

## Appendix Six – Flora and Fauna report

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# ECOLOGICAL ASSESSMENT

PROPOSED HAMILTON SOLAR FARM

7751 HAMILTON PORT-FAIRY ROAD, HAMILTON

PREPARED FOR: TETRIS ENERGY PTY LTD



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## Document Information

Ecological assessment for the proposed Hamilton Solar Farm, Hamilton


Report prepared by Okologie Consulting Pty Ltd for Tetris Energy

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## Document Control

Version	Author	Review	Approval	Date
M875_Hamilton_EcologicalAssessment_Report_17082021_V1	Mark Stockdale	Luke Hynes		17/08/2021

## Acknowledgements

Okologie Consulting acknowledges the following people in their contribution to this project:

- Frank Boland (Tetris Energy) for project information.

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## Summary

Okologie Consulting Pty Ltd was engaged by Tetris Energy on to undertake an ecological assessment for the proposed Hamilton Solar Farm, Hamilton.

The assessment was undertaken to determine the extent of native vegetation and ascertain the presence of any threatened flora or fauna species or associated habitats within the project area. The assessment also informs the approvals requirements in accordance with the *Solar Energy Facilities Design and Development Guideline*.

The project area was highly modified as a result of agricultural use. It was characterised by exotic dominated pasture with planted native and exotic trees around the property boundary and was devoid of remnant native vegetation.

No listed threatened flora or fauna species or associated habitats were recorded within the project area, and none are considered likely to occur due to the absence of suitable habitat. The project area has been extensively modified from agricultural use, which reduces or eliminates the habitat potential for many species.

An *Environment Protection Biodiversity Conservation Act 1999* referral to the Commonwealth Environment Minister is not required as no Matters of National Environmental Significance are present or likely to be significantly impacted by future works in the project area.

Scattered native grasses and sedges that have colonised disturbed (cultivated) ground were considered less than 10 years old, which meet the permit exemption under Clause 52.17-7 *Regrowth* of the Southern Grampians Planning Scheme.

A permit is not required under Clause 52.17 for removal of exotic vegetation. If required for removal for future development, planted native vegetation is considered to meet the permit exemption under Clause 52.17-7 *Planted Vegetation*.

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# 1 Introduction

## 1.1 Project Background

Okologie Consulting Pty Ltd was engaged by Tetris Energy to undertake an ecological assessment for the proposed Hamilton Solar Farm, Hamilton.

The ecological assessment was undertaken to determine the extent of native vegetation and ascertain the presence of any threatened flora or fauna species or associated habitats within the project area. The assessment also informs the approvals requirements in accordance with the *Solar Energy Facilities Design and Development Guideline* (DELWP 2019).

The proposed removal of native vegetation requires a permit under Clause 52.17 (Native Vegetation) (unless exempt) and an application under the *Guidelines for the removal, destruction or lopping of native vegetation* (the Guidelines) (DELWP 2017a).

This report summarises the findings of the assessment and discusses environmental legislation and policy implications associated with future development.

## 1.2 Objectives

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The objectives of the assessment were to:

- Assess terrestrial ecological values (i.e. vegetation communities, flora and fauna species and associated habitats) within the project area.
- Ensure ecological values are identified in the early planning phase.
- Identify environmental legislation and policy requirements.

## 1.3 Site Description

The project area comprises two parcels of land within the property at 7751 Hamilton-Port Fairy Road, Hamilton. It covers approximately 75 hectares and is bound by Monivae-Subdivision Road to the north, and private property to the east, south and west. The proposed solar farm is located in the northeast section of the project area (Figure 1).

The topography comprises low undulating slopes towards the southwest. The project area is used for agriculture (livestock grazing) and consists of exotic dominated pasture, with planted native and exotic trees in windrows around the boundary. A minor ephemeral waterway associated with Violet Creek extends east-west across the southern section of the project area. One farm dam is present on the property. The surrounding land use is predominantly agriculture.



The project area occurs within the Victorian Volcanic Plain bioregion, the Glenelg Hopkins Catchment Management Authority area and the Southern Grampians Shire municipality (DELWP 2021a). The Native Vegetation Location mapping shows the project area occurs within Location 1 and 2 (DELWP 2021b). The project area is zoned Farming Zone (FZ) and is not subject to any environmental overlays under the Southern Grampians Planning Scheme (DELWP 2021c).

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# Figure 1

## Site Location

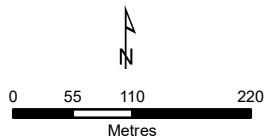
### Hamilton Solar Farm

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## Legend

-  Subject Site
-  Works Area

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## 2 Methodology

### 2.1 Species Information

Scientific and common names of flora species and terrestrial vertebrate fauna follow the Victorian Biodiversity Atlas (VBA) (DELWP 2021d). Vegetation communities follow the Ecological Vegetation Class (EVC) bioregion benchmarks (DELWP 2021b).

