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22 March 2024

Bridge Housing Limited
Level 9
59 Goulburn Street
Sydney NSW 2000

Our ref: 600-23SYD6423

Attention: Lindsey Gray

Dear Lindsey

RE: 600-660 Elizabeth Street, Redfern NSW 2016 - Biodiversity Development Assessment Report (BDAR) Waiver Request (SSD-51274973)

Eco Logical Australia Pty Ltd (ELA) was engaged by Bridge Housing Limited to provide a biodiversity assessment to accompany a State Significant Development Application (SSDA) for the proposed mixed-use development at 600-660 Elizabeth Street, Redfern NSW 2016 (the 'study area') (Figure 1). The study area comprises Lot 1 DP1249145.

The project is a State Significant Development (SSD-51274973). The NSW *Biodiversity Conservation Act 2016* (BC Act) includes the following which is relevant for SSDA. Division 2 Section 7.9 (2) states: *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. If the Planning Agency Head and the Environment Agency Head determine no significant impact to biodiversity will be caused by the proposal then the requirement for a BDAR will be waived*.

The main aim of this document is to provide sufficient information that will allow the NSW government to issue a waiver for the proposed SSDA.

This document has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued 16 December 2022 for the project (SSD-51274973). In relation to Section 11 Biodiversity, the SEARs state:

- *Assess any biodiversity impacts associated with the development in accordance with the Biodiversity Conservation Act 2016 and the Biodiversity Assessment Method 2020, including the preparation of a Biodiversity Development Assessment Report (BDAR), unless a waiver is granted, or the site is on biodiversity certified land.*

- *If the development is on biodiversity certified land, provide information to identify the site (using associated mapping) and demonstrate the proposed development is consistent with the relevant biodiversity measure conferred by the biodiversity certification.*

As discussed above, this document is an application for a BDAR waiver. The site has not been biodiversity certified. No further discussion of biodiversity certification is included in this document.

This document provides an assessment of the proposal's impact on biodiversity values, within the study area, in accordance with the NSW Department of Planning & Environment's *How to apply for a biodiversity development assessment report waiver for a major project application* document (DPIE 2019). Information to support the application is outlined in Tables 1 and 2 below.

ELA undertook two site inspections to assess biodiversity values present and the potential impacts of the proposed development, on 18 October 2023 and on 14 March 2024. The study area contains planted native and exotic vegetation. Mature trees were common throughout the study area, with no midstorey present and a predominately exotic groundcover. There are also street trees adjacent to the study area boundary, some with overhanging canopy. No remnant vegetation or vegetation which corresponds to a plant community type (PCT) or threatened ecological community (TEC) was recorded within the study area. The study area is not connected to patches of intact native vegetation.

No threatened species or significant habitat were recorded or have previously been recorded within the study area. The study area is located within a highly fragmented urban environment. No Matters of National Environmental Significance (MNES) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) will be significantly impacted by the development.

This document assesses the biodiversity values present and the potential impacts of development and has determined that the development will not have a significant impact upon biodiversity values. This document concludes that the proposed mixed-use development is suitable for and warrants approval subject to the implementation of mitigation measures. Therefore, it was determined that the applicant should seek a waiver from the need to prepare a BDAR. The attached tables and figures describe the biodiversity values of the study area in relation to clause 1.4 of the NSW BC Act.

Should you have any questions regarding this assessment, I can be contacted on (02) 9259 3701.

Regards,

Alice Ridyard
Ecologist

1. Introduction

This document has been prepared to accompany an SSDA for the mixed-use development proposal at 600-660 Elizabeth Street, Redfern NSW 2016 (SSD-51274973). The main aim of this document is to provide sufficient information that will allow the NSW government to issue a waiver. Once a waiver is issued for this proposal a BDAR will not be required to be part of the Development Application (DA) submission for the SSDA.

As the project is an SSD, in accordance with Division 2 Section 7.9 (2) of the BC Act, the applicant is seeking to waive the requirement for the preparation of a BDAR.

The application seeks approval for the construction of four buildings including two residential buildings, one mixed use building and one community facility building, as well as a common basement, communal open space, public domain upgrades, and the demolition of the existing community facility building.

The first version of this BDAR waiver application was issued on 12 December 2023. The NSW DCCEEW Environment and Heritage Group – Biodiversity, Science and Conservation (BCS) Group responded with two documents on 21 February 2024. The documents requested more information about potential biodiversity values on the site. This amended version of the BDAR waiver application has been prepared to address BCS's request for additional information.

1.1 The study area

The study area for the purposes of this SSDA is 600-660 Elizabeth Street, Redfern NSW 2016. The study area comprises Lot 1 DP1249145. The study area has an area of approximately 1.1 ha and is identified in Figure 1.

The study area is in the inner southern Sydney suburb of Redfern, within City of Sydney local government area. The study area is approximately rectangular. It is bound by Kettle Street to the north, Walker Street to the east, Phillip Street to the south and Elizabeth Street to the west. To the north, east and south are residential buildings and to the west is Redfern Park.

Part of the site is currently occupied by a community facility operated by Police Citizens Youth Club (PCYC) which will be replaced with a new facility as part of the proposed development. The balance of the site is vacant and mostly inaccessible to the public. The study area contains planted native and exotic vegetation. Mature trees were scattered throughout the study area, with little midstorey and predominately exotic groundcover. There are also street trees adjacent to the study area boundary, some with overhanging canopy.

In the broader context around the study area, the landscape consists of a mix of commercial and residential buildings with ground level retail, restaurant and café uses and are of varying heights, ages, and styles. Approximately 1 km northwest of the study area is Redfern Train Station.

1.2 Methodology

A site inspection was conducted on 18 October 2023 by Daniel McDonald and Alice Ridyard to assess the biodiversity values of the study area. The study area was traversed to identify potential habitat for fauna and identify the vegetation within the study area.

A second site visit was undertaken on 12 March 2024 by Daniel McDonald and Cornelia Ersson to further investigate potential microbat habitat and hollow-bearing trees. Tasks included:

- Ground daytime inspection of hollow/s on site
- Evening ground survey of the single tree with hollows using a headtorch and an ultrasonic detector to observe and record the emergence of any microbats
- Ground daytime inspection of the outside and inside of the building for potential microbat access points
- Evening ground survey of the building using a headtorch and an ultrasonic detector to observe and record the emergence of any microbats.

1.3 Assessment and findings

1.3.1 Remnant vegetation investigations and discussion

No threatened ecological communities were identified during the study area inspection or were considered likely to occur.

A thorough analysis of the plant species and their potential association with any remnant vegetation including threatened ecological communities is provided in Table 2, Table 3 and Table 4.

1.3.2 Field survey work – fauna habitat analysis

The study area contained three habitat features that may potentially be used by threatened highly mobile fauna species. These features were surveyed during the October 2023 survey and the March 2024 survey. These potential habitat features are: one hollow bearing street tree; the buildings and; native tree species and the parkland. The first two features provide potential roosting or nesting habitat, the third feature, namely the native tree species and the parkland provide potential foraging habitat.

1.3.3 Daytime survey of trees with hollows

Near the northeastern extent of the study area a *Melaleuca quinquenervia* (Broad-leaved Paperbark) street tree that contained two hollows was recorded (Figure 7). The first hollow was 2 cm wide and 3.5 m above the ground, and the second hollow was 10-15 cm wide and 2.5 m above ground (Figure 17). The potential hollows were facing the intersection of Kettle Street and Walker Street.

A hollow was previously recorded in the northern extent of the study area within a *Ficus benjamina* (Weeping Fig) during site visit on 18 October 2023, but during the site visit undertaken on 12 March 2024, the tree had split and approximately half of the tree had failed and presumably fallen to the ground. Yellow metal barriers were lying at the base of the tree. It is presumed that the fallen portion of the fig was removed from the site. No hollow was observed in the remaining part of the Weeping Fig.

The Weeping Fig no longer provides suitable roosting or nesting habitat for hollow dependent fauna (Figure 14).

There was also a *Populus nigra* (Black Poplar) that had fallen to the ground. All the leaves on the Black Poplar had died and many had fallen to the ground. With this additional visibility, one hollow was evident (Figure 15). However, as this tree has fallen, this is no longer suitable habitat for threatened species. This hollow was visually investigated. There were no obvious signs of fauna use.

1.3.4 Daytime survey of the PCYC building

All internal rooms within the PCYC building were assessed by Cornelia Ersson and Daniel McDonald. The manager of PCYC, Nicholas Woodfield (PCYC site manager), provided access to all rooms within the building. A handheld ultrasonic recorder (Anabat SD2) was used to detect any microbat activity.

The Anabat SD2 was held up towards any internal roof cavity openings. Photos of internal ceiling openings are presented below (Figure 18 to Figure 20). Two manhole access points were not covered at the time of survey. The Anabat SD2 was also used to assess microbat activity near the manholes. No microbat activity was recorded anywhere in the building while using the Anabat SD2.

No signs of scats, stain accumulation, bat fly casings, feeding remains (partial dead insects), dead microbat remains or roosting microbats were observed beneath any ceiling openings. No microbat activity signs were recorded anywhere within the building.

Three small gaps in the external eves of the PCYC roof were observed (Figure 21 to Figure 23). The external opening considered most likely to provide access for microbats was chosen for the dusk survey. A photo of the chosen opening is shown in Figure 21.

No signs of scats, stain accumulation, bat fly casings, feeding remains (partial dead insects), dead microbat remains or roosting microbats were observed beneath any of the three openings in the exterior of the building.

1.3.5 Dusk and evening survey of the hollow-bearing Broad-leaved Paperbark

A ground survey of the Broad-leaved Paperbark with hollows (Figure 21) for microbats using ultrasonic detectors. The survey was conducted from 7:30 pm until 8:45 pm Tuesday 12 March 2024. A headlamp was used to slightly illuminate the hollows. No microbats were observed exiting either hollow on the evening of the survey.

During the survey two common urban mammals were observed: a *Trichosurus vulpecula* (Common Brush-tailed Possum) climbing on power lines and an unidentified Rat species (likely *Rattus rattus*, the introduced Black Rat) running across the road.

1.3.6 Dusk and evening survey of the PCYC building

Three openings in the roof were observed during the daytime survey (Figure 21 to Figure 23). The most likely exit point for microbats (Figure 21) was chosen to watch for exiting microbats during the dusk and evening survey. The opening chosen to watch was considered the most likely to provide access for microbats as it was a larger opening than the other two openings. It also appeared that the opening provided better access to a relatively large roof cavity.A headlamp was used to slightly illuminate the

hollows. The survey was conducted from 7:30 pm until 8:45 pm Tuesday 12 March 2024. No microbats were observed exiting the external gap in the building.

1.3.7 Analysis of ultrasonic recordings

An ultrasonic recorder (Anabat SD2) was used to internally survey the building during the daytime survey. Two ultrasonic recorders (Anabat SD2 (building survey) and Anabat Swift (tree hollow survey)) were used for the dusk and evening surveys.

Following field work the ultrasonic recorders were checked for any files generated by ultrasonic sounds recorded during the survey. The generated files were checked by Daniel McDonald. Daniel McDonald has approximately ten years of experience analysing microbat calls and more than ten years of experience surveying microbats. All files were viewed using either AnalookW or Anabat Insight.

Two files produced patterns that had some similarities to microbats. Images of the calls as viewed on Anabat Insight are presented below (Figure 24 and Figure 25).

The calls do not meet the quality parameters for analysis. The document Bat Calls of NSW (2004) written by Michael Pennay, Brad Law and Linda Reinhold provides the following guidance for analysing bat calls:

> *There are two general rules that should be applied to bat call analysis:*
>
> *1. Be very cautious of calls consisting of only a few pulses,*
>
> *2. If you are unsure, or a call appears borderline do not try to identify it to species.*

It is unknown what generated the calls, it may have been an insect, other fauna (rats) or perhaps they represent bat calls at the edge of the recording range of the Anabat Swift.

1.3.8 Conclusion from field survey work

Threatened megabat (flying-foxes) and microbat species are likely to use the study area for foraging at least occasionally. No evidence of megabats or microbats using the site for roosting was recorded during the survey.

1.4 Cumulative impacts

Due to a lack of biodiversity values, cumulative impacts are not considered for this study area.

1.5 Mitigation measures

Replacement plantings should represent locally indigenous flowering species where suitable growing conditions are present.

It is recommended that a pre-clearance survey is undertaken prior to:

- removal of the hollow-bearing Broad-leaved Paperbark tree
- demolition of the buildings.

If any fauna is found during the pre-clearance survey then the fauna must be appropriately managed for relocation.

