

Northern Midlands Solar Farm Cressy, Aboriginal Heritage Assessment  
Northern Tasmania CHMA 2023

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Northern Tasmania CHMA 2023

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## **Appendix 5**

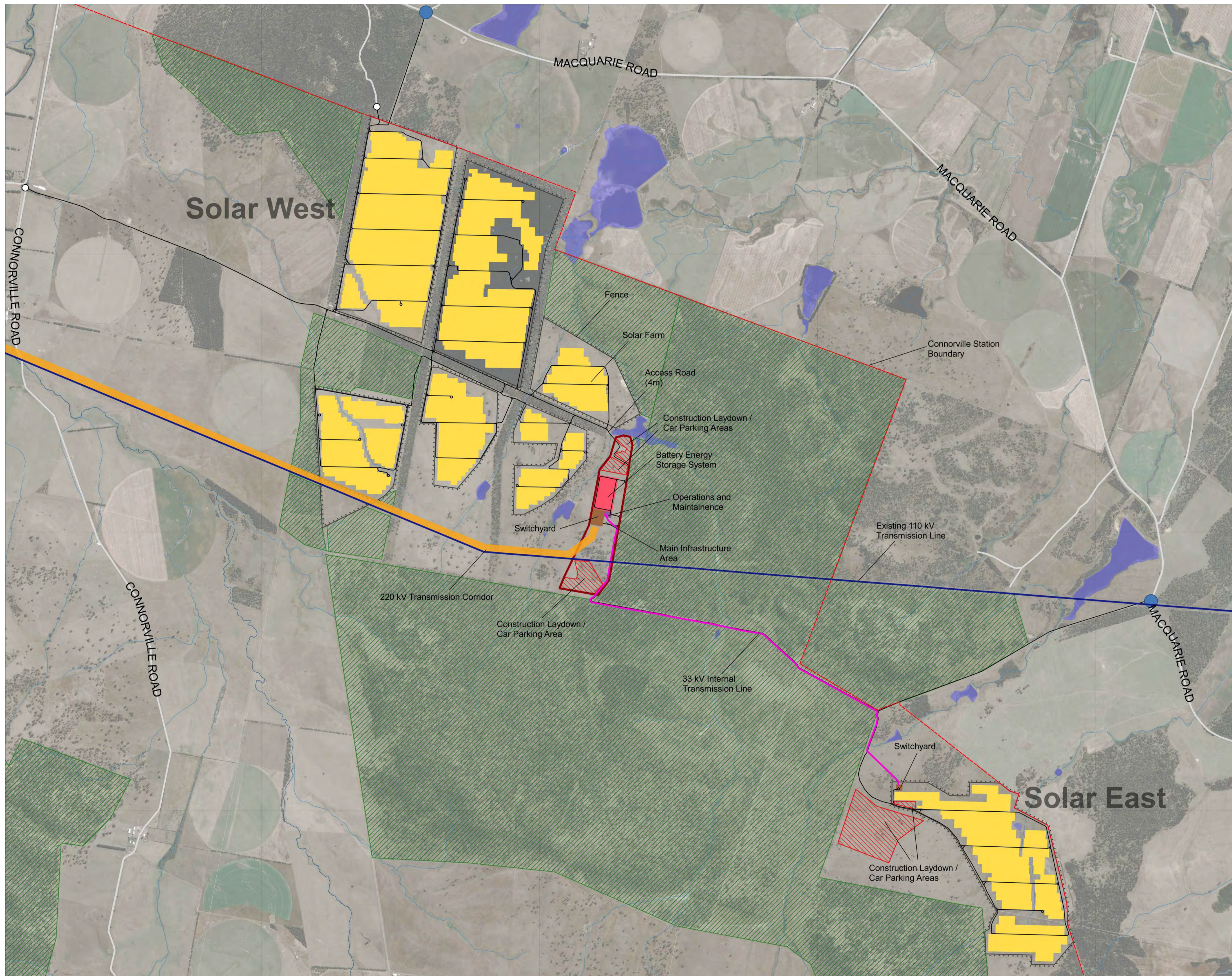
### **Masterplan for the Northern Midlands Solar farm Project**



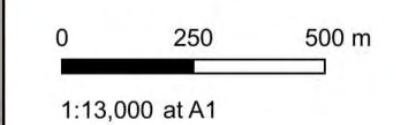
### Masterplan Page 1 Overall Area

2210 - Northern Midlands Solar Farm

- Existing Features**
- Parcels
  - Existing Roads
  - Conservation Covenant and Greening Australia Reserves
  - Dams
  - Watercourse
  - 110 kV Existing Transmission Line
- Proposed Development**
- Connorville Station
  - Access Roads
  - Solar Farm
  - Main Infrastructure Area
  - Battery Energy Storage System
  - Operations and Maintenance
  - Switchyard
  - Construction Laydown / Car Parking Area
  - 220 kV Transmission Corridor
  - 33 kV Internal Transmission Line
  - Fence
  - Main Access Points
  - Secondary/Emergency Access Points



Version: 5  
Date: 21/04/2023



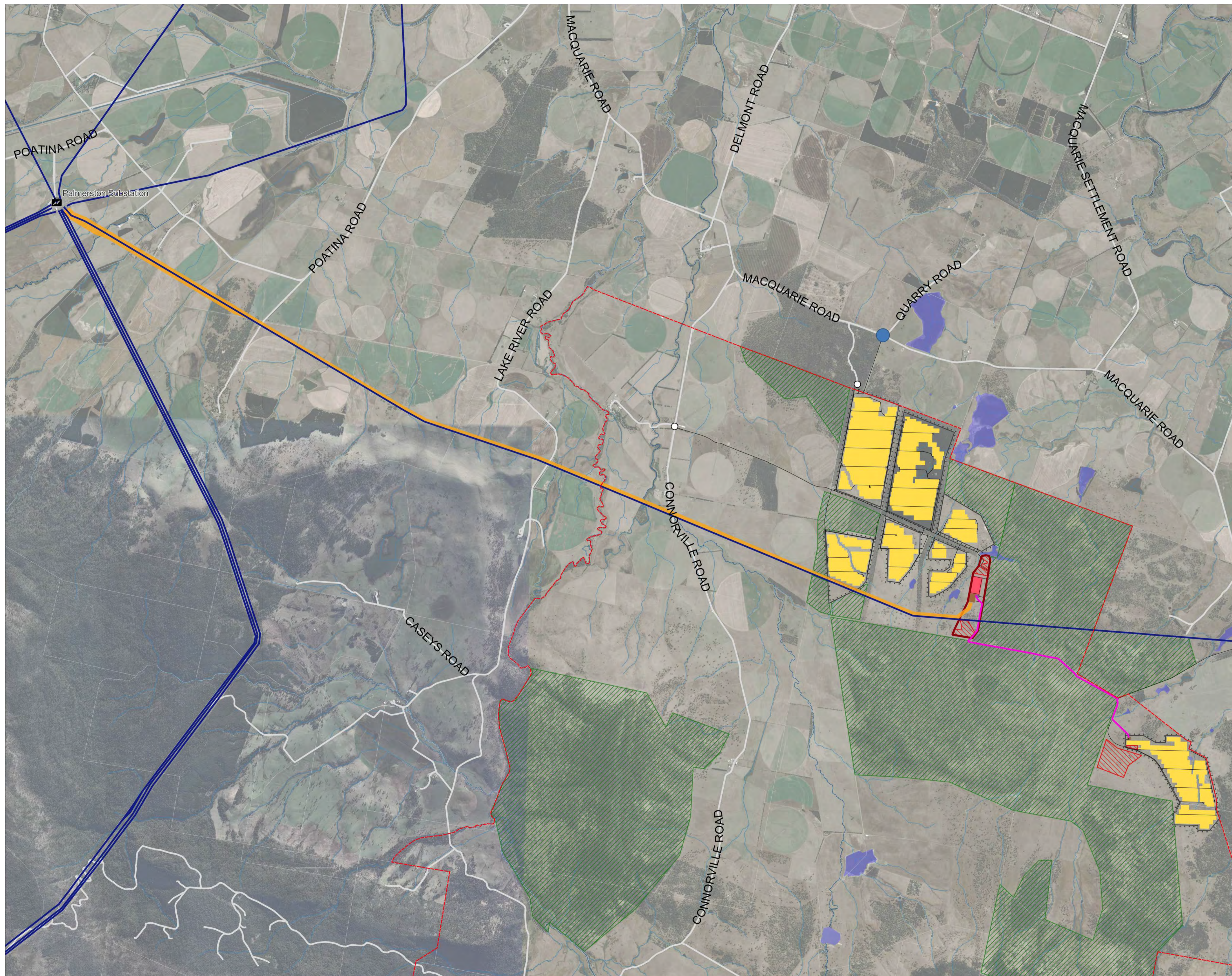
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ROBERT LUXMOORE  
Project Management

### Masterplan Page 2 Transmission Line

2210 - Northern Midlands Solar Farm

- Existing Features**
- Parcels
  - Existing Roads
  - Conservation Covenant and Greening Australia Reserves
  - Dams
  - Watercourse
  - Palmerston Substation
  - Existing Transmission Line
- Proposed Development**
- Connorville Station
  - Access Roads
  - Solar Farm
  - Main Infrastructure Area
  - Battery Energy Storage System
  - Operations and Maintenance
  - Switchyard
  - Construction Laydown / Car Parking Area
  - 220 kV Transmission Corridor
  - 33 kV Internal Transmission Line
  - Fence
  - Main Access Points
  - Secondary/Emergency Access Points



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LUXMOORE  
Project Management

**Masterplan Page 3**  
**Transmission Line -**  
**Palmerston Substation**  
2210 - Northern Midlands Solar Farm

- Existing Features**
- ▭ Parcels
  - Existing Roads
  - ▭ Dams
  - Watercourse
  - ▣ Palmerston Substation
  - Existing Transmission Line
- Proposed Development**
- ▭ 220 kV Transmission Corridor



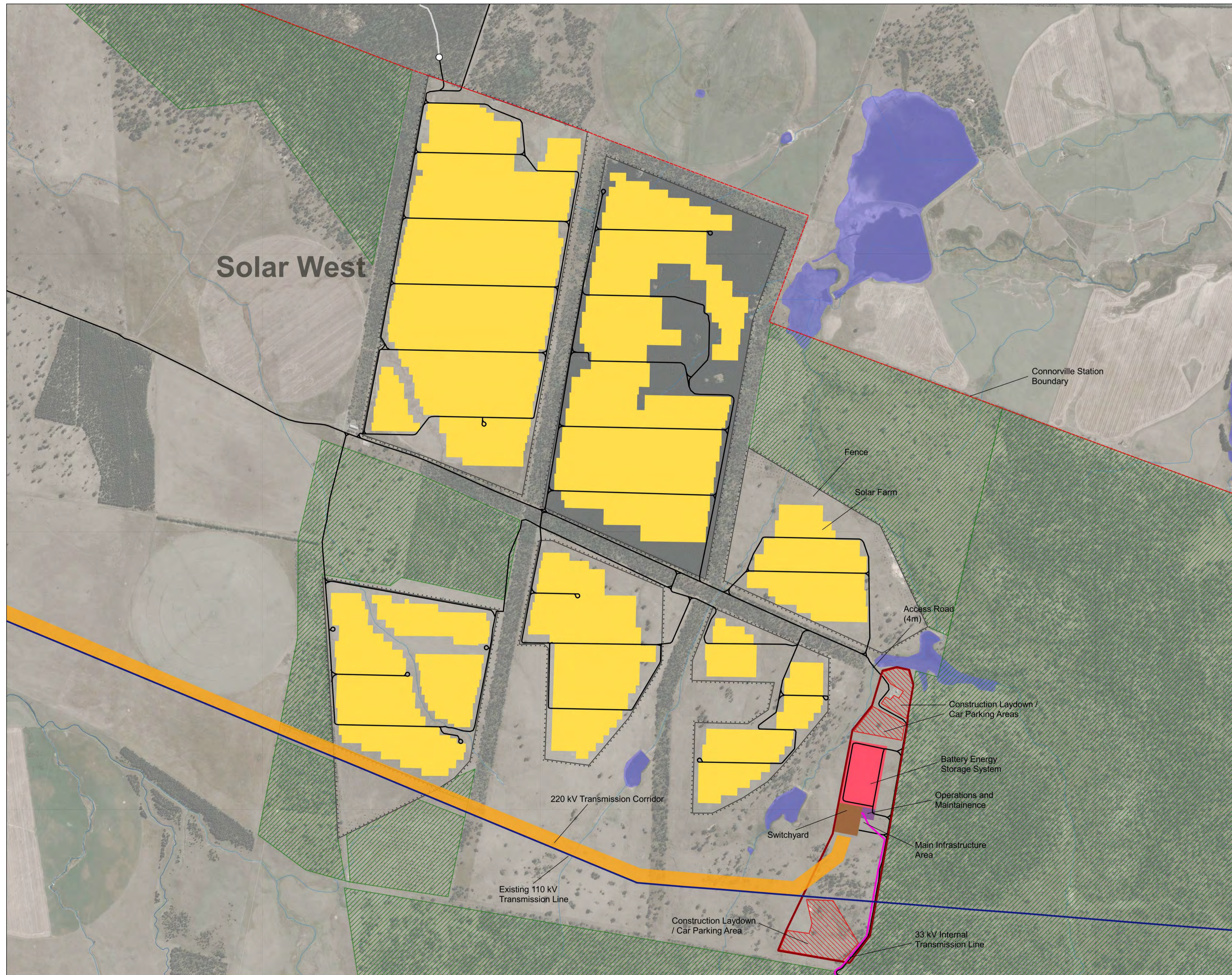
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### Masterplan Page 4 West Area 2210 - Northern Midlands Solar Farm

- Existing Features**
- Parcels
  - Existing Roads
  - Conservation Covenant and Greening Australia Reserves
  - Dams
  - Watercourse
  - 110 kV Existing Transmission Line
- Proposed Development**
- Connorville Station
  - Access Roads
  - Solar Farm
  - Main Infrastructure Area
  - Battery Energy Storage System
  - Operations and Maintenance
  - Switchyard
  - Construction Laydown / Car Parking Area
  - 220 kV Transmission Corridor
  - 33 kV Internal Transmission Line
  - Fence
  - Main Access Points
  - Secondary/Emergency Access Points



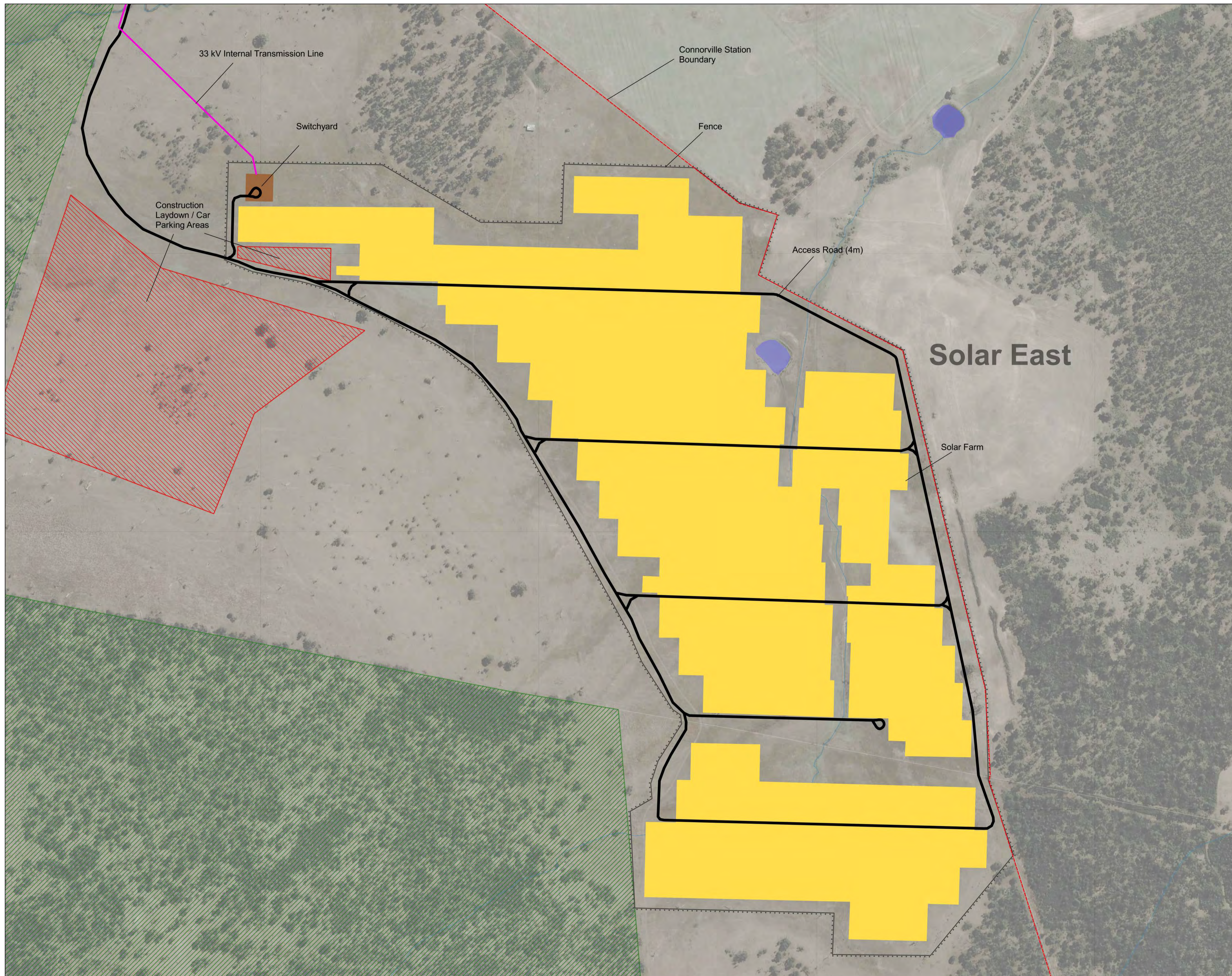
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Masterplan Page 5 East Area

2210 - Northern Midlands Solar Farm

- Existing Features**
- Parcels
  - Existing Roads
  - Conservation Covenant and Greening Australia Reserves
  - Dams
  - Watercourse
- Proposed Development**
- Connorville Station
  - Access Roads
  - Solar Farm
  - Switchyard
  - 33 kV Internal Transmission Line
  - Construction Laydown / Car Parking Area
  - Fence
  - Main Access Points
  - Secondary/Emergency Access Points



Solar East

Solar Farm

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Northern Midlands Solar Farm Project

Historic Heritage Assessment Report

AUTHOR: Stuart Huys  
27 Apsley St, South Hobart TAS 7004

CLIENT: Connorville Estates Pty Ltd

16.5.2023

CULTURAL  
HERITAGE  
MANAGEMENT  
AUSTRALIA

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### Report Version Control

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Draft Report V1	Proponent for Internal Review	5/5/2023
Final Report V2		16/5/2023

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## Executive Summary

### Project Details

Connorville Estates Pty Ltd (Connorville), the proponent, is seeking development approval to establish a solar farm on the Connorville Station property which is at 394 Connorville Rd, Cressy, in the Northern Midlands Region of Tasmania. see Figure 1). The project is known as the Northern Midlands Solar Farm Project (NMSF).

