20th June 2022

Enerfin Energy Services Pty Ltd
Level 19, 90 Collins Street
Melbourne 3000, Australia

Attention: James Taylor (Development Manager)

By email — jtaylor@elecnor.com (phone 0427 475 530)

Dear Scott,

RE: WOOLSTHORPE WIND FARM
FLORA RECONNAISSANCE
PROJECT NO. 18273.4

Background and methods

Nature Advisory Pty Ltd were engaged to undertake an inspection of the planned infrastructure footprint for the Woolsthorpe Wind Farm. Condition 4 of the planning permit for the Wind Farm states:

"The development plans lodged for approval as required by Condition 1 of this permit must be supported by the results of flora surveys conducted by a suitably qualified expert covering all areas to be disturbed plus areas beginning at the perimeters of those areas and extending a distance of 10 metres outside those perimeters.

The flora surveys results must be those of surveys conducted utilising procedures developed in consultation with the DELWP Environment Portfolio and must include the results of surveys conducted in spring/early summer.

Survey results provided to the Minister for Planning must include a list of all flora species observed...."

Methods

The initial site surveys were undertaken by Justin Sullivan (Senior Ecologist) on 9th January and 12th April 2019 and updated by Elinor Ebsworth (Senior Ecologist) on 25th and 26th October 2021. CVs outlining qualifications and experience for Justin and Elinor are included as Appendix 1. During the site surveys, the footprint of all planned internal wind farm infrastructure at the time was investigated, as well as surrounding areas. The investigation area at the time encompassed:

- Turbine locations;
- Access tracks;
- Internal underground power cables;
- Construction compound;
- Batching plant; and
- Substation.

The above is hereafter referred to as the 'investigation area' for the survey. It is shown in Figure 1.

The assessments also included a 'Roadside Study Area' (see Figure 2), which covered both sides of the Woolsthorpe-Heywood Road for a distance of 200 m either side of the proposed site entrance.

The investigation area and roadside study area was initially traversed by vehicle. Where native vegetation existed, the area was then surveyed in more detail on foot and its condition thoroughly assessed. Any native vegetation recorded was mapped and assessed as per the *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017). The likelihood of there being suitable habitat for rare and threatened flora species was also assessed.

The methods used were discussed during a phone conference with Jessie McMaster of the Victorian Department of Environment Land Water and Planning (DELWP) on 8th March 2019, although no formal, written material was exchanged. In response to feedback from DELWP and consistent with the planning permit condition, further discussions were had with DELWP on 23rd September 2019 and two targeted survey sites additional to the roadside vegetation affected by site access were required by them to be surveyed: these were under Monterey Cypress wind rows that intersect the development footprint.

Initial targeted surveys of roadside vegetation and Monterey Cypress wind rows was undertaken on 25th September 2019. Further targeted surveys of Plains Grassland roadside vegetation were undertaken on 25th October 2021 and 1st December 2021, to coincide with the flowering period for listed species for which suitable habitat occurred. Targeted surveys were undertaken by walking five-metre walked transects (searching 2.5 metres either side) for threatened plant species.

Since the final flora survey was undertaken in late 2021, changes have been made to the development layout. During the 2019 and 2021 assessments, it has been confirmed that the investigation area comprises introduced pasture with few indigenous ground cover species present. Given the proportion of the area already surveyed (see Figure 1), the similar improved pasture management regime across the whole property and the findings to date, it is anticipated that the unsurveyed areas will not be any different. The exact characterisation of the areas where the amended development layout has not been surveyed will be confirmed following a site survey in early Spring 2022.

Existing information

To determine the likelihood of listed flora species occurring on site, existing flora species records and information about the potential occurrence of listed flora species was obtained from an area termed the 'search region', defined here as an area with a radius of ten kilometres from the wind farm boundary in Figure 1.

A list of the flora species recorded in the search region was obtained from the Victorian Biodiversity Atlas (VBA), a database administered by DELWP.

The online EPBC Act Protected Matters Search Tool (PMST) was consulted to determine whether nationally listed species or communities potentially occurred in the search region based on habitat modelling.

Results

Site description

The Woolsthorpe Wind Farm occurs across one large farming property, approximately four kilometres west of the township of Woolsthorpe. The site supports a working cattle and sheep grazing property that has been subject to extensive modification for pasture improvement leading to the historical

removal of most native vegetation and the establishment of introduced pasture grass species and associated farmland weeds. The property is largely dominated by introduced grasses, namely Sweet Vernal Grass, Brown-top Bent, Rye Grass, Toowoomba Canary-grass and Soft Brome. Several planted rows of Monterey Cypress occur across the property.

Numerous remnant scattered canopy trees, namely Manna Gum and Swamp Gum, exist in the east and south of the property. These are the only remaining elements of the original native vegetation on the site. As a consequence of past agricultural development of the property, no indigenous understorey or ground cover species remain, apart from very limited areas of Plains Grassy Wetland in damp areas that will not be affected by the project. Notwithstanding this, areas outside the investigation area where wind farm infrastructure has been recently relocated will be assessed in Spring 2022 to confirm this finding.

Native vegetation

During the survey, several small patches of native vegetation as well as 33 large scattered trees were recorded within or immediately adjacent to the investigation area.

Native vegetation recorded in the investigation area is summarised as follows:

- Habitat Zone A, D, H, J, M, N and P – Basalt Shrubby Woodland (EVC 642) – Linear strips of woodland occurring on either side of the Woolsthorpe-Heywood Road dominated by Black Wattle and Blackwood, with an understorey of exotic pasture grasses and Bracken, with scattered native grasses and herbs. **Black Wattle is listed as protected on public land under the FFG Act** and it occurs commonly within all of these habitat zones.
- Habitat Zones B and C – Plains Grassy Wetland (EVC 125) – Two small areas of wetland, both occurring in a low-lying area, dominated by a high cover of Shining Pennywort, Common Blown-grass and wallaby grass.
- Habitat Zones E, F, G, I, K, L and O – *Heavier-soils* Plains Grassland (EVC 132_61) – Linear strips of grassland dominated by Kangaroo Grass (*Themeda australis*) both sides of the Woolsthorpe- Heywood Road. Supporting a dense cover of native grasses and herbs. Zones E, F, G, I and K meet the condition thresholds for the Commonwealth EPBC Act listed threatened community, **Natural Temperate Grassland of the Victorian Volcanic Plain.**
- Scattered trees – 33 scattered trees, most of which were large Manna Gums (all scattered tree data is documented in Appendix 3).