Figure 1: Location and Study Area Map

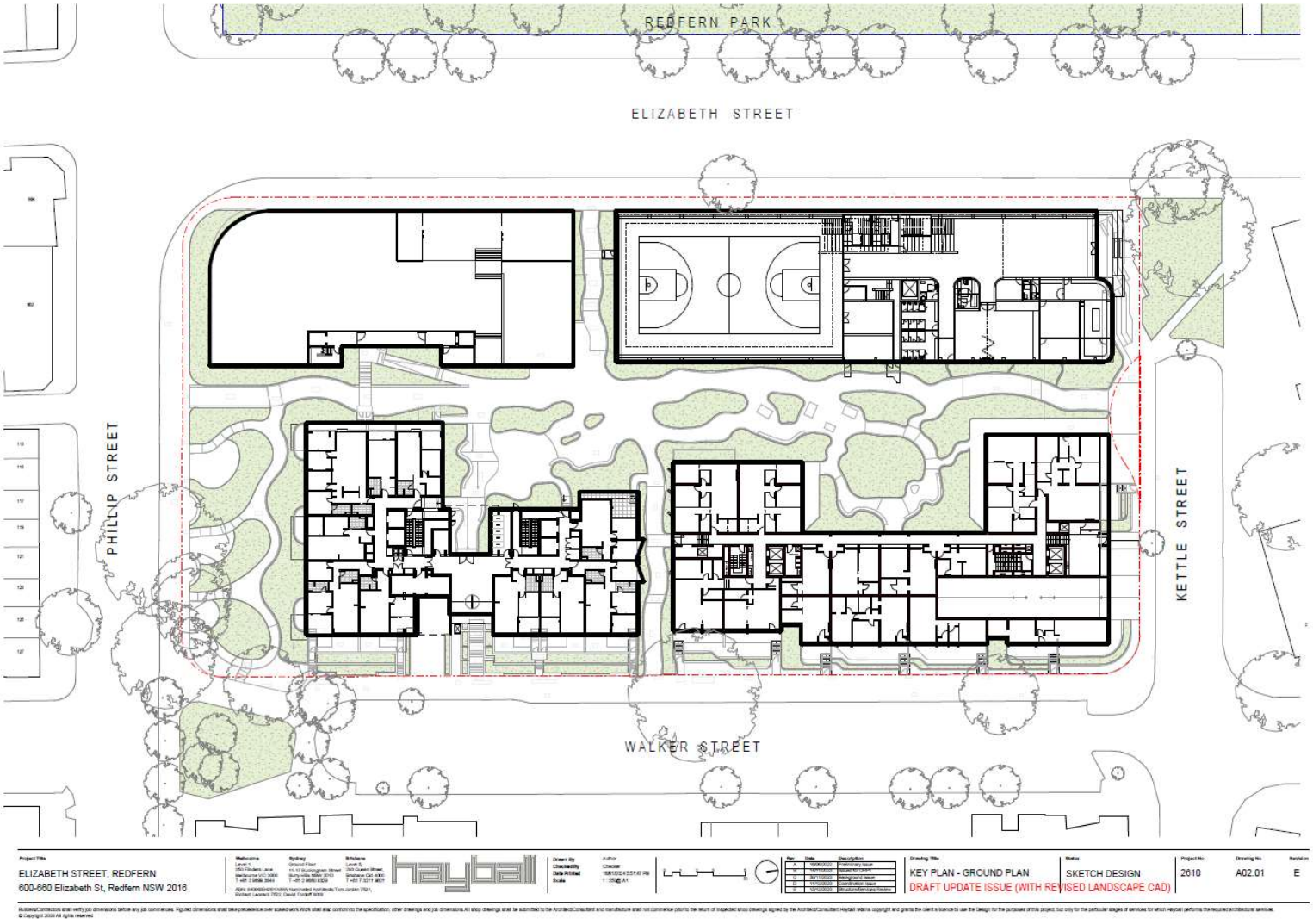

Figure 2: Indicative plan for the proposed development (HAYBALL PTY LTD, 2024)

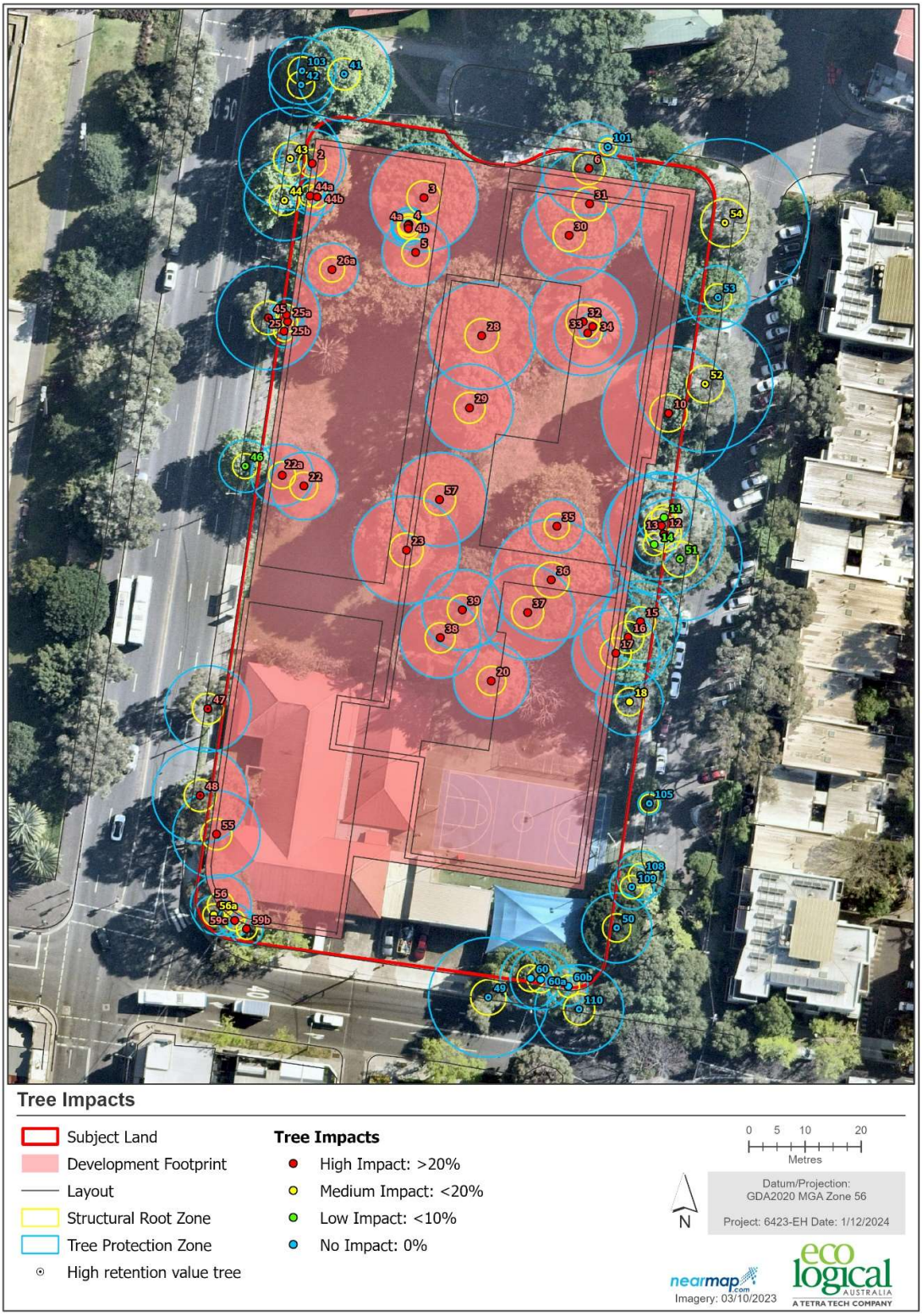

Figure 3: Tree Impacts

Table 1: BDAR waiver request information requirements

Requirement	Information
Administration	**Project ID:** SSD-51274973 **Project name:** 600-660 Elizabeth Street, Redfern - Mixed Use **Proponent:** Bridge Housing Limited Level 9 59 Goulburn Street Sydney NSW 2000 **Contact**: Lindsey Gray **Prepared by:** Alice Ridyard (Eco Logical Australia) - B.Sci., Grad.Cert.ESD. **Reviewed by**: Daniel McDonald (Eco Logical Australia) – PhD Dip.Arb., M.Agr, B.Sc.Agr BAM accredited assessor (BAAS17056) and Tomas Kelly (Eco Logical Australia) – B. Sc., Ad. Dip. Applied Environmental Management, BAM accredited assessor (BAAS19029)
Site Details	**Street address:** 600-660 Elizabeth Street, Redfern NSW 2016 **Lot and DP:** Lot 1 DP1249145 **Local Government Area (LGA):** City of Sydney **Description of site:** The proposed study area is located in the inner southern Sydney suburb of Redfern and is located approximately 1 km southeast of Redfern Train Station. The development covers an area of approximately 1.1 ha. **Biodiversity** The study area contains existing buildings, planted trees and ground cover and adjacent planted street trees. The study area is not mapped under the NSW Government Biodiversity Values Map (accessed 25 October 2023). There is no previously mapped native vegetation within the study area (DPE 2023b) (Figure 8) **Location Map:** Refer to Figure 1. **Proposed development:** Refer to Figure 2.
Proposed Development	This document refers to the proposed development of 600-660 Elizabeth Street, Redfern NSW 2016 (SSD-51274973). The proposal is for the construction of a mixed-use building and the removal of up to 0.77 ha of vegetation within the study area, comprising 0.42 ha of exotic, 0.23 ha of exotic groundcover and 0.12 ha of native vegetation (Figure 3). A description of the proposed works is provided in Section 1 above. Proposed Site Plan: Refer to Figure 2.
Impacts on biodiversity values	See Table 2 and Figure 3.

Table 2 Criteria to assess biodiversity under the BC Act and BC Regulation

Biodiversity Value	Meaning	Relevant (✓ or N/A)	Explain and document potential impacts including additional impacts prescribed under the BC Regulation Attach additional supporting documentation where appropriate
Vegetation Abundance **1.4(b) BC Regulation**	Occurrence and abundance of vegetation at a particular study area.	N/A	***Existing vegetation and discussion of findings*** ***Validated vegetation*** The study area is composed of an existing building, planted native and exotic trees, a mostly cleared midstorey, exotic groundcover, some native naturalised groundcover species and planted native and exotic street trees outside of the study area with some street tree branches overhanging into the study area (Figure 4 to Figure 8). Up to 0.77 ha of vegetation within the study area will be removed, comprising 0.42 ha of exotic, 0.23 ha of exotic groundcover and 0.12 ha of planted native vegetation (Figure 3). No native plant community types (PCTs) have previously been mapped within the study area (Figure 9) or through ELA's validation of vegetation (Figure 11). The vegetation within the study area is disconnected from patches of intact native vegetation. ***Planted native*** The canopy contained a number of native trees including *Ficus rubiginosa* (Port Jackson Fig), *Ficus macrophylla* (Moreton Bay Fig), and *Eucalyptus botryoides* (Bangalay) (Figure 4). The midstorey was absent and the groundcover was dominated by exotic species (see "Groundcover" section below). While some of the trees are known to be naturally present within the Sydney area, for example *Ficus rubiginosa*, the trees are not growing in typical remnant habitat (further justification below). ***Planted or naturalised exotic*** The canopy contained exotic tree species such as *Celtis sinensis* (Japanese Hackberry), *Cupressus sempervirens* (Mediterranean cypress) and *Phoenix canariensis* (Canary Island Date Palm) (Figure 4). The midstorey was generally absent and the groundcover was dominated by exotic species (see "Exotic Groundcover" section below). ***Exotic and naturalised native groundcover*** The groundcover was contiguous across the entire study area apart from the building and playing courts footprint (Figure 5). The ground cover was less than 15% native. Species in the ground cover included *Cynodon dactylon* (Couch), *Bromus catharticus* (Prairie Grass) and *Ehrharta erecta* (Panic Veldtgrass). However, there were several patches (approximately 2m x 2m) where ground cover was greater than 50% native, with native species such as *Microlaena stipoides* (Weeping Grass), *Cyperus imbecillis* and *Commelina* cyanea (Figure 6). ***Street Trees*** The street trees surrounding the study area were a mix of native and exotic species. The street trees present included *Melaleuca quinquenervia* (Broad-leaved Paperbark), *Waterhousea floribunda* (Weeping Lilly Pilly) and *Platanus x acerifolia* (London Plane).

Biodiversity Value	Meaning	Relevant (✓ or N/A)	Explain and document potential impacts including additional impacts prescribed under the BC Regulation Attach additional supporting documentation where appropriate
			The assemblage of species represented within the study area has been established through landscape plantings or naturalised introductions and does not represent a native PCT or remnant vegetation. The vegetation within the study area lacks connectivity with intact native vegetation. There is an absence of native resilience. **Justification for native vegetation being unlikely to be remnant vegetation** While some of the tree species within the study area may be associated with PCTs that were likely to occur in or near the study area pre-clearing, these PCTs are unlikely to occur naturally on site due to history of significant disturbance including construction on site. Non-natural soil profiles and soil conditions (including over 1 m of sandy fill as the topsoil) occur on site. Many of the species are commonly planted within Sydney, other species may have been reintroduced or introduced into the site via flying fauna (*Ficus* sp.) or on lawnmowers (*Cyperus Inbecillis*, *Commelina cyanea* and *Microlaena stipoides*). ***Site history*** According to the Preliminary Built Heritage Assessment (Extent Heritage Pty Ltd 2020), the study area likely fell within Boxley's Lagoon and former swamp, which became part of the Albert Ground in 1864, a privately-owned cricket ground (Figure 26; Figure 27). The land was subdivided and terrace housing was established by 1887. Image of housing on the site from that general period is presented below (Figure 28 and Figure 29). During the early twentieth century, some housing was removed and replaced by small factories and warehouses. This was then cleared and replaced with 18 low density dwellings (nine duplexes) in the central and northern portions of the study area and the PCYC in the south. The dwellings were demolished by 2013 and the rest of the site has remained unchanged since this time (Extent Heritage Pty Ltd, 2020). This history of disturbance and construction makes it highly unlikely that remnant vegetation would persist within the study area. ***Historical imagery*** Historical clearing is evidenced via Historical imagery from 1930 (Figure 30). In 1930 and through 1942, it is evident that almost all vegetation within the study area was removed and replaced with a series of narrow terrace houses (Figure 30 to Figure 31). In 1965, the PCYC building is visible in the southern extent of the study area (Figure 33). To the north are nine freestanding buildings (the duplexes mentioned above) that replaced the terraces that were seen in the 1930 and 1943 imagery and no canopy vegetation. By 1978, the buildings are in the same location but there are now a several trees visible (Figure 34). In 2014, all the 9 free-standing buildings are absent and the PCYC in the southern extent of the study area and numerous mature trees and lawn in the northern extent remain (Figure 38). In

