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Sydney Helicopters Redevelopment Biodiversity Development Assessment Report

Heliport Developers Pty Ltd & Sydney Helicopters Pty Ltd

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Abbreviations

Abbreviation	Description
AHD	Australian Height Datum
BAM	Biodiversity Assessment Method 2020
BAMC	Biodiversity Assessment Method Credit Calculator
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DPIE	NSW Department of Planning, Industry 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>
FATO	Final approach and take off area
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
PCT	Plant Community Type
SEPP	State Environmental Planning Policy
SSD	State Significant Development
TEC	Threatened Ecological Community
WM Act	NSW <i>Water Management Act 2000</i>

1. Introduction

This Biodiversity Development Assessment Report (BDAR) was prepared by Michelle Frolich, an Accredited Person (BAAS18064) under the NSW *Biodiversity Conservation Act 2016* (BC Act) with assistance from Matthew Dowle (also an Accredited Person – BAAS17046) and Roshan Kalugalage. This report was prepared to meet the requirements of the Biodiversity Assessment Method (BAM) 2020 and the Planning Secretary’s Environmental Assessment Requirements (SEARs) pertaining to biodiversity for Designated Development Application 1604, issued 25 August 2021.

The BDAR has used the Streamlined Assessment Module – Planted Native Vegetation and has applied the minimum requirements of Appendix L (Table 28) of the BAM (DPIE 2020).

Definitions of terminology used throughout this report are presented in Appendix A:.

1.1. General description of the subject land

The subject land is located at 89-151 Old Castlereagh Road, Castlereagh (Lot 2 DP 1013504) and is within the Penrith City Council Local Government Area (LGA) (Figure 1). It comprises the land immediately south of the Sydney International Regatta Centre and is the proposed site for the relocation of the current operations of Sydney Helicopters. There are a number of existing administration buildings and small tin sheds on the site. The subject land is very flat in topography, at an elevation of approximately 26 m AHD (Australian Height Datum).

The development site (Figure 2) comprises the portion of the subject land that will be subject to the Designated Development Application 1604 and is the extent of the proposed development and clearing.

1.2. Brief description of the proposal

The development proposal includes the following works for the construction and operation of a new helipad and associated infrastructure (Figure 3, Appendix B):

- Demolition of two sheds and integrated hardstand extending beyond the footprint of the sheds
- Demolition of one small single storey shed and associated pavement
- Removal of one inground tank and one flood light
- Removal of less than 10 trees
- Reinstatement of grass turf in locations of removed hardstands and pavement
- New concrete hardstand in location of existing concrete hardstands
- New lighting as required for the Final approach and take off area (FATO).

1.3. Sources of information used

The following data sources were reviewed as part of this report:

- NSW BioNet Vegetation Classification (DPIE 2021a)
- NSW BioNet / Atlas of NSW Wildlife 5 km database search (DPIE 2021 b) (accessed 08 September 2021)
- The Native Vegetation of the Cumberland Plain (NPWS 2003)
- NSW Key Fish Habitat Maps (DPI 2021)
- Arboricultural Impact Assessment prepared by Creative Planning Solutions (2021)
- Sydney Helicopters Proposed Plan prepared by WMK Architecture (2021)
- Additional Geographic Information Systems (GIS) datasets including soil, topography, geology and drainage.