Native (terrestrial) flora and fauna species and vegetation communities referred to as 'threatened' include:

- Listed as critically endangered, endangered or vulnerable under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) (DAWE 2021).
- Listed as Threatened with a threat category of extinct; extinct in the wild; critically endangered; endangered or vulnerable under the *Flora and Fauna Guarantee Act 1988 – Threatened List* (FFG Act) (DELWP 2021e).

### 2.2 Desktop Assessment

A desktop assessment was undertaken of relevant databases and other resources, including:

- NatureKit 2.0 for modelled biodiversity data (DELWP 2021a).
- Native Vegetation Information Management system tool (DELWP 2021b).
- Planning Schemes Online for planning information (DELWP 2021c).
- The VBA for threatened flora and fauna species records (DELWP 2021d).
- The Protected Matters Search Tool (PMST) for information relating to Matters of National Environmental Significance (MNES) under the EPBC Act (Department of Agriculture, Water and the Environment 2021).
- Relevant environmental legislation, policies and strategies.

### 2.3 Field Assessment

The field assessment was undertaken on 4 August 2021. The project area was traversed on foot to determine the extent of native vegetation and ascertain the presence of any listed threatened flora or fauna species or associated habitats. The extent of native vegetation was mapped using a Trimble Catalyst DA1 differential GPS (sub-metre accuracy post-processing) and recorded to MGA 94, Zone 55 coordinate system. EVCs were determined by reference to the relevant bioregion mapping and benchmarks descriptions (DELWP 2021b), and review of remnant vegetation in the local area.

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## 2.4 Assessment Guidelines

The Guidelines (DELWP 2017a) has been incorporated into the Victoria Planning Provisions and all planning schemes in Victoria. The purpose of the Guidelines is to set out and describe the application of Victoria's statewide policy in relation to assessing and compensating for the removal of native vegetation in response to permit applications under Clause 52.17.

Native vegetation is defined in Clause 72 of the Victoria Planning Provisions as *plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses*. Plants from other states or overseas are not native and the permitted clearing regulations do not apply if they are being removed (DELWP 2017a).

The Guidelines considers the biodiversity value of native vegetation by measuring the following two components:

- Site-based information that can be measured or observed at a site.
- Landscape scale information that cannot be measured or observed at the site and is included in maps and models (DELWP 2017a).

Under the Guidelines native vegetation is classified as a *patch* or *scattered tree*.

A patch of native vegetation is:

- An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native<sup>1</sup>; or
- Any area with three or more native canopy trees<sup>2</sup> where the drip line<sup>3</sup> of each tree touches the drip line of at least one other tree, forming a continuous canopy; or
- Any mapped wetland included in the Current wetlands map.

A scattered tree is:

- A native canopy tree that does not form part of a patch (DELWP 2017a).

The assessment pathway for an application to remove native vegetation reflects its potential impact on biodiversity and is determined from the location and extent of the native vegetation to be removed.

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<sup>1</sup> Plant cover is the proportion of the ground that is shaded by vegetation foliage when lit from directly above. Areas that include non-vascular vegetation (such as mosses and lichens) but otherwise support no native vascular vegetation are not considered to be a patch for the purposes of the Guidelines. However, when non-vascular vegetation is present with vascular vegetation, it does contribute to cover when determining the percentage of perennial understorey plant cover.

<sup>2</sup> A native canopy tree is a mature tree (i.e. it is able to flower) that is greater than 3 metres in height and is normally found in the upper layer of the relevant vegetation type.

<sup>3</sup> The drip line is the outermost boundary of a tree canopy (leaves and/or branches) where the water drips on to the ground (DELWP 2017a).





The three assessment pathways are:

- Basic – limited impacts on biodiversity.
- Intermediate – could impact on large trees, endangered EVCs, and sensitive wetlands and coastal areas.
- Detailed – could impact on large trees, endangered EVCs, sensitive wetlands and coastal areas, and could significantly impact on habitat for rare or threatened species.

The assessment pathway of an application is determined in accordance with the requirements in Table 1.

**Table 1: Assessment pathways**

Extent of native vegetation	Location Category		
	Location 1	Location 2	Location 3
Less than 0.5 hectares and not including any large trees	Basic	Intermediate	Detailed
Less than 0.5 hectares and including one or more large trees	Intermediate	Intermediate	Detailed
0.5 hectares or more	Detailed	Detailed	Detailed

**Source:** DELWP (2017a).

## 2.5 Limitations

The preferred survey period for undertaking vegetation assessments in Victoria is spring, which maximises the likelihood of detecting all flora species within a site. Flora surveys provide a valuable ‘snapshot’ of vegetation at a point in time; however, the limitations of seasonal influence (winter) on the presence/absence of flora species (particularly annuals or cryptic species) must be considered. The short duration of the assessment limited the opportunity to observe migratory, transitory or uncommon fauna species.

The information outlined in this report relies on the accuracy of ecological database information, GIS layers and spatial imagery. To minimise potential errors, the most current available data was obtained from relevant sources.