Biodiversity Value	Meaning	Relevant (✓ or N/A)	Explain and document potential impacts including additional impacts prescribed under the BC Regulation Attach additional supporting documentation where appropriate
			2024, the PCYC building remains, and the canopy cover has increased (Figure 39). The history of widespread clearing of the study area, multiple rounds of development and/or land-use changes and the history of dense residential construction, suggests heavy disturbance of the natural soil profile and makes it unlikely that a remnant vegetation would occur through natural processes. Soil is further discussed below. ***Soil in study area*** The study area is mapped as having Tuggerah soil landscape; and podosols under the Australian Soil Classification (eSpade 2024). The Additional Geotechnical Investigation report involved the drilling and assessment of five boreholes (EI Australia 2023) (Figure 40). The report indicates that the top 1.35-1.8 m of soil is fill (sandy fill). This is underlain by alluvial peat/organic clay, alluvial sand with peat layers/peaty clay and residual soils, over sandstone (EI Australia 2023). Alluvial soil is consistent with the site history outlined above indicating that the study area was part of a lagoon or swamp. It is unknown if the original topsoil was removed previously during past development activities. The existing remnant site soil is now at depth (1.35 – 1.8 m below the existing ground surface). It is unknown if the existing soil at depth represents the original A horizon or if it represents a type of B horizon. To determine if this fill soil is conducive to maintaining remnant or regenerated vegetation associated with a PCT, it was compared with soil requirements for PCTs that were previously mapped in or near the study area "pre-clearing" and associated threatened ecological communities (TECs) (DPE 2023). The pre-clearing extent of PCTs was developed by DPE using a combination of aerial photographic interpretation, environmental layers and historical documents. *PCT 3262* The entire study area was, pre-clearing, mapped as PCT 3262 Sydney Turpentine Ironbark Forest, which requires shale or sheltered shale-sandstone soils (NSW Government 2024) (Figure 10). PCT 3262 is associated with the TEC *Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion*, which is critically endangered under the BC Act and *Turpentine-Ironbark Forest of the Sydney Basin Bioregion*, which is critically endangered under the EPBC Act. This TEC is associated with soils derived either from Wianamatta Shale or from Wianamatta Shale interbedded with Hawkesbury Sandstone (NSW TSSC 2019). A sandy topsoil is not consistent with the requirements of this PCT and TEC, nor is alluvial soils. Therefore, this PCT and TEC are not likely to occur within the study area. *PCT 3806* PCT 3806 Sydney Coastal Sand Mantle Heath was mapped (pre-clearing) within 500 m of the study area). This PCT is found on shallow to moderately deep sand mantles that are perched

Biodiversity Value	Meaning	Relevant (✓ or N/A)	Explain and document potential impacts including additional impacts prescribed under the BC Regulation Attach additional supporting documentation where appropriate
			above some of the major sandstone headlands of Sydney (NSW Government 2024). PCT 3806 is associated with TEC *Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion* which is critically endangered under the BC Act and Eastern Suburbs Banksia Scrub of the Sydney Region which is critically endangered under the EPBC Act. This TEC occurs on aeolian sands of the Tuggerah, Newport, North Head and Kurnell soil landscapes (NSW TSSC 2017). The study area is not on a sandstone headland but does have underlying sandstone bedrock (EI Australia 2023). The topsoil is sandy fill but the layers underneath are alluvial. The Additional Geotechnical report does not indicate any aeolian sands. Therefore, this PCT and TEC are not likely to occur within the study area. *PCT 3962* PCT 3962 Coastal Floodplain Phragmites Reedland was previously mapped (pre-clearing) approximately 1.5 km east of the study area. It occurs on alluvial backswamps on coastal floodplains. Due to the lower layers of soil being alluvial, and the historical records suggesting previous swampland within the study area there is a reasonable chance that this PCT used to exist in the study area (EI Australia 2023; Extent Heritage Pty Ltd 2020). This PCT can be associated with *Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* (endangered under the BC Act), *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* (endangered under the BC Act) and *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community* (endangered under the EPBC Act). TEC *Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.* Due to the historic disturbance of the site, 1.35 - 1.8 m of sandy fill in the top layer, it is unlikely that any remnant vegetation for this PCT or TECs are presently occurring within the study area. While *Casuarina glauca* (Swamp Oak) is present on the site and naturally present in Swamp Oak Floodplain TEC, it is unlikely that Swamp Oak in this situation represents remnant vegetation. The Swamp Oak is growing on fill following extensive disturbance on the site. Swamp Oak is can also be purchased from plant nurseries. Therefore, no remnant PCT and/or TEC are likely to occur within the study area. The sandy fill is not natural topsoil and is not consistent with the soils associated with historically mapped (pre-clearing) PCTs outlined above or their associated TECs. ***Species within the study area associated with PCTs and TECs***

Biodiversity Value	Meaning	Relevant (✓ or N/A)	Explain and document potential impacts including additional impacts prescribed under the BC Regulation Attach additional supporting documentation where appropriate
			It is noted that some of the species within the study area can be associated with a PCT historically mapped (pre-clearing) or an associated TEC. The native species within the study area are highly unlikely to be remnant, due to most being commonly purchased landscape plants, the historical land use of the site and the modified and unsuitable sandy fill topsoil present on site. Table 4 outlines provide a justification for each species as to why they are not likely to be remnant. Some groundcover native species are most likely planted or transported onto site by a lawn mower (e.g. *Cynodon dactylon* (Couch), *Cyperus imbecillis*). It is highly unlikely that any remnant vegetation / natural PCT or Threatened Ecological Community (TEC) are present on site. So, it is highly unlikely that an impact on any BC Act listed TEC will be generated by the proposal.
Vegetation Integrity **1.5(2)(a) BC Act**	The degree to which the composition, structure, and function of vegetation at a particular study area and the surrounding landscape has been altered from a near natural state.	N/A	The study area contains built structures and paved areas. The study area has been historically cleared of remnant vegetation (Figure 30). The existing vegetation is likely to be planted native and exotic vegetation, as justified above. Due to previous and current land management practices, vegetation and soil within the study area has been highly modified or disturbed and lacks any natural resilience. Vegetation within the study area is composed of planted exotic trees, naturalised exotic trees and native trees as well as overhanging vegetation from native and exotic street trees. The vegetation is not consistent with any remnant native or listed PCT in the BioNet Vegetation Classification. The midstorey was lacking and the groundcover was predominately exotic. No TECs will be impacted. The vegetation in the study area is not connected to mapped areas of native vegetation. As the vegetation within the study area is highly modified and altered from its natural state, the development would not compromise the vegetation integrity or impact any remnant native vegetation within the surrounding landscape.
Habitat Suitability **1.5(2)(b) BC Act**	Degree to which the habitat needs of threatened species are present at the particular study area.	N/A	The vegetation provides limited opportunities for highly mobile threatened fauna species to shelter and forage opportunistically, and is not suitable habitat for less mobile threatened species. The study area contained three habitat features that may be used by threatened species. These habitat features were one hollow bearing street tree, a roof cavity in the awning of the PCYC and native tree species within a parkland environment. Near the north eastern extent of the study area was a hollow-bearing Broad-leaved Paperbark (Figure 7). The first hollow was 2 cm wide and 3.5 m above the ground, and the second hollow was 10-15 cm wide and 2.5 m above ground (Figure 17). A hollow was previously recorded in the northern extent of the study area within a Weeping Fig during site visit on 18 October 2023, but during the site visit undertaken on 12 March 2024, the

Biodiversity Value	Meaning	Relevant (✓ or N/A)	Explain and document potential impacts including additional impacts prescribed under the BC Regulation Attach additional supporting documentation where appropriate
			tree had split and the hollow is no longer attached to the tree and therefore not suitable habitat for threatened birds or microbats (Figure 14). There was also a Black Poplar had also fallen to the ground. With this additional visibility one hollow were evident (Figure 15). However, as this tree has fallen down, this is no longer suitable habitat for threatened species. Three small gaps in the awning of the PCYC roof were identified as potential microbat roosting habitat (Figure 21 to Figure 23). No microbat activity was detected during the field survey undertaken on 12 March 2024 using ultrasonic detectors near the Broad-leaved Paperbark with hollows and the gap in the PCYC awning that was most suitable as habitat (Figure 21). Therefore, it is unlikely that microbats are present within the study area. No other potential roosting habitat for threatened microbat species such as culverts, bridges, railway tunnels or stormwater tunnels were identified. *Pteropus poliocephalus* (Grey-headed Flying-fox) may use plants within the study area or in the street trees surrounding the study area occasionally as part of a broader foraging habitat (e.g. *Ficus macrophylla* (Moreton Bay Fig)). This species is vulnerable under the BC Act and EPBC Act.
Threatened Species Abundance **1.4(a) BC Regulation**	Occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular study area.	N/A	As outlined above, due to historical clearing of vegetation and modification of the soil, the native vegetation present within the study area is not consistent with any listed PCT or TEC. The study area has been historically cleared of native vegetation and is situated within a highly urbanised and fragmented environment. There are no BioNet (Atlas of NSW Wildlife) records of threatened flora or fauna species within the study area (Figure 12 and Figure 13). No habitat was available for threatened flora species due to the high level of modification of vegetation and soils within the study area. No threatened fauna species were observed within the study area during the survey. Near the north eastern extent of the study area was a hollow-bearing Broad-leaved Paperbark (Figure 7). The first hollow was 2 cm wide and 3.5 m above the ground, and the second hollow was 10-15 cm wide and 2.5 m above ground (Figure 17). Three small gaps in the awning of the PCYC roof were identified as potential microbat roosting habitat (Figure 21 to Figure 23). No microbat activity was detected during the field survey undertaken on 12 March 2024 using ultrasonic detectors near the Broad-leaved Paperbark with hollows and the gap in the PCYC awning that was most suitable roosting habitat (Figure 21). Therefore, it is unlikely that microbats are present within the study area. The vegetation provides limited opportunities for highly mobile threatened fauna species to shelter and forage opportunistically

Biodiversity Value	Meaning	Relevant (✓ or N/A)	Explain and document potential impacts including additional impacts prescribed under the BC Regulation Attach additional supporting documentation where appropriate
			and is not suitable habitat for less mobile threatened species. *Pteropus poliocephalus* (Grey-headed Flying-fox) may use plants within the study area or in the street trees surrounding the study area occasionally as part of a broader foraging habitat (e.g. *Ficus macrophylla* (Moreton Bay Fig)). The proposed development is unlikely to significantly affect threatened species, TECs or their habitat.
Habitat Connectivity **1.4(c) BC Regulation**	Degree to which a particular study area connects different areas of habitat of threatened species to facilitate movement of those species across their range.	N/A	Vegetation within the study area is limited to planted native and exotic vegetation which does not form part of a PCT or TEC, and is located within a highly fragmented and developed urban area in the inner southern Sydney suburb of Redfern. The study area is surrounded by roads and residential buildings and is not connected to areas of intact native vegetation. As such, the study area provides very limited connectivity to facilitate the movement of threatened species across their range.
Threatened Species Movement **1.4(d) BC Regulation**	Degree to which a particular study area contributes to the movement of threatened species to maintain their lifecycle.	N/A	The study area contains limited vegetation which is highly fragmented by buildings, roads, and areas of hardstand surfaces. Movement for less mobile threatened fauna such as non-flying species, across the study area is highly unlikely due a lack of connective vegetation. Opportunities for movement across the study area for mobile threatened fauna including birds and bats are available, however, the study area is not considered to be significant for the movement of any threatened species to maintain their lifecycle and the development is not likely to significantly change their movement.
Flight Path Integrity **1.4(e) BC Regulation**	Degree to which the flight paths of protected animals over a particular study area are free from interference.	N/A	The landscape surrounding the study area consists of commercial and residential buildings and is in close proximity to Redfern Park. Protected animals are unlikely to rely on the limited extent of planted vegetation identified within the study area, along their flight path. The proposed development will not significantly affect flight paths of protected animals.
Water Sustainability **1.4(f) BC Regulation**	Degree to which water quality, water bodies and hydrological processes sustain threatened species and threatened ecological communities at a particular study area.	N/A	No natural water courses are present within the study area. In its current state, the study area is highly modified and does not contain water bodies or contribute to hydrological processes that sustain threatened species or ecological communities within or adjacent to the study area. The proposed development will not impact on water quality, water bodies or hydrological processes.

Figure 4: Planted native and exotic vegetation within study area

Figure 5: Typical Groundcover

Figure 6: There were small areas (~ less than 2 m x 2 m) of ground cover with >50% native species within the study area

Figure 7: Habitat features within the study area

Figure 8: Planted native street tree outside study area, Broad-leaved Paperbark (*Melaleuca quinquenervia*) on Walker Street

Figure 9: Recent vegetation mapping within the vicinity of the study area (DPE 2022)

