Attachment 6

Ecological Memorandum

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MEMORANDUM

TO	Department of Planning and Environment
FROM	Nicole McVicar – Senior Ecologist - Eco Logical Australia Pty Ltd c/- Living Choice Australia Ltd
DATE	26 October 2017
SUBJECT	Glenhaven Retirement Village Expansion – Ecological Assessment Summary

Introduction

ELA was engaged by Living Choice Australia Ltd in December 2016 to undertake a Flora and Fauna Assessment for a proposed development at Glenhaven Retirement Village, Glenhaven (the study area).

This memorandum outlines the methods undertaken to assess ecological values present within the study area, and provides a brief summary of the results.

A summary of the impacts of the development proposal on the ecological values within the study area has also been provided, along with advice on how Living Choice Australia Ltd intends to mitigate these impacts.

Compliance with NSW *Biodiversity Conservation Act 2016*

In November 2016 the NSW parliament passed the *Biodiversity Conservation Bill 2016*. This new legislation replaced the NSW *Threatened Species Conservation Act 1995* (TSC Act) and took effect on 25 August 2017. Among other things, the *Biodiversity Conservation Act 2016* (BC Act) introduces new requirements for biodiversity assessment. However there is a savings and transitional period for certain types of developments to be assessed under previous legislation. It is understood that the Development Application is to be lodged before 25 November 2015, therefore the Flora and Fauna Assessment was prepared and assessed under the TSC Act.

Ecological Assessment

Methodology – Literature review and site inspection

A review of the following data sources was undertaken:

- aerial photographs (Google Earth, Near Map)
- existing Hills Shire vegetation mapping
- existing OEH vegetation mapping
- Atlas of NSW Wildlife
- Commonwealth EPBC Act Protected Matters Search Tool
- threatened species profiles
- final determinations for communities and species by the Scientific Committee
- Commonwealth Species Profile and Threats Database
- The Hills Local Environment Plan 2012

- The Hills Development Control Plan 2012

Site Inspections

Initial site inspection

ELA undertook an initial site inspection of the study area on Tuesday 10 January 2017. The aim of this site inspection was to identify ecological constraints within the study area, identify specific habitat attributes likely to support threatened flora and fauna and confirm the presence of any threatened ecological communities (TECs). During the inspection, the entire study area was traversed. Flora species observed in the canopy, mid-storey and groundcover were recorded. Weed species, exotic, and non-endemic plantings were also recorded. The location of hollow bearing trees were recorded within the study area. Additional habitat features of note for threatened flora and fauna species were recorded, along with incidental fauna sightings within the study area.

Joint site inspection with Council

A joint site inspection with The Hills Council Biodiversity Officer was undertaken on 27 February 2017 to confirm if any TECs were present within the study area.

Biobanking Assessment and Biobanking plots

In order to complete the Biobanking assessment component of the application, additional site inspections were undertaken on 16 May 2017 and 5 June 2017. During these site inspections the vegetation was stratified into vegetation zones and 3 biometric plots were undertaken in accordance with the Biobanking Assessment Methodology 2014. The previously mapped vegetation community boundaries from January 2017 were refined and additional areas comprising the remainder of the Asset Protection Zone (APZ) were added. This biometric data was then used to correlate the vegetation to a plant community type (PCT), which was used in calculations for biodiversity credits, the 'currency' of Biobanking and offsetting in NSW.

Results - Literature review and site inspections

Hills Shire Council vegetation mapping (2008) indicated the presence of Shale Sandstone Transition Forest (high sandstone influence) (SSTF) within the study area. SSTF is listed as a Critically Endangered Ecological Community under both the NSW BC Act and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). SSTF occurs on transitional soils between shale and sandstone and although ecotonal, its vegetation assemblage is recognised as a distinct community (NSW Scientific Committee 2014). According to Tozer 2003 SSTF (high sandstone influence) is characterised by the following plant species in **Table 1**.

The site inspections indicated SSTF was not present within the study area. The landscape was dominated by large sandstone outcrops, sandy soils and presence of Hawkesbury Sandstone flora species; the dominant canopy species were indicative of the more common sandstone ridgetop woodland community, transitioning to a sandstone gully forest. This was also clearly demonstrated with the biometric plot data collected on 5 June 2017.