The Department of Environment, Land, Water and Planning (DELWP) bioregion and EVC mapping are subject to inherently broad environmental and ecological parameters used in the mapping process. Where the observed EVC was not reflective of what would be expected from EVC mapping and classification, it was attributed to the most appropriate EVC based on combination of its floristic, life form and ecological characteristics, and particular environmental conditions.

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### 3 Results

#### 3.1 Ecological Vegetation Classes

NatureKit pre-1750 EVC modelling for the project area predominantly comprised of Plains Grassland (EVC 132), Plains Grassy Woodland (EVC 55) and Swamp Scrub (EVC 53). Extant EVC modelling shows a scattered cover of Plains Grassland and Plains Grassy Woodland (DELWP 2021a). No remnant native vegetation was recorded within the project area (Figure 2).

#### 3.2 Vegetation Condition

The project area was highly modified as a result of agricultural use. It was characterised by exotic dominated pasture with planted native and exotic trees around the property boundary and was devoid of remnant native vegetation. A description of vegetation condition is outlined below.

Exotic dominated grassland (mapped as predominantly introduced vegetation) comprised areas of improved pasture previously subject to cultivation (fallow lines present). The vegetation was dominated by exotic Perennial Ryegrass *Lolium perenne*, Barley Grass *Hordeum murinum*, Cocksfoot *Dactylis glomerata*, Brown-top Bent *Agrostis capillaris*, Onion Grass *Romulea rosea*, Yorkshire Fog-grass *Holcus lanatus*, Winter Grass *Poa annua*, Perennial Veldt-grass *Ehrharta calycina*, Prairie Grass *Bromus catharticus*, Bearded Oat *Avena barbata*, Ribwort *Plantago lanceolata*, Flat Weed *Hypochoeris radicata*, Long Storksbill *Erodium botrys*, Sheep sorrel *Acetosella vulgaris*, Cape Weed *Arctotheca calendula*, Spear Thistle *Cirsium vulgare*, Burr Medic *Medicago polymorpha*, Sow-thistle *Sochus asper* and Curled Dock *Rumex crispus*. Native vegetation in open pasture was limited to a sparse cover (~1% overall perennial cover) of Finger Rush *Juncus subsecundus* and Bristly Wallaby-grass *Rytidospermum setaceum* that has colonised disturbed ground (Plates 1 to 4).

The access road to the solar farm area comprised an unmade road dominated by exotic Toowoomba Canary-grass *Phalaris aquatica*, Paspalum *Paspalum dilatatum*, Soft Brome *Bromus hordeaceus*, Yorkshire Fog-grass, Cocksfoot, Bearded Oat and Flat Weed (Plate 5).

Planted trees and shrubs occur in windrows around the property boundary and included native Swamp Gum *Eucalyptus ovata* and Manna Gum *Eucalyptus viminalis*, Black Wattle *Acacia mearnsii*, Green Honey-myrtle *Melaleuca diosmifolia* and Giant Honey-myrtle *Melaleuca armillaris*, as well as exotic Monterey Cypress *Cupressus macrocarpa* and Radiata Pine *Pinus radiata* (Plates 6 to 8).

#### 3.3 Fauna Survey Results



Fourteen fauna species were recorded during the field assessment, comprising 10 native species (all birds). Species observed included Sulphur-crested Cockatoo *Cacatua galerita*, Australian Raven *Corvus coronoides*, Black-shouldered Kite *Elanus axillaris*, Galah *Eolophus roseicapilla*, Australian Magpie *Cracticus tibicen*, Magpie-lark *Grallina cyanoleuca*, Welcome Swallow *Hirundo neoxena*, Willie Wagtail *Rhipidura leucophrys*, Australasian Pipit *Anthus novaeseelandiae* and Grey Shrike-thrush *Colluricincla harmonica*.

The paucity of fauna species recorded during the assessment was attributed to the modified condition of habitat from agricultural use.

### 3.4 Fauna Habitat

The project area supports three habitat types: planted trees, exotic grassland and ephemeral waterway/farm dam.

Planted trees and shrubs provide habitat for common birds including Australian Raven, Sulphur-crested Cockatoo, Magpie-lark and Grey Shrike-thrush. Areas of exotic grassland provides habitat for birds adapted to modified habitats such as Australian Magpie, Galah, Welcome Swallow and Willie Wagtail.

The VBA (2021d) contains 25 records for Brolga *Grus rubicunda* in the local area. Brolga habitat comprises open wetlands, grassy plains, well-watered farmland and coastal mudflats (DELWP 2017b). There is a low likelihood of occurrence for this species on the site, and within the proposed Solar Farm area due to the absence of suitable habitat and intensive agricultural activity (livestock grazing) on the site.

During periods of inundation ephemeral creeklines associated with Violet Creek and the farm dam are likely to provide suitable habitat for common waterbirds such as Chestnut Teal *Anas castanea*, Pacific Black Duck *Anas superciliosa* and Australian Wood Duck *Chenonetta jubata*. The creekline would provide potential habitat for common frogs such as Common Froglet *Crinia signifera*, Spotted Marsh Frog *Limnodynastes tasmaniensis* and Eastern Banjo Frog *Limnodynastes dumerilii*.

