pgv ENVIRONMENTAL

Phone + 61 8 9202 6819
Mob +61 0 427 005 226
Email paul@pgv.net.au

Suite 3, 67 Howe Street
Osborne Park WA 6017

ABN 44 981 725 498
Knightside Nominees Pty Ltd

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[redacted]

RE: Deep Space Facility, New Norcia - Targeted Flora Survey and Carnaby's Black Cockatoo Additional Information

Following are the results of our targeted flora survey and Carnaby's Cockatoo habitat assessment in the footprint of the proposed Deep Space Facility near New Norcia.

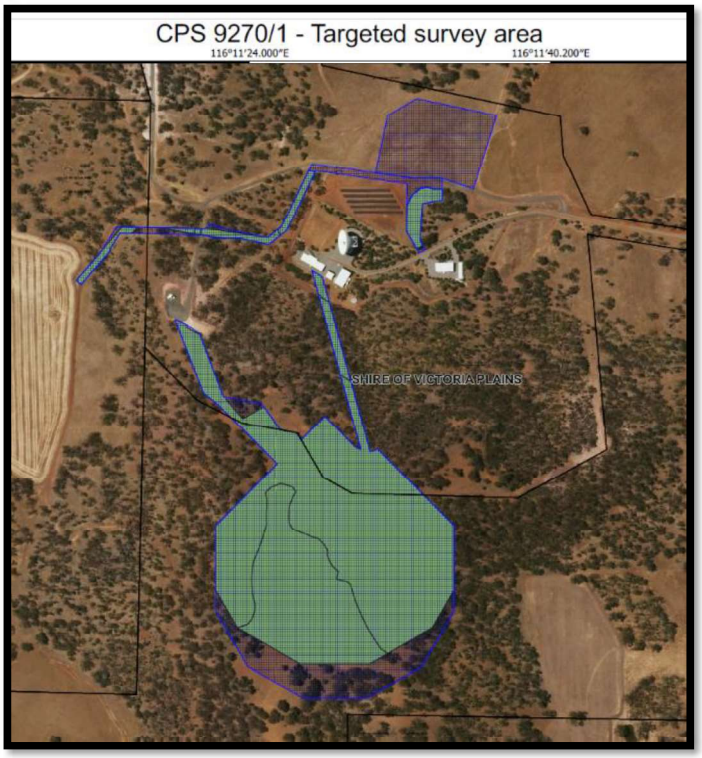
1 Background

The proposed Deep Space facility near New Norcia requires the clearing of native vegetation. The proponent has lodged a Clearing Permit Application (CPS 9720/1) to clear approximately 11.69 ha. Additional information requested by the Department of Water and Environmental Regulation (DWER) includes:

An additional targeted flora and vegetation survey is required for the area marked within the attached map (CPS 9270/1 – Targeted survey area) within the flowering time for threatened species Spirogardnera rubescens (T), Banksia serratuloides subsp. serratuloides (T), Melaleuca sciotostyla (T) (Attachment 1).