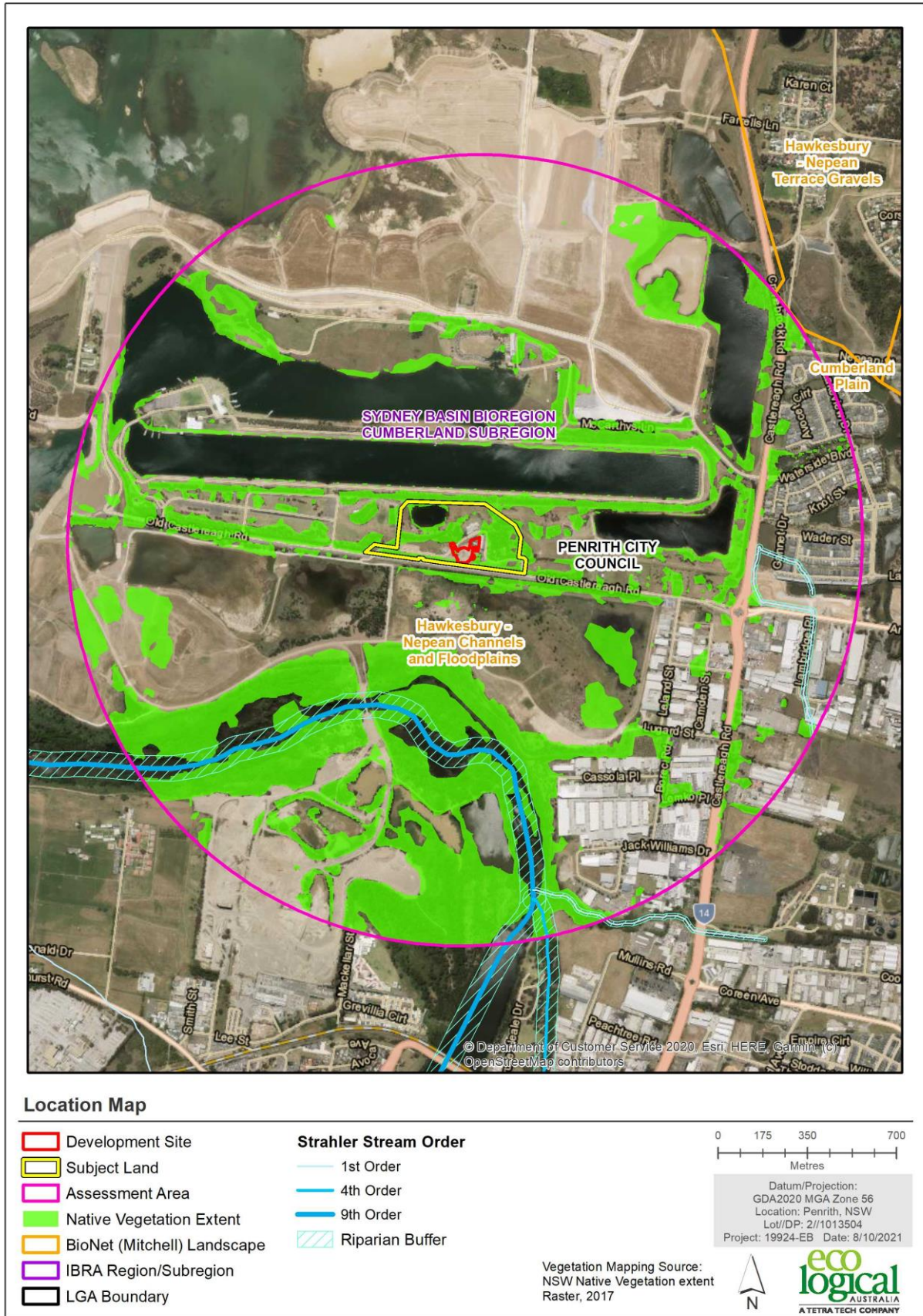


Figure 1: Location Map



Figure 2: Site Map

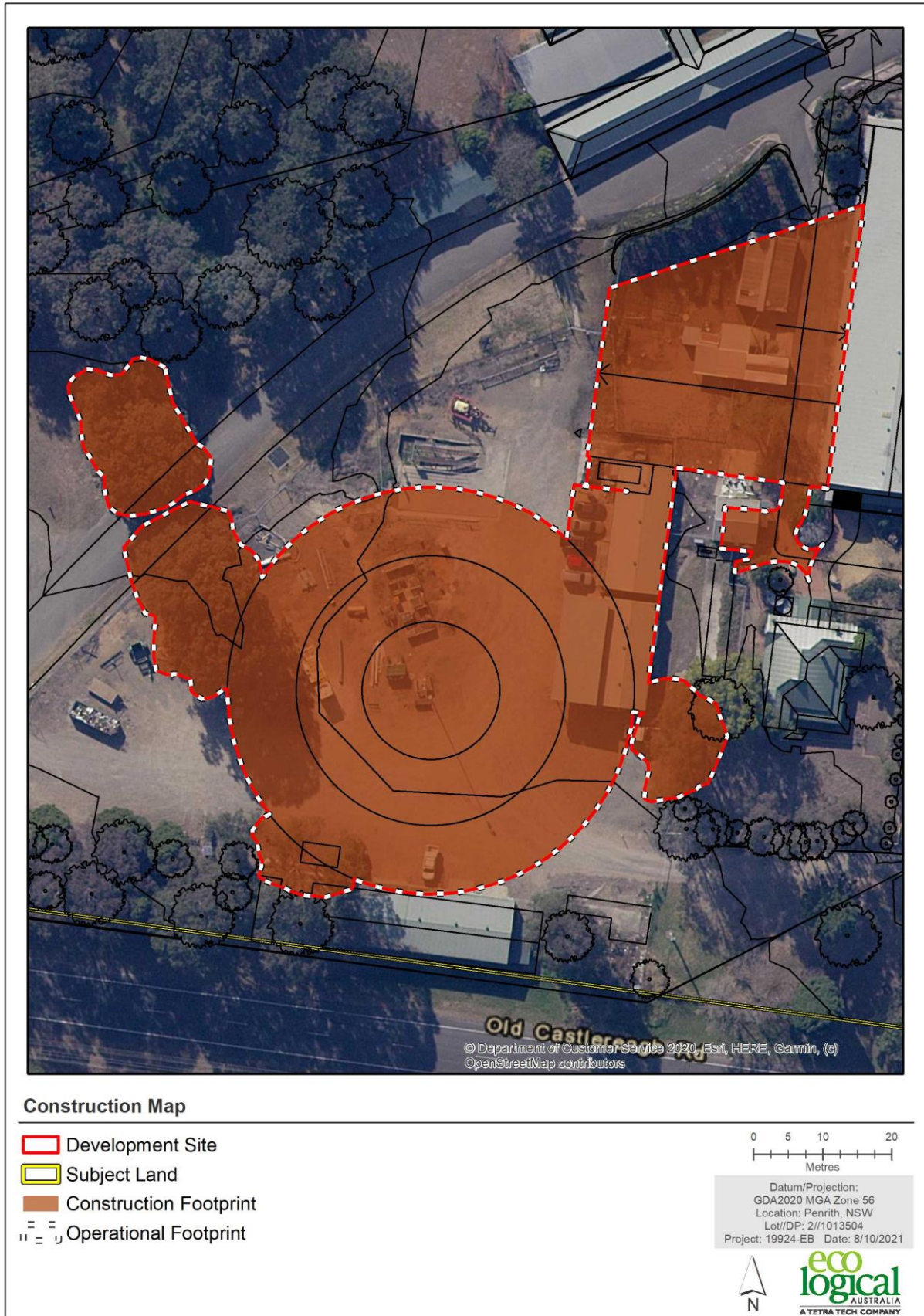


Figure 3: Construction and Operational Footprint

1.4. Legislative context

Legislation relevant to the development site is outlined in Table 1.

Table 1: Legislative context

Name	Relevance to the project
Commonwealth	
<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 (see Section 8).
State	
<i>Environmental Planning and Assessment Act 1979</i> (EP&A Act)	<p>The EP&A Act is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of development proposals.</p> <p>The proposed development is to be assessed as a Designated Development (1604) under Part 4.12 (8) of the EP&A Act. SEARs were issued on 25 August 2021. This report addresses Biodiversity requirements as follows:</p> <ul style="list-style-type: none"> • <i>The Proponent must assess biodiversity impacts in accordance with section 7.9 of the Biodiversity Conservation Act 2016 (BC Act), the Biodiversity Assessment Method (BAM), and be documented in a Biodiversity Development Assessment Report (BDAR).</i> • <i>The BDAR must include information in the form detailed in section 6.12 of the BC Act, clause 6.8 of the Biodiversity Conservation Regulation 2017 and the BAM.</i> • <i>The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017 under section 6.10 of the BC Act.</i> • <i>The Proponent must assess any impacts on biodiversity values not covered by the BAM. This includes a threatened aquatic species assessment (Part 7A Fisheries Management Act 1994) to address whether there are likely to be any significant impact on listed threatened species, populations or ecological communities listed under the Fisheries Management Act 1994 (FM Act).</i> • <i>The Proponent must identify whether the development, or any component of the development, would be classified as a Key Threatening Process (KTP) in accordance with the listings in the BC Act, FM Act and the Environmental Protection and the Biodiversity Conservation Act 2000.</i> <p>This BDAR meets the requirements of the SEARs and has been conducted under the BAM in accordance with the BC Act. The BDAR has been certified by Michelle Frolich, an Accredited Assessor (#18064) under the Biodiversity Offset Scheme (BOS) and BC Act.</p>
<i>Biodiversity Conservation Act 2016</i> (BC Act)	The proposed development is to be assessed as a Designated Development and is required by the SEARS to be assessed in accordance with section 7.9 of the BC Act under the BAM, and therefore requires submission of a Biodiversity Development Assessment Report (BDAR). The BDAR has applied the Streamlined Assessment Module – Planted Native Vegetation.
<i>Fisheries Management Act 1994</i>	<p>The proposed 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.</p> <p>No land listed under Part 7A of the Fisheries Management act is present within the development site.</p>
<i>Water Management Act 2000</i>	The proposed development does not involve works on waterfront land. Therefore, a Controlled Activity Approval under s91 of the WM Act is not required.