All the above native vegetation recorded is shown in Figures 1 to 3, including the final infrastructure layout, showing that the only area of native vegetation impacted is that required to be removed for the northern access on the road reserve of the Woolsthorpe – Heywood Road. This is the subject of an application to amend the existing permit (PA 2006/0220/B) to reflect a slightly different access layout.

During all surveys, no additional FFG Act listed threatened flora species or threatened communities were found anywhere in the project footprint, including in the small area of vegetation proposed for removal along the Woolsthorpe – Heywood Road, and beneath Monterey Cypress plantations.

Species recorded

During the assessments, a total of 76 flora species were recorded. Of these, 40 (53%) were indigenous and 36 (47%) were introduced or non-indigenous native in origin (Appendix 1).

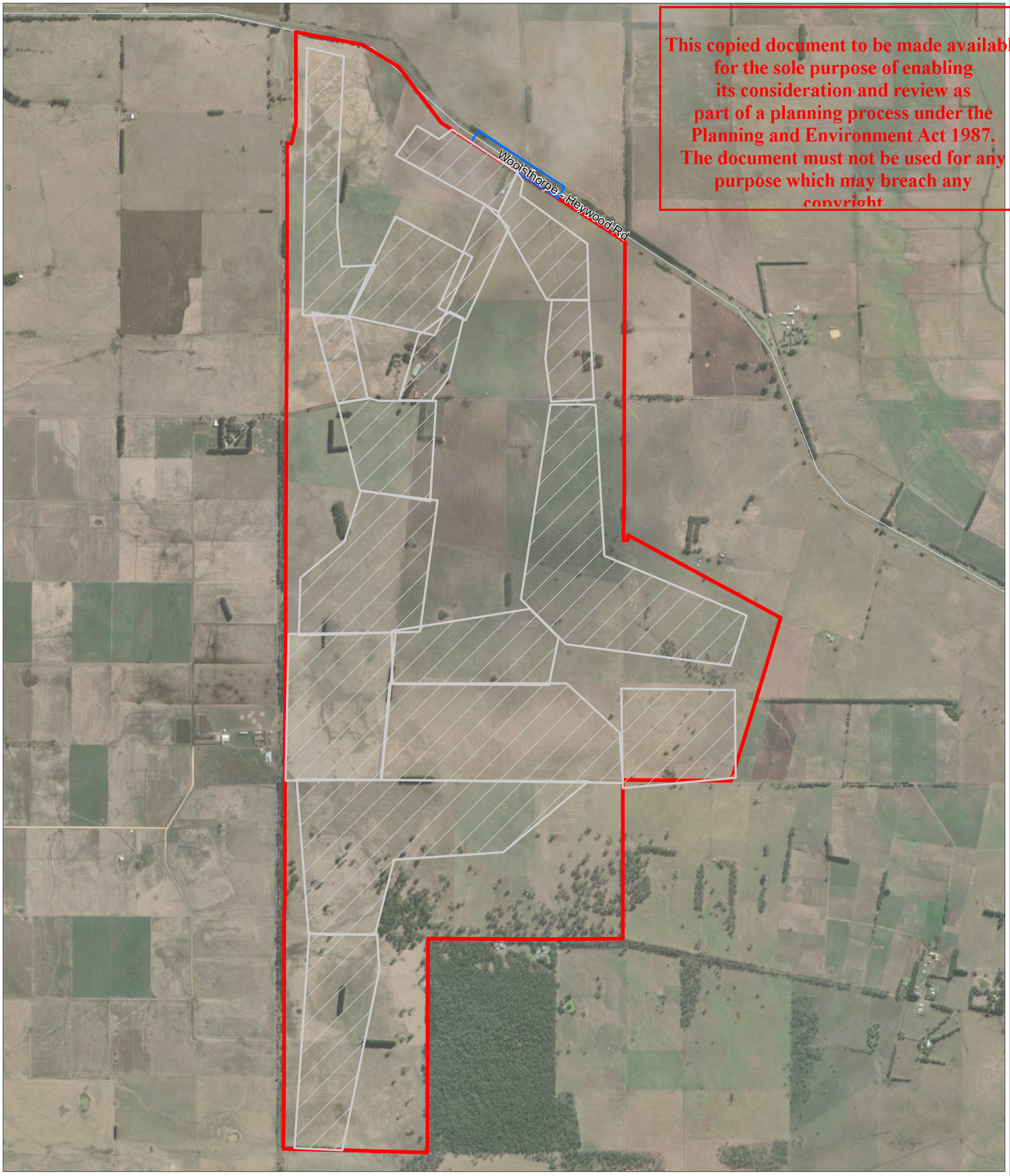

Figure 1: Woolsthorpe Wind Farm surveyed areas

Project: Woolsthorpe Wind Farm **Client**: Elecnor Australia Pty Ltd **Date**: 16/06/2022

Wind farm boundary

Roadside study area

Investigation area

N

Metres 0 200

Nature Advisory

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Layers - Created by: - \\Nat-haw-dt04\e\GIS\2018 Jobs\18273\18273_WF_Layout_190415.mxd

Figure 2: Roadside study area and native vegetation

Project: Woolsthorpe Wind Farm **Client**: Elecnor Australia Pty Ltd **Date**: 2/06/2022

Roadside study area
Wind farm boundary
Roads
Construction compound office
Temporary batching plant

Native vegetation

Basalt Shrubby Woodland (EVC 642)
Plains Grassland (EVC 132)
Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP)