The proposed Northern Midlands Solar Farm will be situated on approximately 543ha of private rural land currently used for cropping and grazing livestock. The development area will be split into Solar West which encompasses approximately 369.2ha and Solar East which encompasses approximately 63.1ha.

The solar farm will be connected to the existing Palmerston Substation by a 220kV double circuit overhead transmission line. The proposed transmission line easement runs adjacent to the existing 110kV line (which does not have the capacity to accommodate this project). The proposed 220kV line is 15.4km in length and the easement is 35m in width (the easement width is narrow as it is proposed to utilise some of the existing 110kV easement). The width of the transmission easement increases as the line approaches Palmerston Substation, to allow for additional infrastructure. It should be noted that three 220kV transmission line route options were explored as part of the planning and technical assessment of the Northern Midlands Solar Farm proposal (Option 1, Option 2.1 and Option 2.2). In addition, there will be an internal 33kV transmission line which connects Solar East and Solar West and runs overhead along an existing access track. The proposed 33kV line is 4.0 km in length and the easement is expected to be 12m in width.

The entire "Development Area" for the project is approximately 543 Ha (This includes all the Proposal elements, i.e. Solar East & Solar West, access tracks, 220kV transmission line, main infrastructure area (including the switchyard, BESS, and O&M compound), construction areas/car parking, and internal 33kV line). Figure 2 shows the study area footprint for the Northern Midlands Solar Farm (NMSF).

CHMA Pty Ltd has been engaged by the proponent to undertake an historic heritage assessment for the proposed Northern Midlands Solar Farm Project (as shown in Figure 2), to identify any potential heritage constraints. This report presents the findings of the historic heritage assessment.

It should be noted that following the completion of the investigations, the proposed development footprint has been amended. Based on the findings of the assessments and advice from Watts Advisory and TasNetworks, Option 1 was selected as the preferred route for the new 220kV transmission line. The footprint for the solar farm was also slightly adjusted. Figure 3 shows the revised project footprint. The historic heritage management recommendations presented in section 8 of this report are based on this revised NMSF Project Footprint.

### Results of the Search of the Heritage Registers

The search of the various historic heritage registers shows that there are two heritage listed properties that are intersected by the NMSF study area footprint. These are the Connorville property and Woodside properties, both of which are listed on the Tasmanian Heritage Register (THR) and are on the Heritage Code of the *Northern Midlands Interim Planning Scheme 2015*. As such, both properties are afforded Statutory protection.

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Table i provides the summary details for these two heritage-listed properties, with Figure i showing the heritage registered boundaries of the properties in relation to the Northern Midlands Solar Farm project footprint.

The listing for the Connorville Station property is based primarily on the heritage values of the buildings. However, the title boundaries of the property are from the heritage listing boundaries. The majority of the Northern Midlands Solar Farm project footprint is located within the heritage-listed boundaries of the Connorville property. This includes the solar farm footprint (the Solar West which encompasses approximately 369.2ha and Solar East which encompasses approximately 63.1ha), and the majority of the proposed transmission line easement.

The Central Plan Register (CPR) for the Woodside property shows that the heritage listed boundaries of the property is restricted to a 2.35ha area that encompasses the main homestead and immediate surrounds. Approximately 1.5km of the transmission line corridor runs through the boundaries of the Woodside property. However, the transmission line corridor is situated over 500m south of the CPR listed boundaries of the Woodside Homestead complex.

**Table i: Summary details for the THR Listed Connorville and Woodside Properties**

Property Name	Address	Register	THR ID
Connorville	394 Macquarie Road, Cressy	THR	5056
Woodside	4740 Poatina Rd Cressy, 7302	THR	5072

### Survey Results and Statement of Archaeological Potential

No historic heritage features were identified during the survey of the Connorville section of the Northern Midlands Solar Farm. It is confirmed that the Northern Midlands Solar Farm footprint avoids any of the buildings on this property, which are the primary basis for the heritage significance of the property and heritage landscape plantings associated with the property. A review of the available information does not indicate that any dwellings or other structures were ever constructed within or in the immediate vicinity of the Northern Midlands Solar Farm footprint and based on the observations made during the survey, the archaeological potential along this section of the Northern Midlands Solar Farm is assessed as being low.

No historic heritage features were identified during the survey of the transmission line corridor that traverses the Woodside property. As noted in section 5 of this report, the transmission line corridor is situated over 500m south of the CPR listed boundaries of the Woodside Homestead complex and avoids all buildings and associated heritage plantings.

Besides the Connorville and Woodside properties described above, no other historic sites or suspected features were identified during the field survey assessment of the Northern Midlands Solar Farm footprint. As described in section 3 of the report, surface visibility across the Northern Midlands Solar Farm footprint was variable, ranging between <10% to 90%. Given these constraints, it can't be stated with absolute certainty that there are no undetected historic heritage sites present in the Northern Midlands Solar Farm footprint. With this acknowledged, the potential for undetected historic sites to be present is assessed as being low.

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### **Management Recommendations**

The heritage management options and recommendations provided in this report are made on the basis of the following criteria.

- Background research into the extant archaeological and historic record for the study area and its surrounding regions, as documented in section 4 of this report.
- The results of the heritage register searches and field investigation as documented in section 5 of this report.
- The results of the field survey assessment, as presented in section 6 of the report.
- The legal and procedural requirements as summarised in section 7 of this report.

#### ***Recommendation 1 (Connorville)***

The majority of the proposed development footprint for the proposed Northern Midlands Solar Farm is located on the Connorville property, which is listed on the Tasmanian Heritage Register (THR ID 5056). Works to or on places included in the THR require approval, either through a Certificate of Exemption for works which will have no or negligible impact, or through a discretionary permit for those works which may impact on the significance of the place.

This assessment has confirmed that the proposed NMSF Project Footprint does not intersect with any of the buildings on this property, which are the primary basis for the heritage significance of the property. The Northern Midlands Solar Farm also avoids all heritage landscape plantings associated with the property. On the basis of the above, it is clear that the impacts on the heritage values of the Connorville property will be negligible. It is therefore advised that a Certificate of Exemption is warranted for these works.

#### ***Recommendation 2 (Woodside)***

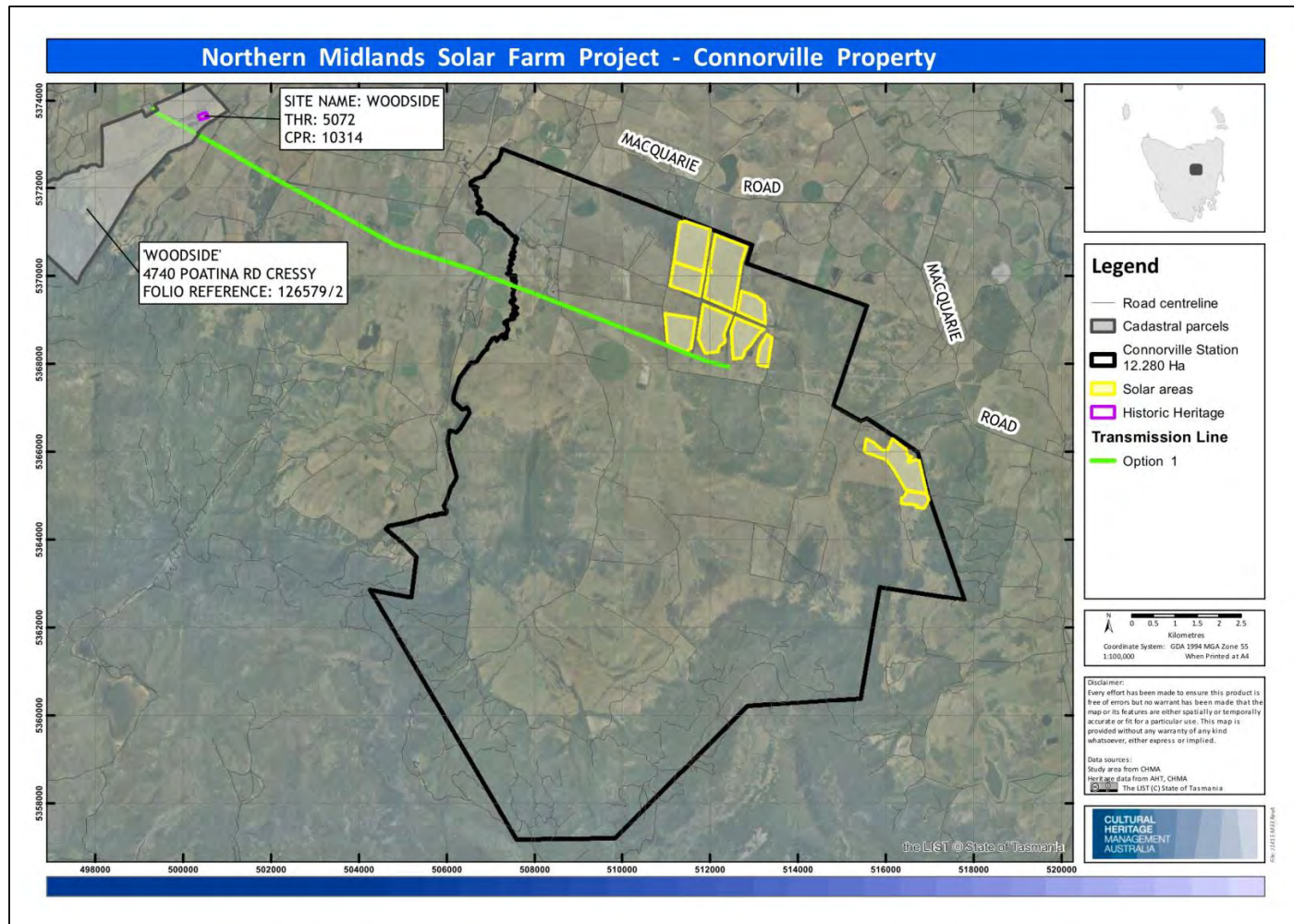
This assessment has confirmed that the proposed transmission line corridor associated with the NMSF project is situated over 500m south of the CPR listed boundaries of the Woodside Homestead complex and avoids all buildings and associated heritage plantings. On this basis it is advised that there are no further project requirements with regards to this property.

#### ***Recommendation 3 (Unanticipated Discoveries of historic features)***

No other historic sites or suspected features were identified during the field survey assessment of the Northern Midlands Solar Farm footprint. As discussed in section 5, the heritage registers search results show that apart from the Connorville and Woodside properties, there are no registered heritage sites or features that are intersected by the Northern Midlands Solar Farm and it is assessed that there is a very low potential for undetected Historic heritage sites to occur within the Northern Midlands Solar Farm project footprint. However, as per Practice Note No 2 by the Tasmanian Heritage Council, processes must be followed should any unexpected archaeological features and/or deposits be revealed during works. An Unanticipated Discovery Plan for the project is presented in Section 9 of this report.



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**Figure i: Aerial image showing the NMSF Project Footprint in relation to the heritage listed boundaries of the Connorville and Woodside properties**

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## 1.0 Project Outline

### 1.1 Project Details

Connorville Estates Pty Ltd (Connorville), the proponent, is seeking development approval to establish a solar farm on the Connorville Station property which is at 394 Connorville Rd, Cressy, in the Northern Midlands Region of Tasmania. see Figure 1). The project is known as the Northern Midlands Solar Farm Project (NMSF).

The proposed Northern Midlands Solar Farm will be situated on approximately 543ha of private rural land currently used for cropping and grazing livestock. The development area will be split into Solar West which encompasses approximately 369.2ha and Solar East which encompasses approximately 63.1ha.

The solar farm will be connected to the existing Palmerston Substation by a 220kV double circuit overhead transmission line. The proposed transmission line easement runs adjacent to the existing 110kV line (which does not have the capacity to accommodate this project). The proposed 220kV line is 15.4km in length and the easement is 35m in width (the easement width is narrow as it is proposed to utilise some of the existing 110kV easement). The width of the transmission easement increases as the line approaches Palmerston Substation, to allow for additional infrastructure. It should be noted that three 220kV transmission line route options were explored as part of the planning and technical assessment of the Northern Midlands Solar Farm proposal (Option 1, Option 2.1 and Option 2.2). In addition, there will be an internal 33kV transmission line which connects Solar East and Solar West and runs overhead along an existing access track. The proposed 33kV line is 4.0 km in length and the easement is expected to be 12m in width.

The entire "Development Area" for the project is approximately 543 Ha (This includes all the Proposal elements, i.e. Solar East & Solar West, access tracks, 220kV transmission line, main infrastructure area (including the switchyard, BESS, and O&M compound), construction areas/car parking, and internal 33kV line). Figure 2 shows the study area footprint for the Northern Midlands Solar Farm (NMSF).

CHMA Pty Ltd has been engaged by the proponent to undertake an historic heritage assessment for the proposed Northern Midlands Solar Farm Project (as shown in Figure 2), to identify any potential heritage constraints. This report presents the findings of the historic heritage assessment.

It should be noted that following the completion of the investigations, the proposed development footprint has been amended. Based on the findings of the assessments and advice from Watts Advisory and TasNetworks, Option 1 was selected as the preferred route for the new 220kV transmission line. The footprint for the solar farm was also slightly adjusted. Figure 3 shows the revised project footprint. The historic heritage management recommendations presented in section 8 of this report are based on this revised NMSF Project Footprint.

### 1.2 Aims of the Investigation

The principal aims of the present heritage assessment are as follows.

- Complete a Historic Heritage Assessment for the Northern Midlands Solar Farm (the study area as shown in Figure 2). The assessment is to be compliant with both State and Commonwealth legislative regimes.
- To determine the extent of previously identified Historic heritage sites within and in the immediate vicinity of the study area.

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- To locate and document Historic heritage sites that may be present within the identified bounds of the study area.
- To assess the archaeological sensitivity values of the study area.
- To assess the scientific and cultural values of identified Historic heritage sites.
- To advise on the management of Historic heritage in line with best practice archaeological guidelines.
- Prepare a report that documents the findings of the Historic heritage assessment.

### **1.3 Project Methodology**

A three-stage project methodology was implemented for this assessment.

#### ***Stage 1 (Pre-Fieldwork Background Work)***

Prior to fieldwork being undertaken, the following tasks were completed by CHMA.

##### *The collation of relevant documentation for the project*

As part of Stage 1, the following research was carried out and background information was collated for this project.

- A review of the relevant heritage registers and the collation of information pertaining to any registered heritage sites located within the general vicinity of the study area.
- Maps of the study area.
- Relevant reports documenting the outcomes of previous heritage studies in the vicinity of the study area.
- Historical literature for the region.
- References to the land use history of the study area.
- GIS Information relating to landscape units present in the study area.
- Geotechnical information for the study area, including soil and geology data.

#### ***Stage 2 (Field Work)***

Stage 2 entailed the fieldwork component of the assessment. The field survey was undertaken by Stuart Huys and Shay Hannah (CHMA archaeologists), Vernon Graham (Senior Aboriginal Heritage Officer) and Kieran Graham (Trainee Aboriginal Heritage Officer), over a period of 6 days (24-11-2022 – 28-11-2022, then a final survey 30-3-2023).

The field team walked a total of 91.9km of survey transects across the proposed Northern Midlands Solar Farm footprint and associated infrastructure, with the average width of each transect being 10m. Each transect was conducted by an archaeologist and AHO in tandem spread 5m apart. As part of the field survey program, additional transects were walked in areas where there was improved surface visibility, to gain a better insight as to the potential presence or absence of historic sites across the study area. Section 3 provides further details as to the survey coverage achieved within the study area.

#### ***Stage 3 (Reporting)***

Stage three of the project involves the production of a Draft and Final Report that includes an analysis of the data obtained from the field survey, an assessment of archaeological sensitivity and management recommendations. The report has been prepared by Stuart Huys and Shay Hannah from CHMA.

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**1.4 Project Limitations**

All archaeological investigations are subject to limitations that may affect the reliability of the results. The main constraint to the present investigation was restricted surface visibility due primarily to vegetation cover. At the time of the field survey, surface visibility within the Solar West and Solar East developments and associated transmission line corridor infrastructure were restricted to an estimated average being 25%. These constraints limited to some extent the effectiveness of the survey assessment. The issue of surface visibility is further discussed in Section 3 of this report.

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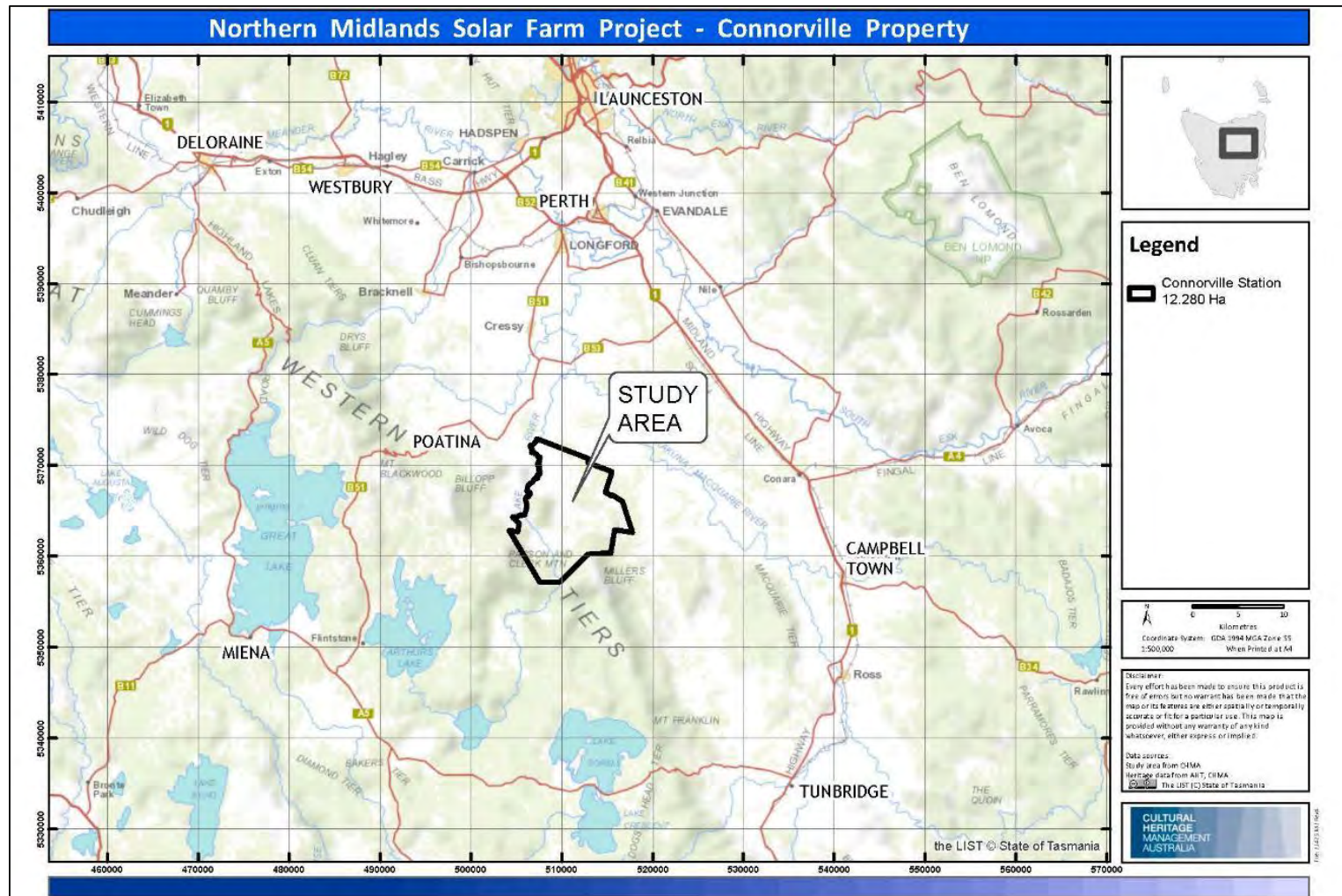


Figure 1: Topographic map showing the general location of the study area at Cressy in the Midlands Region of Tasmania.