Name	Relevance to the project
Planning instruments	
State Environmental Planning Policy (SEPP) (Coastal Management) 2018	The proposed development is located on land to which this SEPP does not apply.
State Environmental Planning Policy (Koala Habitat Protection) 2021	This SEPP does not apply to the Penrith City Council LGA in which the development site is located.
State Environmental Planning Policy (Penrith Lakes Scheme) 1989 (1986 EPI 18)	The development site is zoned T: Tourism in accordance with the State Environmental Planning Policy (Penrith Lakes Scheme) 1989 (1986 EPI 18).
Penrith Lakes Draft Development Control Plan – Stage 1	<p>The Draft Penrith Lakes DCP applies to Tourism and Employment zoned land at Penrith Lakes as required under the Penrith Lakes SEPP. Subsection 3.4 Tree Preservation states the following objectives:</p> <ul style="list-style-type: none"> • To prescribe which species or kinds of trees or other vegetation are protected by Clause 21 (Preservation of trees or vegetation) of the Penrith Lakes SEPP. • To protect existing trees and vegetation and ensure that any new development accounts for existing vegetation in the design and construction of the development. <p>The controls under the draft DCP State:</p> <ul style="list-style-type: none"> • The prescribed trees or other vegetation that are protected by Clause 21 of Penrith Lakes SEPP are: • any tree or other vegetation that has one or more of the following: <ul style="list-style-type: none"> ○ height greater than 3.5 metres; ○ canopy spread greater than 4 metres; and ○ primary trunk diameter greater than 400 millimetres when measured 1 metre above the base of the tree. • any tree or other vegetation that is, or forms part of, a heritage item or is within a heritage conservation area. • Development must seek to retain existing trees. Any tree loss shall be offset with replacement plantings at a ratio of at least 2:1 (new to existing). <p>The proposed development would remove planted native plants and trees. Landscape plans for the proposed development should consider these objectives and associated controls.</p>

2. Landscape context

The landscape features provide a general description of the Development Site in relation to its topographic and hydrological setting, geology and soils. The landscape features considered for this assessment are presented above in **Figure 1** and Figure 2 and described below in Table 2.

The site-based method was applied for this assessment, therefore, the Assessment Area is the 1,500 m buffer surrounding the outside edge of the boundary of the subject land.

Table 2: Landscape features

Landscape feature	Description	Data source
IBRA Region(s)	The assessment area and development site are within the Sydney Basin IBRA Region.	Interim Biogeographic Regionalisation for Australia, Version 7
IBRA subregion(s)	The assessment area and development site are within the Cumberland IBRA subregion.	Interim Biogeographic Regionalisation for Australia, Version 7
Rivers and streams	No rivers or streams are present within the development site. Penrith Lakes, a manmade system of lakes, are located within the assessment area, north of the development site. The Nepean River, mapped as a 9 th order stream (Strahler classification system) is located within the Assessment Area, approximately 500 m south of the development site.	NSW LPI Waterway mapping, Aerial imagery
Estuaries and wetlands	The development site does not contain estuaries or wetlands. However, a number of wetland features have been mapped as under the EPI Wetlands dataset.	NSW directory of important wetlands, Aerial imagery
Connectivity of different areas of habitat	Connectivity is present within the Assessment Area throughout the vegetated corridors of the Nepean River and to the west of the development site. Vegetation within the development site is fragmented and lacks connectivity. At best, planted vegetation within the development site may provide stepping-stone habitat or linking vegetation to that within the nearby riparian corridors for common highly mobile species.	Aerial imagery
Geological features of significance and soil hazard features	The development site and Assessment Area do not contain any geological features of significance (i.e., karst, caves, crevices, cliffs etc.) or soil hazard features.	Aerial imagery
Biodiversity Values	The development site and Assessment Area do not include areas mapped on the NSW Biodiversity Values Map (accessed 25 September 2021).	Biodiversity Values Map and Threshold Tool
Areas of Outstanding Biodiversity Value	The development site and Assessment Area do not include areas of declared critical habitat (accessed 25 September 2021).	Register of Declared Areas of Outstanding Biodiversity Value (DPIE 2020)

3. Native vegetation

The Streamlined Assessment Module (Planted Native Vegetation) in accordance with Appendix D of the BAM has been used to assess and map the native vegetation present.

3.1. Survey effort

ELA completed a field survey on 14th of September 2021 by ecologist James King. The development site was traversed on foot to:

- Determine if vegetation present met the description for a Plant Community Type (PCT) and/or Threatened Ecological Community (TEC)
- Search for any threatened flora species that may be present
- Search for hollows, nests or dreys, or any other habitat feature that may be important for threatened fauna species, including searches for habitat within the existing buildings.

Mapping was undertaken using Avenza Maps, while tracks and photographs were recorded on a mobile phone. Tree numbers were noted and compared with the Arboricultural Impact Assessment Report (Creative Planning Solutions 2021).

3.2. Vegetation present

Remnant vegetation within the development site has historically been cleared and replaced by planted native and exotic species or colonized by exotic grasses (Figure 4). Therefore, the vegetation present could not be assigned to a PCT or a TEC.

The subject land occurs within the Penrith Lakes Regional Park, which includes the Sydney International Regatta Centre used for the Sydney Olympics. A review of historical imagery (Historical, Aerial and Satellite Imagery; NSW Spatial Services) shows the subject land and surrounds was cleared prior to the year 1998, existing as agricultural grazing land or as an old quarry within the flood plain of the Nepean River (see Figure 5 below; subject land cleared in 1986, new plantings established in 1998 and young growth in 2005). A progression of historical imagery over the last 20+ years shows the trees having been planted in rows in 1998 and growing to their current state.

The planted vegetation represents a combination of indigenous native species occurring naturally on the Cumberland Plain and exotic species, including *Eucalyptus baueriana* (Blue Box), *Eucalyptus moluccana* (Grey Box) and *Eucalyptus tereticornis* (Forest Red Gum). These trees have been used extensively in the Sydney Metropolitan Area as part of landscaping. The species identification of the trees along the driveway on the western side of the site differed from that identified by the Arboricultural Impact Assessment report, which identified the trees (Trees 1 to 8) as *Eucalyptus moluccana* (Grey Box) (Creative Planning Solutions 2021). These trees were confirmed by ELA in the field and by Senior Ecologists post-field survey as *Eucalyptus baueriana* (Blue Box). Photos of the planted vegetation are shown in Figure 6. A species list is provided in Appendix C.

Groundcover were present (i.e. not cleared) was dominated by non-native plant species including *Sida rhombifolia* (Paddy's Lucerne), *Senecio madagascariensis* (Fireweed), *Plantago lanceolata* (Lamb's Tongues) and *Solanum nigrum* (Black-berry Nightshade) with the majority of the area covered with mulch in order to suppress plant growth (Figure 7). The groundcover is representative of land that has been modified through clearing and significant earthworks, resulting in a highly modified soil profile and substantially degraded habitat.