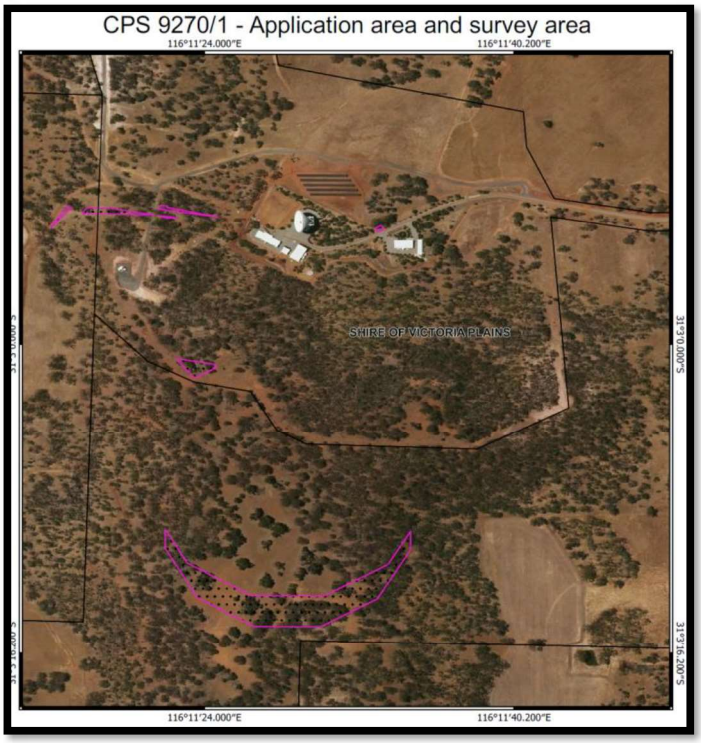
The survey areas for the targeted flora survey are the green coloured areas shown in Plate 1.

Plate 1: Targeted Flora Survey Area (green)



The preliminary assessment by DWER also noted that there are areas within the application area that have not been surveyed for Black Cockatoo Habitat (shown below outlined in pink).

Plate 2: Area deemed by DWER to require additional Carnaby's Black Cockatoo Tree survey



2 Targeted Species

A description of the three Threatened species identified by DWER for the targeted flora survey follows.

2.1 Spirogardnera rubescens

Spirogardnera rubescens also known as Spiral Bush, is an erect, open plant to 1.6 m tall, with succulent, light green flowering branches which twist in a spiral shape. There are reddish bracts on these stalks to 0.4 cm long and the flowers are arranged in sessile clusters, each with four flowers and up to 20 clusters along each stalk. The flowers are 0.2 cm long, with five perianth lobes, white on the outside and yellow-green with fine hairs on the inside. There are five stamens opposite the petals. The fruit is stalkless and succulent, surrounded by the persistent perianth segments, which become dark red with age (George, 1984). *Spirogardnera rubescens* is found in gently undulating country in a number of ecological communities.

Spirogardnera rubescens flowers between August and December (DBCA, 2021).

2.2 *Banksia serratuloides* subsp. *serratuloides*

Banksia serratuloides subsp. *serratuloides* and also known as Southern Serrate Dryandra, is a low, compact shrub, growing to 1 m tall and 1.2 m in diameter. The leaves, up to 8 cm long, are crowded on erect branches. They are paler on the underside and divided almost to the midrib, forming long flat lobes which are quite rigid. The flower heads are axillary, surrounded by lanceolate bracts which are hairless on the back and with white woolly ciliate margins that later become smooth. The yellow flowers are up to 2.5 cm long, with the outer floral whorl covered with silky hairs. The long, hairless style has a narrow, furrowed, darker coloured stigmatic end (George, 1996; Brown *et al*., 1998; Patrick & Brown, 2001).

Banksia serratuloides subsp. *serratuloides* grows in dense low heath, sometimes in open low woodland of *Eucalyptus wandoo* or *E. drummondii* or mallee eucalypt. It is found growing in lateritic gravel and brown loam on ridge tops or slopes in red-brown clay sand in lower areas (DBCA, 2021). This species flowers in July to September (DBCA, 2021).

2.3 Melaleuca sciotostyla

Melaleuca sciotostyla is a shrub growing up to 1.5 m tall. It has flat leaves 5–8 mm long and the inflorescence occurs at the tips of branches and usually consists of four pink/cream flowers. The fruit is barrel-shaped and papery or somewhat corky (Barlow and Cowley, 1988). Wongan Melaleuca grows in orange clayey sand with lateritic pebbles and scree slopes in dense shrubland. Associated species include *Eucalyptus erythronema, Eucalyptus obtusiflora and Eucalyptus sheathiana* (Stack *et al*., 2006).

Melaleuca sciotostyla flowers in August (DBCA, 2021).