### 3.5 Threatened Flora Species

The VBA (DELWP 2021d) contains records of two listed threatened flora species in local area (within a five-kilometre radius of the project area). The PMST (DAWE 2021) identified 16 EPBC Act listed flora species or species habitats as likely to occur within the local area (Appendix 4).

No listed threatened flora species were recorded during the field assessment. No listed threatened flora species are considered likely to occur due to the absence of suitable



habitat resulting from agricultural use (grazing, cultivation) which reduces or eliminates the habitat potential for many species.

### 3.6 Threatened Fauna Species

No listed threatened fauna species were recorded during the field assessment. The VBA (DELWP 2020d) contains records of 17 listed threatened fauna species in the local area. The PMST (DAWE 2021) identified 20 EPBC Act listed fauna species or species habitats (terrestrial) as likely to occur within the local area (Appendix 5).

There is a low likelihood of occurrence for any listed threatened fauna species due to the absence of suitable habitat from agricultural use (grazing, cultivation), which limits habitat availability to generalist species adapted to modified habitats.

### 3.7 Threatened Ecological Communities

#### *Commonwealth Listed Ecological Communities*

Review of the PMST (DAWE 2021) identified three EPBC Act listed ecological communities may or are known to occur within the local area:

- *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* (critically endangered).
- *Natural Temperate Grassland of the Victorian Volcanic Plain* (critically endangered).
- *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (critically endangered).

No EPBC Act listed ecological communities occur within the project area.

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Plate 1: Exotic dominated vegetation



Plate 2: Exotic dominated vegetation



Plate 3: Exotic dominated vegetation



Plate 4: Exotic dominated vegetation





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Plate 5: Exotic dominated vegetation on the access road



Plate 6: Planted native trees and shrubs in windrows



Plate 7: Planted native trees and shrubs in windrows



Plate 8: Planted exotic trees in windrows (Radiata Pine)







## Figure 2

### Ecological Features

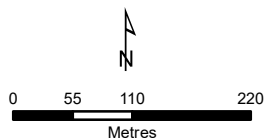
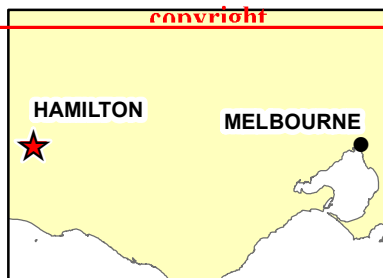
#### Hamilton Solar Farm

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### Legend

-  Subject Site
-  Works Area
-  Planted Vegetation
-  Predominantly Introduced Vegetation

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## 4 Environmental Legislation and Policy Implications

### 4.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides a process for assessment of proposed actions that may have a significant impact on a MNES, which includes EPBC Act listed flora, fauna and ecological communities (DoE 2013).

The EPBC Act affects any group or individual (including companies) whose actions (i.e. proposal or project) are assessed for environmental impacts under the EPBC Act. An action requires approval from the Commonwealth Environment Minister if it is considered likely to have a significant impact on a MNES (DoE 2013).

No EPBC Act listed threatened ecological communities or flora, or fauna species were recorded within the project area, and none are considered likely to occur due to the absence of suitable habitat. An EPBC Act referral to the Commonwealth Environment Minister will not be required as no MNES are present or likely to be significantly impacted by future works in the project area.

### 4.2 Flora and Fauna Guarantee Act 1988

The FFG Act is the key piece of Victorian legislation for the conservation of threatened species and communities and for the management of potentially threatening processes.

A permit is required from DELWP to 'take' (kill, injure, disturb or collect) listed flora species, flora species that are members of listed communities or protected flora from public land. Protected flora species includes all members of the following plant families Asteraceae (Daisies), Epacridaceae (Heaths) and Orchidaceae (Orchids), all clubmosses, ferns and fern allies (excluding *Pteridium esculentum*). All species of the following genera are also protected: *Acacia* (excluding *Acacia dealbata*, *Acacia decurrens*, *Acacia implexa*, *Acacia melanoxylon* and *Acacia paradoxa*), *Baeckea*, *Calytrix*, *Correa*, *Darwinia*, *Eremophila*, *Eriostemon*, *Gompholobium*, *Grevillea*, *Prostanthera*, *Sphagnum*, *Thryptomene*, *Thysanotus* and *Xanthorrhoea* (Grass-trees) (DELWP 2021e).

No listed threatened or protected flora species or communities, or species listed as critically endangered, endangered, vulnerable or rare in Victoria were recorded within the project area. An FFG Act permit will not be required in this instance.