Figure 4: Vegetation identified within the development site

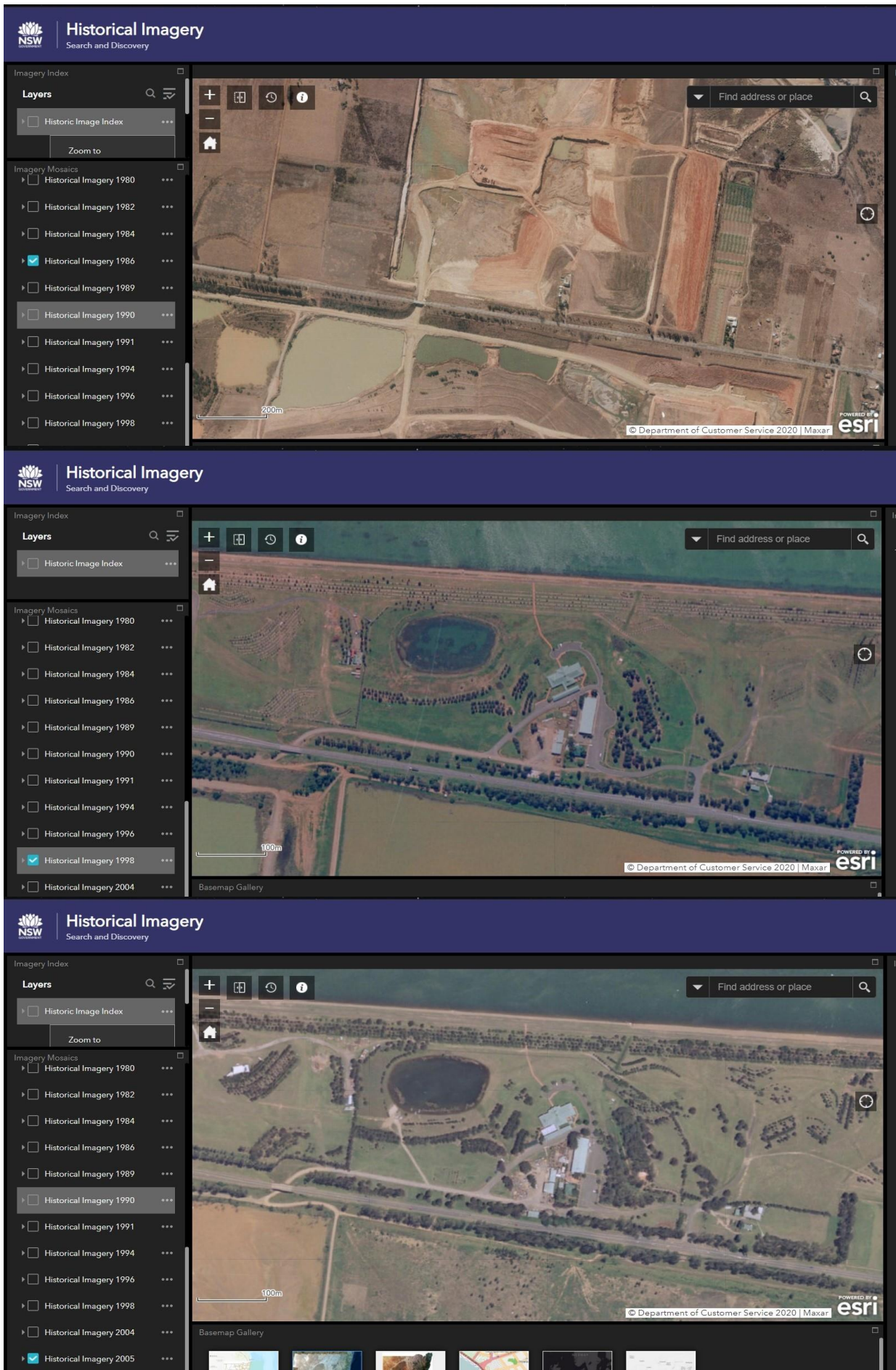


Figure 5: Historical imagery of the development site. Top – 1986; Middle – 1998; Bottom – 2005.



Figure 6: Planted vegetation in the development site: Left – western extent; right – eastern extent



Figure 7: Left - extent of planted vegetation due for removal; Right – mulching and managed ground layer beneath trees

3.3. Streamlined assessment module – planted native vegetation

Due to the presence of planted native vegetation within the development site, this BDAR was prepared using the streamlined assessment module for planted native vegetation in accordance with Appendix D of BAM 2020. This appendix contains a decision-making key which provides a framework for the assessment of planted native vegetation using the BAM (Table 3).

The decision-making key (D.1) identified option 5 as the most appropriate selection for the Planted Native Vegetation within the Development Site. Furthermore, following D.2, no threatened species or any evidence of threatened species utilising the planted vegetation was observed during the field surveys.

Table 3: Decision-making key for planted native vegetation (Appendix D of the BAM 2020)

Question	Response and justification
1) Does the planted native vegetation occur within an area that contains a mosaic of planted and remnant native vegetation and which can be reasonably assigned to a PCT known to occur in the same IBRA subregion as the proposal? <ul style="list-style-type: none"> i Yes – the planted native vegetation must be allocated to the best-fit PCT and the BAM must be applied. ii No – Go to 2. 	No – No remnant vegetation is present, and the planted vegetation could not be assigned to a PCT. The vegetation has been planted in rows as part of the rehabilitation of the land by the Penrith Lakes Development Corporation following the use of the land as quarry sites (see Figure 5 above).
2. Is the planted native vegetation: <ul style="list-style-type: none"> a. Planted for the purpose of environmental rehabilitation or restoration under an existing conservation obligation listed in BAM Section 11.9(2.), and b. The primary objective was to replace or regenerate a plant community type of a threatened plant species or its habitat? <ul style="list-style-type: none"> i Yes – the planted native vegetation must be assessed in accordance with Chapters 4 and 5 of the BAM ii No – Go to 3. 	No – The vegetation has not been planted as part of an existing conservation obligation, nor was is planted to replace a PCT, threatened plant or its habitat.
3. Is the planted / translocated native vegetation of a threatened species or other native species planted/translocated for the purpose of providing threatened species habitat under one of: <ul style="list-style-type: none"> a. A species recovery project b. <i>Saving our Species</i> project c. Other types of government funded restoration project d. Condition of consent for a development approval that required those species to be planted or translocated for the purpose of providing threatened species habitat e. Legal obligation as part of a condition of ruling of court. This includes regulatory directed or ordered remedial plantings (e.g. Remediation Order for clearing without consent issued under the BC Act or the Native Vegetation Act) f. Ecological rehabilitation to re-establish a PCT or TEC that was, or is carried out under a mine operations plan, or g. Approved vegetation management plan (e.g. as required as part of a Controlled Activity Approval for 	No – the planted vegetation is not a translocated individual of a threatened species. The vegetation was not planted for the purpose of providing threatened species habitat under one of the defined projects, condition of consent or management plans listed on the left. The vegetation was planted as part of the establishment of the Penrith Lakes Regional Park by the Penrith Lakes Development Corporation.