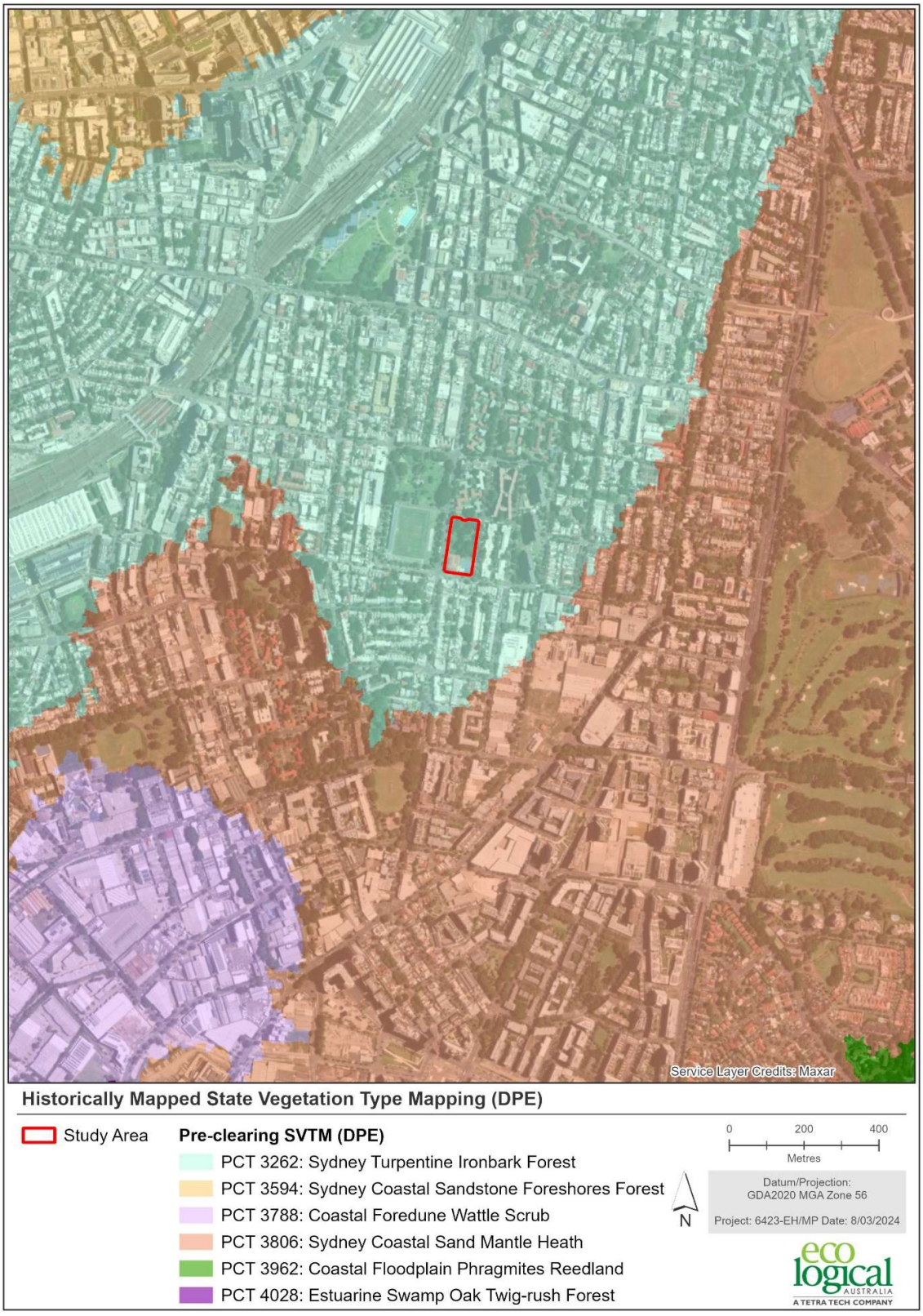

Figure 10: Previously mapped vegetation (pre-clearing) within the study area

Figure 11: Validated vegetation

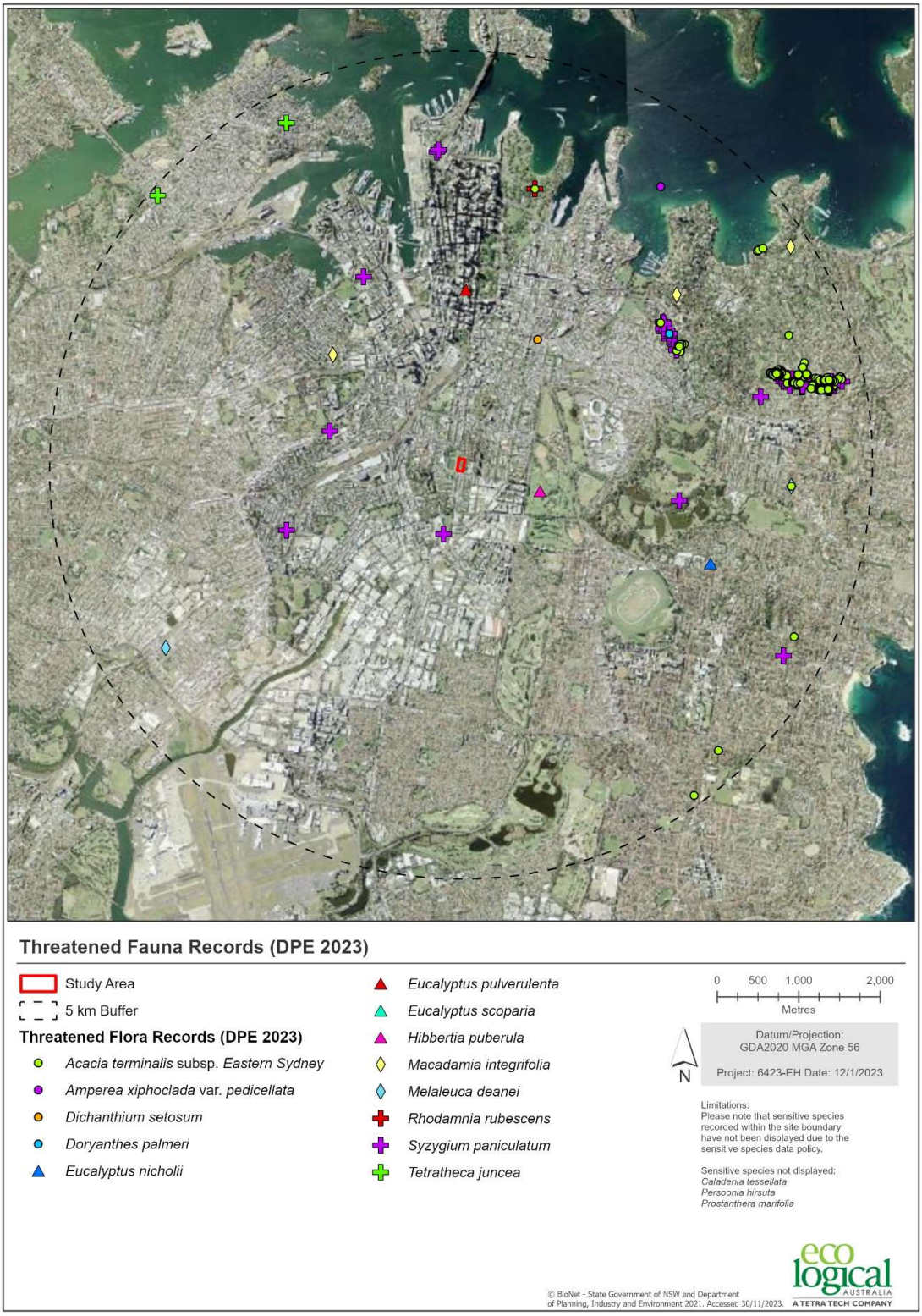

Figure 12: Threatened flora records within a 5km buffer of the study area (BioNet)

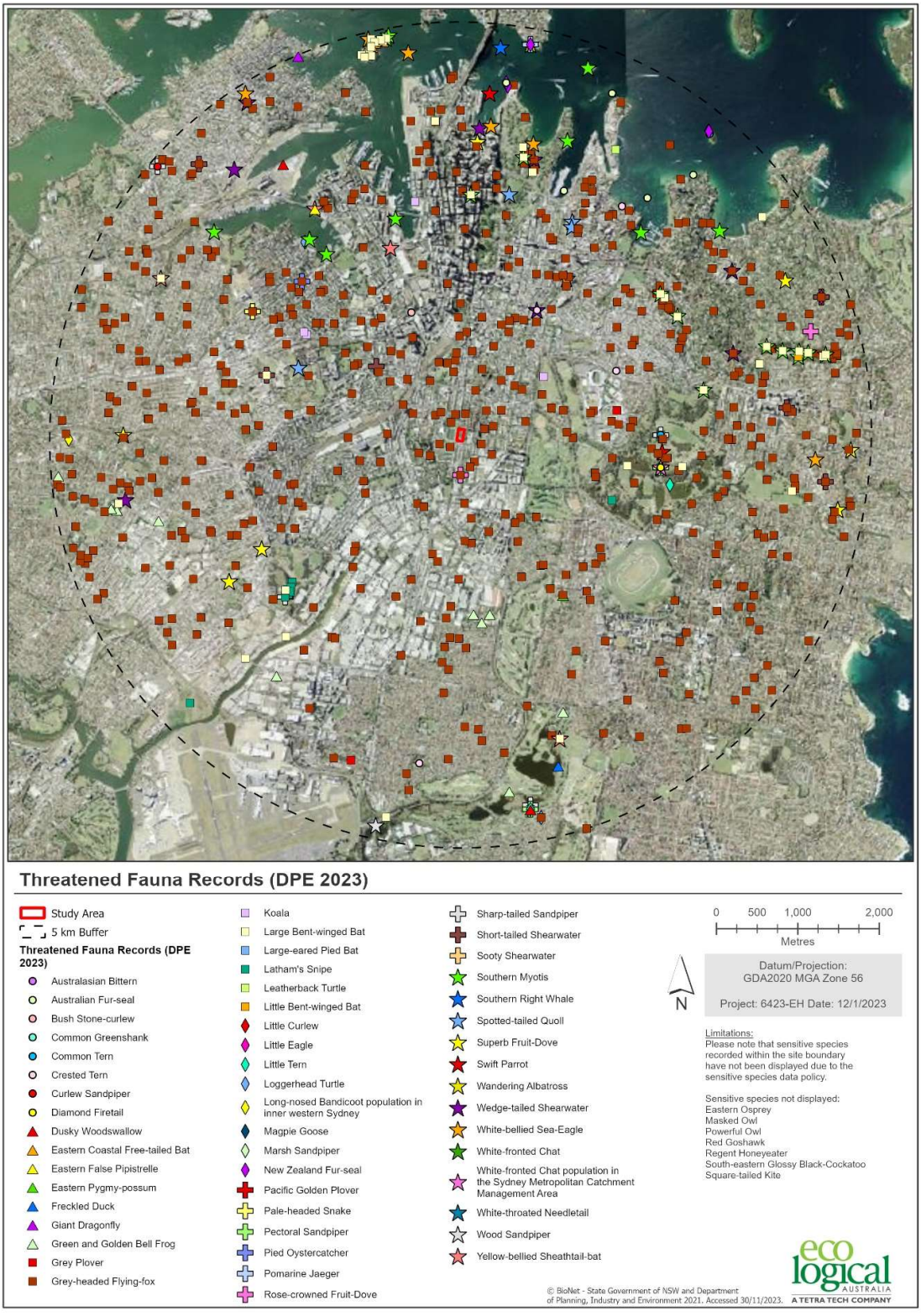

Figure 13**: Threatened fauna records within a 5km buffer of the study area (BioNet)**

Figure 14: *Ficus benjamina* (Weeping Fig) that used to have a hollow, but split and no longer has a hollow

Figure 15: Hollow in prone *Populus nigra* (Black Poplar)

Figure 16: 2 cm wide hollow in Broad-leaved Paperbark, a street tree near the northeastern boundary of the study area that was surveyed with an ultrasonic detector. Note the lack of evidence of use. E.g. no wear marks at the bottom of the entrance.

Figure 17: 10-15 cm wide hollow in Broad-leaved Paperbark, a street tree near the northeastern boundary of the study area that was surveyed with an ultrasonic detector. Note the lack of evidence of use. E.g. no wear marks at the bottom of the entrance.

Figure 18: An opening the ceiling. The Anabat SD2 ultrasonic detector was directed at the opening to listen for microbat vocalisations.

Figure 19: An opening in the corner of the room. The Anabat SD2 ultrasonic detector was directed at the opening to listen for microbat vocalisations.

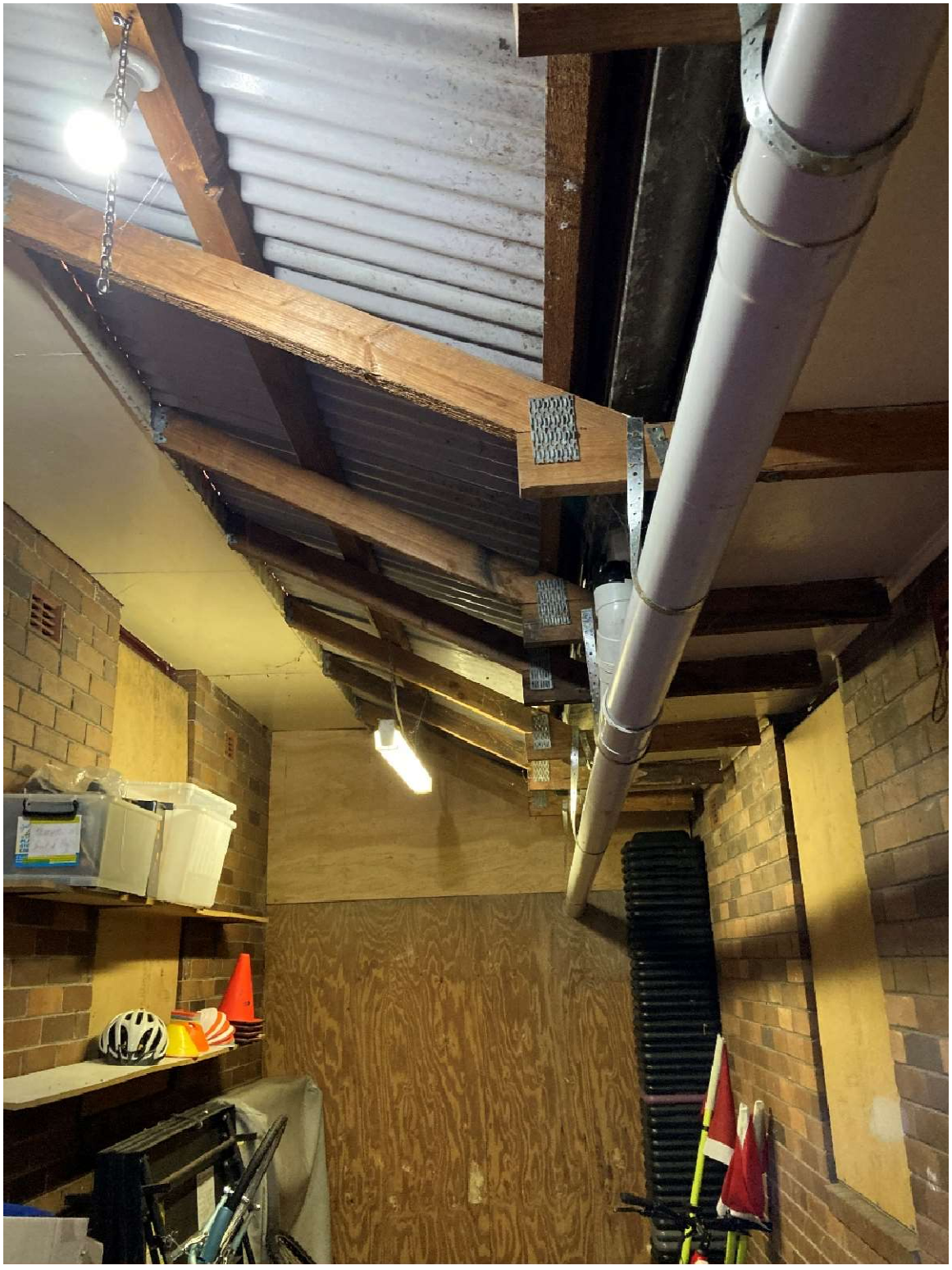

Figure 20: An unlined internal room. The Anabat SD2 ultrasonic detector was directed towards various parts of the ceiling to listen for microbat vocalisations.