### 4.3 Environmental Effects Act 1978

The *Environment Effects Act 1978* provides for assessment of proposed projects that are capable of having a significant effect on the environment. The 'environment' in

this context comprises *the physical, biological, heritage, cultural, social, health, safety and economic aspects of human surroundings, including the wider ecological and physical systems within which humans live* (DSE 2006).

A project with potential adverse environmental effects that, individually or in combination, could be significant in a regional or State context should be referred. The criteria for referral under the Act are focused on the potential for a significant effect on the environment.

The relevant ecological referral criteria for this project comprises individual types of potential effects on the environment of regional or State significance that may warrant referral, including:

- Potential clearing of 10 ha or more of native vegetation from an area that:
  - Is an Endangered EVC;
  - Of very high conservation significance; or,
  - Is not authorised under an approved Forest Management Plan or Fire Protection Plan.
- Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria.
- Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'.
- Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term (DSE 2006).

Review against the individual and combined criteria listed above following the Ministerial guidelines for assessment of environmental effects is outlined below:

- The project area does not support any native vegetation (following disturbance from agricultural use).
- The project area does not contain any threatened flora or fauna species or associated habitat.
- The project area does not support any listed wetlands.
- Future works are unlikely to impact aquatic ecosystems or any estuarine or marine ecosystems.

A referral or preparation of an Environmental Effects Statement under the *Environment Effects Act 1978* is not required in this instance.

#### 4.4 Planning and Environment Act 1987

The purpose of the *Planning and Environment Act 1987* is to establish a framework for planning the use, development and protection of land in Victoria. Native





vegetation clearance is managed under the Act and through municipal planning schemes (DELWP 2021c).

A permit is required under Clause 52.17 (Native Vegetation) to remove, destroy or lop native vegetation, including dead vegetation, unless the action is exempt. To ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation, the following three step approach is applied in accordance with the Guidelines:

1. Avoid the removal, destruction or lopping of native vegetation.
2. Minimise impacts from the removal, destruction or lopping of native vegetation that cannot be avoided.
3. Provide an offset to compensate for the biodiversity impact if a permit is granted to remove, destroy or lop native vegetation.

If native vegetation removal is required, a permit application must be categorised as a basic, intermediate or detailed assessment pathway as specified in the Guidelines (DELWP 2017). Each assessment pathway has specific application requirements and decision guidelines that must be considered by the responsible authority.

Clause 66 (Referral and Notice Provisions) requires that the following applications to remove native vegetation be referred to the Secretary to DELWP:

- To remove, destroy or lop native vegetation in the Detailed Assessment Pathway
- To remove, destroy or lop native vegetation if a Property Vegetation Plan applies to the site.
- To remove, destroy or lop native vegetation on Crown land, which is occupied or managed by the responsible authority (DELWP 2021c).

### ***Clause 52.17 – Native Vegetation***

The project area was highly modified as a result of agricultural use. It was characterised by exotic dominated pasture with planted native and exotic trees around the property boundary. Areas of exotic pasture contain a scattered cover (~1% overall perennial cover) of native grasses and sedges that do not meet the cover threshold for a remnant patch under the Guidelines (DELWP 2017a).

The solar panels will be located in highly modified areas of exotic pasture, which meets the siting and design meets the criteria under the *Solar Energy Facilities Design and Development Guideline* (DELWP 2019).

Scattered native grasses and sedges that have colonised disturbed (cultivated) ground were considered less than 10 years old, which meet the permit exemption under Clause 52.17-7 Regrowth: *Native vegetation that is to be removed, destroyed or lopped*



*that has naturally established or regenerated on land lawfully cleared of naturally established native vegetation, and is less than 10 years old (DELWP 2021c).*

A permit is not required under Clause 52.17 for removal of exotic vegetation within the site. If required for removal, planted native vegetation are considered to meet the permit exemption under Clause 52.17-7 *Planted Vegetation*, which states: *Native vegetation that is to be removed, destroyed or lopped that was either planted or grown as a result of direct seeding. This exemption does not apply to native vegetation planted or managed with public funding for the purpose of land protection or enhancing biodiversity unless the removal, destruction or lopping of the native vegetation is in accordance with written permission of the agency (or its successor) that provided the funding (DELWP 2021c).* Planted native trees within the project area were not planted for conservation purposes using public funding.

#### 4.5 Solar Energy Facilities Design and Development Guideline

The *Solar Energy Facilities Design and Development Guideline* (DELWP 2019) identifies the requirement for a solar energy facility proposal to avoid or minimise impacts on flora and fauna species and habitats through design considerations at the project planning stage. The relevant environmental legislative requirements identified under the Guideline include the EPBC Act, FFG Act, *Environment Effects Act 1978* and *Planning and Environment Act 1987*, which have been addressed in this report.

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## 5 Conclusion

The project area was highly modified as a result of agricultural use. It was characterised by exotic dominated pasture with planted native and exotic trees around the property boundary and was devoid of remnant native vegetation.

No listed threatened flora or fauna species or associated habitats were recorded within the project area, and none are considered likely to occur due to the absence of suitable habitat. The project area has been extensively modified from agricultural use, which reduces or eliminates the habitat potential for many species.