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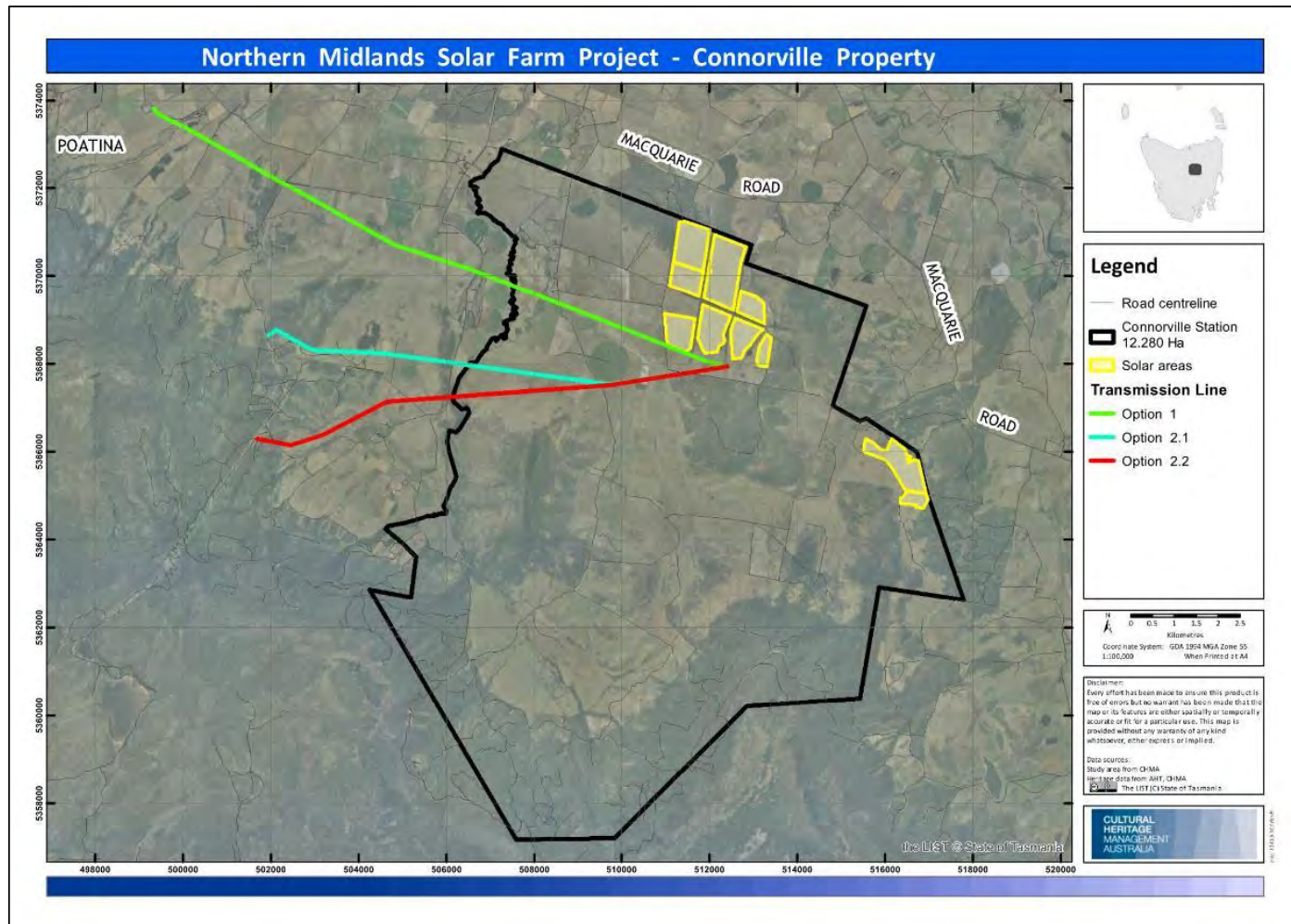


Figure 2: Aerial image showing the NMSF study area footprint.

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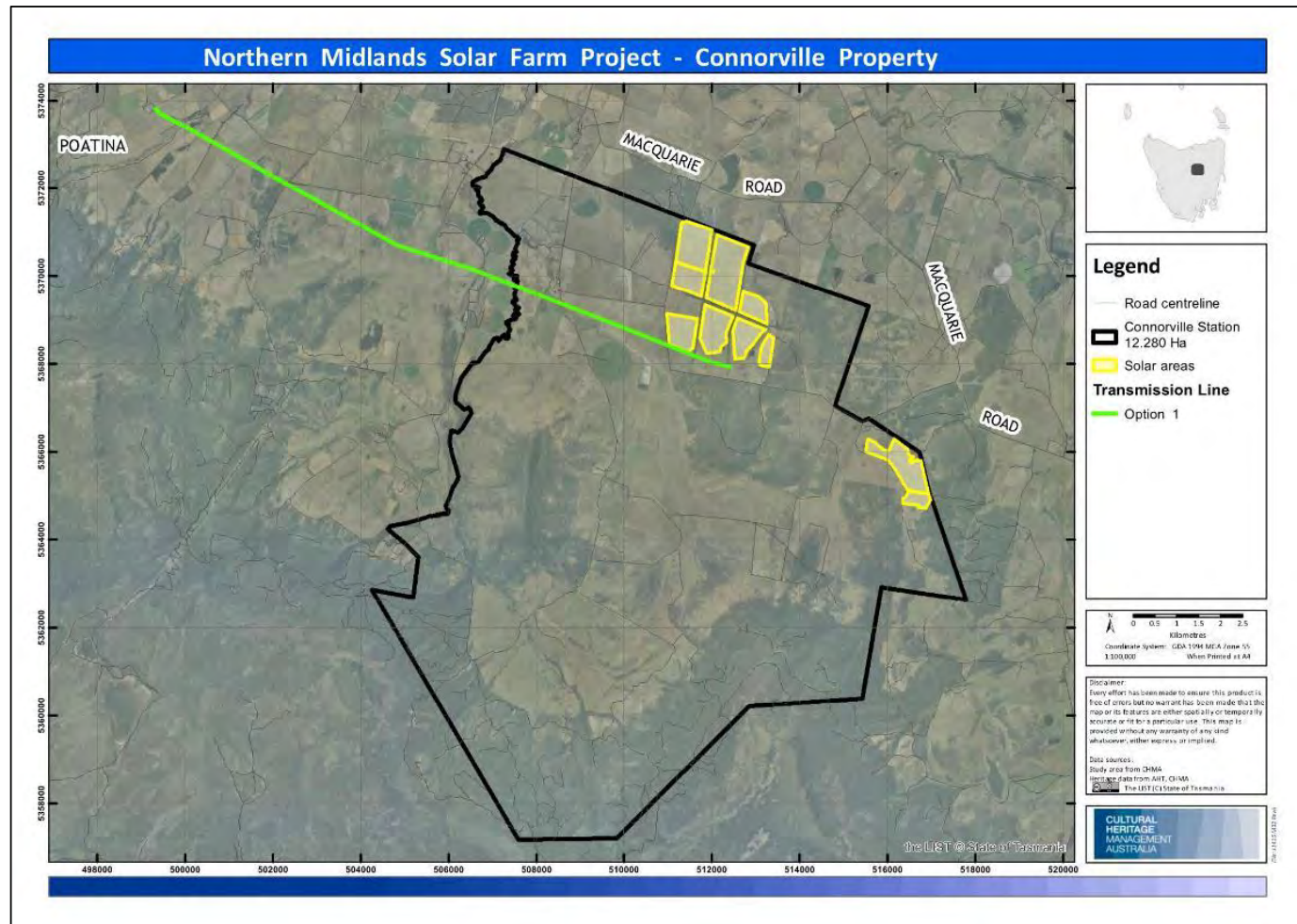


Figure 3: Aerial image showing the revised NMSF Project Development Footprint.

## 2.0 Environmental Setting of the Study Area

The proposed Northern Midlands Solar Farm (the study area) will be situated on approximately 11,1374ha. The landscape within the study area is gentle to moderately undulating pastureland with slopes varying from 5°– 40° and some sections of lowland floodplains surrounding watercourses such as Lake River and Dairy Creek, as well as unnamed watercourses and drainage lines (see Plate 1 and Plate 2). The more gentle slopes occur within the northwest sections of the study area, where gradients ranged between 5°– 15° (see Plate 7). In the southern and western sections of the study area, gradients increased to between 10°– 40° (see Plate 5).

The solar farm will predominately be located on a private property known as Connorville which is set in low-lying land between the Western Tiers and the Macquarie River. This forms the western rim of the northern Tasmanian midlands.

To the south of the study area are the Mitford Hills and Millers Bluff, leading into the rugged slopes of the Western Tiers that mark the western boundary of the midlands. Immediately west of the study area are the slopes of O'Connor's Peak. North of the study area is the Macquarie River valley, with gentle, undulating land extending through to the southern point of the Tamar Valley. To the east are the low, rolling plains of the Macquarie River valley that characterise the Tasmanian midlands.

The underlying geology of the study area is a variable patchwork. The majority of the northern and western sections of the study area are Cenozoic cover sequences consisting of undifferentiated sediments. The eastern and southern sections of the study area feature Cenozoic cover sequences of sand gravel and mud of alluvial, lacustrine and littoral origin. There is also a small section of the Palaeozoic Upper Parmeener Supergroup predominately consisting of quartz sandstone, Mesozoic – Cenozoic dominantly non-marine sequences of gravel, sand, silt, clay and regolith and Jurassic Dolerite (tholeiitic) with locally developed granophyre (List 2023). Soils present within the northern, north-western and western sections consisted primarily of dark red-brown loam soils, in the southern and eastern sections the soils are dark brown sandy loam and patches of light grey-coloured sandy soils (see Plate 9).

Four named watercourses run through the western section of the study area. The largest of these watercourses is Lake River, which starts at Paradise Hill and merges into the Macquarie River. Lake River runs in a southwest-to-northeast direction for approximately 57.9km. This is a semi-permanent watercourse. Woodside Rivulet runs through the western section of the study area and runs in a northeast-to-southwest direction (see Figure 2). Dairy Creek is also situated within the study area and runs in the northeast-to-southwest direction. Both of these watercourses are semi-permanent and tributaries associated with Brumby's Creek which is situated 4.1km northeast of the western boundary of the study area (see Figure 2). Numerous drainage lines and unnamed watercourses are also present throughout the study area (see Plate 1).

The vegetation within the study area primarily consisted of native and introduced grasses such as Prairie Grass (*Bromus catharticus*), Yorkshire Fog (*Holcus lanatus*) and Annual ryegrass (*Lolium rigidum*) (Lane et al. 2015:26–102). Weed species, notably Gorse and Cape Weed are also present throughout the study area (see Plate 2 and Plate 5). Within the study area are stands of eucalypts and native vegetation, notably vegetation corridors that act as paddock borders or vehicle tracks. Bracken Fern (*Pteridium esculentum*), eucalypts, Sagg (*Lomandra longifolia*), Black Wattle trees/saplings (*Acacia mearnsii*) and other native species are present within these vegetation corridors (see Plate 3). In the middle of the



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northern section of the study area is a Radiata Pine (*Pinus radiata*) plantation and in the southwest of the study area are eucalypt plantations (see Plate 9 and Plate 11). Stands of eucalypt reforestation are present within the southern, north-eastern and western sections of the study area. Surrounding the various drainage lines, unnamed and named watercourses are species of vegetation such as native rushes including Austral Rush (*Juncus australis*), Silver Tussock Grass (*Poa labillardierei*), native ground covers and introduced grass species such as Yorkshire Fog (Lane et al. 2015:26–102).

The study area has a cool, wet climate typical of northern Tasmania. Rainfall occurs throughout the year; with a mean annual rainfall of 589mm. Rainfall is highest in August and September (64mm – 71mm) and lower from January to February (28 – 31mm). The warmest months of the year are January and February when mean temperatures range from minimums of 10°C to maximums of about 23°C. Winter tends to be cold with mean annual temperatures in the coldest months of June and July ranging from 1.5°C mean minimum to maximum temperatures of about 11°C (BOM 2020).



Plate 1: View west showing one of the unnamed watercourses within the study area.

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Plate 2: View north showing Vernon Graham (SAHO) surveying a drainage line within the study area.



Plate 3: View northeast showing a vegetation corridor and ungraded access track.

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Plate 4: View west showing Kieran Graham (Trainee Aboriginal Heritage Officer) overlooking an area where the 5°– 40° slopes present within the study area could be observed.



Plate 5: View east showing an ungraded access track overlooking the 40° slopes present within the study area.

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Plate 6: View northwest showing 40° slopes and existing transmission line within the study area.



Plate 7: View northwest showing a graded access track present within the study area.

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Plate 8: View north showing a graded access track present within the study area.



Plate 9: View southeast showing the eucalypt plantation located within the southwest section of the study area.

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Plate 10: View southeast showing the light grey sand present within the study area.



Plate 11: View southeast overlooking the Radiata Pine plantation.

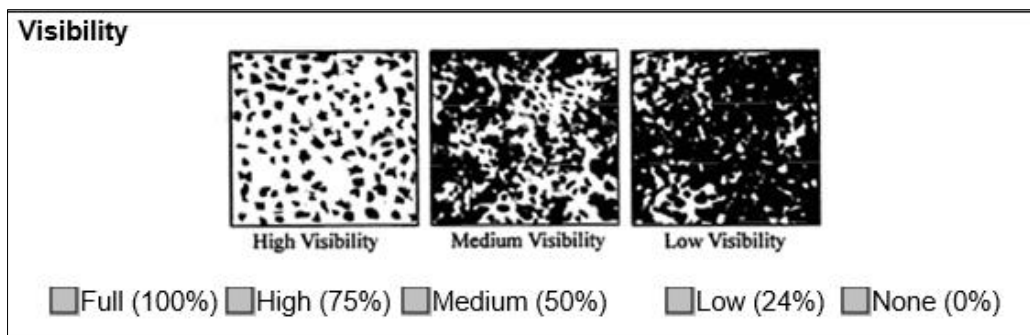
### 3.0 Survey Coverage of the Study Area

#### Survey Coverage and Surface Visibility

Survey coverage refers to the estimated portion of a study area that has been visually inspected during a field survey. Surface visibility refers to the extent to which the actual soils of the ground surface are available for inspection. There are a number of factors that can affect surface visibility, including vegetation cover, surface water and the presence of introduced gravels or materials. Figure 4 provides a useful guide for estimating surface visibility.

The field survey was undertaken by Stuart Huys and Shay Hannah (CHMA archaeologists), Vernon Graham (Senior Aboriginal Heritage Officer) and Kieran Graham (Trainee Aboriginal Heritage Officer), over a period of 6 days (24-11-2022 – 28-11-2022 and then a final survey 30-03-2023). The field team walked a total of 91.9km of survey transects across the proposed Northern Midlands Solar Farm footprint, with the average width of each transect being 10m. Table 1 provides the total transects walked for each section and Figure 5 shows the alignment of the survey transects walked by the field team.

The survey transects were predominately focussed on the Northern Midlands Solar Farm footprint, including the associated transmission line corridors and access tracks. As part of the field survey program, additional transects were walked in areas where there was improved surface visibility, to gain a better insight as to the potential presence or absence of Aboriginal sites across the study area. Surface visibility across the study area was variable, ranging between <10% to 90%, averaging at 25% which is in the low range. Improved surface visibility was found within erosion scalds which ranged from 50% and 100%, averaging at 70%. Vegetation cover was the main impediment to visibility.



**Figure 4: Guidelines for the estimation of surface visibility.**

#### Effective Coverage

Variations in both survey coverage and surface visibility have a direct bearing on the ability of a field team to detect Aboriginal heritage sites, particularly site types such as isolated artefacts and artefact scatters (which are the site types most likely to occur in the study area). The combination of survey coverage and surface visibility is referred to as effective survey coverage. Table 1 presents the estimated effective survey coverage achieved during the course of the survey assessment. The effective coverage is estimated to have been around 231,337.5m<sup>2</sup>. This level of effective coverage is assessed as being adequate for the purposes of identifying historic sites that may be present across the study area.

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**Table 1: Effective Survey Coverage achieved across the surveyed areas.**

Area Surveyed	Survey Transects	Estimated Surface Visibility	Effective Survey Coverage
Northern Midlands Solar Farm	19400m x 10m= 194,000m <sup>2</sup>	25%	48,500m <sup>2</sup>
Transmission Lines	34405m x 10m= 344,050m <sup>2</sup>	25%	86,012.5m <sup>2</sup>
Access Tracks	38730m x 10m= 387,300m <sup>2</sup>	25%	96,825m <sup>2</sup>
<b>Total</b>	<b>925,350m<sup>2</sup></b>		<b>231,337.5m<sup>2</sup></b>



Plate 12: View northeast showing surface visibility at <10% due to native vegetation cover.



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Plate 13: View northwest showing the average surface visibility of an access track within the study area.



Plate 14: View north showing surface visibility at <10% within the Northern Midlands Solar Farm study area.