During the joint site inspection with The Hills Council Senior Biodiversity Officer on 27 February 2017 it was agreed that the vegetation communities present in the study area were indicative of sandstone ridgetop woodland and sandstone gully forest vegetation communities, and not the TEC SSTF as mapped by The Hills Council in 2008. A summary is provided below in **Table 2.**

Table 1: Dominant plant species within SSTF (high sandstone influence) according to Tozer 2003

Dominant plant species within SSTF
Canopy (dominant) *Eucalyptus punctata* (grey gum)*, Eucalyptus crebra* (narrow –leaved ironbark)
Canopy (subdominant) *Eucalyptus fibrosa* (broad-leaved ironbark), *Corymbia gummifera* (red bloodwood)*, Syncarpia glomulifera* (turpentine)
Midstory *Allocasuarina littoralis, Persoonia linearis, Acacia decurrens, Kunzea ambigua, Bursaria spinosa, Jacksonia scoparia*
Groundcover *Entolasia stricta, Themeda triandra, Stipa pubescens, Pomax umbellata*

Table 2: Dominant plant species within the study area from site inspection on 10 January 2017

Dominant plant species within study area
Canopy (dominant) *Eucalyptus haemastoma* (Scribbly Gum)*, Corymbia eximia* (Yellow Bloodwood), *Corymbia gummifera* (Red Bloodwood)*, Eucalyptus pilularis* (Blackbutt) (along creekline)
Canopy (subdominant) *Eucalyptus piperita* (Sydney peppermint), *Eucalyptus sparsifolia (*Narrow-leaved Stringybark)
Midstory *Allocasuarina littoralis, Banksia serrata, Angophora hispida, Leptospermum trinervium, Leptospermum polygalifolium, Kunzea ambigua, Lambertia formosa, Angophora hispida*
Groundcover *Entolasia stricta, Entolasia marginata, Caustis flexulosa, Lepyrodia scariosa, Phyllanthus hirtellus, Zanthosia pilosa, Xanthosia tridentata, Platysace linifolia*

During the site inspections the following habitat elements were also recorded and mapped:

- location of hollow bearing trees and termite mounds
- riparian areas.

The remnant bushland and riparian areas provide a direct link to the Dooral Dooral Creek north east of the study area. No threatened flora and fauna species were observed and no TECs were identified. Although no threatened species were identified within the study area during the literature review and site inspection, it was recognised that the study area does contain suitable habitat for the following threatened species:

- Red-crowned Toadlet
- Giant Burrowing Frog
- Powerful Owl

Accordingly, appropriate assessment under NSW and Commonwealth legislation will be undertaken.

Constraints Assessment

Remnant vegetation communities identified were mapped and ranked based on condition. This has been summarised below in **Table 3**. Hollow bearing trees and other significant habitat features were identified with a hand held GPS. This information is displayed in **Figure 1.**

Table 3: Summary of vegetation communities, condition and level of ecological constraint

Validated vegetation community	Condition	Constraint level	Area (ha)
Sydney Sandstone Ridgetop Woodland (SSRW) (PCT1083)	Good Moderate – Good condition under BAM	High	3.26
SSRW	Moderate- containing scattered remnant canopy trees	Moderate	0.56
Sydney Sandstone Gully Forest	Good	High	0.39
Mixed Exotic and Native Plantings	Poor	Low	1.75
Cleared/Managed Land	Poor	Low	15.48
Total			21.44