An EPBC Act referral to the Commonwealth Environment Minister is not required as no MNES are present or likely to be significantly impacted by future works in the project area.

Scattered native grasses and sedges that have colonised disturbed (cultivated) ground were considered less than 10 years old, which meet the permit exemption under Clause 52.17-7 *Regrowth* of the Southern Grampians Planning Scheme.

A permit is not required under Clause 52.17 for removal of exotic vegetation. If required for removal for future development, planted native vegetation is considered to meet the permit exemption under Clause 52.17-7 *Planted Vegetation*.

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## Appendices

### Appendix 1 – Likelihood of Occurrence

One or more of the following criteria was used to establish the likelihood of occurrence for threatened flora and fauna species within the project area.

Present: Recorded during the field survey.

High likelihood:

- Previously recorded within the site.
- Likely to visit the site during seasonal movements.
- Frequently recorded within the local area.
- Known or likely to maintain resident populations in the local area.
- Presence of preferred habitat within the site.

Moderate likelihood:

- May regularly move through or visit the site as a seasonal visitor.
- Previous records within the local area.
- Some characteristics of a species preferred habitat is present although in a modified condition.
- Unlikely to maintain a population within the site.

Low Likelihood:

- Species likely to occur as a rare or opportunistic visitor.
- Few previous records within the local area.
- Habitat within the site is highly modified and does not represent the species preferred habitat.

Unlikely:

- No suitable habitat present on the site or in the surrounding area.
- No species records in the local area.
- Beyond the species natural distribution or considered locally extinct.

The outcome of the assessment of likelihood of occurrence for threatened flora is Appendix 3 and Appendix 4 for threatened fauna.

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## Appendix 2 – Flora Species Recorded

**Table 2: Flora species recorded during the field assessment**

Scientific Name	Common Name
<i>Acacia mearnsii</i>	Black Wattle#
<i>Acetosella vulgaris</i>	Sheep Sorrel*
<i>Agrostis capillaris</i>	Brown-top Bent*
<i>Aira caryophyllaea</i> subsp. <i>caryophyllaea</i>	Silvery Hair-grass*
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass*
<i>Arctotheca calendula</i>	Cape Weed*
<i>Avena barbata</i>	Bearded Oat*
<i>Brassica fruticulosa</i>	Twiggy Turnip*
<i>Bromus catharticus</i>	Prairie Grass*
<i>Bromus hordeaceus</i>	Soft Brome*
<i>Cenchrus clandestinus</i>	Kikuyu*
<i>Chenopodium murale</i>	Sowbane*
<i>Cirsium vulgare</i>	Spear Thistle**
<i>Coprosma repens</i>	Mirror Bush*
<i>Cupressus macrocarpa</i>	Monterey Cypress*
<i>Cynodon dactylon</i> var. <i>dactylon</i>	Couch*
<i>Cynosurus echinatus</i>	Rough Dog's-tail*
<i>Dactylis glomerata</i>	Cocksfoot*
<i>Ehrharta erecta</i>	Panic Veldt-grass*
<i>Ehrharta longiflora</i>	Annual Veldt-grass*
<i>Erodium cicutarium</i>	Common Heron's-bill*
<i>Eucalyptus ovata</i>	Swamp Gum#
<i>Eucalyptus viminalis</i>	Manna Gum#
<i>Galium aparine</i>	Cleavers*
<i>Helminthotheca echioides</i>	Ox-tongue*
<i>Holcus lanatus</i>	Yorkshire Fog*
<i>Hordeum murinum</i>	Barley-grass*
<i>Hypochaeris glabra</i>	Smooth Cat's-ear*
<i>Hypochaeris radicata</i>	Flatweed*
<i>Juncus subsecundus</i>	Finger Rush
<i>Lolium perenne</i>	Perennial Rye-grass*
<i>Malva parviflora</i>	Small-flowered Mallow*
<i>Medicago polymorpha</i>	Burr Medic*
<i>Melaleuca armillaris</i>	Giant Honey-myrtle#
<i>Melaleuca diosmifolia</i>	Green Honey-myrtle#
<i>Paspalum dilatatum</i>	Paspalum*

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Scientific Name	Common Name
<i>Phalaris aquatica</i>	Toowoomba Canary-grass*
<i>Pinus radiata</i>	Radiata Pine#
<i>Plantago coronopus</i>	Buck's-horn Plantain*
<i>Plantago lanceolata</i>	Ribwort*
<i>Rhynchospora setacea</i>	Bristly Wallaby-grass
<i>Romulea rosea</i>	Onion Grass*
<i>Rumex conglomeratus</i>	Clustered Dock*
<i>Rumex crispus</i>	Curled Dock*
<i>Sonchus asper</i>	Rough Sow-thistle*
<i>Sonchus oleraceus</i>	Common Sow-thistle*
<i>Stellaria media</i>	Chickweed*
<i>Trifolium campestre</i> var. <i>campestre</i>	Hop Clover*
<i>Trifolium fragiferum</i> var. <i>fragiferum</i>	Strawberry Clover*
<i>Trifolium repens</i> var. <i>repens</i>	White Clover*
<i>Trifolium subterraneum</i>	Subterranean Clover*
<i>Vicia sativa</i>	Common Vetch*
<i>Vulpia myuros</i>	Rat's-tail Fescue*