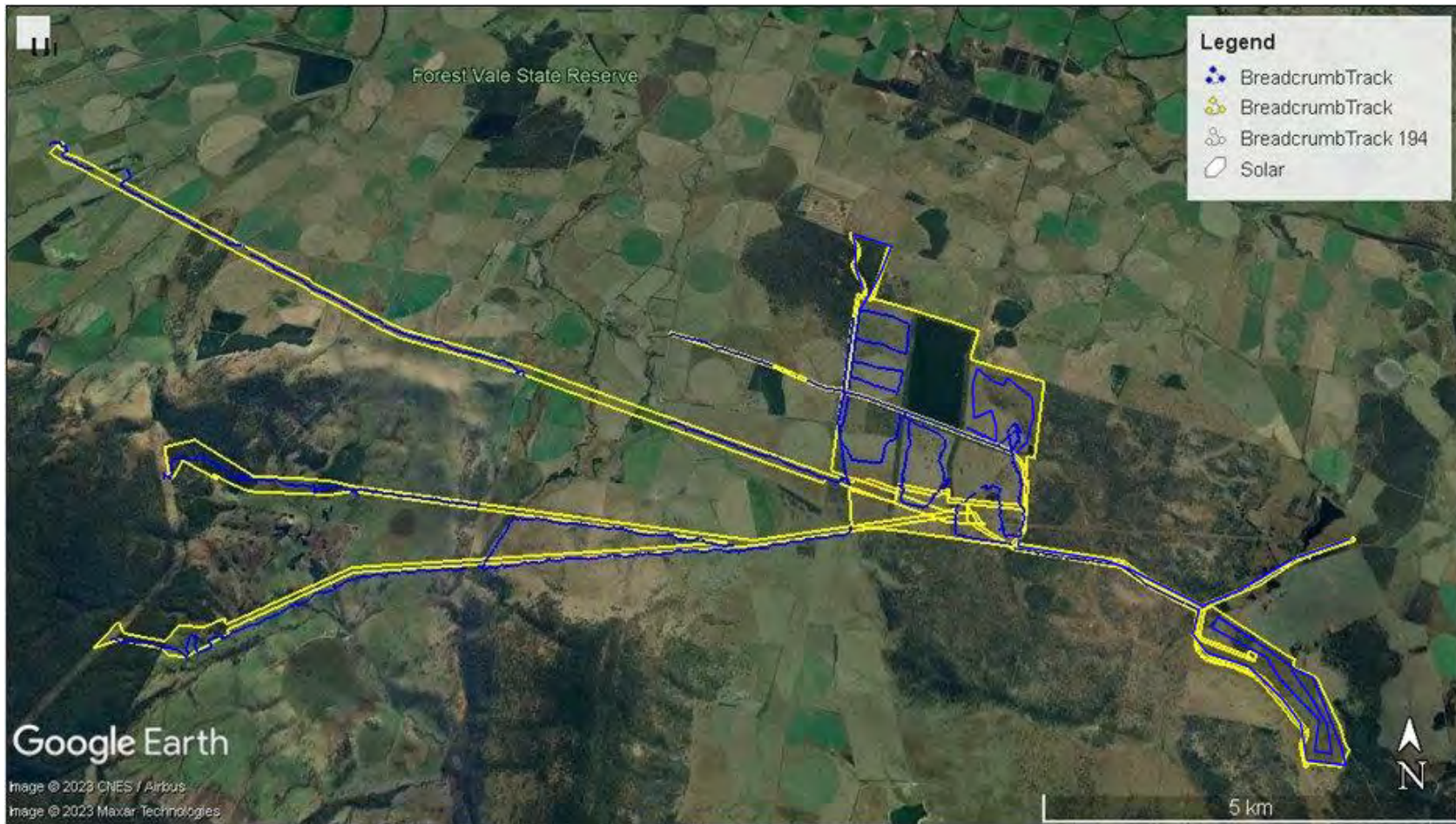
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Plate 15: View southeast showing an erosion scald within the study area where surface visibility is increased to 100%.

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**Figure 5: Aerial image showing survey transects (shown in blue) walked by the field team across the study area (shown in yellow).**

## 4.0 Historic Background

### 4.1 Midlands Settlement and Establishment of Highway

The establishment of a land route between Hobart and Launceston—the major settlements in the north and south of colonial Tasmania; established in 1804 and 1806, respectively—began to be explored soon after they were established. In 1807, an expedition from Launceston by Lieutenant Thomas Laycock had identified the possibility of a land route between the north and south, which led to Surveyor General, Charles Grimes, being sent to formally investigate the potential to create a permanent land route (AT 2014a, p. 17-18).

In 1810, Governor Macquarie was interested in developing the overland route to maintain communication between Hobart and Launceston. In 1820, Major Thomas Bell was tasked with turning the rough traveller's track between the south and the north into a formed road. The route, known as Bell's Line, started at Old Beach (Hobart), and reached St Peter's Pass in 1824; it was the first attempt to build a surveyed and formed road between Hobart town and Launceston (AT 2014a, p. 17-18).

However, there were issues with Bell's Line, especially in that it went over major hills and took a difficult route through St Peter's Pass, and an alternative was recommended by the Land Commissioners in 1826. This alternative route became known as the Main Line of road, which was rapidly established and formalised. Additional corrections to the Main Line alignment continued to be made into the 1840s (AT 2014a, p. 17-18).

The contemporary Midland Highway continues to follow the same Main Line of road alignment established by the 1840s. The Main Line of the road provided an important overland connection between the two settlements and facilitated the spread of European settlement through the Midlands.

### 4.2 The Establishment of Cressy

The town of Cressy and its surrounds was developed by the New South Wales and Van Diemen's Land Establishment, also known as the Cressy Company, formed in London in 1825. The partnership was initiated by Bartholomew Thomas and a 20,000-acre grant was given in the Cressy district, to run grazing enterprises and agricultural farms (Heazlewood 2006; Harman 2006). Thomas named the company after the Battle of Crecy that took place in the 14<sup>th</sup> century (Our Tasmania 2023). In 1833, the Cressy Company faced bankruptcy but was saved by the new manager James Toosey (Heazlewood 2006). Before the foundation of the town, the Cressy district was the centre of a large wheat-growing area within Van Diemen's Land (Harman 2006).

In 1848 the Cressy township was established, however, the first building in the town was the Cressy Hotel built by William Brumby in 1845 (Our Tasmania 2023). Much of the land within the Cressy district was owned by the O'Connor family, founded by the Irish migrant Roderic O'Connor (Our Tasmania 2023). The Cressy Company would be sold in 1855 by James Toosey, with the original land grant being divided into 52 farms and auctioned off (Heazlewood 2006). By 1887 the town of Cressy was a flourishing agricultural town. In 1937 the Cressy Research and Development Station, and was operated by the Department of

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Primary Industries Water and Environment (Harman 2006). The Cressy–Longford Irrigation Scheme, developed in the early 1970s, provided farmers with the opportunity to diversify their agricultural pursuits, which saw wheat crops largely disappear with wool growing, cattle and crops such as poppies and vegetables now adding to the rural economy (Harman 2006).

Present-day Cressy is still a thriving agricultural town, however, tourism also makes up a significant portion of the town's economy with it being a trout fishing paradise being the gateway to waterways such as Macquarie, Lake and Liffey Rivers, Brumby's Creek and the Weirs, all top spots that attract anglers from around the world (Northern Midlands 2023; Our Tasmania 2023).



**Figure 6: A typical Cressy property, drawn in 1855 by Emily Bowring (AOT, PH30/1/2183) (Heazlewood 2006).**

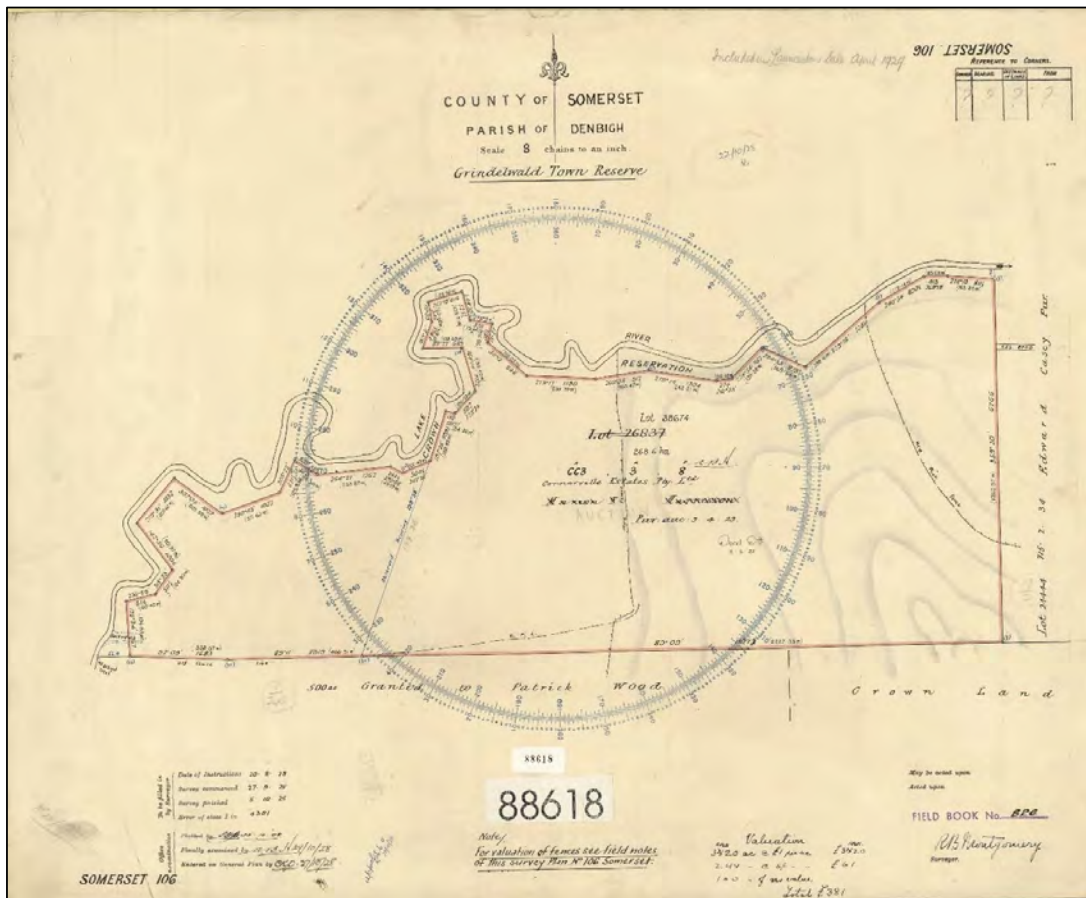
#### 4.3 Connorville

The Connorville property was established by Roderic O'Connor, who emigrated to Van Diemen's Land from Ireland in 1824 with his two sons. O'Connor came from a wealthy family of landowners and when in Van Diemen's Land received a free 1000-acre land grant on the Lake River, which he would increase to 11 properties and 65,000 acres (Alexander 2006). O'Connor used his experiences from working on his father's land and practical engineering to construct weirs, farm buildings and bridges within his properties (Eldershaw 2006). Lt. Governor Sir George Arthur would choose O'Connor to be the third Commissioner of Survey and Valuation in 1826, a position held until 1828 (Eldershaw 2006). Later O'Connor would be made Inspector of Roads and Bridges which put him in charge of convict labour that would see the construction of large projects including the Bridgewater Bridge (Alexander 2006). He would also be active within the Legislative Council for two terms 1844–48 and 1852–53 (Alexander 2006). Roderic O'Connor died in 1860, leaving the property to his son Arthur.

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Connorville would be a productive farming property throughout the nineteenth century and the site of significant colonial society activity, most notably an annual race meeting that was hosted on the property (Launceston Examiner Thursday 13 March 1873:5). The main house on the property would be rebuilt in 1924 (THRA 2022). In 1954 the Connorville property would play host to Queen Elizabeth II and the Duke of Edinburgh, who stayed a night (Examiner Friday 19 February 1954:19).

The Connorville property has remained within the O'Connor family. Today, the property is best known for producing superfine Merino wool and being an active participant in the Tasmania Island Ark Project, aiming to protect and regenerate native environments (Woolmark 2023).



**Figure 7: A map from 1928 showing the boundaries of Connorville Estates Pty Ltd (Tasmanian Archive and Heritage Office AF396/1/1052).**

## 5.0 Heritage Database Searches

A search was carried out of a number of historic registers and databases in order to determine the extent of historic sites and features in the vicinity of the Northern Midlands Solar Farm study area. Agency databases searched included:

- Australian National Heritage List (NHL);
- Australian Commonwealth Heritage List (CHL);
- The Australian Heritage Database (AHD);
- Tasmanian Heritage Register (THR);
- Australian Heritage Places Inventory (AHPI);
- The National Trust (NT).

The search of the various historic heritage registers shows that there are two heritage listed properties that are intersected by the NMSF study area footprint. These are the Connorville property and Woodside properties, both of which are listed on the Tasmanian Heritage Register (THR) and are on the Heritage Code of the *Northern Midlands Interim Planning Scheme 2015*. As such, both properties are afforded Statutory protection. Table 2 provides the summary details for these two heritage-listed properties, with Figure 8 showing the heritage registered boundaries of the properties in relation to the Northern Midlands Solar Farm project footprint.

### **Connorville**

The listing for the Connorville Station property is based primarily on the heritage values of the buildings. However, the title boundaries of the property are from the heritage listing boundaries. Connorville was originally owned by Roderic O'Connor, a wealthy landowner and practical engineer who emigrated from Ireland. The house, mill, outbuildings and garden were constructed in the period between 1824–1842. The house would be rebuilt in 1924 but the outbuildings remain. It is still owned by the O'Connor family. The setting of the house in the landscape and the relationship to the outbuildings is important.

The majority of the Northern Midlands Solar Farm project footprint is located within the heritage-listed boundaries of the Connorville property. This includes the solar farm footprint (the Solar West which encompasses approximately 369.2ha and Solar East which encompasses approximately 63.1ha), and the majority of the proposed transmission line easement.

### **Woodside**

The Central Plan Register (CPR) for the Woodside property shows that the heritage listed boundaries of the property is restricted to a 2.35ha area that encompasses the main homestead and immediate surrounds. Approximately 1.5km of the transmission line corridor runs through the boundaries of the Woodside property. However, the transmission line corridor is situated over 500m south of the CPR listed boundaries of the Woodside Homestead complex.

**Table 2: Summary details for the THR Listed Connorville and Woodside Properties**

Property Name	Address	Register	THR ID
Connorville	394 Macquarie Road, Cressy	THR	5056
Woodside	4740 Poatina Rd Cressy, 7302	THR	5072

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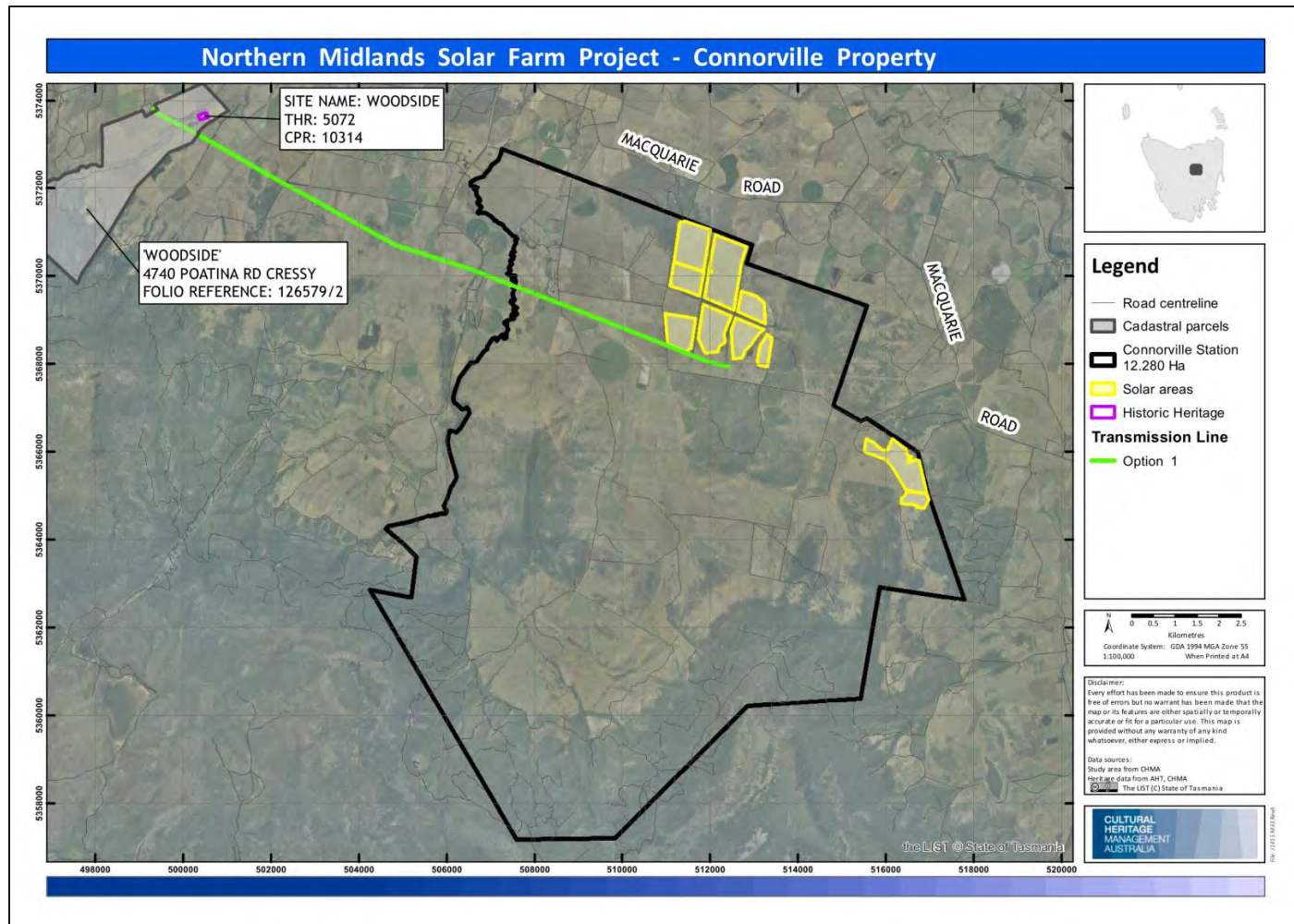


Figure 8: Aerial image showing the NMSF Project Footprint in relation to the heritage listed boundaries of the Connorville and Woodside properties



## **6.0 Survey Results, Statement of Heritage Impacts and Statement of Archaeological Potential**

A survey inspection of the Connorville section of the Northern Midlands Solar Farm was carried out over a period of 6 days (24-11-2022 – 28-11-2022 and then a final survey 30-03-2023) by Shay Hannah (CHMA archaeologist), Vernon Graham (Senior Aboriginal Heritage Officer) and Kieran Graham (Trainee Aboriginal Heritage Officer).