N

Metres 0 30

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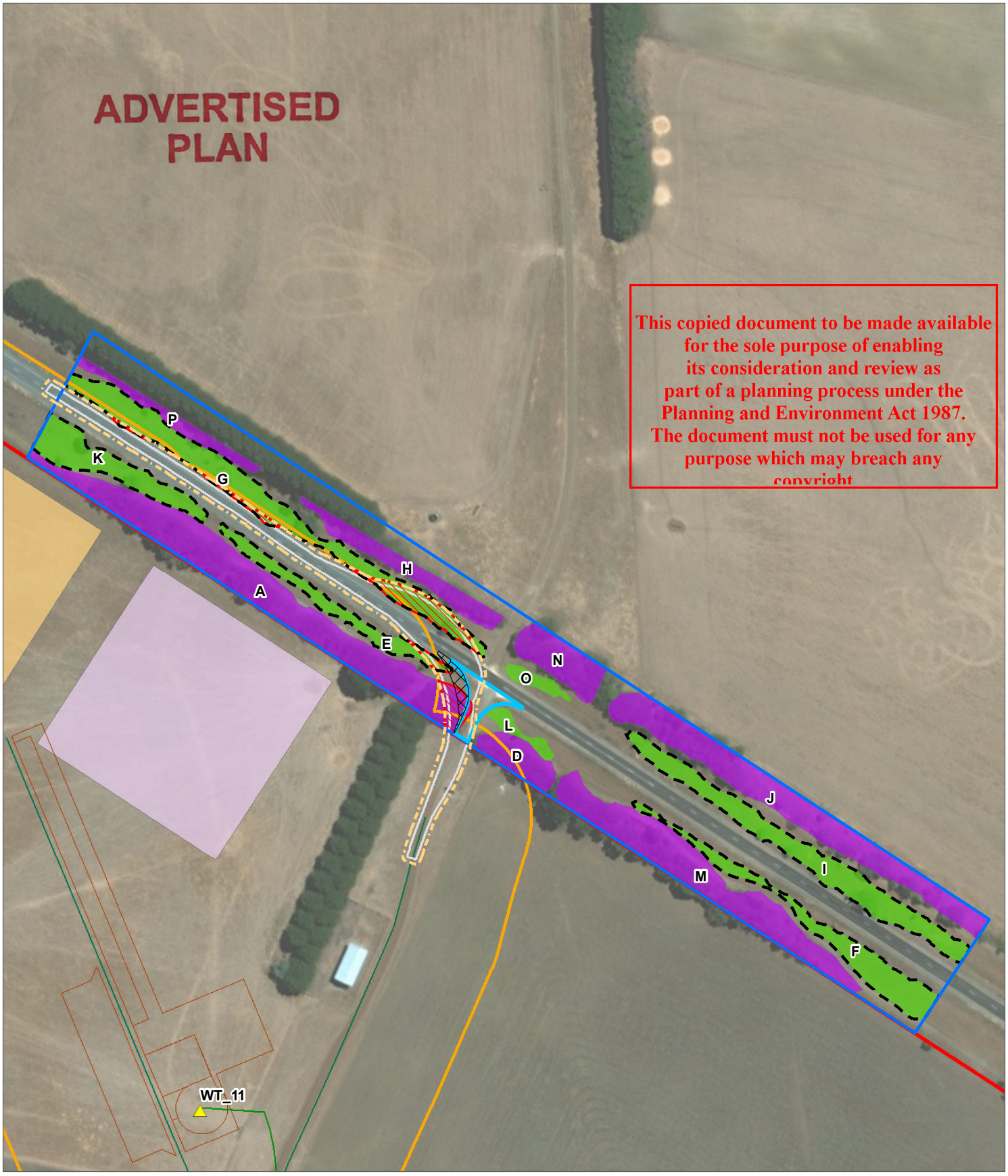

Figure 3: Roadside native vegetation to be removed

Project: Woolsthorpe Wind Farm **Client**: Elecnor Australia Pty Ltd **Date**: 2/06/2022

- Wind farm boundary
- Roadside study area
- Investigation area for layout 2022
- Turbines
- Swept path
- Swept path buffer (2m)
- Proposed construction site entrace roaworks
- Permanent site entrance

Native vegetation

- Western Basalt Plains Grassland community
- Basalt Shrubby Woodland (EVC 642)
- Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP)
- Native vegetation to be removed

N

Metres 0 30

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Listed flora species

VBA records (DELWP 2021a) and the EPBC Protected Matters Search Tool (DAWE 2021a) indicated that within the search region there were records of, or there occurred potential suitable habitat for, 18 species listed under the Commonwealth EPBC Act and 28 listed under the state FFG Act, including 15 listed under both Acts. No flora species listed under the EPBC Act were recorded during the field surveys.

The likelihood of occurrence in the study area of species listed under the EPBC Act and FFG Act is addressed in Table 1. Species considered 'likely to occur' are those that have a very high chance of being in the study area based on numerous records in the search region and suitable habitat in the study area. Species considered to have the 'potential to occur' are those for which suitable habitat exists, but recent records are scarce.

This analysis indicates that following targeted surveys undertaken in October and December 2021, no listed flora species are likely to occur within the investigation area.

Table 1: Listed flora species and the likelihood of their occurrence in the study area