**Notes:** \*Exotic species; \*\*Listed noxious weed; #Planted

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## Appendix 3 – Fauna Species Recorded

**Table 3: Fauna species recorded during the field assessment**

Scientific Name	Common Name
<i>Corvus coronoides</i>	Australian Raven
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo
<i>Cacatua tenuirostris</i>	Long-billed Corella
<i>Grallina cyanoleuca</i>	Magpie-lark
<i>Grallina cyanoleuca</i>	Australian Magpie
<i>Colluricincla harmonica</i>	Grey Shrike-thrush
<i>Hirundo neoxena</i>	Welcome Swallow
<i>Rhipidura leucophrys</i>	Willie Wagtail
<i>Eolophus roseicapilla</i>	Galah
<i>Elanus axillaris</i>	Black-shouldered Kite

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## Appendix 3 – Threatened Flora Records

Table 4. Threatened flora records

Scientific Name	Common Name	Status	Count of Sightings	Last Record	Likely Occurrence	Comments
<i>Acacia howittii</i>	Sticky Wattle	vu	1	26/3/11	U	Absence of suitable habitat
<i>Bossiaea walkeri</i>	Cactus Bossiaea	en	1	13/8/51	U	Absence of suitable habitat

**Notes:** Threatened species records were sourced from the VBA (DELWP 2021d), within a 5 km radius of the project area. Likelihood of occurrence: P = Present; H = High likelihood; M = Moderate likelihood; L = Low likelihood; U = Unlikely to occur (Appendix 1).

EPBC Act listed species (DAWE 2021)

Cr Critically Endangered

En Endangered

V Vulnerable

FFG Act listed species (DELWP 2021e)

L Listed as Threatened

cr Critically endangered

e Endangered

v Vulnerable

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## Appendix 4 – Threatened Fauna Records

Table 5. Threatened fauna records

Scientific Name	Common Name	Status	Count of Sightings	Last Record	Likely Occurrence	Comments
<i>Ornithorhynchus anatinus</i>	Platypus	vu	1	15/2/10	U	Absence of suitable habitat
<i>Antigone rubicunda</i>	Brolga	en	25	5/9/10	U	Absence of suitable habitat
<i>Spatula rhynchotis</i>	Australasian Shoveler	vu	5	9/3/19	U	Absence of suitable habitat
<i>Stictonetta naevosa</i>	Freckled Duck	en	2	4/3/04	U	Absence of suitable habitat
<i>Aythya australis</i>	Hardhead	vu	4	9/3/19	U	Absence of suitable habitat
<i>Oxyura australis</i>	Blue-billed Duck	vu	6	15/2/18	U	Absence of suitable habitat
<i>Biziura lobata</i>	Musk Duck	vu	7	11/3/10	U	Absence of suitable habitat
<i>Accipiter novaehollandiae</i>	Grey Goshawk	en	1	1/2/01	U	Absence of suitable habitat
<i>Hieraaetus morphnoides</i>	Little Eagle	vu	14	16/1/19	U	Absence of suitable habitat
<i>Falco subniger</i>	Black Falcon	cr	1	16/1/19	U	Absence of suitable habitat
<i>Lathamus discolor</i>	Swift Parrot	CR cr	1	1/10/00	U	Absence of suitable habitat
<i>Hirundapus caudacutus</i>	White-throated Needletail	VU vu	1	20/3/86	U	Absence of suitable habitat
<i>Dasyurus maculatus maculatus</i>	Spot-tailed Quoll	EN en	1	2/5/58	U	Absence of suitable habitat
<i>Perameles gunnii</i>	Eastern Barred Bandicoot	VU en	102	1/3/89	U	Absence of suitable habitat
<i>Pseudemoia pagenstecheri</i>	Tussock Skink	en	1	3/11/04	U	Absence of suitable habitat
<i>Litoria raniformis</i>	Growing Grass Frog	VU vu	1	15/2/10	U	Absence of suitable habitat
<i>Synemon plana</i>	Golden Sun Moth	CR vu	1	26/12/49	U	Absence of suitable habitat

**Notes:** Threatened species records were sourced from the VBA (DELWP 2021d), within a 5 km radius of the project area. Likelihood of occurrence: H = High likelihood; M = Moderate likelihood; L = Low likelihood; U = Unlikely to occur (Appendix 1).