No historic heritage features were identified during the survey of the Connorville section of the Northern Midlands Solar Farm. It is confirmed that the Northern Midlands Solar Farm footprint avoids any of the buildings on this property, which are the primary basis for the heritage significance of the property and heritage landscape plantings associated with the property. A review of the available information does not indicate that any dwellings or other structures were ever constructed within or in the immediate vicinity of the Northern Midlands Solar Farm footprint and based on the observations made during the survey, the archaeological potential along this section of the Northern Midlands Solar Farm is assessed as being low.

No historic heritage features were identified during the survey of the transmission line corridor that traverses the Woodside property. As noted in section 5 of this report, the transmission line corridor is situated over 500m south of the CPR listed boundaries of the Woodside Homestead complex and avoids all buildings and associated heritage plantings.

Besides the Connorville and Woodside properties described above, no other historic sites or suspected features were identified during the field survey assessment of the Northern Midlands Solar Farm footprint. As described in section 3 of the report, surface visibility across the Northern Midlands Solar Farm footprint was variable, ranging between <10% to 90%. Given these constraints, it can't be stated with absolute certainty that there are no undetected historic heritage sites present in the Northern Midlands Solar Farm footprint. With this acknowledged, the potential for undetected historic sites to be present is assessed as being low.

## 7.0 Statutory Controls and Legislative Requirements

The following provides a summary overview of the various legislative instruments and statutory requirements relating to historic heritage in Tasmania. The review is presented in order to provide the proponent with a basic understanding of the statutory frameworks and procedures relating to heritage in Tasmania.

### 7.1 National Conventions

#### *Council of Australian Governments Agreement 1997*

In 1997, COAG reached an agreement on Commonwealth, State and local government roles and responsibilities for heritage management. Local government, through the Australian Local Government Association, and the Tasmanian Government were both signatories to this Agreement. The Agreement resulted in the following outcomes:

- Acceptance of a tiered model of heritage management, with the definition of places as being of either, world, national, state or of local heritage significance;
- Nominations of Australian places for the World Heritage List and management of Australia's obligations under the World Heritage Convention would be carried out by the Commonwealth Government;
- A new National Heritage System on one was created in January 2004, comprising the Australian Heritage Council (AHC), National Heritage List (NHL) and Commonwealth Heritage List (CHL);
- The Commonwealth Government, through the Australian Heritage Council, would be responsible for listing, protecting and managing heritage places of national significance;
- State and Territory Governments would be responsible for listing, protecting and managing heritage places of state significance; and
- Local government would be responsible for listing, protecting and managing heritage places of local significance.

#### *Environment Protection and Heritage Council of the Australian and State/Territory Governments 1998*

In 1998, the National Heritage Convention proposed a set of common criteria to be used in order to better assess, understand and manage the heritage values of places.

The Environment Protection and Heritage Council of the Australian and State/Territory Governments adopted this as a national set of desirable common criteria (known as the HERCON criteria). The adoption of these criteria by Heritage Tasmania has not yet been formalised. These criteria are also based on the Burra Charter values. The Common Criteria (HERCON Criteria) adopted in April 2008 are summarised below:

- a) *Importance to the course or pattern of our cultural or natural history.*
- b) *Possession of uncommon, rare or endangered aspects of our cultural or natural history.*
- c) *Potential to yield information that will contribute to an understanding of our cultural or natural history.*
- d) *Importance in demonstrating the principal characteristics of a class of cultural or natural places or environments.*
- e) *Importance in exhibiting particular aesthetic characteristics*

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- f) *Importance in demonstrating a high degree of creative or technical achievement at a particular period.*
- g) *Strong or special association with a particular community or cultural group for social, cultural or spiritual reasons. This includes the significance of a place to Indigenous peoples as part of their continuing and developing cultural traditions.*
- h) *Special association with the life or works of a person, or group of persons, of importance in our history.*

These criteria have been endorsed by the Heritage Chairs and Officials of Australia and New Zealand (HCOANZ) in the Supporting Local Government Project document, "Protecting Local Heritage Places: A National Guide for Local Government and Communities" (March 2009).

*Burra Charter 1999*

Australia ICOMOS (International Council on Monuments and Sites) is the peak body of professionals working in heritage conservation in Australia. The Burra Charter was adopted by Australia ICOMOS in 1979 in Burra, South Australia based on other international conventions. Further revisions were adopted in 1981, 1988 and 1999 to ensure the Charter continues to reflect best practice in heritage and conservation management. The current version of the Australia ICOMOS Burra Charter 1999 is the only version that should be used.

The Burra Charter provides guidance for the conservation and management of places of cultural significance (cultural heritage places) and is based on the knowledge and experience of Australian ICOMOS members. The Charter sets a standard of practice for those who provide advice, make decisions about, or undertake works to places of cultural significance, including owners, managers and custodians.

The Charter recognises the need to involve people in the decision-making process, particularly those that have strong associations with a place. It also advocates a cautious approach to changing heritage places: do as much as necessary to care for the place and to make it useable, but otherwise change it as little as possible so that its cultural significance is retained.

## **7.2 Commonwealth Legislation**

*Environment Protection and Biodiversity Conservation Act 1999*

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) provides for the listing of natural, historic or indigenous places that are of outstanding national heritage value to the Australian nation as well as heritage places on Commonwealth lands and waters under Australian Government control.

Once a heritage place is listed under the EPBC Act, special requirements come into force to ensure that the values of the place will be protected and conserved for future generations.

The following heritage lists are established through the EPBC Act:

- *National Heritage List* - a list of places of natural, historic and indigenous places that are of outstanding national heritage value to the Australian nation
- *Commonwealth Heritage List* - a list of natural, historic and indigenous places of significance owned or controlled by the Australian Government.

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- *List of Overseas Places of Historic Significance to Australia* – this list recognises symbolically sites of outstanding historic significance to Australia but not under Australian jurisdiction.

*Australian Heritage Council Act 2003*

The Australian Heritage Council is a body of heritage experts that has replaced the Australian Heritage Commission as the Australian Government's independent expert advisory body on heritage matters when the new Commonwealth Heritage System was introduced in 2004 under amendments to the Environment Protection and Biodiversity and Conservation Act 1999.

The Council plays a key role in assessment, advice and policy formulation and support of major heritage programs. Its main responsibilities are to assess and nominate places for the National Heritage List and the Commonwealth Heritage List, promote the identification, assessment, conservation and monitoring of heritage; and advise the Minister on various heritage matters.

*Protection of Movable Cultural Heritage Act 1986*

The PMCH Act regulates the export of cultural heritage objects from Australia. The purpose of the Act is to protect, for the benefit of the nation, objects which if exported would significantly diminish Australia's cultural heritage. Some Australian protected objects of Aboriginal, military heritage and historical significance cannot be granted a permit for export. Other Australian-protected objects may be exported provided a permit or certificate has been obtained.

**7.3 State Legislation**

*Land Use Planning and Approvals Act 1993*

This Act (LUPA) is the cornerstone of the State Resource Management and Planning System (RMPS). It establishes the legitimacy of local planning schemes and regulates land use planning and development across Tasmania. With regard to historic heritage, LUPAA requires that planning authorities will work to conserve those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest, or otherwise of special cultural value" [Schedule 1 Part 2(g)].

*Resource Planning and Development Commission Act 1997*

The Resource Planning and Development Commission (now referred to as the Tasmanian Planning Commission) is responsible for overseeing Tasmania's planning system, approving planning schemes and amendments to schemes and assessing Projects of State Significance. In terms of heritage management, the TPC will consider the establishment of heritage overlays, precincts or areas as part of the creation of planning schemes.

*Resource Management and Planning Appeal Tribunal Act 1993*

The Resource Management and Planning Appeal Tribunal determine planning appeals and enforce the Acts within the RMPS. The Tribunal plays an important role in the management of heritage places through its determinations on proposed development on, or near to, places of heritage significance.

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*Historic Cultural Heritage Act 1995*

The *Historic Cultural Heritage Act 1995* (HCH Act) is the key piece of Tasmanian legislation for the identification, assessment and management of historic cultural heritage places. The stated purpose of the HCH Act is to promote the identification, assessment, protection and conservation of places having historic cultural heritage significance and to establish the Tasmanian Heritage Council". The HCH Act also includes the requirements to:

- establish and maintain the Tasmanian Heritage Register (THR);
- provide for a system for a system of approvals for work on places on the Register;
- provide for Heritage Agreements and assistance to property owners;
- provide for protection of shipwrecks;
- provide for control mechanisms and penalties for breaches of the Act.

Under the HCH Act, "conservation" in relation to a place is defined as

- the retention of the historic cultural heritage significance of the place; and
- any maintenance, preservation, restoration, reconstruction and adaption of the place.

The definition of "place" under the HCH Act includes:

- a site, precinct or parcel of land;
- any building or part of a building;
- any shipwreck;
- any item in or on, or historically or physically associated or connected with, a site precinct or parcel of land where the primary importance of the item derives in part from its association with that site, precinct or parcel of land; and
- any equipment, furniture, fittings, and articles in or on, or historically or physically associated or connected with any building or item.

The Act created the Tasmanian Heritage Council (THC), which came into existence in 1997 and operates within the State RMPS. The THC is a statutory body, separate from government, which is responsible for the administration of the HCH Act and the establishment of the Tasmanian Heritage Register (THR), which lists all places assessed as having heritage values of state significance. The THC also assesses works that may affect the heritage significance of places and provides advice to state and local governments on heritage matters. The primary task of the THC is as a resource management and planning body, which is focused on heritage conservation issues. Any development on heritage-listed places requires the approval of the THC before works can commence.

Heritage Tasmania (HT), which is part of the Department of Primary Industry, Parks, Water and the Environment, also plays a key role in fulfilling statutory responsibilities under the HCH Act.

HT has three core roles:

- coordinating historic heritage strategy and activity for the State Government;
- supporting the Tasmanian Heritage Council to implement the HCH Act; and
- facilitating the development of the historic heritage register.

In 2013, *Historic Cultural Heritage Act 1995* was amended, with the primary goal of streamlining the approvals process and better align the Heritage Act with the Planning Act. Under the Amendment applicants need only lodge a single Development Application (DA)

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(as opposed to both a Works Application and DA), which will be referred to the Heritage Council by the local planning authority. Heritage Council then has the opportunity to advise the planning authority whether or not it has an interest in the DA and may request further information under s57 of the LUPAA. If the Heritage Council does not have an interest in the DA, it reverts to the status it has under the Scheme or Planning Act. Where Heritage Council does have an interest in the DA, the Council decision must be incorporated into the final permit (or refusal) issued by the local planning authority.

Also included in the amendments is the incorporation of the HERCON significance criteria for assessing the significance of heritage sites. The Heritage Council may enter a place in the Heritage Register if it satisfied that the place has historic cultural heritage significance by meeting threshold values for one or more of eight individual criteria. Aesthetic characteristics of a place now forms the eighth criterion against which heritage significance may be assessed.

Works to places included in the THR require approval, either through a Certificate of Exemption for works which will have no or negligible impact, or through a discretionary permit for those works which may impact on the significance of the place.

Discretionary permit applications are lodged with the relevant local planning authority. On receipt, the application is sent to the Heritage Council, which will firstly decide whether they have an interest in determining the application. If the Heritage Council has no interest in the matter, the local planning authority will determine the application.

If the Heritage Council has an interest in determining the application, a number of matters may be relevant to its decision. This includes the likely impact of the works on the significance of the place; any representations; and any regulations and works guidelines issued under the HCH Act. The Heritage Council may also consult with the planning authority when making a decision. In making a decision, the Heritage Council will exercise one of three options: consent to the discretionary permit being granted; consent to the discretionary permit being granted subject to certain conditions; or advise the planning authority that the discretionary permit should be refused. The Heritage Council's decision is then forwarded to the planning authority, which will incorporate the decision into any planning permit

#### *Works Guidelines for Historic Heritage Places*

The Tasmanian Heritage Council and Heritage Tasmania have issued Works Guidelines for Historic Heritage Places. The guidelines provide a general reference for the types of works, which may be exempt, or those where a permit will be required. They also define appropriate outcomes for a range of different works and development scenarios. Although specifically designed for places included in the THR, the guidelines provide useful advice for the management of heritage places generally.

#### **7.4 Local Planning Schemes**

The *Tasmanian Planning Scheme* came into effect on 22 July 2020, and replaces the former *Northern Midlands Interim Planning Scheme 2015*. The *Tasmanian Planning Scheme* provides a single planning scheme and a consistent set of rules and requirements

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in relation to the manner in which all land in Tasmania may be used, developed, protected and conserved. It consists of two parts:

1. **State Planning Provisions** contain the mandatory common rules that are to apply in all municipal areas. For consistency in permit and compliance requirements that must be met by a proposed use or development.
2. **Local Provision Schedule** for each municipal area setting out how the State Planning Provisions are to apply.

The planning scheme supports strategic land use planning for residential, business, agriculture, utilities, environmental and recreational zones. The scheme includes considerations such as natural hazards, local heritage values, natural assets, parking requirements and the protection of road, railway and electricity infrastructure.

Section C6 of the *Tasmanian Planning Scheme* deals specifically with the Local Heritage Code. The stated purpose of the code is to recognise and protect the local historic heritage significance of local places, precincts, landscapes and areas of archaeological potential and significant trees by regulating development that may impact on their values, features and characteristics.

This code applies to:

(a) development on land within any of the following, as defined in this code:

- (i) a local heritage place;
- (ii) a local heritage precinct;
- (iii) a local historic landscape precinct; and
- (iv) for excavation only, a place or precinct of archaeological potential; and

(b) the lopping, pruning, removal or destruction of a significant tree as defined in this code.

If a site is listed as a local heritage place and also within a local heritage precinct or local historic landscape precinct, it is only necessary to demonstrate compliance with the standards for the local heritage place unless demolition, buildings and works are proposed for an area of the site outside the identified specific extent of the local heritage place.

This code does not apply to a registered place entered on the Tasmanian Heritage Register (THR). As noted, the Connorville and Woodside properties are both listed on the THR, so the code is not applicable.

## 8.0 Heritage Management Plan

The heritage management options and recommendations provided in this report are made on the basis of the following criteria.

- Background research into the extant archaeological and historic record for the study area and its surrounding regions, as documented in section 4 of this report.
- The results of the heritage register searches and field investigation as documented in section 5 of this report.
- The results of the field survey assessment, as presented in section 6 of the report.
- The legal and procedural requirements as summarised in section 7 of this report.

### ***Recommendation 1 (Connorville)***

The majority of the proposed development footprint for the proposed Northern Midlands Solar Farm is located on the Connorville property, which is listed on the Tasmanian Heritage Register (THR ID 5056). Works to or on places included in the THR require approval, either through a Certificate of Exemption for works which will have no or negligible impact, or through a discretionary permit for those works which may impact on the significance of the place.

This assessment has confirmed that the proposed NMSF Project Footprint does not intersect with any of the buildings on this property, which are the primary basis for the heritage significance of the property. The Northern Midlands Solar Farm also avoids all heritage landscape plantings associated with the property. On the basis of the above, it is clear that the impacts on the heritage values of the Connorville property will be negligible. It is therefore advised that a Certificate of Exemption is warranted for these works.

### ***Recommendation 2 (Woodside)***

This assessment has confirmed that the proposed transmission line corridor associated with the NMSF project is situated over 500m south of the CPR listed boundaries of the Woodside Homestead complex and avoids all buildings and associated heritage plantings. On this basis it is advised that there are no further project requirements with regards to this property.

### ***Recommendation 3 (Unanticipated Discoveries of historic features)***

No other historic sites or suspected features were identified during the field survey assessment of the Northern Midlands Solar Farm footprint. As discussed in section 5, the heritage registers search results show that apart from the Connorville and Woodside properties, there are no registered heritage sites or features that are intersected by the Northern Midlands Solar Farm and it is assessed that there is a very low potential for undetected Historic heritage sites to occur within the Northern Midlands Solar Farm project footprint. However, as per Practice Note No 2 by the Tasmanian Heritage Council, processes must be followed should any unexpected archaeological features and/or deposits be revealed during works. An Unanticipated Discovery Plan for the project is presented in Section 9 of this report.



## 9.0 Unanticipated Discovery Plan

The following text describes the proposed method for dealing with unanticipated discoveries of heritage features or objects during the proposed Northern Midlands Solar Farm works. The plan provides guidance to project personnel so that they may meet their obligations with respect to heritage legislation. Please Note: There are two different processes presented for the mitigation of these unanticipated discoveries. The first process applies to the discovery of all cultural heritage objects or features, with the exception of skeletal remains (burials). The second process applies exclusively to the discovery of skeletal remains (burials).

### Discovery of Heritage Objects or Features

#### *Step 1*

If any person believes that they have discovered or uncovered a heritage object or feature, the individual should notify any machinery operators that are working in the general vicinity of the area that earth disturbance works should stop immediately.

#### *Step 2*

A buffer protection zone of 5m x 5m should be established around the suspected heritage find. No unauthorised entry or earth disturbance will be allowed within this 'archaeological zone' until such time as the suspected heritage find has been assessed, and appropriate mitigation measures have been carried out.

#### *Step 3*

A qualified heritage consultant should be engaged to assess the suspected heritage find. As a first step in the process, the heritage consultant should contact Heritage Tasmania, the Heritage Council and the Local Council and notify them of the find. The heritage consultant will ensure that Heritage Tasmania, the Heritage Council and the Local Council are consulted throughout the assessment process.

#### *Step 4*

If the heritage find is a movable object, then the find should be recorded, photographed and a decision should be made as to whether the object should be re-located to a designated Keeping Place. If the find is an unmovable heritage object or feature, then the find should be recorded and photographed and a HIA and HMP developed for the feature. This should be then submitted to Heritage Tasmania, the Heritage Council and the Local Council for review and advice.

Possible outcomes may necessitate:

- a. An amendment to the design of the development
- b. Carrying out of archaeological excavations prior to the re-commencement of works
- c. Archaeological monitoring and recording during works
- d. Preparation (and implementation) of a strategy to ensure communication of the new information to the community.
- e. A combination of the above.

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**Discovery of Skeletal Material**

Step 1:

Call the Police immediately. Under no circumstances should the suspected skeletal material be touched or disturbed. The area should be managed as a crime scene. It is a criminal offence to interfere with a crime scene.

Step 2:

Any person who believes they have uncovered skeletal material should notify all employees or contractors working in the immediate area that all earth disturbance works cease immediately.

Step 3:

A temporary 'no-go' or buffer zone of at least 50m x 50m should be implemented to protect the suspected skeletal material, where practicable. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected skeletal remains have been assessed by the Police and/or Coroner.

Step 4:

If it is suspected that the skeletal material is Aboriginal, Aboriginal Heritage Tasmania should be notified.