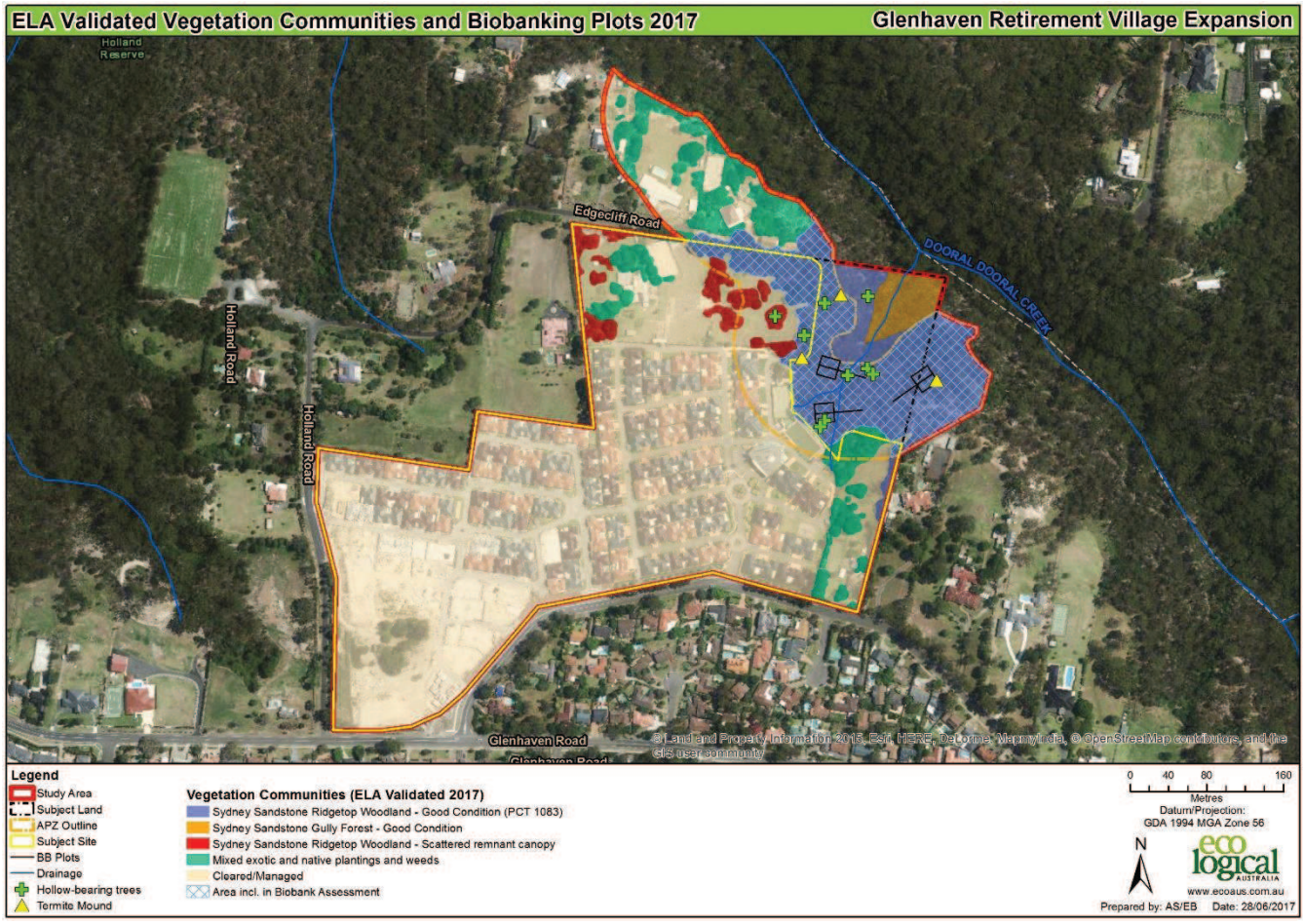

Figure 1: Map of ELA validated vegetation communities and ecological constraints, habitat features and biometric plot locations

Proposed Mitigation and Offset Measures

The proposed development footprint is primarily located within the previously cleared and disturbed areas. However the APZ for this development requires direct modification through partial clearance of all bushland within the study area. This bushland is mapped as a high constraint and will also include a portion of land outside of the study area, proposed to be included as APZ via a section 88B instrument under the *Conveyancing Act 1919*.

It is proposed to implement an integrated strategy to manage the ecological impacts of this development. A detailed assessment will be prepared for the development consent application.

A brief summary of this integrated strategy is as follows:

1. Preparation of a BioBanking assessment to determine the number of credits required to offset impacts of the development and associated APZ
2. Preparation of a Vegetation Management Plan for the APZ to provide in-perpetuity guidelines for:
    a. appropriate fuel management techniques within the APZ
    b. weed control and bush regeneration
    c. management of riparian areas

d. management of habitat elements such as hollow bearing trees, threatened fauna feed trees, termite mounds to help maintain connectivity within the adjacent Dooral Dooral Creek wildlife corridor.

3. Provision of additional mitigation measures within the Flora and Fauna Assessment such as appropriate landscaping within the development site, ongoing erosion and sediment control and ongoing weed control within the development areas.

References

Tozer M 2003 *The native vegetation of the Cumberland Plain, western Sydney: systematic classification and field identification of communities* NSW National Parks and Wildlife Service, Hurstville.