Question	Response and justification
<p>works on waterfront land under the NSW <i>Water Management Act 2000</i>)?</p> <ul style="list-style-type: none"> i Yes – the planted native vegetation must be assessed in accordance with Chapters 4 and 5 of the BAM ii No – Go to 4. 	
<p>4. Was the planted native vegetation (including individuals of a threatened flora species) undertaken voluntarily for revegetation, environmental rehabilitation or restoration within a legal obligation to secure or provide for management of the native vegetation?</p> <ul style="list-style-type: none"> i Yes – Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied) ii No – Go to 5. 	<p>No – the planted native vegetation forms part of the landscaping for Penrith Lakes Regional Park and was not planted as part of a legal obligation .</p>
<p>5. Is the planted native vegetation (including individuals of a threatened flora species) planted for functional, aesthetic, horticultural or plantation forestry purposes? This includes examples such as; windbreaks in agricultural landscapes, roadside plantings (including street trees, median stripes, roadside batters), landscaping in parks, gardens and sport fields/complexes, macadamia plantations or teatree farms?</p> <ul style="list-style-type: none"> i Yes – Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied) ii No – Go to 6. 	<p>Yes – the planted native vegetation forms part of the aesthetic landscaping for the existing Penrith Lakes Regional Park, which is zoned <i>T: Tourism</i> in accordance with the State Environmental Planning Policy (Penrith Lakes Scheme) 1989 (1986 EPI 18) .</p> <p>Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied).</p>
<p>6. Is the planted native vegetation a species listed as a widely cultivated native species on a list approved by the Secretary of the Department (or an officer authorised by the Secretary)?</p> <ul style="list-style-type: none"> i Yes – Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied) ii No – There may be other types of occurrences of planted native vegetation that do not easily fit into the decision-making key above. 	<p>N/A</p>

4. Threatened species

4.1. D.2. Assessment of planted native vegetation for threatened species habitat:

The decision-making key above identified option 5 as the most appropriate selection for the planted native vegetation within the development site. Therefore, part D.2 of the streamlined assessment module – planted native vegetation is then applied for the assessment of threatened species and Chapters 4 and 5 of the BAM are not required.

D.2 requires the assessor to assess the suitability of the planted native vegetation for use by threatened species and record any incidental sightings or evidence (e.g. scats, stick nests) of threatened species credit species (flora and fauna) using, inhabiting or being part of the planted native vegetation. If there is evidence that threatened species are using the planted native vegetation as habitat, the assessor must then apply Section 8.4 of the BAM to mitigate and manage impacts on these species. Species credits are not required to offset the proposed impacts from planted native vegetation.

No threatened species were observed during the field surveys and there was no evidence for threatened species utilising habitat within the development site. There were no stick nests, dreys, hollows, fallen logs or other important habitat features recorded during the field survey. The existing buildings were also determined to not provide any habitat for species credit species. Therefore, threatened species are considered unlikely to use habitat within the development site.

The planted vegetation may represent habitat for common mobile species such as *Cacatua galerita* (Sulphur-crested Cockatoo), *Trichoglossus moluccanus* (Rainbow Lorikeet), *Gymnorhina tibicen* (Australian Magpie) and *Eolophus roseicapillus* (Galah). These species may use the canopy as stepping-stone habitat, as shelter, or as a foraging resource when in flower. However, the use of the planted vegetation as habitat by other species (particularly those less mobile) is likely to be limited due to the managed state (e.g. mulching), its isolation to areas of established remnant vegetation (e.g. Nepean River riparian corridor) and lack of important habitat features (e.g. hollows, dreys and logs).

4.2. Prescribed additional biodiversity impact entities

Prescribed impacts are impacts on threatened biodiversity values which are not related to, or are in addition to, native vegetation clearing, and habitat loss as described in Section 6 of the BAM (BAM 2020). Prescribed impacts (including direct and indirect) are impacts:

- on the habitat of threatened entities including;
 - karst caves, crevices, cliffs, rocks and other geological features of significance, or
 - human-made structures, or
 - non-native vegetation
- areas connecting threatened species habitat, such as movement corridors
- impacts that affect water quality, water bodies and hydrological processes that sustain threatened entities (including from subsidence or upsidence from underground mining)
- threatened and protected animals from turbine strikes from a wind farm
- threatened species or fauna that are part of a TEC from vehicle strikes.

The development site is not considered to have any prescribed biodiversity impacts. Whilst the development site contains planted vegetation, existing dwellings and water features are approximately 100m away, these habitat features do not represent habitat for known threatened species, nor are threatened species considered likely to utilise or rely on the habitat for their survival.

5. Avoid and minimise impacts

5.1. Locating a project to avoid and minimise impacts on biodiversity values

The primary mechanism for avoiding and minimising impacts to biodiversity from the proposed development is the initial site selection of historically cleared land and planted native vegetation within a managed landscape. As described above (and shown in Figure 5), the site existed prior to its current form as a quarry and/or agricultural grazing within the flood plains of the Nepean River.

The location of the project is proposed on heavily modified land with degraded habitat values. The vegetation present could not be assigned to a PCT and instead the BDAR has applied the streamlined assessment module for planted native vegetation. Following the decision-making key (Section 3.1) in the module, Chapters 4 and 5 of the BAM are not required, and therefore the clearing of the planted vegetation does not require the use of the BAM Calculator to determine a vegetation integrity score (condition), supporting the low / degraded condition of the vegetation.

5.2. Designing a project to avoid and minimise impacts on biodiversity values

The project is proposed on heavily modified / degraded land within a managed landscape. The design has incorporated existing cleared areas as much as possible and minimised the clearing and pruning of planted native vegetation. Other planted vegetation within the subject land will be retained, thereby avoiding and minimising direct impacts on biodiversity values where possible.

5.3. Locating and designing a project to avoid or minimise prescribed biodiversity impacts

The development has avoided prescribed biodiversity impacts (see Section 4.2) and has been located and designed in a way which avoids and minimises prescribed biodiversity impacts (Table 4).

Table 4: Locating and designing a proposal to avoid and minimise prescribed biodiversity impacts

BAM Section 7.2 location and design principles	How addressed / Justification
Locate surface works and design measures to avoid direct impacts on the habitat features identified as potential prescribed biodiversity impacts	No prescribed biodiversity impacts were considered likely as a result of the proposal.
Locate subsurface works, in both the horizontal and vertical planes, and design measures to avoid and minimise operations beneath the habitat features identified as potential prescribed biodiversity impacts	N/A – the development site does not include geological features of significance or groundwater-dependent plant communities. No prescribed impacts are present.
Locate the proposal to avoid severing or interfering with corridors connecting different areas of habitat and migratory flight paths, to important habitat or local movement pathways	The proposed development will remove planted vegetation which provides limited steppingstone habitat for common mobile species (non-threatened species).
Optimise the proposal layout and include design elements to minimise interactions with threatened entities	N/A – the proposed development does not include the construction of structures which could regularly interact with threatened entities (e.g., wind turbines).
Locate the proposal to avoid impacts on water bodies or hydrological processes and design measures that maintain hydrological processes that sustain threatened entities and control the quality of water released from the site, to avoid or minimise downstream impacts on threatened entities	N/A – the development site does not contain water bodies and would not result in prescribed impacts to hydrological processes.
Engineering solutions, such as proven techniques to: <ul style="list-style-type: none"> minimise fracturing of bedrock underlying features of geological significance or groundwater-dependent communities and their supporting aquifers restore connectivity and movement pathways 	N/A – the development site does not have prescribed impacts that require engineering solutions.

6. Assessment of impacts

6.1. Assessment of direct impacts

The proposed development would directly affect 0.10 ha of planted native vegetation which does not conform to a Plant Community Type or Threatened Ecological Community. The direct impacts include the removal of eight *Eucalyptus baueriana* (Blue Box) and the pruning of two *Eucalyptus moluccana* (Grey Box).

The majority of direct impacts however will occur to areas already cleared or consists of exotic vegetation. Of the 0.55 ha of the development site, only 0.10ha is planted native vegetation, which represents 18% of the proposed direct impacts.