Step 5:

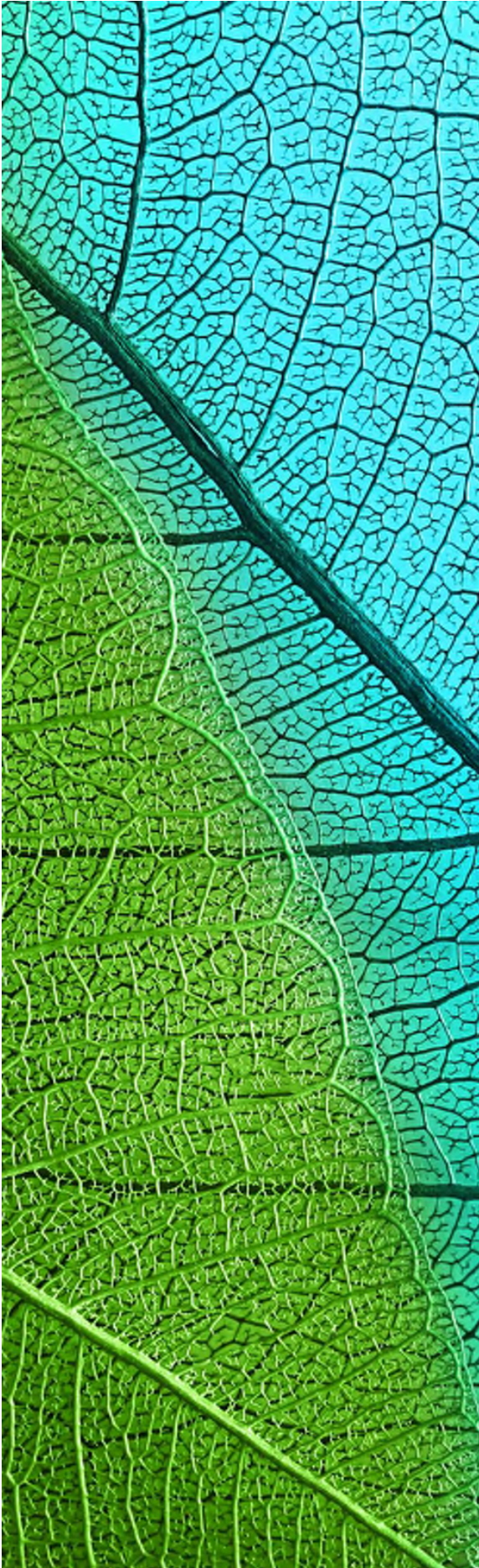
Should the skeletal material be determined to be Aboriginal, the Coroner will contact the Aboriginal organisation approved by the Attorney-General, as per the *Coroners Act 1995*.

Northern Midlands Solar Farm Cressy, Historic Heritage Assessment Report  
Northern Tasmania CHMA 2023

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# Northern Midlands Solar Farm, Tasmania

## Flora and Fauna Assessment

Prepared for  
Connorville Estates Pty Ltd  
c/- Robert Luxmoore Pty Ltd

May 2023  
Report No. 22239.01 (1.5)



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## 1. Executive summary

Nature Advisory Pty Ltd undertook a flora and fauna assessment of approximately 1,900 hectare area of land in the Northern Midlands Council Area, located near Connorville Road, south of Cressy. A solar farm and battery energy storage system with an associated transmission line is proposed within the study area. The development area comprising all components of the project will be 543 hectares.

This investigation was commissioned to provide information on the extent and quality of native vegetation and fauna habitat within the study area of the proposed Northern Midlands solar farm, battery infrastructure area and associated transmission line. This assessment was conducted through a combined desktop analysis and field survey approach, in which vegetation and habitat was broadly mapped, and the potential for listed flora and fauna species as well as ecological communities was assessed.

The area assessed (herein referred to as the 'study area') included two polygons to the east of Connorville Road, connected by an access road, and three 220kV transmission line options extending west as well as a 33kV internal transmission connection. The study area was made up of agricultural land, native vegetation, and a recently cleared pine plantation.

### *Native vegetation*

Much of the study area within the proposed solar farm site had been cleared of trees in the past to support pasture for grazing of livestock. These cleared areas were generally considered to be of low quality native or non-native vegetation, with a low potential to support listed flora and fauna species. Areas of native vegetation were generally found along the habitat corridors between paddocks, and along the proposed access roads, and considered to be of 'moderate' 'high', or 'very high' quality, and provide 'moderate' or 'high' fauna habitat. These areas had a higher potential to support listed flora and fauna species compared to the agricultural land.

Three transmission line options were investigated. The northern option mostly comprised cleared land or vegetation of low quality whereas the two southern options would run through some patches of moderate to high habitat quality.

### *Listed flora species*

This combined desktop evaluation and field survey indicated potential suitable habitat for 31 listed flora species occurred in the study area. The listed species that are likely to occur or have potential to occur are listed in Tables 1 and 2.

Potential habitat for most of these species occurs within higher quality shelter belts and treed reserves around the properties and in adjacent woodland/forest habitat of the access track between the eastern and western properties of the proposed solar farm.

Some listed wetland flora species could potentially occur within lower lying areas of the central properties, drainage lines, small ponds and higher quality riparian habitat along Lake River within option 2.1 and 2.2 of the transmission line.

It is recommended to avoid habitat mapped as moderate, high and very high quality in Figure 2, where possible.

### *Listed fauna species*

The combined desktop evaluation and field survey indicated potential suitable habitat for 13 listed or migratory fauna species occurred in the study area. During the field survey, two fauna species

listed under the Environment Protection and Biodiversity Conservation Act (EPBC Act), Wedge-tailed Eagle and Tasmanian Devil, and one species listed under the Threatened Species Act 1995 (TSP Act), White-bellied Sea-Eagle, were recorded in the study area. The listed and migratory species that are likely to occur or have potential to occur are listed in Table 2.

#### *Ecological communities*

Two vegetation communities listed under the Nature Conservation Act were found within the study area. These were *Eucalyptus amygdalina* forest and woodland on sandstone and *Eucalyptus amygdalina* inland forest and woodland on cainozoic deposits.

Much of the site was mapped by TASVEG (4.0) as native vegetation, in the form of sclerophyll woodland, dry forest, grassy woodland, and grassland. This vegetation varied in quality from very low to very high. The majority of lower quality vegetation occurred on the agricultural land. The higher quality vegetation was generally in the vegetation corridors, or along access roads.

Fauna habitat was also mapped and assigned a measure of quality, varying from low to high. The habitat corridors between paddocks were generally assigned a higher quality than the agricultural paddocks.

#### *Conclusion and Recommendations*

Three transmission line options and the infrastructure study area were assessed. Transmission line option 1 had the least interaction with higher quality vegetation and fauna habitat. Infrastructure should be placed within areas of no mapped native vegetation or low quality habitat (see Figure 3 and Figure 4). As demonstrated in the masterplan, the solar farm layout is proposed to be built on predominantly low quality agricultural land, leaving the native vegetation corridors intact. Furthermore, the proposal seeks to utilise existing access tracks or tracks through farmland where possible to avoid impacts on treed shelterbelts or woodland areas. This approach would result in the proposal having the least impact on native vegetation and listed matters.

Targeted surveys for threatened flora species and ecological communities would be required if any higher quality flora habitat especially within wooded areas or wetland areas is proposed to be impacted.

An EPBC Act Referral would only be required if EPBC Act listed flora species or ecological communities were found to be present within impacted areas during further surveys and if a significant impact to these values is expected. The current layout aims to avoid any suitable habitat for EPBC Act listed values through further surveys and micro-siting of access tracks and solar farm elements, in which case an EPBC Referral would not be required.



## 2. Introduction

Connorville Estates Pty Ltd engaged Nature Advisory Pty Ltd to undertake a flora and fauna assessment for the proposed Northern Midlands Solar Farm. The specific area investigated, herein referred to as the 'study area', comprised around 1,900 hectares of predominantly private land in the Northern Midlands of Tasmania approximately 20 kilometres south of Cressy, including three transmission line options to the west between eight and ten kilometers in length. Proposed works are the development of a solar farm and battery energy storage system and a 220kV transmission line and 33kV internal transmission connection (see Figure 1) and will comprise 543 hectares of development area.

This investigation was commissioned to provide information on the potential extent and condition of native vegetation, fauna habitat, and specifically suitable habitat and the likelihood of occurrence of listed flora and fauna species listed under the state *Threatened Species Protection Act 1995* (TSP Act) and *Nature Conservation Act 2002* (NC Act), and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This report screens the site for flora and fauna species and ecological communities listed under these Acts and discusses the implications of this for project planning and assessment. The assessment was based on a desktop evaluation of available information on the flora, fauna habitat and ecological communities of the study area and its surrounds, followed up by a field assessment to ground truth the actual or potential occurrence of these matters.

Specifically, the scope of this investigation included the following components:

- A review of existing information regarding the flora, fauna and native vegetation of the study area and surrounds, including the following:
  - *Natural Values Atlas* administered by the Department of Natural Resources and Environment Tasmania; and
  - The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) *Protected Matters Search Tool*.
- A site survey involving the following:
  - High level characterisation and mapping of native vegetation in the study area, identifying areas as native, potentially native or non-native vegetation;
  - High level assessment of the nature and quality of native fauna habitat, identifying areas of high, moderate and low ecological value for fauna; and
  - Assessment of the likelihood of occurrence of listed flora, fauna and communities in the study area.

This investigation was undertaken by a team from Nature Advisory comprising Carter Carvalho (Technical officer), Jaslyn Allnutt (Zoologist), Dean Karopoulos (Botanist), and Inga Kulik (Senior Ecologist, Project Manager / Director).



## 3. Planning and legislative considerations

This investigation and report address the application on the site of relevant legislation and planning policies that protect biodiversity. Local, state and Commonwealth controls are summarised below.

### 3.1. Local planning provisions

The study area is located within the Northern Midlands local government area and is zoned Agricultural Zone in the Northern Midlands Planning Scheme 2022.

Local planning provisions apply under the *Land Use Planning and Approvals Act 1993*.

#### 3.1.1. Local Planning Policies

Any proposed use or development within the Northern Midlands local government area requires a permit to be granted in accordance with the *Land Use Planning and Approvals Act 1993* and the provisions of the Northern Midlands Planning Scheme 2022.

Under the *Northern Midlands Planning Scheme 2022*, the council may require any application for a permit to include a site plan which shows vegetation types and distribution including any known threatened species, and trees and vegetation to be removed.

#### 3.1.2. Codes

The Northern Midlands Planning Scheme 2022 specifies codes which identify areas or planning issues requiring compliance with additional provisions set out in the codes. Land to which these codes apply is identified through the use of overlays on the local government area map.

The study area is subject to seven overlays in the Northern Midlands Planning Scheme. Below outlines each overlay and where they fall within the study area:

- Local Historical Heritage Code (Code 6) – transmission line options 1, 2.1 and 2.2
- Bushfire-prone areas (Code 13) – entire area
- Natural Assets Code (Code 7) – around all waterways
- Flood-prone areas (Code 12) – along certain rivers and creeks
- Scenic protection area (Code 8) – transmission line options 2.1 and 2.2 only
- Landslip hazard (Code 15) – around areas of potential ‘high’, ‘medium’ or ‘low’ landslip
- Electricity transmission infrastructure protection (Code 4) - along the existing 110kV transmission line connecting the study area to the Palmerston Substation

### 3.2. State planning provisions

State planning provisions are established under the *Land Use Planning and Approvals Act 1993*.

These planning provisions came into effect in 2017 as part of the Tasmanian Planning Scheme, but have no practical effect until a Local Provisions Schedule is developed and implemented for a municipal area.

The Northern Midlands council has implemented a Local Provisions Schedule under the Tasmanian Planning Scheme on 9<sup>th</sup> November 2022, and as such the state planning provisions have effect in this municipality.

### 3.3. EPBC Act

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects a number of threatened species and ecological communities that are considered to be of national conservation significance. Any significant impacts to these species require the approval of the Australian Minister for the Environment.

If there is a possibility of a significant impact on nationally threatened species, communities or listed migratory species, a Referral under the EPBC Act should be considered. The Minister will decide whether the project will be a ‘controlled action’ under the EPBC Act after 20 business days, in which case the project can only be undertaken with the approval of the Minister. This approval depends on a further assessment and approval process (lasting between three and nine months, depending on the level of assessment).

Implications under the EPBC Act for the current proposal are discussed in Section 7.1.

### 3.4. TSP Act

The Tasmanian *Threatened Species Protection Act 1995* (TSP Act) lists threatened species in Tasmania (Department of National Resources and Environment 2022). A permit is required under this act to knowingly take, keep, trade, or process any specimen of a listed species. To ‘take’ under the TSP involves killing, injuring, catching, damaging, destroying, or collecting a specimen.

A permit is not required for the following:

- A person may take, keep or process, without a permit, a specimen of a listed taxon of flora in a domestic garden.
- A person acting in accordance with a certified forest practices plan or a public authority management agreement may take, without a permit, a specimen of a listed taxon of flora or fauna, unless the Secretary, by notice in writing, requires the person to obtain a permit.
- A person undertaking dam works in accordance with a Division 3 permit issued under the Water Management Act 1999 may take, without a permit, a specimen of a listed taxon of flora or fauna.

Implications under the TSP Act for the current proposal are discussed in Section 7.2.

### 3.5. NC Act

Schedule 3A of the Tasmanian *Nature Conservation Act 2002* lists native vegetation communities which are threatened in Tasmania. Controls may apply to the removal of these threatened communities.

The occurrence of vegetation communities listed under the NC Act is discussed in Section 5.6.

### 3.6. Forest Practices Act

The Tasmanian *Forest Practices Act 1985* provides a code of practice for all forest practices conducted in Tasmania. Under the act, a forest practices plan must be developed and certified prior to clearing of land and other forestry practices. This includes the clearing of native vegetation.

Specifically, a certified forest practices plan is required to authorise the following:

- a) The establishment of forests;
- b) The harvesting of timber;
- c) The clearing of trees;

- d) The clearance and conversion of a threatened native vegetation community;
- e) The construction of a road in connection with activities a), b) or c); or
- f) The operation of a quarry in connection with activities a), b) or c).

#### *Exemptions*

The Tasmanian *Forest Practices Regulations 2017* are established under the *Forest Practices Act 1985*, and describe circumstances in which a forest practices plan is not required.

Exemptions listed in the regulations which may apply to the study area include the following:

- The harvesting of timber or the clearing of trees, with the consent of the owner of the land, if the land is not vulnerable land, and:
  - The volume of timber harvested or trees cleared is less than 100 tonnes for each area of applicable land per year; or
  - The total area of land on which the harvesting or clearing occurs is less than one hectare for each area of applicable land per year;

whichever is the lesser.

- The harvesting of timber or the clearing of trees, or the clearance and conversion of a threatened native vegetation community, with the consent of the owner of the land, carried out in accordance with:
  - A conservation covenant of a kind that the Authority has approved in writing for the purposes of this paragraph; or
  - A vegetation management agreement of a kind that the Authority has approved in writing for the purposes of this paragraph.

## 4. Existing information and methods

### 4.1. Existing information

Existing information used for this investigation is described below.

#### 4.1.1. Existing reporting and documentation

The existing documentation below, relating to the study area, was reviewed.

- Northern Midlands Planning Scheme 2022.

#### 4.1.2. Native vegetation

Vegetation mapping administered by TASVEG was reviewed to determine the type of native vegetation likely to occur in the study area and surrounds.

Sources included the following:

- *Natural Values Atlas* (Department of Natural Resources and Environment 2022).

#### 4.1.3. Listed matters

Existing flora and fauna species records and information regarding the potential occurrence of listed matters were obtained from an area termed the 'search region', defined here as an area with a radius of 10 kilometres from the approximate centre point of the study area footprint (including the transmission line options).

A list of the flora and fauna species recorded in the search region was obtained from the *Natural Values Atlas* (NVAA), a database administered by DPIPW. E.

The online EPBC Act *Protected Matters Search Tool* (DAWE 2022a) was consulted to determine whether nationally listed species or communities potentially occurred in the search region based on habitat modelling.

### 4.2. Field methods

The field assessment was conducted from 10<sup>th</sup> to 12<sup>th</sup> October 2022. Prior to the field assessment, aerial photography (Nearmap 2020) and TASVEG 4.0 modelled native vegetation extent mapping (DPIPWE 2020b) was reviewed in order to attempt to gain a general understanding of the extent and types of native vegetation that could be expected to occur within the study area. During this assessment, the study area was surveyed by vehicle and areas supporting high quality native vegetation or fauna habitat were inspected in more detail on foot.

Areas which were difficult to access (due to factors such as patch size and absence of vehicle tracks) were surveyed with binoculars from the closest suitable vantage point. Sites in the study area found to support native vegetation or with potential to support listed matters were mapped through a combination of aerial photograph interpretation and ground-truthing using a hand-held GPS (accurate to approximately five metres). Species and ecological communities listed as threatened under the EPBC Act or TSP Act were also mapped using the same method.

#### 4.2.1. Native vegetation

The quality of native vegetation was assessed by making general observations of floral diversity, health of canopy trees, presence of suitable life-forms and connectivity to other habitat. Quality was assigned as:

- Very High quality: Native vegetation with high diversity and most life forms present. Known/likely to support multiple listed matters.
- High quality: Native vegetation with high diversity and most life forms present. Likely to support some listed matters.
- Medium quality: Predominantly native vegetation with some patches of non-native vegetation. Potential to support some listed matters.
- Low quality: Predominantly non-native vegetation with some patches of native vegetation. Unlikely to support listed matters.
- Very low quality: Scattered trees and incidental occurrences of native species only. Does not support listed matters.

#### 4.2.2. *Flora species and habitats*

Records of flora species were made. Species protected under the TSP Act were determined by crosschecking against the TSP Act List of Threatened Species (DPIPWE 2021).

The potential for habitats to support listed flora species was assessed based on the following criteria:

- The presence of suitable habitat for flora species such as soil type, floristic associations and landscape context; and
- The level of disturbance of suitable habitats by anthropogenic disturbances and invasions by pest plants and animals.

Wherever appropriate, a precautionary approach was adopted in determining the likelihood of occurrence or flora listed under the EPBC Act and/or TSP Act. That is, where insufficient evidence was available regarding the potential occurrence of a listed species, the assumption was made that this could be in an area of suitable habitat.

#### 4.2.3. *Fauna species and habitats*

The techniques below were used to detect fauna species using the study area.

- Incidental searches for mammal scats, tracks and signs (e.g. diggings, signs of feeding and nests/burrows).
- Daytime bird observations.
- General searches for reptiles and frogs, including identification of frog calls in seasonally wet areas.