Figure 21: One of the gaps in awning of roof of the PCYC building that was surveyed with an ultrasonic detector

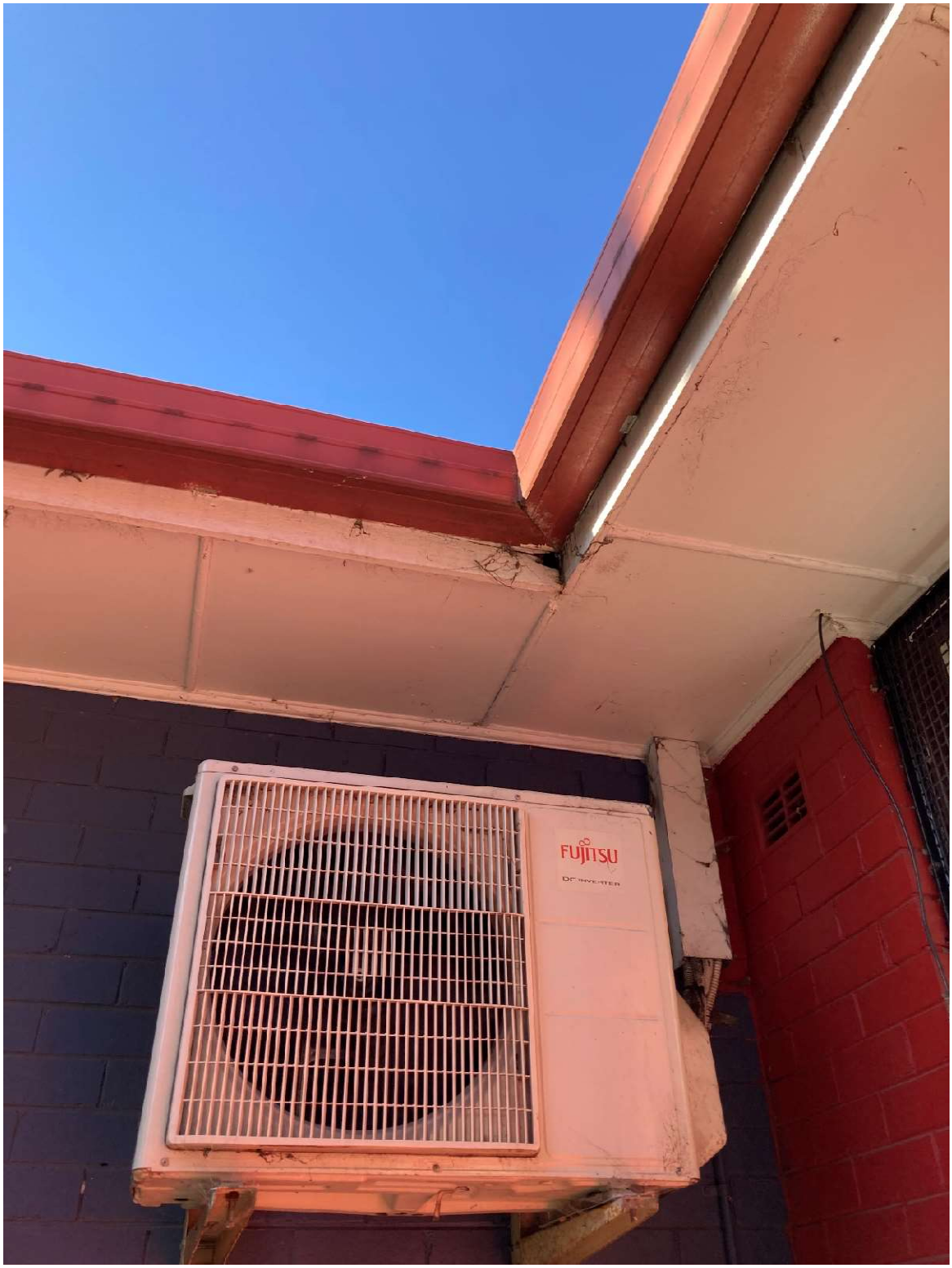

Figure 22: One of the gaps in awning of roof of the PCYC building that was not surveyed with an ultrasonic detector

Figure 23: One of the gaps in awning of roof of the PCYC building that was not surveyed with an ultrasonic detector

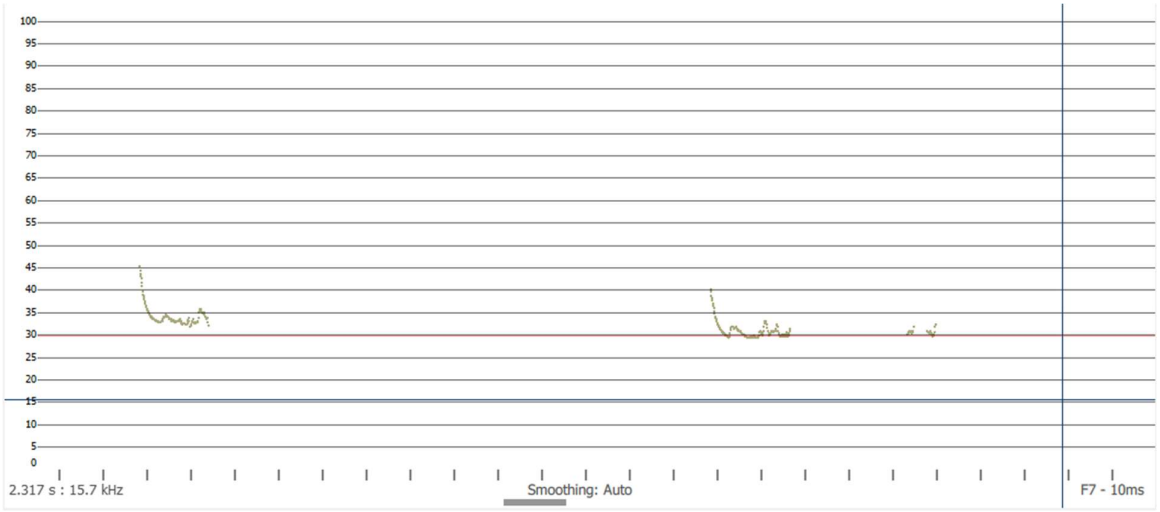

Figure 24: An image of one of 'calls' recorded on the Anabat Swift as viewed on Anabat Insight

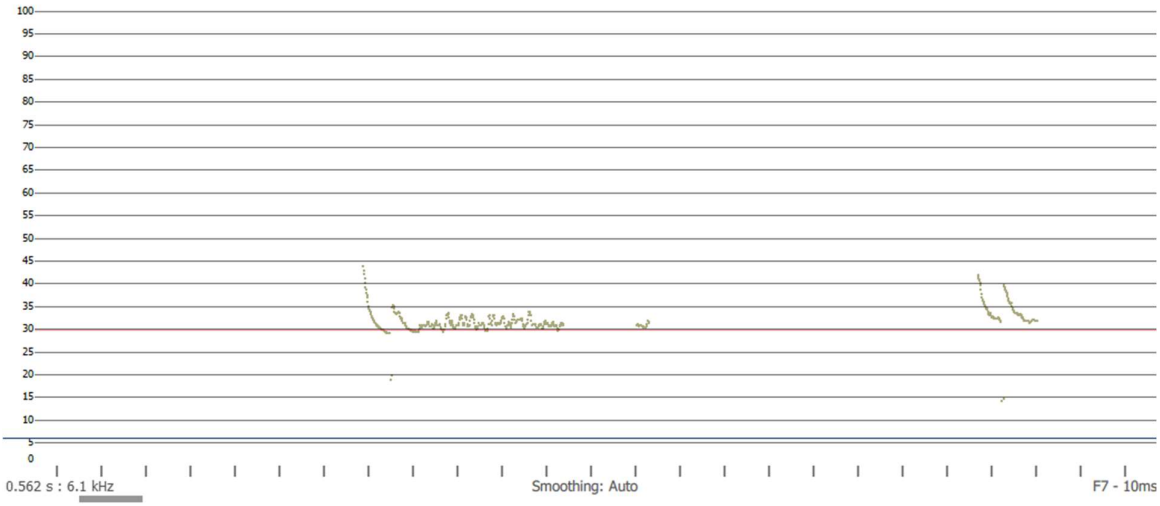

Figure 25: An image of the second 'call' recorded on the Anabat Swift as viewed on Anabat Insight

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A1 – Flora List

Species Name	Common Name	Exotic (X)	Priority Weeds (State Level)	Priority Weeds (Regional Level)	Other Weeds of Regional Concern	WoNs
Afrocarpus falcatus		x				
Agonis flexuosa	Willow Myrtle					
Allocasuarina gymnanthera (tentative)						
Alstroemeria psittacina	Parrot Lily	x				
Anredera cordifolia	Madeira vine	x	AP			X
Araujia sericifera	Moth vine, Moth plant	x			X	
Arctotheca calendula	Capeweed	x				
Asteraceae		x				
Bignoniacease vine (tentative)		x				
Bougainvillea sp.	Bougainvillea	x				
Briza minor	Shivery Grass	x				
Bromus catharticus	Prairie Grass	x				
Callistemon viminalis	Weeping Bottlebrush					
Capsella bursa-pastoris	Shepherd's Purse	x				
Casuarina cunninghamiana subsp. *cunningamhiana*	River Oak					
Casuarina glauca	Swamp Oak					
Cayratia clematidea	Native Grape					
Cedrus deodara		x				
Celtis sinensis	Chinese celtis/ Chinese hackberry	x			X	
Cenchrus clandestinum	Kikuyu	x			X	
Cestrum parqui	Green cestrum	x		AP		
Chamaecyparis obtusa	Japanese Cypress	x				
Chenopodium album	Fat Hen	x				
Commelina cyanea	Scurvy Weed					
Conyza bonariensis	Flaxleaf Fleabane	x				
Cotula australis	Common Cotula					
Cupaniopsis anacardioides	Tuckeroo					
Cupressus sempervirens	Mediterranean Cypress	x				
Cyclospermum leptophyllum	Slender Celery	x				
Cynodon dactylon	Couch					

Species Name	Common Name	Exotic (X)	Priority Weeds (State Level)	Priority Weeds (Regional Level)	Other Weeds of Regional Concern	WoNs
Cyperus brevifolius	Mullumbimby Couch	x				
Cyperus imbecillis						
Ehrharta erecta	Panic Veldtgrass	x				
Eucalyptus botrioydes	Bangalay					
Eucalyptus microcorys	Tallowwood					
Eucalyptus umbra	Broad-leaved White Mahogany					
Euphorbia peplus	Petty Spurge	x				
Ficus benjamina	Weeping Fig	x				
Fraxinus griffithii	Ash					
Gamochaeta sp.	Cudweed	x				
Hedera helix	English Ivy	x				
Hypochaeris sp.	Catsear	x				
Jacaranda mimosifolia	Jacaranda	x				
Liquidambar formosana	Formosan Gum	x				
Lolium sp.	Ryegrass	x				
Lomandra longifolia	Spiny-headed Mat-rush					
Lysimachia arvensis	Scarlet Pimpernel	x				
Malva parviflora	Small-flowered Mallow	x				
Medicago sp.	Medic	x				
Melaleuca quinquenervia	Broad-leaved Paperbark					
Melaleuca styphelioides	Prickly-leaved Tea Tree					
Microlaena stipoides						
Modiola caroliniana	Red-flowered Mallow	x				
Nothoscordum gracile	Onion Weed	x				
Oxalis sp.	Yellow-flowered Oxalis	x				
Pandorea jasminoides	Bower Vine					
Parietaria judaica	Pellitory, Asthma weed	x			X	
Paronychia brasiliana	Chilean Whitlow Wort	x				

Species Name	Common Name	Exotic (X)	Priority Weeds (State Level)	Priority Weeds (Regional Level)	Other Weeds of Regional Concern	WoNs
Phoenix canariensis	Phoenix palm, Canary Island date palm	x			X	
Phyllostachys sp.	Bamboo	x				
Pistacia chinensis	Chinese Pistachio					
Plantago lanceolata	Lamb's Tongues, Plantain	x				
Platanus × acerifolia	London Plane Tree	x				
Poa annua	Annual Poa					
Polycarpon tetraphyllum	Four-leaved Allseed	x				
Populus nigra	Black Poplar	x				
Ricinus communis	Castor Oil Plant	x				
Robinia pseudoacacia	Black locust	x			X	
Rumex brownii	Swamp Dock					
Sida rhombifolia	Paddy's Lucerne	x				
Solanum nigrum	Black-berry Nightshade	x				
Sonchus sp.	Sowthistle	x				
Stellaria media	Chickweed	x				
Stenotaphrum secundatum	Buffalo Grass	x				
Syagrus romanzoffiana	Cocos palm	x			X	
Syzygium australe	Brush Cherry					
Taraxacum sp.	Dandelion	x				
Trifolium repens	White Clover	x				
Tristaniopsis laurina	Water Gum					
Veronica (*arvensis*).	Speedwell	x				
Viola odorata	English Violet	x				
Vulpia sp.		x				
Waterhousea floribunda	Weeping Lilly Pilly					

A2 – Response to BDAR decision report

Table 3: Table from the BDAR decision report dated 21 February 2024 that outlines the Environment and Heritage Group's comments on this BDAR waiver, with an additional column has been added to the end with ELA's responses to these comments.