No threatened species habitat will be removed as a result of the proposed works.

6.2. Assessment of indirect impacts

The indirect impacts of the development are outlined in Table 5. Indirect impacts include, but are not limited to:

- inadvertent impacts on adjacent habitat or vegetation
- reduced viability of adjacent habitats due to noise, dust or light spill
- transport of weeds and pathogens from the site to adjacent vegetation
- rubbish dumping, wood collection and rock removal
- increase in pest or feral animal populations.

The residual indirect impacts from the project are considered to be minor. Mitigation measures designed to decrease the potential indirect impacts are outlined in Table 6.

6.3. Prescribed biodiversity impacts

The development does not have any prescribed biodiversity impacts.

6.4. Impact summary

Native vegetation within the development site consists of planted individuals only. Therefore, the streamlined assessment module – planted native vegetation was applied (Appendix D of the BAM). Following the decision-making key in Appendix D of the BAM, the planted native vegetation could not be assigned to a PCT in the IBRA Sub-region, rather it was considered that the vegetation was planted for functional, aesthetic, horticultural or plantation forestry purposes (option 5 of the key). A total of 0.10 ha of planted native vegetation, consisting of the removal of eight trees and trimming of a further two, will be impacted by the development site.

Chapters 4 and 5 of the BAM were not required to assess impacts to native vegetation and threatened species habitat (determined by the decision-making key for planted vegetation). Therefore, the project is not required to apply Chapter 9 of the BAM for the assessment and calculation of an offset credit liability.

Therefore, no credits are required to be offset as a result of the proposed development.

Table 5: Assessment of indirect impacts on native vegetation and threatened species

Indirect impacts	Project phase	Nature	Extent	Frequency	Duration of short-term & long-term impacts	Timing
Inadvertent impacts on adjacent habitat or vegetation	Construction	Damage to adjacent planted vegetation. Minor impacts only.	Limited to adjacent plantings	Infrequent during construction phases	Sporadic and short-term	Timing limited to construction
Reduced viability of adjacent habitat due to edge effects	Construction	Reduced viability of adjacent planted vegetation and habitat. Any impacts considered to be minor.	Limited to adjacent plantings and habitat	Infrequent during construction phases	Sporadic and short-term	Timing limited to construction
Reduced viability of adjacent habitat due to noise, dust or light spill	Construction / operation	Noise and dust created from machinery. No night works, so light spill unlikely. Minor impacts only	Adjacent areas	Daily/nightly	Sporadic and short-term	Timing limited to construction
Transport of weeds and pathogens to adjacent vegetation	Construction	Spread of weed seed or pathogens	Potential for spread into adjacent habitat	Infrequent during construction phases	Sporadic and short-term	Timing limited to construction
Increased risk of starvation or exposure, and loss of shade or shelter	N/A	N/A - unlikely due to limited removal of less than 10 planted trees.	N/A	N/A	N/A	N/A
Loss of breeding habitat	N/A	N/A - no breeding habitat present	N/A	N/A	N/A	N/A
Trampling of threatened flora species	N/A	N/A - no threatened species present	N/A	N/A	N/A	N/A
Inhibition of nitrogen fixation and increased soil salinity	N/A	N/A - site is man-made and no remnant soil present	N/A	N/A	N/A	N/A
Fertiliser drift	N/A	N/A – fertiliser not likely to be used	N/A	N/A	N/A	N/A
Rubbish dumping	N/A	N/A – rubbish dumping unlikely	N/A	N/A	N/A	N/A
Wood collection	N/A	N/A – no woody debris present	N/A	N/A	N/A	N/A
Removal and disturbance of rocks, including bush rock	N/A	N/A – no bush rocks present	N/A	N/A	N/A	N/A
Increase in predators	N/A	N/A – no increase in predators	N/A	N/A	N/A	N/A
Increase in pest animal populations	N/A	N/A – no increase in pest animals	N/A	N/A	N/A	N/A
Changed fire regimes	N/A	N/A – fire regimes won't change	N/A	N/A	N/A	N/A
Disturbance to specialist breeding and foraging habitat	N/A	N/A – no specialist breeding habitat present	N/A	N/A	N/A	N/A

7. Mitigating and management of impacts

Recommended measures proposed to mitigate and manage direct and indirect impacts from the development before, during and after construction are outlined in Table 6 and have been assessed in accordance with Section 8.4 of the BAM. The proponent will develop an adaptive management plan to address any remaining impacts where mitigation has not been proposed in this BDAR. The adaptive management will be incorporated into the Construction Environmental Management Plan (CEMP).

A site-specific CEMP will be developed and implemented prior to construction taking place and incorporate adaptive management principles. The CEMP will be span the pre, during and post-construction period and address the indirect impacts specified in Table 5 and consider the recommended mitigation measures outlined in Table 6.

A number of non-threatened fauna species such as birds, arboreal mammals and amphibians are likely to be present at the development site. Therefore, an appropriate pre-clearance and fauna management protocol, and unexpected finds procedure will be incorporated into the CEMP to avoid and mitigate any potential harm or injury to these individuals.

Table 6: Measures proposed to mitigate and manage impacts

Mitigation measure	Risk before mitigation	Risk after mitigation	Outcome	Timing	Responsibility
<p>A Construction Environmental Management Plan (CEMP) would be prepared and include the following:</p> <ul style="list-style-type: none"> identification of any hold points to ensure all biodiversity management actions are met, e.g. pre-clearing protocol followed by stage clearing maps to identify construction limits and any sensitive areas site induction procedures erosion and sediment control weed control and management noise, dust and light spill protocols pre-clearing and fauna management procedures. 	Moderate	Minor	<p>Construction activities will be undertaken following best practice and adaptive management protocols to limit impacts on biodiversity.</p> <p>Flora and fauna would be managed to avoid and minimise any residual impact; prevent over clearing of vegetation; limit erosion and sedimentation prevent establishment and invasion of weeds; minimisation of noise, dust and light spill.</p>	During construction works	Project Manager
Erosion and sediment control actions in accordance with the Blue Book (Landcom 2004) to be implemented during construction phases.	Moderate	Minor	Prevent the erosion of soil on site and prevent impacts to nearby water features from run-off and sedimentation.	During construction works	Project Manager
Weed control and management to be undertaken where required (with weeds to be removed in accordance with the <i>Biosecurity Act</i> 2015 protocols if any high threat weeds identified).	Moderate	Minor	Control of any weeds present and prevention of weed spread into adjacent areas.	During construction works	Project Manager