The quality of fauna habitat was assessed by the presence of habitat components and connectivity to other habitat. Habitat components include old-growth trees, layers of vegetation present in the habitat, fallen timber, leaf litter and surface rocks. Habitat connectivity (i.e. degree of isolation/fragmentation), including linkages to other habitats in the region, was determined from field observations and recent aerial photography. Using these factors, habitat quality was assigned as:

- High: the majority of fauna habitat components are present and habitat linkages to other remnant ecosystems in the landscape are intact.
- Moderate: the majority of fauna habitat components are present but habitat linkages to other remnant ecosystems in the landscape are absent; or the majority of habitat

components are absent but habitat linkages to other remnant ecosystems in the landscape are intact.

- Low: the majority of fauna habitat components are absent and habitat linkages to other remnant ecosystems in the landscape are absent.

Wherever appropriate, a precautionary approach was adopted in determining the likelihood of occurrence or fauna listed under the EPBC Act and TSP Act. That is, where insufficient evidence was available regarding the potential occurrence of a listed species, the assumption was made that this could be in an area of suitable habitat.

#### 4.2.4. *Threatened ecological communities*

The likelihood of listed threatened ecological communities occurring in the study area was determined by checking general field observations against published descriptions of relevant listed ecological communities modelled to potentially occur in the study area.

Reviewed ecological community descriptions comprised identification criteria and condition thresholds from listing advice for EPBC Act communities and NC Act-listed community descriptions (TNVC 2020).

#### 4.3. *Limitations of field assessment*

The overview field assessment was conducted during mid-spring, when annual or seasonally emergent flora species are present, and many plant species are actively growing and flowering. Therefore, this timing was deemed appropriate for identifying broad native vegetation extents, and the potential for these areas to support listed matters. However, some flora species and lifeforms may have been undetectable at this time, or lacked identifying features such as flowers or fruit.

Likewise, spring was considered an appropriate time to identify fauna presence. Many species become more active during this time, breeding commences, and important habitat features are observable. This makes it an ideal season to assess the quality and extent of fauna habitat, and record which fauna are present within the study area.

Given this was an overview, the assessment did not capture all potential habitat components supporting listed species, and vegetation extents and quality was mapped at a coarse resolution. For example, there may have been additional old-growth trees supporting breeding activity for birds, which were not marked during the survey, or small pockets of high quality native vegetation that were missed.

The review of existing information combined with the field survey was considered appropriate to address the purpose of this investigation, broadly mapping the extent of native vegetation, and assigning a high-level rating of quality for both the fauna and flora it may support. This information is useful in understanding the biodiversity constraints of the proposed solar farm.

These limitations were not considered to compromise the validity of the current investigation that was designed to address the relevant policies and decision guidelines.



## 5. Assessment results

### 5.1. Site description

The study area for this investigation including the transmission line corridors (Figure 2) constituted approximately 1,900 hectares of private land located at Connorville Road, near Cressy, Tasmania. The proposed solar farm occupies approximately 543 hectares.

#### Geology

The study area supported sedimentary and igneous geology on an undulating landscape. The majority of the solar farm site as well as the lowland areas of the transmission line corridors supported Quaternary sedimentary deposits consisting of Cenozoic sandstones, sand gravels, and several small emergent areas of ironstone gravels. This transitioned into Triassic-Jurassic geology mainly in the form of dolerite in the low rises of the southern edge of the central properties as well as to the northeast of these properties and the adjacent conservation areas. Low rises along the transmission line corridors as well as the foothills of the Western Tiers also supported this Triassic-Jurassic geology. No major rivers flowed through the core of the study area, however, all three transmission line options have been proposed to cross Lake River.

#### Vegetation

The solar farm site supports agricultural land, pine plantations, corridors of native vegetation, and some man-made waterbodies. Native vegetation has largely been cleared to form paddocks now used for sheep and cattle grazing in the central properties, with only scattered trees and small patches of low quality native vegetation in the form of derived grassland left remaining. Clearing has also occurred in one of the northern properties to support pine silviculture.

A number of grazed properties supported large amounts of remnant native vegetation in moderate-high condition, with areas along the creekline bisecting the northeastern property being dominated by native grassland and *Eucalyptus amygdalina* woodland. Remnant native vegetation predominantly occurs in corridors throughout the solar farm site and in adjoining conservation areas. These areas of native vegetation were dominated by *Eucalyptus amygdalina* woodland or forest, with *Bursaria* – *Acacia* woodland and Lowland Grassland Complex occurring in pockets in the southeast of the solar farm site and throughout the conservation areas. These corridors have evidence of logging (tree stumps with clean cuts), resulting in woodlands and forest habitats with trees sparser than what might exist without human disturbance, but are otherwise largely of high or very high quality, supporting a large diversity of native flora species including disturbance-sensitive species such as orchids and generally having low levels of intrusion from weeds.

Native vegetation of moderate-high quality comprising the above vegetation types also occurred along the transmission line routes, typically restricted to low rises along transmission line options 2.1 and 2.2. *Eucalyptus viminalis* grassy woodland also occurred along Lake River. However, the majority of land along all the transmission line routes was primarily used for grazing and crops, supporting only scattered trees and small patches of low quality native vegetation in the form of derived grassland, particularly along transmission line option 1. Areas of native vegetation throughout the study area were mapped to similar extents as those mapped on the TASVEG 4.0 data accessed through LISTmap, although several pockets of grassland or grassy woodland which were not mapped were recorded, especially in the central properties.

There are five small, man-made dams on-site, and several more on the site boundaries or along the edge of access roads. Permanent or seasonal streams connect some of these dams. The east

and west areas of the site are connected by an access road cutting through the conservation covenant, which supports a large area of treed native vegetation. The areas adjacent to the site appear to be very similar mosaics of native vegetation and farmland.

#### *Fauna habitat*

Fauna habitat within the study area comprised remnant native treed areas, native grassland, farm dam and small creek habitats, eucalypt plantations and agricultural land. Native-treed habitats predominantly occurred along the edges of paddocks, in small strips acting as corridors through the site. These often contained a variety of habitat features such as organic litter, fallen trees, ground-cover vegetation, shrubs, and trees of diverse ages and heights, with some supporting hollows. The quality of native treed habitat was moderate – high. This compared to the agricultural land which was generally assigned low quality, as it provided little or no habitat features for fauna.

The site is well connected to large areas of high quality habitat and is directly adjacent to a 2100-hectare Conservation Covenant. The site has high connectivity to the Great Western Tiers Conservation Area, which covers almost 23000 hectares, and is situated only seven kilometres to the south and west. There are fewer important habitats on the northern side of the site, however a patchwork of smaller conservation areas does exist in amongst the farmland.

The main habitat features facilitating connectivity to and from the site are scattered trees, slim vegetation corridors, and a wide, continuous wooded link to the Great Western Tiers Conservation Area.

The study area is situated in the Northern Midlands IBRA Bioregion, in the Brumbys – Lake catchment, and the Northern Midlands local government area.

## 5.2. Native vegetation

### 5.2.1. Patches of native vegetation

The Natural Values Atlas (Department of Natural Resources and Environment Tasmania 2022) models eight native vegetation communities which were found to occur within the study area. These are:

#### **Non eucalypt forest and woodland:**

- *Bursaria – Acacia* woodland (NBA)

This community was observed to occur in pockets along the access track between the two parts of the study area. It was largely dominated by Black Wattle (*Acacia mearnsii*) and Silver Wattle (*Acacia dealbata*) with occasional occurrences of Sweet Bursaria (*Bursaria spinosa*) with a diverse understory of native graminoids and herbs.



**Photograph 1: Typical non-eucalypt forest and woodland habitat**

#### **Dry eucalypt forest and woodland:**

- *Eucalyptus amygdalina* inland forest and woodland on Cainozoic deposits (DAZ)

This community was the dominant form of native vegetation across the solar farm site, occurring in the vegetation corridors between properties as well as throughout the adjoining conservation areas, particularly to the northwest. This vegetation was largely of high-very high quality, with a canopy of large, hollow-forming Black Peppermint (*Eucalyptus amygdalina*) with occasional occurrences of White Sallee (*Eucalyptus pauciflora*) and Black Gum (*Eucalyptus ovata*) and a diverse understory of graminoids, herbs and shrubs, often including disturbance-sensitive species such as Wax-lip Orchid (*Glossodia major*), Sun Orchid (*Thelymitra* sp.) and Greenhood (*Pterostylis* sp.). Patches of this community in the northwest of the solar farm site typically had a dense canopy closer representing forest, transitioning into a more open woodland habit towards the southeast of the site. In addition, some patches of this community on the western edge of the southwestern property had prominent infestations of weedy pasture grasses, resulting in a lower quality.

- *Eucalyptus amygdalina* forest and woodland on dolerite (DAD)

This community was the second-most dominant form of native vegetation across the solar farm site, occurring along the southern border of the central properties as well as on stony rises within the conservation area between the eastern and western part of the study area. Vegetation was largely of a similar composition and quality to DAZ, although with a higher dominance of grass species and large emergent stones prominent in the ground layer. In addition, some areas of this community in the conservation area had a lower quality due to

Gorse infestation. Black Peppermint and Mountain Gum (*Eucalyptus dalrympleana*) were the dominant canopy species.

- *Eucalyptus amygdalina* forest and woodland on sandstone (DAS)

This community occurred on a sandstone rise in the Ponds property and between the two southwestern properties. Vegetation was largely of a similar composition and quality to DAZ, although with a more open canopy and large emergent stones prominent in the ground layer.

- *Eucalyptus viminalis* grassy forest and woodland (DVG)

This community was largely restricted to the conservation areas south of the solar farm site, only occurring in the study area along Lake River within the transmission line layout (Options 2.1 and 2.2). Vegetation was dominated by an open canopy of White Gum (*Eucalyptus viminalis*) with a dense understory of diverse shrub species, and was largely high quality, with some medium quality areas due to gorse infestation.



Photograph 2: Typical Dry Eucalyptus Forest habitat

#### Native Grassland:

- Lowland Grassland Complex (GCL)

This vegetation community was the most common native grassland community within the study area, occurring in the central properties, between Connorville and Lake River Road within the transmission line route (options 2.1 and 2.2), and in patches throughout the conservation areas. Vegetation consisted of a diverse assemblage of graminoids and herbs dominated by Spear Grasses, Wallaby Grasses, Common Tussock-grass and Kangaroo Grass with emergent Black Wattle and Sweet Bursaria. These patches were typically of moderate quality owing to intensive grazing and infestation from weedy pasture grasses.

- Lowland *Poa labillardierei* grassland (GPL)

This vegetation community was only recorded in the development area in a single patch on the south side of the access track between the eastern and western properties, and in two patches along the Transmission line option 2.1. Vegetation was dominated by dense Common Tussock-grass with a ground layer of herbs and rushes, and was of moderate quality.

- Lowland *Themeda triandra* grassland (GTL)

This vegetation community was only recorded in the conservation area on the northwest boundary of the eastern property. Vegetation was dominated by Kangaroo Grass with a groundlayer of herbs and several low-lying areas with semi-aquatic species. This patch was of moderate quality due to gorse infestation.



**Photograph 3: Typical Native Grassland habitat**

A further five native vegetation communities were modelled within the study area, but were not recorded in the field due to a lack of characteristic species. In most cases, one of the above communities was recorded in their place. These are:

- *Allocasuarina verticillata* forest (NAV)
- Eastern riparian scrub (SRE)
- *Eucalyptus ovata* forest and woodland (DOV)
- *Eucalyptus viminalis* wet forest (WVI)
- Lowland Grassy Sedgeland (GSL)

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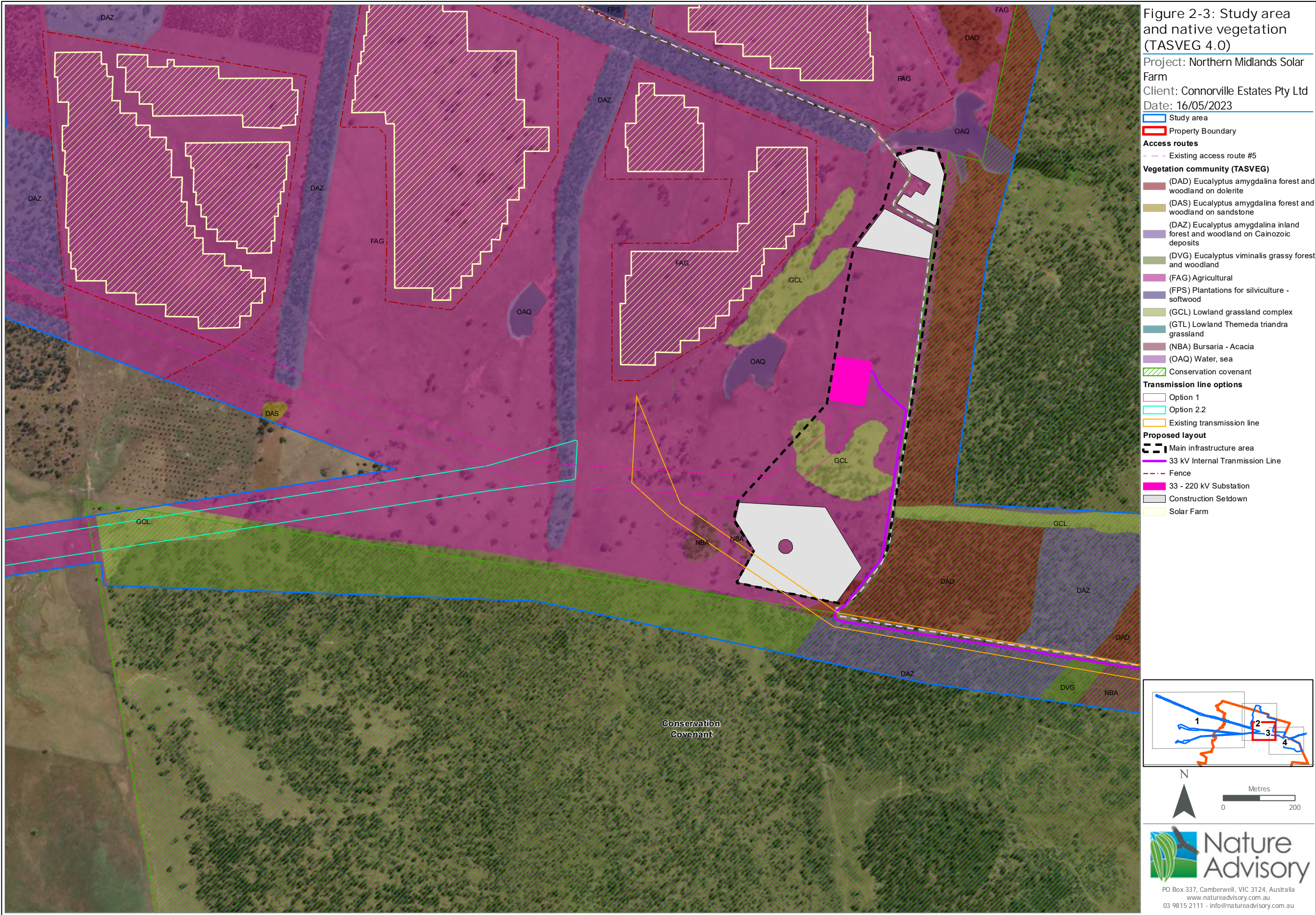
**Figure 2: Study area and native vegetation (TASVEG 4.0)**













### 5.3. Flora species

#### 5.3.1. Species recorded

During the field assessment, 131 plant species were recorded, of which 88 (67%) were indigenous and 43 (33%) were introduced or non-indigenous native in origin (Appendix 1).

#### 5.3.2. Listed species

Records from the EPBC Protected Matters Search Tool (DAWE 2022a) and the *Natural Values Atlas* indicated that within the search region there were records of 62 flora species listed under the Commonwealth EPBC Act or the state TSP Act. Eighteen of these are listed under the Commonwealth EPBC Act, 60 under the TSP Act, including 16 listed under both.

The likelihood of occurrence of species listed under the EPBC Act and TSP Act in the study area is addressed in Table 1. Species considered 'likely to occur' have very high potential of occurring 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 the following 31 listed flora species have the potential to occur or are likely to occur within suitable habitat of the study area:

#### Listed under the EPBC Act:

##### ***Grassy Woodland Shelterbelts***

- Clover Glycine (EPBC Act: Vulnerable, TSP Act: Vulnerable)
- Matted Flax-lily (EPBC Act: Endangered, TSP Act: Rare)
- Soft Peppercross (EPBC Act: Endangered, TSP Act: Endangered)
- White Sunray (EPBC Act: Endangered, TSP Act: Endangered)
- Grassland Greenhood, Cape Portland Greenhood (EPBC Act: Vulnerable, TSP Act: Vulnerable)

##### ***Only along Lake River***

- Midlands Wattle (EPBC Act: Vulnerable, TSP Act: Vulnerable)

#### Listed under the TSP Act:

##### ***Only along Lake River***

- Dagger Wattle (TSP Act: Rare)
- Inland Sickle-fern (TSP Act: Rare)
- Slender Knotweed (TSP Act: Vulnerable)
- Ferny Small-flower Buttercup (TSP Act: Rare)
- Eel Grass (TSP Act: Rare)

##### ***Along Lake River, creeks, drainage lines***

- Long-nosed Swamp Wallaby-grass (TSP Act: Endangered)

##### ***Wetland species within low lying wet areas and drainage lines***

- Slender Aphelia (TSP Act: Rare)

- Dwarf Aphelia (TSP Act: Rare)
- Slender Twig-sedge (TSP Act: Rare)
- Salt Club-sedge (TSP Act: Rare)
- Swamp Sedge (TSP Act: Rare)
- Poison Lobelia (TSP Act: Vulnerable)

***Within Grassy Woodlands of Shelterbelts and Conservation Covenant areas***

- Blue Pincushion (TSP Act: Rare)
- Blue Grass-lily (TSP Act: Rare)
- Small-leaf Glycine (TSP Act: Vulnerable)
- Moss Sunray (TSP Act: Endangered)
- Pretty Pearlflower (TSP Act: Endangered)
- Dwarf Bush-pea (TSP Act: Vulnerable)
- Dwarf Bush-pea (TSP Act: Vulnerable)
- Silky Bush-pea (TSP Act: Vulnerable)
- Spreading Knawel (TSP Act: Vulnerable)
- Small Wrinklewort (TSP Act: Rare)
- Propeller Plant (TSP Act: Vulnerable)
- Forest Germander (TSP Act: Rare)
- Yellow Rush-lily (TSP Act: Vulnerable)
- Common Sunray (TSP Act: Vulnerable)
- Handsome Hooksedge (TSP Act: Rare)

***Low-lying areas of the central properties, as well as in conservation covenant areas***

- Varied Raspwort (TSP Act: Rare)

***Farm Dams***

- Yellow Bladderwort (TSP Act: Rare)

Potential habitat for most of these species occurs within higher quality shelter belts and treed reserves around the development area and in adjacent woodland/forest habitat of the access track between the Solar East and Solar West sites in the proposed development area.