3 Methodology

The targeted survey was undertaken on 3 September 2021 b y Dr Paul van der Moezel, a botanist with more than 30 years' experience in Western Australia. The survey was undertaken at a time when all species are within their flowering period, although at the end of the *Melaleuca sciotostyla* flowering time. *Melaleuca sciotostyla* is readily identifiable by its corky branches and fruit and does not need flowers for identification.

The targeted survey included walking parallel traverses through the main survey area on the hill and along the linear tracks that are proposed to be upgraded to access tracks and roads. As all three plants are medium sized shrubs and the understorey is very open, a spacing of 20m was considered appropriate between traverses. The track log for the survey area is shown in Attachment 2. A total of 8.4km was walked.

The Carnaby's Black Cockatoo habitat assessment was to be done as per DWER instructions being:

> *… survey is required to identify all trees that have a diameter, measured at 1.3 metres from the base of the tree, of 30 centimetres (for Wandoo trees) or 50 centimetres (for Corymbia calophylla) or greater that contain a hollow(s) that may be suitable for breeding by Carnaby's cockatoo. The survey must document:*
>
> - *the date(s) of the survey;*
> - *the GPS locations (i.e. eastings and northings or decimal degrees) of all trees identified as containing hollows which may be suitable for black cockatoos;*
> - *the methodology for determining the evidence of use of each hollow; and*
> - *a description/photo of the evidence of use.*

4 Results

4.1 Targeted Flora Search

The survey of the proposed roads and access tracks was mostly through Wandoo (*Eucalyptus wandoo*) and York Gum (*Eucalyptus loxophleba*) over an understorey of pasture and introduced species, particularly Capeweed (*Arctotheca calendula*) and Oats (*Avena fatua*), with very few to no native species (Plate 3).

Plate 3: Wandoo and York Gum over weeds.

The vegetation in the main survey area on the hill was a mixture of Wandoo on the upper slopes and hilltop and Marri (*Corymbia calophylla*) on the hill top, particularly at the southern end. Some native understorey shrubs occurred on the north-east breakaway, including *Trymalium odoratissimum* and *Melaleuca marginata* (Plate 4). Other breakaways were very sparsely vegetated (Plate 5).

Plate 4: Wandoo over *Trymalium odoratissimum* and *Melaleuca marginata* on north-east breakaway

Plate 5: Wandoo over bare understorey on western breakaway

Very few native shrubs were observed on the hilltop (Plate 6 and 7).

Plate 6: Wandoo over bare understorey on hill top

Plate 7: Marri over bare understorey on hill top

No plants of either of the three Threatened species were observed during the survey.

4.2 Carnaby's Black Cockatoo Habitat

Comparison of the Ecoscape tree survey and the area of proposed clearing on site confirmed that the Ecoscape survey did cover the whole clearing permit application area. PGV Environmental identified one additional Marri tree at the southern end of the site that was not included in the Ecoscape report. Details of the Marri tree are:

- Height – 25m
- DBH – 91cm
- Hollows – No hollows
- Co-ordinates: - 422802E 6564194N (Plate 8)

Plate 8: Additional Significant Marri Tree

5 Summary and Conclusion

The targeted flora survey did not record any Threatened species in the areas proposed to be cleared. The very open, almost bare understorey over most of the site made observations very easy.

An on-site assessment of the Ecoscape tree survey concluded that the survey covered the clearing permit application area. One additional large Marri tree was recorded at the southern end of the hill. The tree did not have any hollows.

Please contact me if you would like to discuss any aspects of this report.

Yours sincerely

Paul van der Moezel
Managing Director

6 List of Attachments

Attachment 1: DWER Request for Additional Information
Attachment 2: Track Log

7 References

Barlow BA and Cowley KJ (1988). Contributions to a Revision of *Melaleuca* (Myrtaceae): 4 6. *Australian Systematic Botany*. 1(2).

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