EPBC Act listed species (DAWE 2021)

Cr Critically Endangered  
En Endangered  
V Vulnerable

FFG Act listed species (DELWP 2021e)

L Listed as Threatened  
cr Critically endangered  
e Endangered  
v Vulnerable

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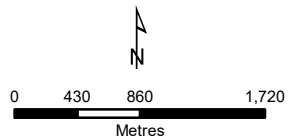
**Figure 3**  
*Significant Flora Species*  
*within 5km of the Subject*  
*Site*  
 Hamilton Solar Farm

**Legend**

- Subject Site
- Works Area
- Cactus Bossiaea
- Sticky Wattle

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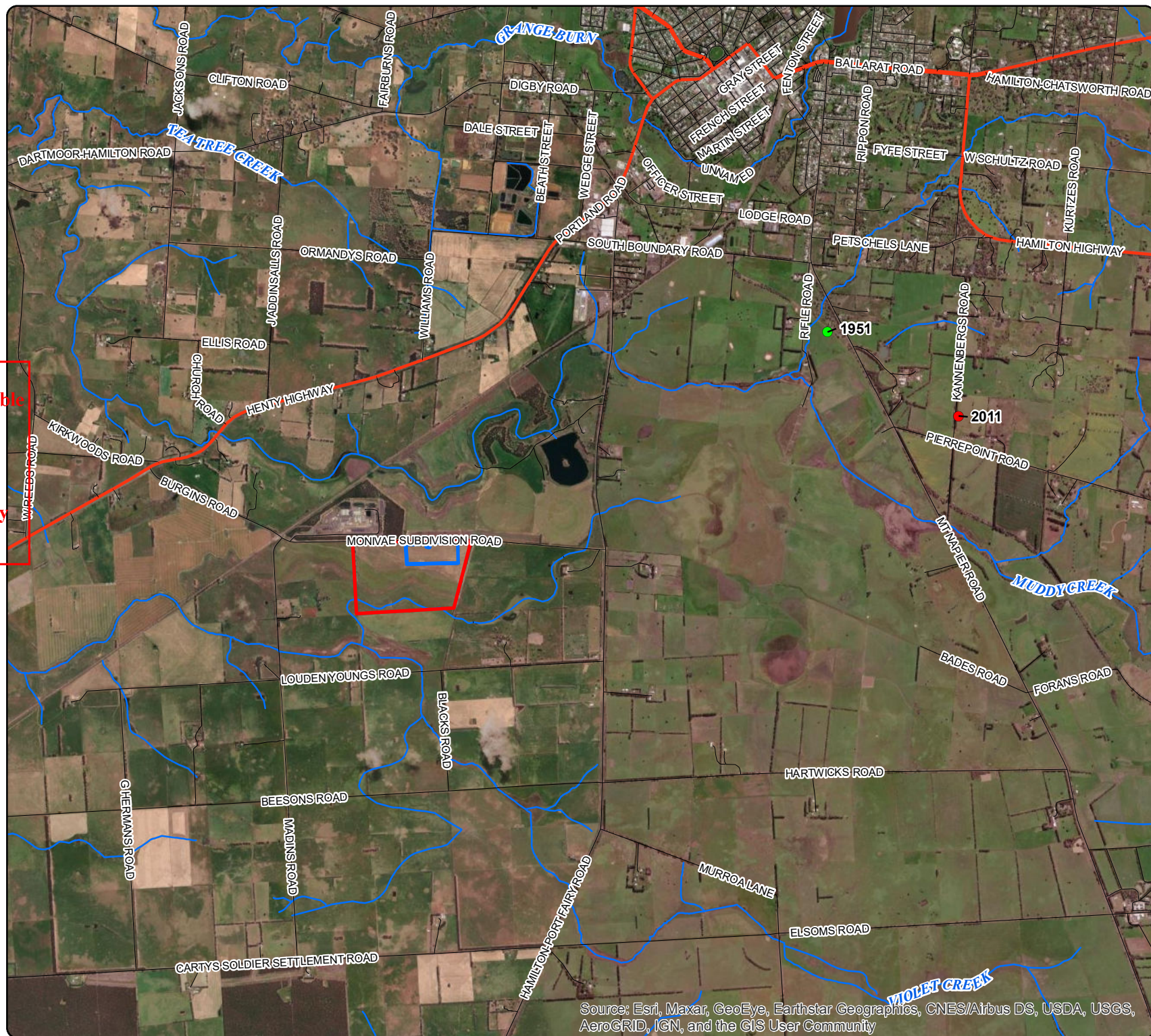


Coordinate System: GDA 1994 MGA Zone 55  
 Map Scale when printed @ A4 1:52,000



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# Hamilton Solar Farm

☐ Subject Site

 Works Area

-  Australasian Shoveler
-  Black Falcon
-  Blue-billed Duck
-  Brolga
-  Eastern Barred Bandicoot
-  Freckled Duck
-  Golden Sun Moth
-  Grey Goshawk
-  Growling Grass Frog
-  Hardhead
-  Little Eagle
-  Musk Duck
-  Platypus
-  Spot-tailed Quoll
-  Swift Parrot
-  Tussock Skink
-  White-throated Needletail

White-throated Needletail

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