Common Name	Scientific name	EPBC	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
River Swamp Wallaby-grass	*Amphibromus fluitans*	VU		River Swamp Wallaby-grass grows mostly in permanent swamps and also lagoons, billabongs, dams and roadside ditches. The species requires moderately fertile soils with some bare ground; conditions that are caused by seasonally-fluctuating water levels (DAWE 2021b).	None	N/A	No suitable habitat. **Unlikely to occur.**
Fine-hairy Spear-grass	*Austrostipa puberula*		en	Mostly confined to sandy tracts in the far north-west of the State, with isolated occurrences near Ararat, Horsham, Lake Bolac and Dartmoor. Often associated with calcareous soils (Walsh 1994).	1	18/11/2011	No suitable habitat. **Unlikely to occur.**
Tuberous Bitter-cress	*Cardamine gunnii s.s.*		ex	Appears to have been a plant of lowland swamps. The species is probably extinct due to extensive habitat clearing for agriculture. One recent (1968) collection was from Mount Gambier in South Australia (Thompson 1996).	2	1/11/1903	Habitat highly modified and nearby records are very old with the species likely to be extinct. **Unlikely to occur.**
Matted Flax-lily	*Dianella amoena*	EN	cr	Lowland grassland and grassy woodlands on well-drained to seasonally waterlogged fertile sandy loams to heavy cracking soils derived from sedimentary or volcanic Geology. It is widely distributed from eastern to south-western Victoria (DAWE 2021b).	1	29/10/2007	Potential to occur in areas of Plains Grassland. Not recorded during targeted surveys, therefore now considered **Unlikely to occur.**
Swamp Flax-lily	*Dianella callicarpa*		en	seasonally inundated, permanently moist or waterlogged basalt, in remnant Leptospermum lanigerum scrub (Conran 1994).	6	1/02/2012	No suitable habitat. **Unlikely to occur.**
Glaucous Flax-lily	*Dianella longifolia var. grandis*		cr	Occurs in lowland plains grassland and grassy woodlands (e.g. Volcanic Plain and Riverina) as well as around rocky outcrops at higher altitudes than the var. *longifolia.* (Conran 1994).	1	12/12/1979	Potential to occur in areas of Plains Grassland. Not recorded during targeted surveys, therefore now considered **Unlikely to occur.**
Bell-flower Hyacinth-orchid	*Dipodium campanulatum*	EN	en	Reported from only a few scattered localities west of Melbourne to Portland (Entwisle 1994). The bell-flower hyacinth orchid is typically found on deep grey sands or limestone in woodland (DAWE 2021b).	None	N/A	No suitable habitat. **Unlikely to occur.**
Swamp Diuris	*Diuris palustris*		en	Scattered distribution throughout western Victoria. Usually in swampy depressions in grassland or open woodland (Entwisle 1994).	1	21/09/1903	Potential to occur in areas of Plains Grassland. Not recorded during targeted surveys, therefore now considered **Unlikely to occur.**
Pale-flower Crane's-bill	*Geranium sp. 3*		en	Open, grassy areas of dry woodlands and forests (Smith 1999).	2	25/09/2019	No suitable habitat. **Unlikely to occur.**
Clover Glycine	*Glycine latrobeana*	VU	vu	Found across south-eastern Australia in native grasslands, dry sclerophyll forests, woodlands and low open woodlands with a grassy ground layer. In Victoria, populations occur in lowland grasslands, grassy woodlands and sometimes in grassy heath (DAWE 2021b).	5	13/11/2019	Potential to occur in areas of Plains Grassland. Not recorded during targeted surveys, therefore now considered **Unlikely to occur.**
Adamson's Blown-grass	*Lachnagrostis adamsonii*	EN	en	Confined to slow moving creeks, swamps, flats, depressions or drainage lines that are seasonally inundated or waterlogged and usually moderately to highly saline. Appear to favour sites that have some shelter from the wind (DAWE 2021b).	None	N/A	No suitable habitat. **Unlikely to occur.**
Purple Blown-grass	*Lachnagrostis punicea subsp. filifolia*		en	Seasonally wet, heavy clay soils (Walsh 1994).	1	1/11/1902	Potential to occur in areas of Plains Grassy Wetland, although no recent records within 10 km. As these areas will not be impacted, there is **no threat to this species.**
Basalt Peppercress	*Lepidium hyssopifolium s.s.*	EN	en	Known to establish on open, bare ground with limited competition from other plants. Previously recorded from Eucalypt woodland with a grassy ground cover, low open Casuarina woodland with a grassy ground cover and tussock grassland. Now generally found amongst exotic pasture grasses and beneath exotic trees (DAWE 2021b).	2	05/12/1893	No suitable habitat. **Unlikely to occur.**
Lanky Buttons	*Leptorhynchos elongatus*		en	Dry open forest, mostly in Victoria's eastern uplands (e.g. Benambra, Omeo, Wulgulmerang and Corryong areas). There are also historical records from the southern mallee areas in western Victoria (Flann 1999).	1	1/11/1902	No suitable habitat. **Unlikely to occur.**
Slender Stylewort	*Levenhookia sonderi*		en	Seasonally damp ground and drying swamps in lowland areas (Raulings 1999).	1	01/11/1899	Potential to occur in areas of Plains Grassy Wetland, although no recent records within 10 km. As these areas will not be impacted, there is **no threat to this species.**
Giant Honey-myrtle	*Melaleuca armillaris subsp. armillaris*		en	Near coastal sandy heaths. Widely planted (Spencer 1996).	3	26/02/2011	No suitable habitat. **Unlikely to occur.**
Pretty Leek-orchid	*Prasophyllum anticum*		cr	Grassland on moist to wet black basaltic loam (Jeanes 2015).	1	30/06/2002	Potential to occur in areas of Plains Grassland. Not recorded during targeted surveys, therefore now considered **Unlikely to occur.**