Mitigation measure	Risk before mitigation	Risk after mitigation	Outcome	Timing	Responsibility
<p>Noise, dust and light spill protocols – for example:</p> <p>Daily timing of construction activities is recommended in accordance with Table 1 of Interim Noise Guidelines (2009).</p> <p>Dust suppression for exposed soil if required.</p> <p>Construction only during daylight hours (no night lights)</p>	Moderate	Minor	Impacts to fauna using adjacent vegetation and/or their habitat from noise, dust and light avoided	During construction works	Project Manager
<p>Pre-clearance, fauna management and unexpected finds protocol to ensure fauna are not present and/or appropriately managed prior to clearing works.</p>	Moderate	Minor	Impacts and injury to resident fauna avoided and minimised	During construction works	Project Manager / Ecologist
<p>Site inductions during construction to include a briefing regarding the local fauna of the site and protocols to be undertaken if fauna are encountered.</p>	Moderate	Minor	Impacts and injury to resident fauna avoided and minimised	During construction works	Project Manager / Ecologist
<p>Frequent maintenance of construction machinery and plant will be undertaken to minimise unnecessary noise or air pollution</p>	Moderate	Minor	Minimises disruption to fauna foraging, nesting or roosting behaviours	During construction works	Project Manager
<p>Washdown protocols for vehicles should be observed to prevent the entry of soil borne pathogens such as Phytophthora.</p>	Moderate	Minor	Spread of weeds and pathogens prevented	During construction works	Project Manager

8. Consistency with Legislation

8.1. Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act establishes a regime for assessing and regulating the environmental impact of activities (including development) where a Matter of National Environmental Significance (MNES) may be affected. Under the EPBC Act, any action which has, will have, or is likely to have a significant impact on a matter of MNES is defined as a “controlled action”, and requires approval from the Minister. The Commonwealth Department of Agriculture, Water and the Environment (DAWE), is responsible for administering the EPBC Act.

The process includes undertaking an Assessment of Significance for listed threatened species and ecological communities that represent a matter of MNES that will be impacted as a result of the proposed action. The Federal Department of the Environment developed Significant impact guidelines (DoE 2013) and species-specific referral guidelines that outline a number of criteria to provide assistance in conducting Assessments of Significance and help decide whether or not a referral is required.

Vegetation within the development site is limited to 0.10 ha of degraded planted native vegetation within a managed landscape and lacks important habitat features relied upon by threatened species. No threatened species or ecological communities listed under the EPBC Act were recorded during the field surveys. Furthermore, no threatened species or ecological communities are considered likely to occur within the development site, or to be impacted (directly or indirectly) by the proposed development.

8.2. Secretary’s Environment Assessment Requirements

The proposed development is to be assessed as a Designated Development (1604) under Part 4.12 (8) of the EP&A Act. SEARs were issued on 25 August 2021 and those relating to biodiversity are outlined below in Table 7

Table 7: SEARs biodiversity requirements

SEARs Requirement	Comment
The Proponent must assess biodiversity impacts in accordance with section 7.9 of the <i>Biodiversity Conservation Act 2016</i> (BC Act), the Biodiversity Assessment Method (BAM), and be documented in a Biodiversity Development Assessment Report (BDAR)	This BDAR has been conducted in accordance with Section 7.9 of BC Act and the BAM
The BDAR must include information in the form detailed in section 6.12 of the BC Act, clause 6.8 of the <i>Biodiversity Conservation Regulation 2017</i> and the BAM	This BDAR has been prepared and assessed in accordance with the BAM and is consistent with Section 6.12 of the BC Act and Clause 6.8 of the Regulation. This BDAR details how the BAM has been applied to the project and includes measures to avoid and minimise impacts of the development. The BDAR details, through the application of the BAM, that no biodiversity credits are required to be retired to offset the residual impact of the development.
The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017 under section 6.10 of the BC Act	The BDAR has been prepared and certified by Michelle Frolich, an Accredited Assessor (#18064) under the Biodiversity Offset Scheme (BOS) and BC Act.

SEARs Requirement	Comment
<p>The Proponent must assess any impacts on biodiversity values not covered by the BAM. This includes a threatened aquatic species assessment (<i>Part 7A Fisheries Management Act 1994</i>) to address whether there are likely to be any significant impact on listed threatened species, populations or ecological communities listed under the <i>Fisheries Management Act 1994 (FM Act)</i>.</p>	<p>A search of the Key Fish Habitat maps (DPI 2021) determined that the proposed development does not involve impacts to Key Fish Habitat, does not involve harm to marine vegetation, dredging, reclamation or obstruction of fish passage. No watercourse or waterbodies are present within the development site. A permit or consultation under the FM Act is not required and no further assessment is required to be included in this BDAR.</p> <p>No land listed under Part 7A of the Fisheries Management Act is present within the development site. No threatened aquatic communities listed under Schedules 4, 4A and 5 of the FM Act are present within the development site.</p>
<p>The Proponent must identify whether the development, or any component of the development, would be classified as a Key Threatening Process (KTP) in accordance with the listings in the BC Act, FM Act and the <i>Environmental Protection and the Biodiversity Conservation Act 2000</i></p>	<p>The development or any part of the development is <u>not</u> considered to be classified as a key threatening process in accordance with the listings in the BC Act, FM Act or EPBC Act.</p> <p>The development will not adversely affect threatened species or ecological communities, or cause species or ecological communities to become threatened under the BC Act, FM Act or EPBC Act.</p> <p><i>Note: Key threatening processes are the things that threaten, or could threaten, the survival or evolutionary development of species, populations, or ecological communities</i></p>

9. References

Creative Planning Solutions 2021. *Arboricultural Impact Assessment – Proposed Demolition of Existing Structures and Construction of a New Hard Stand and Final Approach and Take-off Area. Lot 2 & 19 Penrith Lake, Castlereagh NSW 2749*. Report prepared for Colliers International.

Department of Planning, Industry and Environment (DPIE) 2020. *Biodiversity Assessment Method*. Environment, Energy and Science, Department of Planning, Industry and Environment, Parramatta.

Department of Planning, Industry and Environment (DPIE) 2021a. *BioNet Vegetation Classification*. Department of Planning, Industry and Environment, Sydney.

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Department of Primary Industries (DPI) 2021. *Key Fish Habitat Maps*. Available at <https://www.dpi.nsw.gov.au/fishing/habitat/publications/pubs/key-fish-habitat-maps> (Accessed 6 October 2021).

National Parks and Wildlife Service (NPWS) 2003. *The Native Vegetation of the Cumberland Plain*. NPWS, Hurstville.

