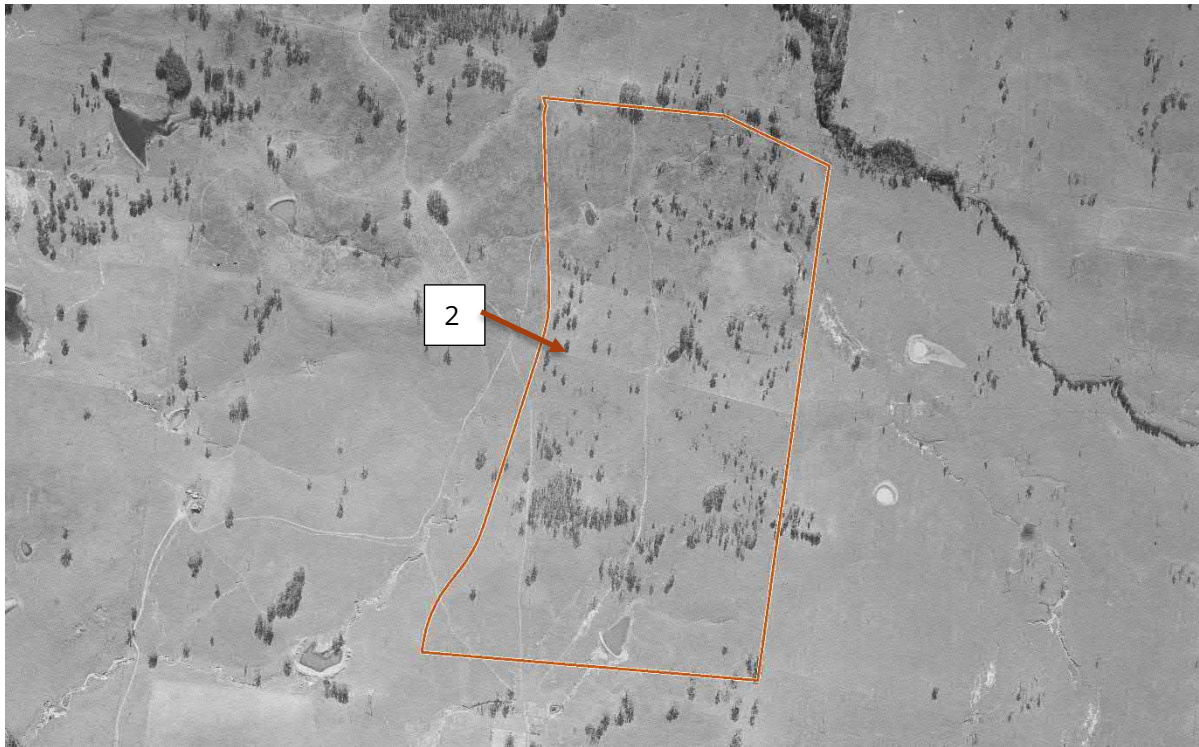


**Photo 3 Crown plan dated to 1963, with the study area outlined in red (Source: NSW Land Registry Services, Crown Plan 19097.3000)**

Historical aerial photographs record modern developments that have occurred within the study area. A historical aerial from the 1970s (Photo 4) shows the study area to be mostly cleared of vegetation. Despite this, few other developments have taken place within the study area. The tributary of Ropes creek in the north-east remains intact as does the creek line to the south. A number of dams are visible within the north-west, central and southern portions of the study area. A vehicle track longitudinally transects the central portion of the study area and the south-western corner, while a fence line [2] transects the central portion of



the study area. A residential property is located to the south and is likely the primary residence developed within the 1050 acre allotment the study area was originally part. A smaller residential property can also be seen outside of the study area to the west, also contained within the 1050 acre allotment. This indicates that the land within the study area was primarily used for pastoral grazing rather than domestic occupation.



**Photo 4 1970s aerial photograph of the study area (Source: NSW aerial imagery)**

An aerial from 1986 (Photo 5) shows the study area to be somewhat disturbed. Although originally gazetted in the 1950s, Aldington Road was not constructed until the 1980s and is recorded to be abutting the western border of the study area. By this time more intensive farming practices began to take place within the study area. This included the construction of more dams located within the western, central, southern and south eastern portions of the study area. A number of residential houses were also constructed throughout the area between 1970 and 1986, representing the first development of the study area. The residential property in the north-west [3] also contains one large and one small associated shed [4]. A residential property [5] to the south of this also contains a large shed [6] and evidence of stockpiling. Three residential properties [7] [8] and [9] have been developed in the central west, including associated sheds. Three further residential properties [10] [11] and [12] and associated sheds, including one large shed [13], are present within the southern portion of the study area. Significant cropping and market gardening practices have occurred extensively throughout portions of the area from the 1970s.