Common Name	Scientific name	EPBC	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Gorae Leek-orchid	*Prasophyllum diversiflorum*	EN	cr	Wet grasslands or inundated swamps among tussocks (Jones 2006).	None	N/A	Potential to occur in areas of Plains Grassy Wetland, although no records within 10 km. As these areas will not be impacted, there is **no threat to this species.**
Maroon Leek-orchid	*Prasophyllum frenchii*	EN	en	Grows mainly in open sedge swampland or in wet grassland and wet heathland generally bordering swampy regions. Sites are generally low altitude, flat and moist. Soils are generally moderately rich damp sandy or black clay loams. Climate is mild, with an annual rainfall of 600–1100 mm, occurring predominantly in winter and spring (DAWE 2021b).	3	13/11/2005	Potential to occur in areas of Plains Grassy Wetland. As these areas will not be impacted, there is **no threat to this species.**
Dense Leek-orchid	*Prasophyllum spicatum*	VU	cr	Occurs in coastal and near-coastal heathland and heathy woodland. Soils are generally sandy, with some sites seasonally waterlogged (Duncan 2010).	1	01/12/1893	No suitable habitat. **Unlikely to occur.**
Green-striped Greenhood	*Pterostylis chlorogramma*	VU	en	Occurs in mixed Box-Stringybark forest with a shrubby understorey, often with Pteridium esculentum as a major component on sandy or clay loam soils (Duncan et al. 2009).	None	N/A	No suitable habitat. **Unlikely to occur.**
Leafy Greenhood	*Pterostylis cucullata*	VU		Tea-tree scrubs on tall sandy and calcareous dunes, in moist, open or even deep shaded locations (Jones 1994).	None	N/A	No suitable habitat. **Unlikely to occur.**
Small Sickle Greenhood	*Pterostylis lustra*		en	Apparently restricted to waterlogged black, peaty alkaline soils in closed, Woolly Tea-tree scrub within swamps and along watercourses. Vegetation considered to be suitable habitat provides a continuous canopy over a relatively open understorey with a herbaceous ground layer. Gahnia species, Viola hederacea, Lobelia species, Selliera radicans and Geranium molle are notable associated species (Duncan et al. 2009).	2	18/12/1900	No suitable habitat. **Unlikely to occur.**
Button Wrinklewort	*Rutidosis leptorhynchoides*	EN	en	In Victoria restricted to open stands of plains grassland and grassy woodlands, on fertile clays to clay loams, usually in areas where the grass cover is more open, either as a result of recurrent fires or grazing by native macropods or stock. It also occurs on low rises with shallow, stony soils at less than 100 m above sea level.	None	N/A	Potential to occur in areas of Plains Grassland, although no records within 10 km. Not recorded during targeted surveys, therefore now considered **Unlikely to occur.**
Large-headed Fireweed	*Senecio macrocarpus*	VU	cr	In Victoria, Large-fruit Fireweed occurs most commonly in grasslands on red-brown earth soils. It may also occur in grassy woodlands and open woodlands predominantly in the Western (Basalt) Plains grassland on red brown earth soils found on recent Quaternary (basalt) deposits (DAWE 2021b).	None	N/A	Potential to occur in areas of Plains Grassland, although no records within 10 km. Not recorded during targeted surveys, therefore now considered **Unlikely to occur.**
Swamp Fireweed	*Senecio psilocarpus*	VU		Herb-rich winter-wet swamps on volcanic clays or peaty soils (Walsh 1999). Known from approximately 10 sites between Wallan, about 45 km north of Melbourne, and Honans Scrub in south-eastern South Australia (TSSC 2008).	1	3/09/1995	Potential to occur in areas of Plains Grassy Wetland. As these areas will not be impacted, there is **no threat to this species.**
Coast Dandelion	*Taraxacum cygnorum*	VU	cr	Woodland and scrub on limestone (Scarlett 1999).	None	N/A	No suitable habitat. **Unlikely to occur.**
Metallic Sun-orchid	*Thelymitra epipactoides*	EN	en	Grows primarily in mesic coastal heathlands, grasslands and woodlands, but is also found in drier inland heathlands, open forests and woodlands. Substrates may be moist or dry sandy loams or loamy sands. Critical habitat has not been determined but the species is likely to require open conditions, which may be created by soil disturbance or fire, for recruitment (DAWE 2021b).	None	N/A	No suitable habitat. **Unlikely to occur.**
Spiral Sun-orchid	*Thelymitra matthewsii*	VU	en	Slightly elevated sites to 300m in well-drained soils (sandy loams to gravelly limestone soils) in light to dense forest; sometimes in coastal sandy flats (Weber & Entwisle 1994).	None	N/A	No suitable habitat. **Unlikely to occur.**
One-flower Early Nancy	*Wurmbea uniflora*		vu	An uncommon species, mostly from moist, heathy lowland sites (Conran 1994).	1	2/11/2007	No suitable habitat. **Unlikely to occur.**
Swamp Everlasting	*Xerochrysum palustre*	VU	cr	Grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils. Commonly associated genera include Amphibromus, Baumea, Carex, Chorizandra, Craspedia, Eleocharis, Isolepis, Lachnagrostis, Lepidosperma, Myriophyllum, Phragmites australis, Themeda triandra and Villarsia (DAWE 2021b).	None	N/A	Potential to occur in areas of Plains Grassy Wetland, although no records within 10 km. As these areas will not be impacted, there is **no threat to this species.**

Notes: EPBC = threatened species status under EPBC Act (EN = endangered; VU = vulnerable); **FFG** = threatened species status under the FFG Act = (ex = presumed extinct in the wild; cr = critically endangered; en = endangered; vu = vulnerable)

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Implications

Northern access

Native vegetation in the form of Plains Grassland and Basalt Shrubby Woodland occurs either side of the Woolsthorpe-Heywood Road and is separated on both sides by existing driveways and a livestock underpass. Site access is proposed in this area and some removal of grassy ground cover will be required (i.e. HZs A or D, see Figure 3). This is the subject of an application to amend a planning permit for additional native vegetation removal being considered by the Minister for Planning.

A protected flora permit under the FFG Act is required from DELWP for the removal or lopping of any Black Wattle plants and the protected flora that make up the listed threatened community (0.051 ha) in these areas. An application for this permit will be made in due course.

Wetland patches

Impacts to Habitat Zones B and C will be avoided. A 5-metre buffer has been applied around these zones to ensure no impacts to these wetland patches.

Scattered trees

Tree protection zones have been applied using the standard approach (12 x the DBH to determine the radius of the TPZ) for all scattered trees. No works should occur in the TPZ of the scattered trees (See Figures 1 to 3).

I trust the foregoing is informative. If you have any enquiries please do not hesitate to call me.

Yours sincerely,

Brett Lane
Managing Director
Nature Advisory Pty. Ltd.

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References

Conran JG 1994, 'Liliaceae', in Walsh NG, Entwisle TJ (eds), Flora of Victoria Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons, Inkata Press, Melbourne.

Department of Agriculture, Water and the Environment (DAWE) 2021a, *EPBC Act Protected Matters Search Tool*, Department of Agriculture, Water and the Environment, Canberra, viewed 15th November 2021, https://www.environment.gov.au/epbc/pmst/index.html.

Department of Environment, Land, Water and Planning (DELWP) 2017, *Guidelines for the removal, destruction or lopping of native vegetation*, Department of Environment, Land, Water and Planning, East Melbourne.

Department of Environment, Land, Water and Planning (DELWP) 2021a, *Victorian Biodiversity Atlas 3.2.5*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria, viewed 15th November 2021, https://vba.dse.vic.gov.au.

Department of Environment, Land, Water and Planning (DELWP) 2021b, *Flora and Fauna Guarantee Act 1988 – Threatened List, October 2021*, Department of Environment, Land, Water and Planning, East Melbourne.

Department of Environment, Land, Water and Planning (DELWP) 2021c, *NatureKit*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria, viewed 25th October 2021, https://www.environment.vic.gov.au/biodiversity/naturekit.

Department of Environment, Land, Water and Planning (DELWP) 2021d, *MapShareVic*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria, viewed 2021, https://www2.delwp.vic.gov.au/maps/maps-and-services/interactive-maps.

Department of Environment, Land, Water and Planning (DELWP) 2021e, *Native Vegetation Information Management system*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria, viewed 2021, https://nvim.delwp.vic.gov.au/.

Department of Environment, Land, Water and Planning (DELWP) 2021f, *Online Search of the Native Vegetation Credit Register,* Department of Environment, Land, Water and Planning, East Melbourne, viewed 2021, https://nvcr.delwp.vic.gov.au.

Department of Agriculture, Water and the Environment (DAWE) 2021b, *Species Profile and Threats Database*, Department of Agriculture, Water and the Environment, Canberra, http://www.environment.gov.au/sprat.

Duncan M 2010, *National Recovery Plan for the Dense Leek Orchid Prasophyllum spicatum*, Department of Agriculture, Water and the Environment, Canberra.