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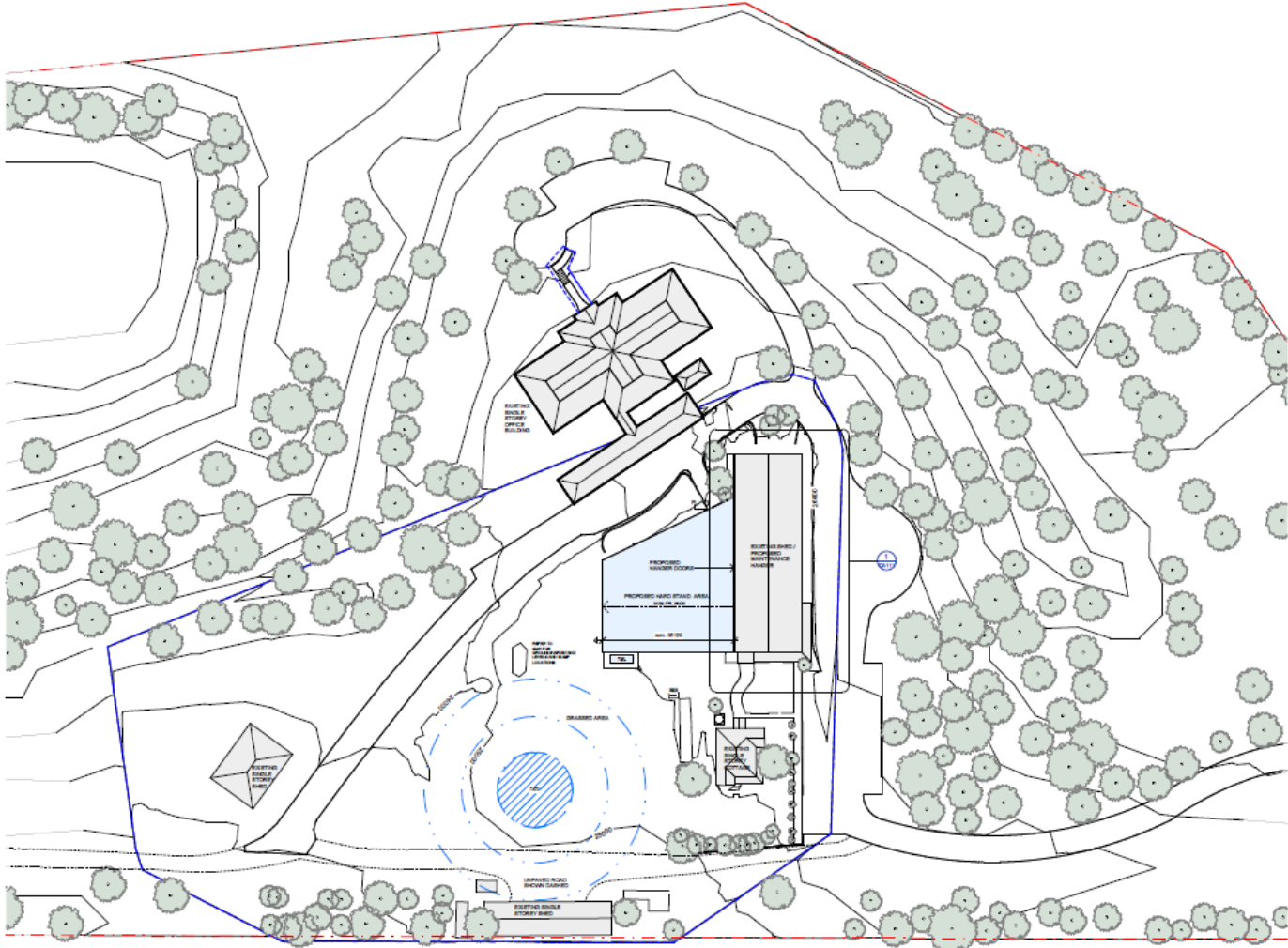
Appendix A: Definitions

The following terminology has been used throughout this report for the purposes of describing the impacts of the proposal in the context of a biodiversity assessment in accordance with the NSW Biodiversity Assessment Method 2020. This terminology may or may not align with other technical documents associated with the proposed development.

Terminology	Definition
Accredited person / Assessor	A person accredited under section 6.10 of the BC Act to prepare those reports in accordance with the biodiversity assessment method.
Assessment area	Includes the subject land and the area of land within the 1500 m buffer zone surrounding the subject land (or 500 m buffer zone for linear proposals)
Biodiversity credit report	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.
BioNet Atlas	The BioNet Atlas (formerly known as the NSW Wildlife Atlas) is the DPIE 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
Connectivity	The measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.
Credit Calculator	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.
Development	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.
Development footprint	The area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials.
Development site	An area of land that is subject to a proposed development that is under the EP&A Act.
Ecosystem credits	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.
Hollow bearing tree	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.
Linear shaped development	Development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length
Local population	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.
Local wetland	Any wetland that is not identified as an important wetland (refer to definition of Important wetland).
Mitchell landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.
Operational Manual	The Operational Manual published from time to time by DPIE, which is a guide to assist assessors when using the BAM
Patch size	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

Terminology	Definition
	area of native vegetation (or ≤ 30 m for non-woody ecosystems). Patch size may extend onto adjoining land that is not part of the development site or stewardship site.
Proponent	A person who intends to apply for consent to carry out development or for approval for an activity.
Reference sites	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.
Regeneration	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.
Remaining impact	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.
Retirement of credits	The purchase and retirement of biodiversity credits from an already-established biobank site or a biodiversity stewardship site secured by a biodiversity stewardship agreement.
Riparian buffer	Riparian buffers applied to water bodies in accordance with the BAM
Sensitive biodiversity values land map	Development within an area identified on the map requires assessment using the BAM.
Site attributes	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.
Site-based development	a development other than a linear shaped development, or a multiple fragmentation impact development
Species credits	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.
Subject land	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.
Threatened Biodiversity Data Collection	Part of the BioNet database, published by DPIE and accessible from the BioNet website.
Threatened species	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.
Vegetation Benchmarks Database	A database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by DPIE and is part of the BioNet Vegetation Classification.
Vegetation zone	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.
Wetland	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
Woody native vegetation	Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs

Appendix B: Proposed Plan



Name	Description	Date
A1	ISSUED FOR COORDINATION	03/08/2021
A2	ISSUED FOR COORDINATION	17/08/2021
A3	ISSUED FOR COORDINATION	08/09/2021
A4	ISSUED FOR APPROVAL	08/09/2021
A5	ISSUED FOR APPROVAL	08/09/2021

LEGEND

- SITE BOUNDARY
- - - - - EXTENT OF SURVEY
- - - - - TO BE DEVELOPED
- ▭ PROPOSED WORKS
- ▭ EXISTING
- CLEARANCE ZONE

NOTES

1. SITE INFORMATION, AS WELL AS LOCATION TYPING, SHALL BE PROVIDED TO THE CLIENT BY THE CLIENT. THE CLIENT SHALL BE RESPONSIBLE FOR THE EXTENT OF SURVEY INFORMATION SHOWN. DETAILED AREAS OUTSIDE THIS PLAN, INCLUDING SITE BOUNDARY, SHALL INDICATE.

FOR APPROVAL

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Client:
 SYDNEY HELICOPTERS

Project:
 SYDNEY HELICOPTERS
 LOT 2 & 19 PENRITH LAKE, CASTLEREAGH

Title:
 PROPOSED PLAN

Drawing No.	Issue
DA101	B
Scale	Drawing Size
1:500	A1
Project No.	Drawn By
21000	CLT

GD Reference:
 1:500

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Appendix C: Species list

Scientific Name	Common Name	Exotic
<i>Casuarina cunninghamiana</i>	River Oak	N
<i>Eucalyptus baueriana</i>	Blue Box	N
<i>Eucalyptus moluccana</i>	Grey Box	N
<i>Eucalyptus tereticornis</i>	Forest Red Gum	N
<i>Melaleuca styphelioides</i>	Prickly-leaved Paperbark	N
<i>Plantago lanceolata</i>	Lamb's Tongues	Y
<i>Senecio madagascariensis</i>	Fireweed	Y – High threat weed
<i>Sida rhombifolia</i>	Paddy's Lucerne	Y
<i>Solanum nigrum</i>	Blackberry Nightshade	Y