Biodiversity value	Meaning	Relevant (✓or NA)	Potential impacts		
			Applicant comment/justification	EHG comment	ELA's response
Vegetation abundance 1.4(b) BC Regulation	Occurrence and abundance of vegetation at a particular site	NA	**Planted native** The canopy contained a number of native trees including Ficus rubiginosa (Port Jackson Fig), Ficus macrophylla (Moreton Bay Fig), and Eucalyptus botryoides (Bangalay). The midstorey was absent and the groundcover was dominated by exotic species (see "Groundcover" section below). While some of the trees are known to be naturally present within the Sydney area, for example Ficus rubiginosa, the trees are not growing in typical remnant habitat. **Planted exotic** The canopy contained exotic tree species such as Celtis sinensis (Japanese Hackberry), Cupressus sempervirens (Mediterranean cypress) and Phoenix canariensis (Canary Island Date Palm). The midstorey was generally absent and the groundcover was dominated	It is noted that there has been significant disturbance (1943 imagery shows near full clearing), however, as some of the species found on site are not typical of planted vegetation and are associated with historically mapped PCT's, there is potential for a native seed bank to have persisted. Both PCT 3262 – *Sydney Turpentine Ironbark Forest*, and PCT 3806 – *Sydney Coastal Sand Mantle Heath* have been mapped on or near the site historically. A total of 12 species identified in the Flora List (App. 1 BDAR Waiver Req.) are associated with one or both PCT's mentioned above.	While some of the tree species within the study area may be associated with PCTs that were likely to occur in or near the study area pre-clearing, these PCTs are unlikely to occur naturally on site due to history of construction on site, unsuitable soil conditions (including over 1 m of sandy fill as the topsoil) and many of the species are commonly planted within Sydney. **Site history** According to the Preliminary Built Heritage Assessment (Extent Heritage Pty Ltd 2020), the study area likely fell within Boxley's Lagoon and former swamp, which became part of the Albert Ground in 1864, a privately-owned cricket ground. Subdivision and terrace housing was established in the late 1800s. During the early twentieth century, some housing was removed and replaced by small factories and warehouses. This was then cleared and replaced with 18 low density dwellings (nine duplexes) in the central and northern portions of the study area and the PCYC in the south. The dwellings were demolished by 2013 and the rest of the site has remained unchanged since this time (Extent Heritage Pty Ltd, 2020). This history of construction makes it unlikely that remnant vegetation would grow within the study area. **Historical imagery**

Biodiversity value	Meaning	Relevant (✓or NA)	Potential impacts		
			Applicant comment/justification	EHG comment	ELA's response
			by exotic species (see "Groundcover" section below). PTO **Exotic Groundcover** The groundcover was contiguous across the entire study area. The ground cover was less than 15% native. Species in the ground cover included Cynodon dactylon (Couch), Bromus catharticus (Prairie Grass) and Ehrharta erecta (Panic Veldtgrass). However, there were several patches (approximately 2m x 2m) where ground cover was greater than 50% native, with native species such as Microlaena stipoides (Weeping Grass), Cyperus imbecillis and Commelina cyanea. **Street Trees** The street trees surrounding the study area were a mix of native and exotic species. The street trees present included Melaleuca quinquenervia (Broad-leaved Paperbark), Waterhousea floribunda (Weeping Lilly Pilly) and Platanus x acerifolia (London Plane). The assemblage of species	3262 – -Casuarina glauca -Cayratia clematidea -Cupaniopsis anacardioides -Cyperus imbecillis -Melalueca styphelioides 3806 – -Lomandra longifolia -Commelina cyanea Both – -Cynodon dactylon -Eucalyptus botryoides -E. umbra -Lomandra longifolia -Microlaena stipoides Further justification is requested to ensure that the native vegetation on site is not consistent with a PCT known to occur in the same IBRA subregion, and that no TEC is to be impacted (see Sydney Turpentine Ironbark Forest TEC listing).	Historical clearing is evidenced via Historical imagery from 1930 (Figure 30). In 1930 and through 1942, it is evident that almost all vegetation within the study area was removed and replaced with a series of narrow terraces (Figure 30 to Figure 31). In 1965, the PCYC building is visible in the southern extent of the study area (Figure 33). To the north are nine freestanding buildings (the duplexes mentioned above) that replaced the terraces that were seen in the 1930 and 1943 imagery and no canopy vegetation. By 1978, the buildings are in the same location but there are now a several trees visible (Figure 34). In 2014, all the 9 free-standing buildings are absent and the PCYC in the southern extent of the study area and numerous mature trees and lawn in the northern extent remain (Figure 38). In 2024, the PCYC building remains, and the canopy cover has increased (Figure 39). The history of widespread clearing of the study area, and history of dense residential construction, suggests heavy disturbance of the natural soil profile and makes it unlikely that a remnant vegetation would occur through natural processes. Soil is further discussed below. **Soil in study area** The study area is mapped as having Tuggerah soil landscape and podosols under the Australian Soil Classification (eSpade 2024). The Additional Geotechnical Investigation report involved the drilling and assessment of five boreholes (EI Australia 2023) (Figure 40). The report indicates that the top 1.35-1.8 m of soil is sandy fill. This is underlain by alluvial peat/organic clay, alluvial sand with peat layers/peaty clay and residual soils, over sandstone (EI Australia 2023). Alluvial soil is consistent with the site history outlined above indicating that the study area was part of a lagoon or swamp.

Biodiversity value	Meaning	Relevant (✓or NA)	Potential impacts		
			Applicant comment/justification	EHG comment	ELA's response
			represented within the study area has been established through landscape plantings and does not represent a native PCT or remnant vegetation. The vegetation within the study area lacks connectivity with intact native vegetation. There is an absence of native resilience.		To determine if this fill soil is conducive to maintaining remnant or regenerated vegetation associated with a PCT, it was compared with soil requirements for PCTs that were previously mapped in or near the study area "pre-clearing" and associated threatened ecological communities (TECs) (DPE 2023). The pre-clearing extent of PCTs was developed by DPE using a combination of aerial photographic interpretation, environmental layers and historical documents. *PCT 3262* The entire study area was, pre-clearing, mapped as PCT 3262 *Sydney Turpentine Ironbark Forest,* which requires shale or sheltered shale-sandstone soils (NSW Government 2024) (Figure 10). PCT 3262 is associated with the TEC *Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion*, which is critically endangered under the BC Act and *Turpentine-Ironbark Forest of the Sydney Basin Bioregion*, which is critically endangered under the EPBC Act. This TEC is associated with soils derived either from Wianamatta Shale or from Wianamatta Shale interbedded with Hawkesbury Sandstone (NSW TSSC 2019). A sandy topsoil is not consistent with the requirements of this PCT and TEC, nor is alluvial soils. Therefore, this PCT and TEC are not likely to occur within the study area. *PCT 3806* PCT 3806 was mapped (pre-clearing) within 500 m of the study area). This PCT is found on shallow to moderately deep sand mantles that are perched above some of the major sandstone headlands of Sydney (NSW Government 2024). PCT 3806 is associated with TEC *Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion* which is critically endangered under the BC Act and Eastern Suburbs Banksia Scrub of the Sydney Region which

Biodiversity value	Meaning	Relevant (✓or NA)	Potential impacts		
			Applicant comment/justification	EHG comment	ELA's response
					is critically endangered under the EPBC Act. This TEC occurs on aeolian sands of the Tuggerah, Newport, North Head and Kurnell soil landscapes (NSW TSSC 2017). The study area is not on a sandstone headland, but does have underlying sandstone bedrock (EI Australia 2023). The topsoil is sandy fill but the layers underneath are alluvial. The Additional Geotechnical report does not indicate any aeolian sands. Therefore, this PCT and TEC are not likely to occur within the study area. *PCT 3962* PCT 3962 *Coastal Floodplain Phragmites Reedland* was previously mapped (pre-clearing) approximately 1.5 km east of the study area. It occurs on alluvial backswamps on coastal floodplains. Due to the lower layers of soil being alluvial, and the historical records suggesting previous swampland within the study area there is a decent chance that this PCT used to exist in the study area (EI Australia 2023; Extent Heritage Pty Ltd 2020). This PCT can be associated with *Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* (endangered under the BC Act), *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* (endangered under the BC Act) and *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community* (endangered under the EPBC Act). TEC *Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.* Due to the historic disturbance of the site, 1.35-1.8 m of sandy fill in the top layer, it is unlikely that any remnant vegetation for this PCT or TECs are presently occurring within the study area.

Biodiversity value	Meaning	Relevant (✓or NA)	Potential impacts		
			Applicant comment/justification	EHG comment	ELA's response
					Therefore, this PCT and TEC are not likely to occur within the study area. The sandy fill is not natural topsoil and is not consistent with the soils associated with historically mapped (pre-clearing) PCTs outlined above or their associated TECs. **Vegetation within the study area** It is noted that some of the species within the study area can be associated with a PCT historically mapped (pre-clearing) or an associated TEC. The native species queried by EHG, are likely to be planted or transported onto site by a lawnmower. They are highly unlikely to be remnant, due to most being commonly purchased landscape plants, historical land use and the modified topsoil on site. Table 4 outlines provide a justification for each species as to why they are not likely to be remnant. The native species are most likely planted or transported onto site by a lawn mower (e.g. *Cynodon dactylon* (Couch)).
Vegetation integrity 1.5(2)(a) BC Act	Degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been	NA	The study area contains built structures and paved areas. The study area has been historically cleared of remnant vegetation. Due to previous and current land management practices, vegetation and soil within the study area has been highly modified or disturbed and lacks any natural resilience. Vegetation within the study area is composed of planted exotic trees, naturalised exotic	The site has a long history of disturbance and alteration from its natural / near natural state (see 1943 aerial imagery). There is potential that, if the seed bank has remained somewhat intact, then some regrowth has occurred. It remains unclear what portion of the vegetative features of	See above for explanation of the extent of disturbance to vegetation and topsoil within the study area, and an explanation as to why the native vegetation is unlikely to conform to a TEC.

Biodiversity value	Meaning	Relevant (✓or NA)	Potential impacts		
			Applicant comment/justification	EHG comment	ELA's response
	altered from a near natural state		trees and native trees as well as overhanging vegetation from native and exotic street trees. The vegetation is not consistent with any remnant native or listed PCT in the BioNet Vegetation Classification. The midstorey was lacking and the groundcover was predominately exotic. No Threatened Ecological Communities will be impacted. The vegetation in the study area is not connected to mapped areas of native vegetation. As the vegetation within the study area is highly modified and altered from its natural state, the development would not compromise the vegetation integrity or impact any remnant native vegetation within the surrounding landscape.	the site may be modified and what parts may be a result of natural processes. Section 3.1.6 of the STIF Final Determination states "Remnants of Sydney Turpentine-Ironbark Forest have historically been subjected to a range of anthropogenic disturbances including logging, grazing by domesticated livestock and burning at varying intensities (Benson and Howell 1994). These disturbances have affected the structure and potentially the composition of remnants." Given the lack of aerial photography between clearing and revegetation of the site, the disturbance history and potential for regrowth of native vegetation communities remains unclear. Any potential TECs that may occur are recognised to have a history of disturbance as can be read	

Biodiversity value	Meaning	Relevant (✓or NA)	Potential impacts		
			Applicant comment/justification	EHG comment	ELA's response
				in the final determination for STIF.	
Habitat suitability 1.5(2)(b) BC Act	Degree to which the habitat needs of threatened species are present at a particular site	NA	The planted vegetation or existing buildings within the study area do not contain any significant habitat for threatened species. The vegetation provides limited opportunities for highly mobile threatened fauna species to shelter and forage opportunistically, and is not suitable habitat for less mobile threatened species. Pteropus poliocephalus (Grey-headed Flying-fox) may use plants within the study area or in the street trees surrounding the study area occasionally as part of a broader foraging habitat (e.g. Ficus macrophylla (Moreton Bay Fig)). This species is vulnerable under the BC Act and EPBC Act.	If the small hollow on site could be utilised by a species such as *Trichoglossus moluccanus* (Rainbow Lorikeet), then that same hollow could potentially be utilised by a threatened species, including but not limited to *Miniopterus australis* (Little Bent- winged Bat), which was identified in the threatened fauna records. Further evidence is requested to show that any habitat on the site including but not limited to	An additional site visit was undertaken on 12 March 2024 to further assess potential microbat habitat. Tasks included: • Ground daytime inspection of hollow/s on site • Evening ground survey of trees with hollows to observe and record the emergence of any microbats • Ground daytime inspection of the outside and inside of the building for potential microbat access points, • Ground evening survey of building to observe and record the emergence of any microbats. The hollow that has previously been recorded in the northern extent of the study area within a *Ficus benjamina* during site visit on 18 October 2023 is no longer available as habitat for bats and birds. During the site visit undertaken on 12 March 2024, the tree had split, and the hollow is no longer attached to the tree and therefore not suitable habitat for threatened birds or microbats (Figure 14). Another tree, *Populus nigra* (Black Poplar) had also fallen to the ground. With this additional visibility one hollow were evident

Biodiversity value	Meaning	Relevant (✓or NA)	Potential impacts		
			Applicant comment/justification	EHG comment	ELA's response
			One hollow bearing tree, Ficus benjamina, was identified in the study area during surveys. The tree contained one small hollow which may to be utilised by a non- threatened species such as Trichoglossus moluccanus (Rainbow Lorikeet) for nesting. The human made structures present within the study area are do not consist of potential roosting habitat for threatened microbat species such as open roof crevices, and there were no culverts, bridges, railway tunnels or stormwater tunnels. The development will not compromise habitat suitability for threatened species.	hollow-bearing trees or the human made structures do not consist of potential roosting habitat for threatened microbat species, as, from aerial imagery, it is not clear that is the case.	(Figure 15). However, as this tree has fallen, this is no longer suitable habitat for threatened species. Two additional hollows were observed within a street tree near the northeastern boundary of the study area in a *Melaleuca quinquenervia* (Prickly-leaved Tea Tree) (Figure 17). The first hollow was 2 cm wide and 3.5 m above the ground, and the second hollow was 10-15 cm wide and 2.5 m above ground. Three small gaps in the awning of the PCYC roof were identified as potential microbat roosting habitat (Figure 21 to Figure 23). A ground survey of the *Melaleuca quinquenervia* with hollows and the gap in the PCYC awning that was most suitable as roosting habitat (Figure 21) using ultrasonic detectors did not detect any microbat activity. Therefore, it is unlikely that microbats are utilising this potential habitat present within the study area.
Threatened species abundance 1.4(a) BC Regulation	Occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular site	NA	No threatened ecological communities were present within the study area. The vegetation present within the study area is not consistent with any listed PCT. The study area has been historically cleared of native vegetation and is situated within a highly urbanised and fragmented environment. There are no BioNet (Atlas of NSW Wildlife) records of threatened flora or fauna species within the study area	Pending the above.	As above. All hollows and roof gaps within the study area were surveyed. It was confirmed that microbats are unlikely to microbats present within the study area. Due to historical clearing of vegetation and modification of the soil, the native vegetation present within the study area is not consistent with any listed PCT or TEC.