Duncan M, Pritchard A & Coates F 2009, *National Recovery Plan for Fifteen Threatened Orchids in South-eastern Australia*, Department of Agriculture, Water and the Environment, Canberra.

Entwisle TJ 1994, 'Orchidaceae', in Walsh, NG & Entwisle, TJ (eds), Flora of Victoria, Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons, Inkata Press, Melbourne, pp. 740-901.

Flann, C 1999, 'Leptorhynchos', in Walsh, NG & Entwisle, TJ (eds), *Flora of Victoria, Volume 4: Dicotyledons Cornaceae to Asteraceae*, Inkata Press, Melbourne, pp. 769-774.

Jeanes, J 2015, FloraVic Online, Royal Botanic Gardens Victoria, <data.rbg.vic.gov.au>

Jones DL 1994, 'Pterostylis', in Walsh, NG & Entwisle, TJ (eds), *Flora of Victoria, Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons*, Inkata Press, Melbourne, pp. 798-830.

Jones DL 2006, *A Complete Guide to Native Orchids of Australia Including the Island Territories*, Reed New Holland, Sydney.

NSW Office of Environment and Heritage (NSW OEH) 2012, *National Recovery Plan for Button Wrinklewort (Rutidosis leptorhynchoides)*, Department of Agriculture, Water and the Environment, Canberra.

Raulings EJ 1999, 'Stylidiaceae', in Walsh NG, Entwisle TJ (eds), *Flora of Victoria Volume 4: Cornaceae to Asteraceae*, Inkata Press, Melbourne.

Scarlett NH 1999, 'Taraxacum', in Walsh NG and Entwisle TJ (eds) *Flora of Victoria Volume 4: Dicotyledons, Cornaceae to Asteraceae*, Inkata Press, Melbourne, pp. 688-694.

Smith LP 1999, 'Geranium', in Walsh, NG & Entwisle, TJ (eds), *Flora of Victoria, Volume 4: Dicotyledons Cornaceae to Asteraceae*, Inkata Press, Melbourne, pp. 219-233.

Spencer RD 1996, 'Melaleuca', in Walsh NG, Entwisle TJ (eds), *Flora of Victoria Volume 3: Dicotyledons Winteraceae to Myrtaceae*, Inkata Press, Melbourne.

Thompson IR 1996, 'Cardamine', in Walsh, NG & Entwisle, TJ (eds), *Flora of Victoria, Volume 3: Dicotyledons Winteraceae to Myrtaceae*, Inkata Press, Melbourne, pp. 434-442.

Threatened Species Scientific Committee (TSSC) 2008, *Commonwealth Conservation Advice on Senecio psilocarpus*, Department of Agriculture, Water and the Environment, Canberra.

Walsh NG 1994, 'Poaceae', in Walsh NG, Entwisle TJ (eds), *Flora of Victoria Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons*, Inkata Press, Melbourne.

Weber, JZ & Entwisle, TJ 1994, 'Thelymitra', in Walsh, NG & Entwisle, TJ (eds), *Flora of Victoria. Volume 2: Ferns and Allied Plants, Conifers and Monocotyledons*, Inkata Press, Melbourne, pp. 840-854.

Appendix 1: CVs

Elinor Ebsworth

Senior Ecologist

Profile

Elinor is a Senior Ecologist with over 12 years' experience in ecological consultancy. Elinor is based on a farm in Victoria's Western Distict, 35 kilometres south of Ararat, and thus offers region-specific ecological and landscape knowledge to Nature Advisory's Western Victorian clients.

An experienced field ecologist with a high degree of attention to detail, Elinor is completion oriented and possesses strong problem solving and communication skills. These have come to the fore during her involvement with a number of large renewable energy projects, in which she has provided technical expertise over several years, to assist in taking projects from feasibility study through construction and operation.

Ecological assessment work has included rapid overview assessments, detailed vegetation mapping and habitat hectare assessments, targeted flora and fauna surveys and offset site surveys. She regularly conducts assessments under the Guidelines for the removal, destruction or lopping of native vegetation 2017 (as well as preceding Victorian native vegetation legislation) and the federal Environment Protection and Biodiversity Conservation Act 1999.

Elinor has also been involved in the preparation of a number of land management plans, particularly within the grasslands and grassy woodlands of the Victorian Volcanic Plain. She strongly believes in drawing on contempory literature and applying an evidence-based approach to achieve the optimum outcome for management sites.

Biography

Elinor is accredited by the Department of Environment, Land, Water and Planning to undertake native vegetation (habitat hectare assessments) in Victoria, holds a Construction Industry White Card, Level 2 First Aid, 4WD qualification and Accreditation to Access Rail Corridors Safely. Elinor has worked for Nature Advisory (formerly BL&A) since 2015. Prior to this she led the field program for the University of Tasmania's Environmental Change Biology (Bowman) Lab. She started her career in ecological consultancy in 2012 as a graduate Botanist with GHD.

Key skills

Knowledge of environmental policy and legislation

Native vegetation mapping

Habitat hectare assessments

Overview assessments

Listed flora habitat assessments

Listed fauna habitat assessments

Targeted surveys for listed flora and fauna species

Offset site selection and assessment

Management Plan preparation

Excellent communitcation skills

Project examples

Renewable Energy

Golden Plains Wind Farm, Rokewood, Victoria: Overview vegetation mapping, detailed native vegetation assessment and targeted surveys (2016 – present)

Willatook Wind Farm, Victoria: Native vegetation assessment of over dimensional transport route and layout changes and threatened species targeted surveys (2018 – present)

Salt Creek Wind Farm, Woorndoo, Victoria: Transmission line overview mapping and detailed native vegetation assessment and targeted surveys (2015 – present)

Dundonnell Wind Farm, Victoria: Transmission line native vegetation assessment, including habitat hectare assessment and targeted surveys, preparation of post-approval management plans (2015 – present)

Berrybank Wind Farm, Victoria: Native vegetation assessment for revised layout and transmission line (2015 – present)

Ryan Corner and Hawkesdale Wind Farms, Victoria: Native vegetation assessment, targeted species survey and EPBC Act listed community mapping (2015-present)

Crowlands Wind Farm, Victoria: Site access native vegetation survey (2017), large tree survey and tagging (2018)

Bulgana Wind Farm, Victoria: Noxious weed mapping and FFG Act survey (2018)

Kerang Solar Farm: Overview assessment and native vegetation assessment of site entrance (2018)

Ararat Wind Farm, Victoria: Revised vegetation assessment and Pest Animal Monitoring (2015)

Kiata Wind Farm, Victoria: Desktop native vegetation assessment for revised layout (2015) and FFG Act survey for site access (2017)

Road and Rail Infrastructure

Calder Park Train Stabling Facility: Native vegetation assessment (2018)

V/Line Natural Resource Specialist secondment (2017)

Murray River Crossing - Echuca, Victoria and Moama, New South Wales: Masked Owl and Squirrel Glider Habitat assessment (2016)

Offset sites

Crowlands Wind Farm: Offset site assessment including habitat hectare and gain scoring (2018)

Dundonnell: Offset site assessment including habitat hectare and gain scoring (2018)

Cressy: Targeted Spiny Rice-flower survey and tagging (2018)

Campbelltown: Targeted Spiny Rice-flower survey and tagging (2018)

Nature Advisory

Justin Sullivan
BSc (Honours in Botany), La Trobe University

Senior Ecologist

Profile

Justin has been working in the ecological consulting industry for over 10 years. Over this time, Justin has developed an extensive knowledge of Victoria's flora and native vegetation and also is competent in bird identification and fauna habitat assessment. He is passionate about the flora and birdlife of Victoria, and has a partiuclar interest in forest communities and the iconicly Australian eucalypts.

Biography

Justin started work at Nature Advisory (then Brett Lane and Associates) in 2008 and currently is working in the role of Senior Ecologist. Since beginning in the industry as a graduate botanist, Justin has been highly involved in a broad range of botanical work including impact assessments for residential development, environmental monitoring projects including River Red-gum and floristic monitoring along various reaches of the Murray and Wimmera Rivers, and detailed impact assessments for major infrastructure projects including roads, powerlines and numerous wind farm energy projects.

Between 2011 and 2014 Justin worked in the role of Project Manager at Nature Advisory. Between 2015 and 2016 Justin took a break from consulting and took up the role of Biodiversity Officer at Yarra Ranges Council, where he was responsible for reviewing and assessing planning applications and oversaw the management of a number of Council bushland reserves in the Yarra Ranges Shire.

Since early 2017, Justin has been back at Nature Advisory, working in the role of Senior Ecologist. Justin leads the botanical team at Nature Advisory, and also has important roles in training, OH&S and systems management. Over the last ten years, Justin has gained extensive experience in environmental assessment in Victoria, which allows him to provide detailed recommendations on proposed developments and works with applicants to achieve a positive and sustainable outcome.

Key skills

Specialist botanical knowledge of Victoria's flora

Strong working knowledge of Victoria's Planning Scheme

Strong working knowledge of Australia's environmental regulations

Demonstrated ability in Habitat hectare assessment, tree identification and assessment

Working fauna survey skills, including excellent bird identification skills

Experienced in undertaking targeted surveys for listed flora and fauna species

Experienced in environmental planning advice to applicants

Uses experience to provide project design recommendatons to applicants

Excellent report writing skills

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Project examples

Property Development

Modeina, Burnside, Victoria - Lead the field team to undertake a detailed flora and fauna assessment for a complex, staged property development in Melbourne's west. Justin was involved in the initial field work for this project, which involved the detailed mapping of the extent, type and quality of native vegetation at the site. Justin has also been involved in various targeted surveys at this site for threatened flora and fauna, and also undertaken several monitoring assessments since construction activities began.

Renewable Energy

Golden Plains Wind Farm, centred on Rokewood, western Victoria - Lead the field botanical team to undertake a detailed native vegetation and targeted threatened flora assessment for one of the largest renewable energy projects in the southern hemisphere. This project involved a large amount of field work in the western region, across a large number of private properties. Using his knowledge of the region and grassland habitats in the area, Justin has been working with the wind farm developer to locate wind farm infrastructure (i.e. access tracks, cables and turbines) in areas that best avoid impacts to native vegetation and habitat.

Infrastructure

North East Link, northern and eastern parts of Melbourne - Undertook the peer review of the ecological assessment (Native vegetation, flora and fauna) for a major road project in Victoria. This project involved a detailed review of the reporting provided on the ecological assessment undertaken for the proposal. A site based review was then also undertaken for the whole project area, extending from the end of the Western Ring Road at Greensborough to the Eastern Freeway at Bulleeen Road. Justin was then involved in several meetings with the North East Link Authority and other ecological consultants and provided important input to the final impact assessment for the project.

Moorabool Wind Farm Powerline - Undertook the detailed native vegetation assessment for the development of a powerline linking up Moorabool Wind Farm with Lal Lal Wind Farm in Victoria's west. As part of this project, an initial native vegetation assessment of the entire powerline route was undertaken during which matters listed under the EPBC Act were recorded. Justin then worked closely with the powerline developers to locate powerpoles and lines outside the most senstive areas of vegetation. Justin prepared detailed reports for this project relevant to both the state and Commonwealth approvals.

Bushfire Assessments

Various sites across greater Melbourne - Undertook bushfire site and landscape hazard assessments for mutiple property development sites both in the west and east of Melbourne. The results of the site and landscape hazard assessments are used to inform the preparation of a detailed Bushfire Management Statement, a requirement for proposed developments that fall within a Bushfire Management Overlay (BMO). Justin has also undertaken several bushfire assessments for proposed developments in areas that fall only within a Bushfire Prone Area (BPO).

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Appendix 2:Flora species recorded at Woolsthorpe Wind Farm