Biodiversity value	Meaning	Relevant (✓or NA)	Potential impacts		
			Applicant comment/justification	EHG comment	ELA's response
			(Figure 10 and Figure 11). No habitat was available for threatened flora species due to the high level of modification of vegetation and soils within the study area. No threatened fauna species were observed within the study area during the survey. One hollow bearing tree, Ficus benjamina, was identified in the study area during surveys. The tree contained one small hollow which is likely to be utilised by a non- threatened species such as Trichoglossus moluccanus (Rainbow Lorikeet) for roosting. The vegetation provides limited opportunities for highly mobile threatened fauna species to shelter and forage opportunistically and is not suitable habitat for less mobile threatened species. Pteropus poliocephalus (Grey headed Flying-fox) may use plants within the study area or in the street trees surrounding the study area occasionally as part of a broader foraging habitat (e.g. Ficus macrophylla (Moreton Bay Fig)).		

Biodiversity value	Meaning	Relevant (✓or NA)	Potential impacts		
			Applicant comment/justification	EHG comment	ELA's response
			The proposed development is unlikely to significantly affect threatened species or their habitat.		
Habitat connectivity 1.4 (c) BC Regulation	Degree to which a particular site connects different areas of habitat of threatened species to facilitate the movement of those species across their range	NA	Vegetation within the study area is limited to planted native and exotic vegetation which does not form part of a PCT, and is located within a highly fragmented and developed urban area in the inner southern Sydney suburb of Redfern. The study area is surrounded by roads and residential buildings and is not connected to areas of intact native vegetation. As such, the study area provides very limited connectivity to facilitate the movement of threatened species across their range.	Pending the above.	As above. All hollows and roof gaps within the study area were surveyed. It was confirmed that microbats are unlikely to be utilising this potential habitat present within the study area.

Biodiversity value	Meaning	Relevant (✓or NA)	Potential impacts		
			Applicant comment/justification	EHG comment	ELA's response
Threatened species movement 1.4(d) BC BC Regulation	Degree to which a particular site contributes to the movement of threatened species to maintain their lifecycle	NA	The study area contains limited vegetation which is highly fragmented by buildings, roads, and areas of hardstand surfaces. Movement for less mobile threatened fauna such as non-flying species, across the study area is highly unlikely due a lack of connective vegetation. Opportunities for movement across the study area for mobile threatened fauna including birds and bats are available, however, the study area is not considered to be significant for the movement of any threatened species to maintain their lifecycle and the development is not likely to significantly change their movement.	Pending the above.	As above. All hollows and roof gaps within the study area were surveyed. It was confirmed that microbats are unlikely to be utilising this potential habitat present within the study area.
Flight path integrity 1.4(e) BC Regulation	Degree to which the flight paths of protected animals over a particular site are free from interference	NA	The landscape surrounding the study area consists of commercial and residential buildings and is in close proximity to Redfern Park. Protected animals are unlikely to rely on the limited extent of planted vegetation identified within the study area, along their flight path. The proposed development will not significantly affect flight paths of protected animals.	Supported.	N/A

Biodiversity value	Meaning	Relevant (✓or NA)	Potential impacts		
			Applicant comment/justification	EHG comment	ELA's response
Water sustainability	Degree to which water quality, water bodies and	NA	No natural water courses are present within the study area. In its current state, the study area is highly modified and does not contain water bodies or contribute to hydrological processes that sustain threatened species or ecological communities	Supported.	N/A
1.4(f) BC Regulation	hydrological processes sustain threatened species and threatened ecological communities at a particular site.		within or adjacent to the study area. The proposed development will not impact on water quality, water bodies or hydrological processes.		N/A

A3 – Assessment of species within the study area that can be associated with a PCT or TEC

Some species present within the study area are associated with PCTs and TECs that have been previously mapped (before the site was comprehensivelycleared) within or near the study area. Table 4 assesses the habitat and soil requirements of each species and whether or not they are commonly purchased and planted species of each species. It is concluded that it is unlikely these species are remnant vegetation.

Table 4: Assessment of species within the study area that can be associated with a PCT or TEC previously mapped (pre-cleared) in or near the study area.

Species	Associated PCT	Associated TEC	Commonly available for sale?	Ecology	Assessment
Casuarina glauca	3262 and 3962	Yes - *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Yes (Bunnings 2024).	Seed wind and water dispersed. Coloniser of disturbed sites. Swampy estuarine flats and near creeks with brackish water. Alluvial soils (Benson and McDougall, 1995).	Commonly planted species. Not near current creek or waterbody, but historically part of a lagoon/swamp. Topsoil is sandy fill / heavily modified (i.e. not alluvial). Unlikely to colonise due sandy topsoil. Therefore, unlikely to be remnant vegetation
Cayratia clematidea	3262	Yes - *Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion*	No	Vertebrate-adapted dispersal. Coloniser. Levee banks, margin of rainforest. Clay loam from shale, basalt, quartzite, medium–high nutrients (Benson and McDougall, 2001).	No rainforest. Topsoil is not clay/loam. Therefore, unlikely to be remnant vegetation.
Commelina cyanea	3962	No	No	Shaded forest, often in disturbed areas	Site is disturbed - may be remnant but native groundcover was less than 15% inclusive of this species.
Cupaniopsis anacardioides	3262	No	Yes (Bunnings, 2024; Flower Power 2024)	Fruit eaten by Figbird, Olive-backed Oriole and Pied Currawongs. Near the sea, along estuaries. Sandy to loamy soils on sands, medium–low nutrients (Benson and McDougall, 2001).	Commonly planted species. Not along an estuary, but historically part of a lagoon/swamp. Sandy fill topsoil may be suitable, but is highly disturbed from the naturally occurring soil that would have existed prior to top fill. Therefore, unlikely to be remnant vegetation.

Species	Associated PCT	Associated TEC	Commonly available for sale?	Ecology	Assessment
Cyperus imbecillis	3262	No	No	Moist, shady areas. Clay soil on shale, basalt, medium to high nutrients (Benson and McDougall, 2001).	Topsoil is not clay soil. Likely to have been transported onto site via lawnmower wheels. Therefore, unlikely to be remnant vegetation.
Melaleuca styphelioides	3262	No	Yes (Flower Power 2024)	Tiny seed, wind-dispersed, no dormancy, some seed store maintained on plants, no soil-stored seedbank. Often along stream banks. On alluvial soils from shales, basalt subject to flooding (Benson and McDougall, 1998).	Commonly planted species. Not on streambank but historically part of a lagoon/swamp. Not on soils derived from shale or basalt. Street trees in even spacing indicating of intentional planting. Therefore, unlikely to be remnant vegetation.
Commelina cyanea	3806	No	No	Coloniser of open areas. Moist places, creek banks, disturbed areas. Loamy to clay soils on sandstone, shale, volcanic necks, medium to high nutrients. Possibly somewhat salt-tolerant (Benson and McDougall, 2002).	Disturbed area but not on loamy or clay soils. Therefore, unlikely to be remnant vegetation.
Cynodon dactylon	3262, 3806 and 3962	No	Yes, listed as "couch" (Bunnings, 2024; Flower Power 2024)	Wind-dispersal, dispersed in mud on cars, animal, water and vegetative dispersal. Native and exotic forms occur. Native forms restricted to estuarine areas. Wetland, estuarine areas (native form) (Benson and McDougall, 2005).	Commonly planted species. Not wetland/estuarine but historically part of a lagoon/swamp. Likely to be exotic form with seed transport to the study area via wind or wheels or a lawnmower. Therefore, unlikely to be remnant vegetation.
E. botryoides	3262 and 3806	Yes – Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions and *Eucalyptus saligna* X *E. botryoides* associated	No	Seed wind-dispersed locally. No soil-stored seedbank. Coastal headlands and dunes. On alluvial flats or old beach dunes, low nutrients (Benson and McDougall, 1998).	Not headland, dunes, but historically part of a lagoon/swamp. The top soil is sandy fill, but some of the lower layers are alluvial. Due to the thick layer of sandy fill, this is unlikely to be remnant vegetation.

Species	Associated PCT	Associated TEC	Commonly available for sale?	Ecology	Assessment
		with *Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion*			
E. umbra	3262 and 3806	No	No	Seed dispersed locally by wind or gravity, no dormancy mechanism. Ridges and coastal headlands. Shallow dry soils on sandstone, shale, low nutrients (Benson and McDougall, 1998).	Not on ridges or headlands. Therefore, unlikely to be remnant vegetation.
Lomandra longifolia	3262 and 3806	Yes –*Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion, Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion* and *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Yes (Bunnings, 2024; Flower Power 2024)	Common in many situations including sand dunes, grassy headlands, exposed lateritic ridges, heath, open forest, creek banks and open areas in rainforest (Fairley and Moore, 2010)	Grows in a variety of conditions, but is a commonly planted species. Therefore, unlikely to be remnant vegetation.
Microlaena stipoides	3262 and 3806	Yes – *Sydney Turpentine-Ironbark Forest in the Sydney Basin Bioregion*	No	No special dispersal morphology. Damp shady areas. More fertile or protected areas of natural pastures particularly where there is some timber cover. Sandy loam–clay loams on shale, medium–high nutrients (Benson and McDougall, 2005).	Sandy fill topsoil is not likely to be a "more fertile" soil type, but the study area is somewhat shaded by the canopy. Therefore, unlikely to be remnant vegetation.
Melaleuca quinquenervia	3962	Yes - *Swamp Oak Floodplain Forest of the New South Wales North*	Yes (Flower Power 2024)	Short distance wind and water-dispersed; successful recruitment on moist or saturated soil. Estuarine	Commonly planted species. Not near swamp or lake margin, but historically part of a lagoon/swamp. Topsoil is sandy fill / heavily

Species	Associated PCT	Associated TEC	Commonly available for sale?	Ecology	Assessment
		Coast, Sydney Basin and South East Corner Bioregions		swamps and lake margins. Silty or sandy alluvium (Benson and McDougall, 1998).	modified (i.e. not alluvial). Unlikely to colonise due sandy topsoil. Therefore, unlikely to be remnant vegetation
Melaleuca styphelioides	No	Yes - *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Yes (Flower Power 2024)	Tiny seed wind dispersed. Often along stream banks. On alluvial soils from shales, basalt subject to flooding. (Benson and McDougall, 1998).	Commonly planted species. Not near current creek or waterbody, but historically part of a lagoon/swamp. Topsoil is sandy fill / heavily modified (i.e. not alluvial). Unlikely to colonise due sandy topsoil. Therefore, unlikely to be remnant vegetation

A4 Historical imagery and maps detailing Albert Cricket Ground

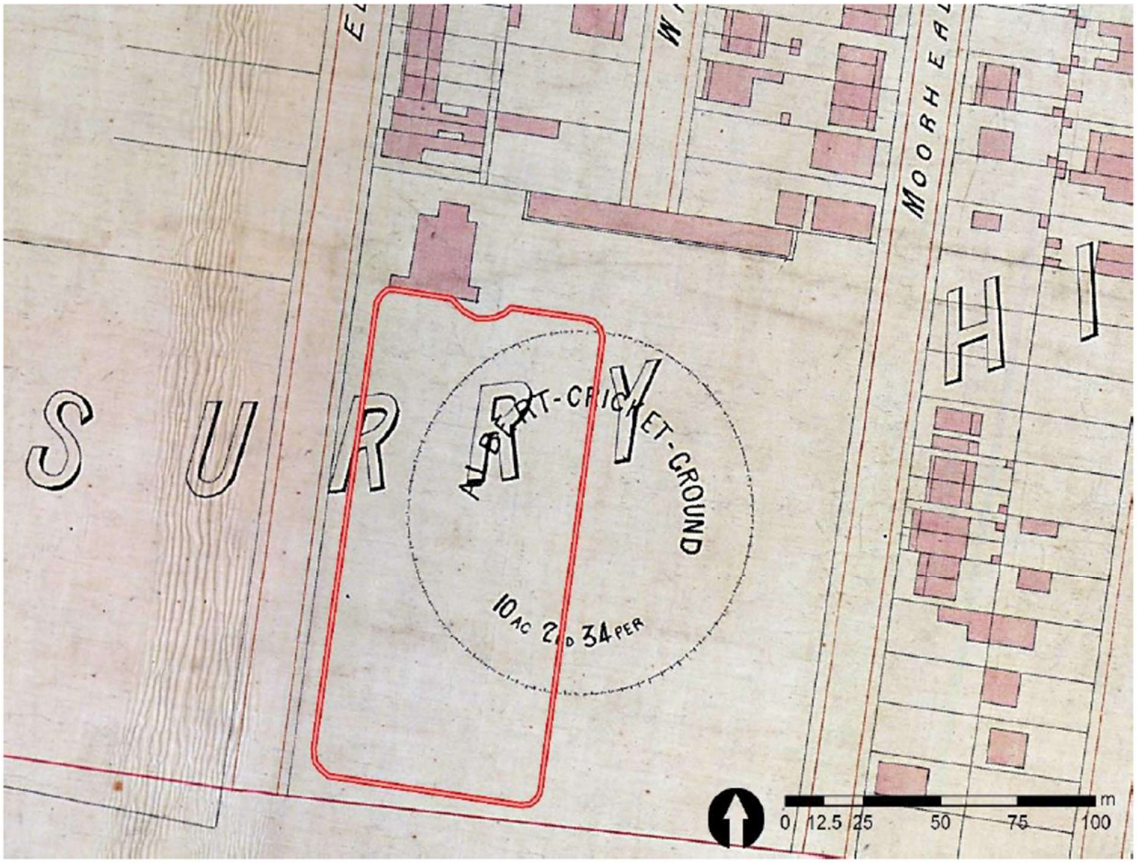

Figure 26: Map showing Albert Cricket Ground showing the study area overlapping the western half

Figure 26 is an extract from page 12 of the *Extant Heritage (February 2020 Update Final v2) 600-660 Elizabeth Street, Redfern NSW – Preliminary Built Heritage Assessment*. The following text appears beneath the map in the Extant Heritage report:

> *Figure 4 'Block 152, Map 50 – The Redfern Municipality' of the Trigonometric survey of Sydney, c. 1864, overlain by modern cadastral boundaries in red. The Albert Cricket Ground encompassed a large part of the study area (Source: City of Sydney, Historical Atlas of Sydney, Block 152, Map 50).*

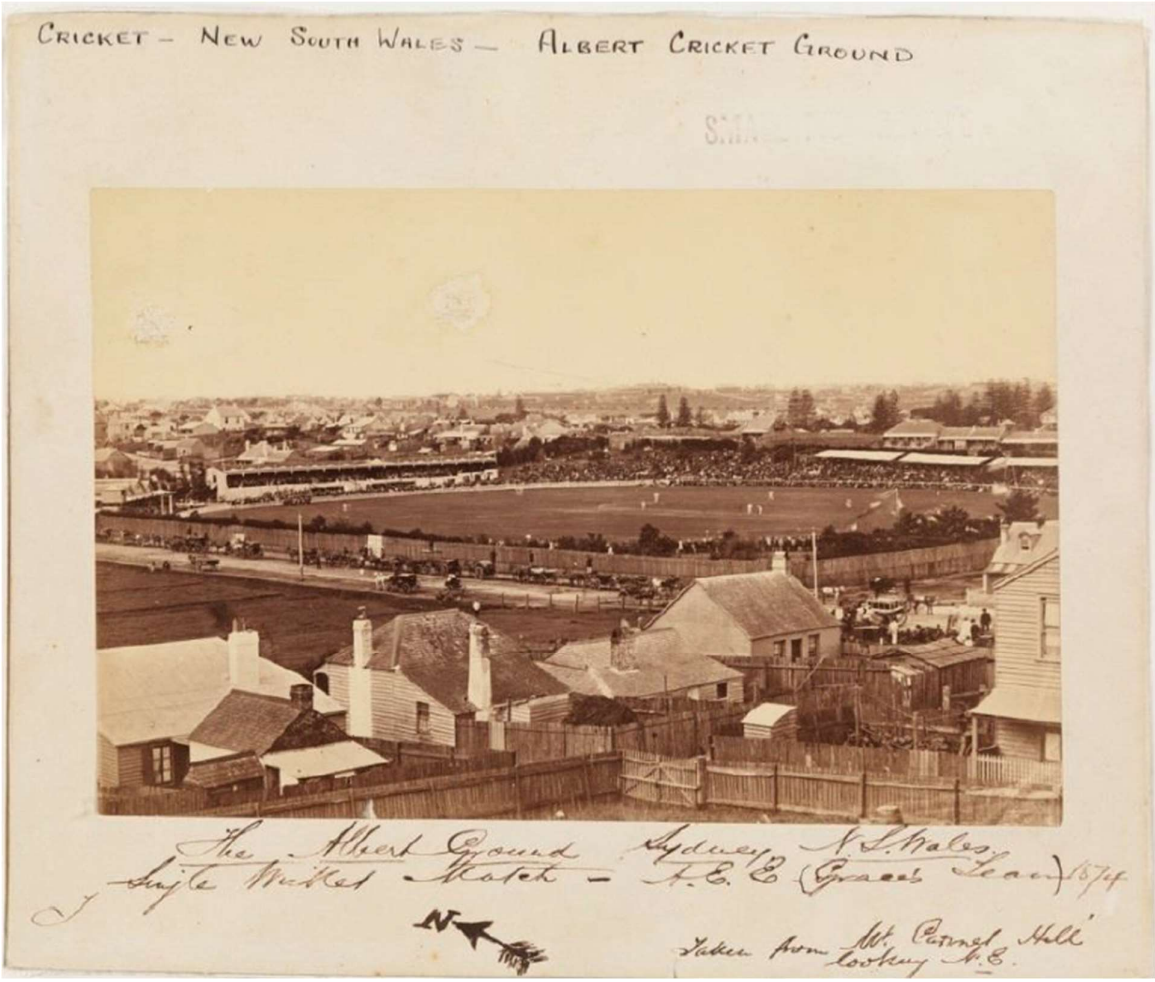

Figure 27. A photo of the Albert Cricket Ground 1874.

Figure 27 is an extract from page 14 of the Extant Heritage *(February 2020 Update Final v2) 600-660 Elizabeth Street, Redfern NSW – Preliminary Built Heritage Assessment*. The caption text in the Extant Heritage report states 'Figure 5 Albert Cricket Ground, 1874 (Source: SLNSW SPF/1570)

The *Extant Heritage* (February 2020 Update Final v2) report also includes a lithograph and drawings of events at the Albert Cricket Ground such as: an Intercolonial cricket match; Highland sports, a Grand bicycle steeplechase over a water jump; and a carnival sports event for the Queen's Birthday.

An internal road called Alderson Street was constructed on the former Albert Cricket Ground. Two photos below show the general lack of vegetation that was present after terrace housing was constructed on the subject land.

Figure 28: Alderson Street showing backyards

Figure 28 is an extract from page 19 of the Extant Heritage *(February 2020 Update Final v2) 600-660 Elizabeth Street, Redfern NSW – Preliminary Built Heritage Assessment*. The caption text in the Extant Heritage report states:

> *Figure 12 Alderson Street showing backyards, date unknown, however Alderson Street was formed only during the late nineteenth century period of subdivision (Source: SLNSW Government Printing Office 1 – 31164).*

Figure 29: Rear of Alderson Street, Sydney (Redfern) about 1900.

Figure 29 is an extract from page 23 of the Extant Heritage *(February 2020 Update Final v2) 600-660 Elizabeth Street, Redfern NSW – Preliminary Built Heritage Assessment*. The caption text in the Extant Heritage report states:

> *Figure 15 Rear of Alderson Street, Sydney (Redfern), about 1900 (Source: State Records of NSW, NRS 12487, Digital ID: 12478_a021_a021000048).*

A5 – Historical aerial imagery of the study area

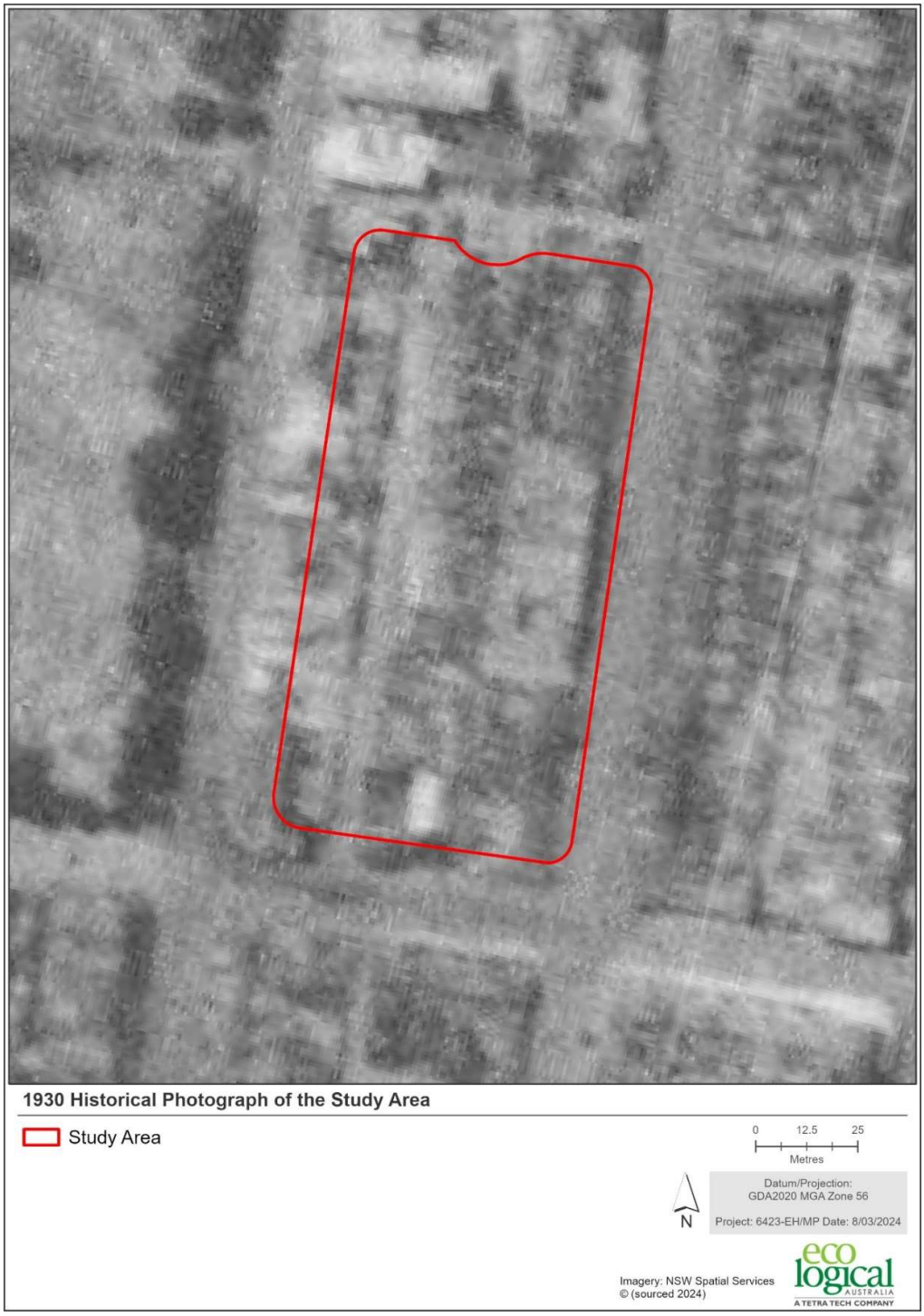

Figure 30: Historical aerial imagery 1930 (NSW Spatial Services, 2024)

Figure 31: Historical aerial imagery 1942 (NSW Spatial Services, 2024)

Figure 32: Historical aerial imagery 1951 (NSW Spatial Services, 2024)

Figure 33: Historical aerial imagery 1965 (NSW Spatial Services, 2024)

Figure 34: Historical aerial imagery 1978 (NSW Spatial Services, 2024)

Figure 35: Historical aerial imagery 1986 (NSW Spatial Services, 2024)

Figure 36: Historical aerial imagery 1994 (NSW Spatial Services, 2024)

Figure 37: Historical aerial imagery 2005 (NSW Spatial Services, 2024)

Figure 38: Historical aerial imagery 2014 (NSW Spatial Services, 2024)

Figure 39: Historical aerial imagery 2024 (NSW Spatial Services, 2024)

A6 – Borehole locations

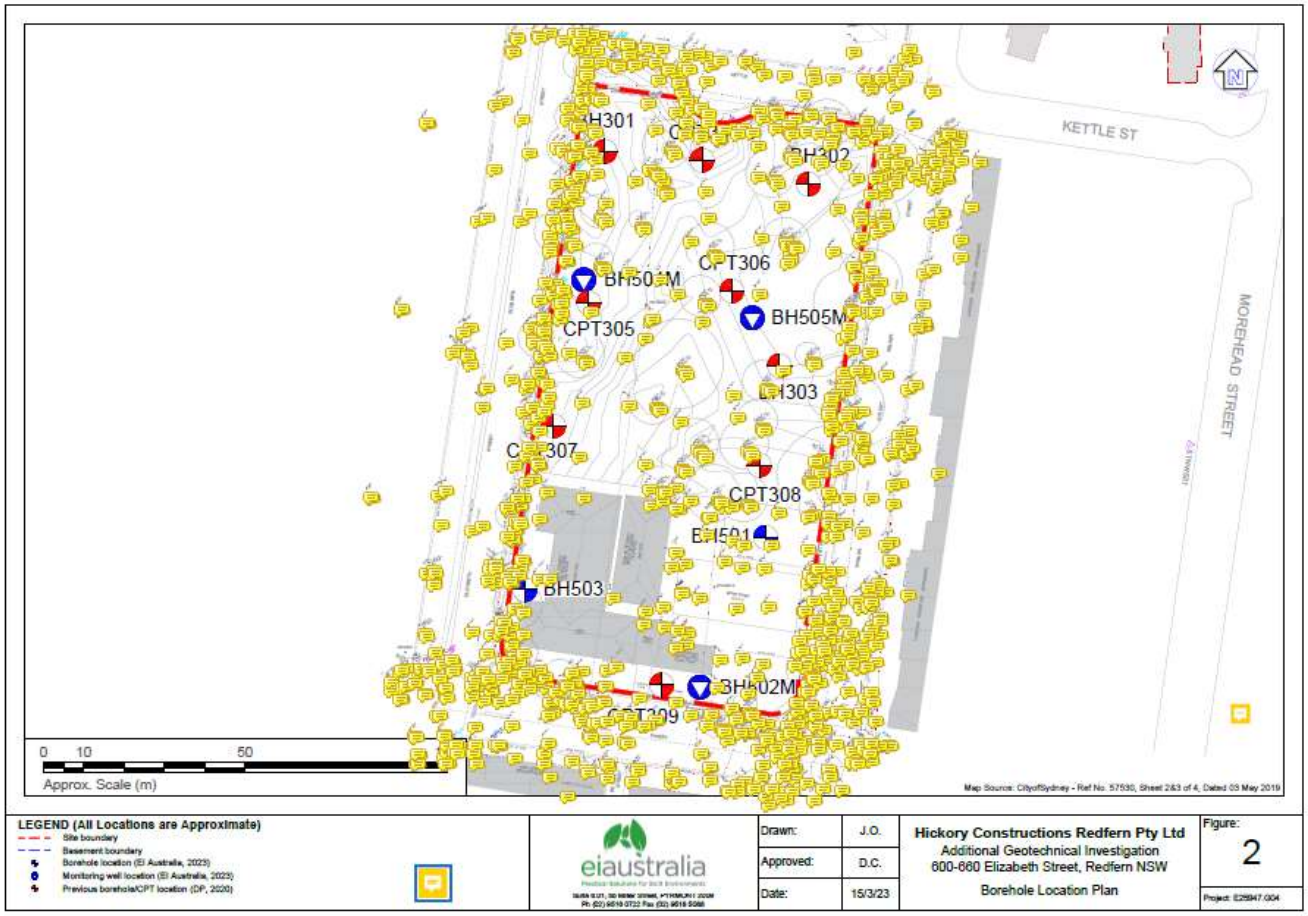

Figure 40: Borehole location plan (EI Australia, 2023