Origin	Common name	Scientific name	FFG-P	CaLP Act
#	Coast Wattle	*Acacia longifolia subsp. sophorae*	p	
	Black Wattle	*Acacia mearnsii*	p	
	Blackwood	*Acacia melanoxylon*		
	Sheep's Burr	*Acaena echinata*		
*	Brown-top Bent	*Agrostis capillaris*		
*	Sweet Vernal-grass	*Anthoxanthum odoratum*		
*	Cape weed	*Arctotheca calendula*		
	Tall Spear-grass	*Austrostipa pubinodis*		
	Rough Spear-grass	*Austrostipa scabra subsp. falcata*		
*	Bearded Oat	*Avena barbata*		
*	Wild Oat	*Avena fatua*		
*	Large Quaking-grass	*Briza maxima*		
*	Lesser Quaking-grass	*Briza minor*		
*	Soft Brome	*Bromus hordeaceus*		
	Milkmaids	*Burchardia umbellata*		
*	Winged Slender-thistle	*Carduus tenuiflorus*		R
	Poong'ort	*Carex tereticaulis*		
*	Common Centaury	*Centaurium erythraea*		
	Plains Everlasting	*Chrysocephalum apiculatum subsp. congestum*	p	
*	Spear Thistle	*Cirsium vulgare*		R
*	Hawthorn	*Crataegus monogyna*		R
*	Cocksfoot	*Dactylis glomerata*		
*	Carrot	*Daucus carota*		
	Black-anther Flax-lily	*Dianella revoluta var. revoluta s.l.*		
	Long-hair Plume-grass	*Dichelachne crinita*		
	Pale Sundew	*Drosera peltata s.l.*		
	Common Spike-sedge	*Eleocharis acuta*		
	River Red-gum	*Eucalyptus camaldulensis*		
*	Sugar Gum	*Eucalyptus cladocalyx*		
	Swamp Gum	*Eucalyptus ovata subsp. ovata*		
	Manna Gum	*Eucalyptus viminalis subsp. viminalis*		
	Crane's Bill	*Geranium spp.*		
*	Monterey Cypress	*Hesperocyparis macrocarpa*		
*	Yorkshire Fog	*Holcus lanatus*		
*	Barley Grass	*Hordeum spp.*		
	Shining Pennywort	*Hydrocotyle sibthorpioides*		
*	Flatweed	*Hypochaeris radicata*		
	Club Sedge	*Isolepis spp.*		
	Toad Rush	*Juncus bufonius*		
	Loose-flower Rush	*Juncus pauciflorus*		
	Broad-leaf Rush	*Juncus planifolius*		
	Rush	*Juncus spp.*		
	Running Postman	*Kennedia prostrata*		
	Common Blown-grass	*Lachnagrostis filiformis s.s.*		
	Poison Lobelia	*Lobelia pratioides*		
*	Rye Grass	*Lolium spp.*		
	Wattle Mat-rush	*Lomandra filiformis*		
	Small Loosestrife	*Lythrum hyssopifolia*		
	Weeping Grass	*Microlaena stipoides var. stipoides*		
	Austral Forget-me-not	*Myosotis australis*		
	Grassland Wood-sorrel	*Oxalis perennans*		
	Wood Sorrel	*Oxalis spp.*		
*	Paspalum	*Paspalum dilatatum*		

Origin	Common name	Scientific name	FFG-P	CaLP Act
*	Toowoomba Canary-grass	*Phalaris aquatica*		
*	Radiata Pine	*Pinus radiata*		
*	Radiata Pine	*Pinus radiata var. radiata*		
#	Sweet Pittosporum	*Pittosporum undulatum*		
*	Ribwort	*Plantago lanceolata*		
	Common Tussock-grass	*Poa labillardierei var. labillardierei*		
*	Prostrate Knotweed	*Polygonum aviculare s.l.*		
*	Annual Beard-grass	*Polypogon monspeliensis*		
	Austral Bracken	*Pteridium esculentum subsp. esculentum*	p	
*	Giant Mustard	*Rapistrum rugosum*		
*	Sweet Briar	*Rosa rubiginosa*		C
*	Clustered Dock	*Rumex conglomeratus*		
	Common Wallaby-grass	*Rytidosperma caespitosum*		
	Wallaby Grass	*Rytidosperma spp.*		
	Annual Fireweed	*Senecio glomeratus*	p	
	Groundsel	*Senecio spp.*	p	
*	Black Nightshade	*Solanum nigrum s.l.*		
	Smooth Solenogyne	*Solenogyne dominii*	p	
*	Common Sow-thistle	*Sonchus oleraceus*		
	Kangaroo Grass	*Themeda triandra*		
*	White Clover	*Trifolium repens var. repens*		
*	Squirrel-tail Fescue	*Vulpia bromoides*		
	Sprawling Bluebell	*Wahlenbergia gracilis*		

Notes
* = introduced
# = native, but occurs beyond its natural range

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Appendix 3: Scattered trees recorded within the wind farm

Tree No.	Common Name	Scientific Name	DBH (cm)	Habitat Category	Radius of TPZ (m)	Remove/ Retain
1	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	152	Large scattered tree	15	Retained
2	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	133	Large scattered tree	15	Retained
3	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	115	Large scattered tree	13.8	Retained
4	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	121	Large scattered tree	14.52	Retained
5	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	130	Large scattered tree	15	Retained
6	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	108	Large scattered tree	12.96	Retained
7	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	129	Large scattered tree	15	Retained
8	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	171	Large scattered tree	15	Retained
9	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	136	Large scattered tree	15	Retained
10	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	87	Large scattered tree	10.44	Retained
11	Stag	*Eucalyptus* spp.	92	Large scattered tree	11.04	Retained
12	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	144	Large scattered tree	15	Retained
13	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	110	Large scattered tree	13.2	Retained
14	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	152	Large scattered tree	15	Retained
15	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	162	Large scattered tree	15	Retained
16	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	100	Large scattered tree	12	Retained
17	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	167	Large scattered tree	15	Retained
18	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	136	Large scattered tree	15	Retained
19	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	141	Large scattered tree	15	Retained
20	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	123	Large scattered tree	14.76	Retained
21	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	126	Large scattered tree	15	Retained

Tree No.	Common Name	Scientific Name	DBH (cm)	Habitat Category	Radius of TPZ (m)	Remove/ Retain
22	Gum	*Eucalyptus* spp.	-	Large scattered tree	15	Retained
23	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	96	Large scattered tree	11.52	Retained
24	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	85	Large scattered tree	10.2	Retained
25	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	90	Large scattered tree	10.8	Retained
26	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	129	Large scattered tree	15	Retained
27	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	73	Large scattered tree	8.76	Retained
28	Manna gum	*Eucalyptus viminalis* subsp. *viminalis*	94	Large scattered tree	11.28	Retained
29	Swamp Gum	*Eucalyptus ovata* subsp. *ovata*	46	Small scattered tree	5.52	Retained
30	Swamp Gum	*Eucalyptus ovata* subsp. *ovata*	77	Large scattered tree	9.24	Retained
31	Swamp Gum	*Eucalyptus ovata* subsp. *ovata*	88	Large scattered tree	10.56	Retained
32	Stag	*Eucalyptus* spp.	108	Large scattered tree	12.96	Retained
33	Swamp Gum	*Eucalyptus ovata* subsp. *ovata*	110	Large scattered tree	13.2	Retained