Some listed wetland species could potentially occur within lower lying areas of the central properties, drainage lines, small ponds and higher quality riparian habitat along Lake River within option 2.1 and 2.2 of the transmission line.

It is recommended to avoid habitat mapped as moderate, high and very high quality in Figure 3, where possible.



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

Common name	Scientific name	Conservation status		Habitat	Number of records	Date of last record	Likelihood of occurrence
		TSP	EPBC				
Midlands Wattle	<i>Acacia axillaris</i>	Vulnerable	Vulnerable	Largely confined to riparian habitat and associated soaks on surrounding slopes, although occasionally present in paddocks and grasslands. Occurs in the north and west of the South East Bioregion as well as in nearby sections of adjacent bioregions.	56	16-Oct-12	Nearby populations restricted to central highlands, and no riparian habitat occurs within solar farm site. Some high quality riparian habitat occurs along Lake River within the Option 2.1 and 2.2 transmission lines. <b>Potential to occur.</b>
Dagger Wattle	<i>Acacia siculiformis</i>	Rare		Occurs near watercourses and in drier, rocky or sandy areas on a range of sites in sclerophyll forest. Occurs in a rough band running from central Tasmania to the east coast.	20	21-Oct-15	Nearby populations restricted to central highlands. No watercourses occur on the solar farm site, but several drier, rocky areas in sclerophyll forest occur in surrounding conservation covenant areas, particularly south of the site. Some high quality riparian habitat on rocky slopes occurs along Lake River within the Option 2.1 and 2.2 transmission lines. <b>Potential to occur.</b>
Long-nosed Swamp Wallaby-grass	<i>Amphibromus macrorhinus</i>	Endangered		Occurs along dams, creeks, ponds, swamps and other water sources and low-lying wet areas in the Northern Midlands bioregion. Habitat can be either permanently or seasonally wet as the species is presumed to have a persistent seedbank.	6	26-Jan-96	Aquatic habitat within solar farm site limited to farm dams, where no species of <i>Amphibromus</i> were observed. Some habitat occurs along Lake River and several unnamed creeks and drainage lines along all transmission line routes. <b>Potential to occur.</b>
Slender Aphelia	<i>Aphelia gracilis</i>	Rare		Occurs in low-lying wet areas and damp sandy ground in the north-east of Tasmania concentrated in the Northern Midlands, as well as sporadically in the south of the state.	3	12-Nov-16	Single observation exists within shelter belt along Site Access 4 adjacent to Macquarie Road. Further habitat occurs in low-lying areas of central properties, as well as in conservation covenant areas along access track between the eastern and western properties. Habitat also occurs in riparian areas along Lake River within the Option 2.1 and 2.2 transmission lines. <b>Known to occur, with potential for further occurrences.</b>
Dwarf Aphelia	<i>Aphelia pumilio</i>	Rare		Occurs in a wide variety of habitat in the Northern Midlands and Tamar region, including damp soils, dry open grassland and dry sclerophyll forest. The species depends on bare ground, but may persist in disturbed areas.	5	27-Oct-99	Habitat occurs in low-lying areas of the central properties, as well as in conservation covenant areas along access track between the eastern and western properties. Habitat also occurs in riparian areas along Lake River within the Option 2.1 and 2.2 transmission lines. <b>Potential to occur.</b>
Prickly Woodruff	<i>Asperula scoparia</i> subsp. <i>scoparia</i>	Rare		Widespread throughout the South East and adjacent bioregions, in grassy woodland and tall eucalypt forest. Species is rare and ecology is poorly understood, but often found in rocky and hilly sites.	1	1-Jan-93	No individuals of <i>Asperula</i> observed during field assessment. No tall eucalypt forest in study area. No recent nearby records. <b>Unlikely to occur.</b>

Common name	Scientific name	Conservation status		Habitat	Number of records	Date of last record	Likelihood of occurrence
		TSP	EPBC				
Water Woodruff	<i>Asperula subsimplex</i>	Rare		Occurs in poorly drained grasslands and floodplains and occasionally in low-lying wet areas of grassy forest and woodlands throughout eastern Tasmania.	1	16-Feb-81	All grassland areas in study area well-drained. No individuals of <i>Asperula</i> observed during field assessment. No recent nearby records. <b>Unlikely to occur.</b>
Native Wintercress, Riverbed Wintercress	<i>Barbarea australis</i>	Endangered	Endangered	Occurs along and near river margins and in the beds of creeks and drainage channels in northern and central Tasmania. Favours slowly-moving water and shallow alluvial soils on stony sites, but occasionally grows among tussock grassland typically dominated by <i>Poa</i> . Commonly associated species include <i>Leptospermum lanigerum</i> , <i>Dodonea viscosa</i> , <i>Pomaderris</i> , <i>Eucalyptus delegatensis</i> , <i>E. dalrympleana</i> , <i>E. pauciflora</i> and <i>E. ovata</i> .	None	None	No riparian habitat occurs within solar farm site. Some suitable habitat occurs along Lake River, but stony areas limited. No nearby records. <b>Unlikely to occur.</b>
Slender Twig-sedge	<i>Baumea gunnii</i>	Rare		Occurs in creeks, moors and riverbanks and occasionally poorly-drained sedgy/grassy forest and woodland throughout northeast and central Tasmania. Often found in rocky soils.	1	1-Jan-79	Some habitat in the form of moist, rocky soils occurs in the central property along drainage line, as well as along Lake River within the Option 2.1 and 2.2 transmission lines. No recent nearby records, but cryptic species which is rarely identified. <b>Potential to occur.</b>
Salt Club-sedge	<i>Bolboschoenus caldwellii</i>	Rare		Occurs mostly in the Northern Midlands and South East bioregions in standing or slowly moving shallow water. Can occur in saline conditions, often in heavy black mud.	9	30-Mar-21	No saline waters occur in study area. Standing water in the study area largely comprises poorly vegetated farm dams, but some habitat occurs in the central property and in conservation covenant areas along access track between the eastern and western properties in the form of small ponds and slowly moving drainage lines. <b>Potential to occur.</b>
Leafy Daisy	<i>Brachyscome rigidula</i>	Vulnerable		Occurs in grasslands, grassy shrublands and grassy woodlands, often on sandstone, dolerite and basaltic soils which often include a high amount of surface stones. Species requires bare ground with limited competition to germinate, but longevity and seed persistence is unknown. Occurs in the South East bioregion and adjacent bioregions to the north.	1	5-Dec-96	Habitat in the form of grassland and grassy woodland occurs in the solar farm site, although bare ground is highly limited. <b>Unlikely to occur.</b>
Blue Pincushion	<i>Brunonia australis</i>	Rare		Occurs on well-drained flats and gentle slopes in grassy woodlands and dry sclerophyll forests as well as occasionally in heathy and shrubby dry forests. Soils are commonly sandy or gravelly, with many populations occurring on ironstone gravels. Commonly associated species include <i>Eucalyptus amygdalina</i> , <i>E. viminalis</i> and <i>E. obliqua</i> . Occurs primarily in the Northern Midlands and Northern Slopes bioregions.	14	18-Oct-06	Habitat occurs throughout study area, which supports associated species and soil types. Multiple nearby records. <b>Likely to occur.</b>
Blue Grass-lily	<i>Caesia calliantha</i>	Rare		Occurs in Northern Midlands and adjacent bioregions in grassland and grassy woodland habitat. Species dies back to rootstock in Autumn and Winter.	8	3-Nov-11	Multiple records in conservation covenant areas adjacent to study area. High quality grassy woodland occurs throughout study area. <b>Likely to occur.</b>



Common name	Scientific name	Conservation status		Habitat	Number of records	Date of last record	Likelihood of occurrence
		TSP	EPBC				
Blacktip Spider-orchid	<i>Caladenia anthracina</i>	Endangered	Critically Endangered	Thought to occur only in a 27km <sup>2</sup> area of the Northern Midlands bioregion, with historic records at the southern tip of the South East bioregion. Recorded in grassy woodland on well-drained sandy soil associated with Silver Wattle and Bracken.	5	22-Oct-07	Species range highly limited, known to occur in area to the southeast of study area. <b>Unlikely to occur.</b>
Hair Sedge	<i>Carex capillacea</i>	Rare		New Zealand and Asia to India. ACT, NSW and Tasmania. Victoria, scattered in alpine areas, bordering high-altitude swamps and wet alpine heathlands, usually associated with Sphagnum moss but uncommon (e.g. at Snowy Range, Bogong High Plains, Nunniong Plateau, Davies Plain and Cobberas) (VicFlora 2022).	1	21-Dec-19	Study area is non-alpine and does not support sphagnum bogs or heathlands. <b>Unlikely to occur.</b>
Swamp Sedge	<i>Carex gunniana</i>	Rare		Grows in a wide variety of moist habitats across Tasmania including wet forest, sandy heathland, littoral sands, damp grasslands, streams and occasionally in pasture.	2	21-Dec-19	Habitat occurs in low-lying areas of central properties, as well as in conservation covenant areas along access track between the eastern and western properties. <b>Potential to occur.</b>
Bergalia Tussock	<i>Carex longibrachiata</i>	Rare		Occurs in central and east Tasmania along riverbanks, in grasslands and occasionally in pasture.	8	1-Jan-92	Habitat occurs in riparian areas along Lake River within the Option 2.1 and 2.2 transmission lines, although no recent nearby records. <b>Unlikely to occur.</b>
Snowy Colobanth	<i>Colobanthus curtisiae</i>	Rare	Vulnerable	Found in grassland and grassy woodland. The species can also be found in areas subject to a variety of environmental conditions. It is commonly found on gentle slopes with elevations between 160 m in lowland areas and 1300 m in alpine areas. The species is found in areas of annual rainfall between 530 mm in the Midlands and 1400 mm on Ben Lomond. Curtis' Colobanth is commonly found on soils derived from sandstone as well as clay loams derived from dolerite and basalt. It can persist in remnant grasslands grazed by stock (DAWE 2020).	None	None	Some habitat in the form of grassy woodland and grassland occurs throughout study area, but outside of known distribution, which is limited to the south and southeast. <b>Unlikely to occur.</b>
Pretty Pearflower	<i>Cryptandra amara</i>	Endangered		Occurs in rocky riverine and grassland habitats. Commonly associated species include <i>Themeda triandra</i> , <i>Bursaria spinosa</i> , <i>Eucalyptus rubida</i> and <i>E. amygdalina</i> . Occurs primarily in Northern Midlands and South East bioregions.	3	1-Oct-06	Some rocky grassland with associated species occurs in conservation covenant areas along access track between the eastern and western properties. Habitat also occurs in riparian areas along Lake River within the Option 2.1 and 2.2 transmission lines. <b>Potential to occur.</b>
Matted Flax-lily	<i>Dianella amoena</i>	Rare	Endangered	Lowland grassland and grassy woodlands on well-drained to seasonally waterlogged fertile sandy loams to heavy cracking soils derived from sedimentary or volcanic Geology. Occurs throughout eastern Tasmania, concentrated in the Midlands.	3	7-Nov-94	Suitable grassy woodland habitat occurs in vegetation corridors surrounding the pine plantation site, as well as vegetation corridors south of the central properties. <b>Potential to occur.</b>
Australian Anchor Plant	<i>Discaria pubescens</i>	Endangered		Usually associated with basaltic substrate streams in cool elevated areas (Walsh 1999). Occurs mainly in the central highlands and along a limited number of river systems elsewhere throughout the state.	1	26-Jan-90	Range restricted to central highlands and isolated pockets near Launceston/Perth and further south in Tasmania. No rocky highland streams occur in study area. <b>Unlikely to occur.</b>
Carpet Willow-herb	<i>Epilobium willisii</i>	Rare		Occurs in wet montane herbfields in central Tasmania and on bare ground in eastern ranges.	7	26-Mar-96	Range restricted to Alpine areas, which study area does not enter. <b>Does not occur.</b>



Common name	Scientific name	Conservation status		Habitat	Number of records	Date of last record	Likelihood of occurrence
		TSP	EPBC				
Miena Cider Gum	<i>Eucalyptus gunnii</i> subsp. <i>divaricata</i>	Endangered	Endangered	Occurs in grassy open woodland at the exposed edges of the treeless flats/hollows on the Great Lakes region of the Central Plateau on sites that are typically poorly drained.	None	None	Range restricted to Alpine areas within the Central Highlands, which study area does not enter. No nearby records. Does not occur.
Clover Glycine	<i>Glycine latrobeana</i>	Vulnerable	Vulnerable	Found across south-eastern Australia in native grasslands, dry sclerophyll forests, woodlands and low open woodlands with a grassy ground layer. In Tasmania, occurs in dry sclerophyll forest, native grassland and woodland, usually on flat sites with loose, sandy soil (DAWE 2020).	6	18-Oct-06	Grassy woodlands occur throughout the study area, and loose, sandy soils occur in areas fringing the pine plantation and south of the northern properties. <b>Potential to occur.</b>
Small-leaf Glycine	<i>Glycine microphylla</i>	Vulnerable		Occurs in a range of habitats in the north and northeast of Tasmania, but is most commonly found in damp eucalyptus forest and woodland. Commonly associated with <i>Desmodium gunnii</i> .	1	5-Jun-96	Species largely restricted to north and east coast of Tasmania, with single record nearby. Wet forest within study area limited to riparian vegetation along Lake River and low rises of the Western Tiers within the Option 2.1 and 2.2 transmission lines, with a record adjacent to the western edge of Option 2.1. <b>Potential to occur.</b>
Varied Raspwort	<i>Haloragis heterophylla</i>	Rare		Occurs primarily in the Northern Midlands and South East bioregions. Occurs in moderately-poorly drained areas of grasslands and grassy woodlands such as shrubby creek lines, broad flats, wet pasture and dam margins. Often associated with <i>Themeda triandra</i> in grasslands and <i>Eucalyptus ovata</i> in woodlands.	8	3-Nov-11	Habitat occurs in low-lying areas of the central properties, as well as in conservation covenant areas along access track between the eastern and western properties. Numerous records adjacent to Old Barton property to the west. <b>Likely to occur.</b>
Rockfield Purplepea	<i>Hovea tasmanica</i>	Rare		Occurs primarily in drier areas of the central highlands and rocky valleys throughout the South-East Bioregion.	9	12-Oct-12	Nearby records in central highlands, which study area does not enter. <b>Unlikely to occur.</b>
Moss Sunray	<i>Hyalosperma demissum</i>	Endangered		Occurs on shallow stony ridgelines and rock plates and sandy soils in drier areas of central and east Tasmania, as well as in dry areas of <i>Eucalyptus amygdalina</i> woodlands. Requires bare ground for germination.	2	27-Oct-99	Bare sandy or stony areas in study area limited, although some habitat occurs along unmade road reserve in south of solar farm site. No recent nearby records, but cryptic species rarely recorded. <b>Potential to occur.</b>
Veiled Quillwort	<i>Isoetes humilior</i>	Rare		Occurs throughout the Central Highlands in areas of still or slow-moving waters.	2	6-Feb-91	Species restricted to Central Highlands, which study area does not enter. <b>Does not occur.</b>
Branching Rush	<i>Juncus prismatocarpus</i>	Rare		Occurs sporadically in swampy areas throughout Tasmania, although distribution poorly understood.	1	23-Mar-85	Standing water and swampy, inundated areas in study area largely limited to farm dams devoid of native vegetation. No recent nearby records. <b>Unlikely to occur.</b>
Soft Peppergrass	<i>Lepidium hyssopifolium</i>	Endangered	Endangered	Occurs throughout Eastern Tasmania on a range of geologies in grassland and grassy woodland, where it typically grows in growth suppression zones beneath the base of large trees. Can be found growing beneath native or exotic trees even in otherwise cleared or degraded land.	114	21-Mar-17	Extensive grassy woodland with abundant large trees occur in shelter belts throughout the study area, and scattered large trees occur sporadically throughout farmland. Extensive nearby records. <b>Potential to occur.</b>

Common name	Scientific name	Conservation status		Habitat	Number of records	Date of last record	Likelihood of occurrence
		TSP	EPBC				
White Sunray	<i>Leucochrysum albicans</i> <i>subsp. tricolor</i>	Endangered	Endangered	Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. Plants can be found in natural or semi-natural vegetation and grazed or ungrazed habitat. Bare ground is required for germination. The unpalatability of this species is likely to protect it in heavily grazed areas where patches of bare ground are likely to develop, favouring recruitment (DAWE 2020).	None	None	Grassland and woodland habitats throughout the study area. Bare ground not widespread, but common in pockets amongst some of the wooded areas. Multiple records within the Northern Midlands area. <b>Potential to occur.</b>
Common Beard-heath	<i>Leucopogon virgatus</i> var. <i>brevifolius</i>	Rare		Rather uncommon on heathland and healthy woodland on deep sands from the Douglas-Edenhope area in the south-west to northern fringe of Little desert (Powell et al. 1996).	7	1-Oct-06	No heath or heathy woodland recorded in the study area. <b>Unlikely to occur.</b>
Poison Lobelia	<i>Lobelia pratioides</i>	Vulnerable		Most records occurring in the Northern Midlands with sites also known in the State's south, east and north. Species occurs in seasonally inundated to waterlogged soils at the margins of swamps, wetlands and drainage lines. Also occurs in damp depressions within grasslands and grassy woodland.	3	1-Jan-92	Seasonally waterlogged areas restricted to man-made dams and the drainage lines connecting these. Some recent records to the east of the study area. <b>Potential to occur.</b>
Inland Sickle-fern	<i>Pellaea calidirupium</i>	Rare		Found predominantly in the eastern half of Tasmania. Occurs in inland, rocky habitats in areas of low to moderate rainfall. Grows in crevices and on ledges on exposed or semi-exposed rock outcrops	3	18-Mar-03	Limited rocky areas in the study area, usually occurring in areas dominated by exotic species. One record along Lake River nearby the proposed option 2.2 transmission line. <b>Potential to occur.</b>
Slender Knotweed	<i>Persicaria decipiens</i>	Vulnerable		In Tasmania, species is local to the banks of rivers and streams, most frequent in the north of the State.	6	21-Mar-17	Multiple records at the nearby Brumbys Creek. All three transmission line options cross Lake River, with the banks of this river providing appropriate habitat. <b>Potential to occur.</b>
Austral Pillwort	<i>Pilularia novae-hollandiae</i>	Rare		Occurs within central/northern Tasmania. Often hidden among grasses and sedges in damp mud, bogs and swamps.	2	1-Jan-90	Bogs and swamps in the study area include man-made dams which had relatively bare margins. No recent records nearby. <b>Unlikely to occur.</b>
Golfers Leek-orchid	<i>Prasophyllum incorrectum</i>	Endangered	Critically Endangered	Endemic to Tasmania's Northern Midlands. Grows in damp native grassland and grassy eucalypt and banksia woodland on sandy loams.	None	None	Native grassland recorded in the study areas was well-drained, and soil was not sandy loam. No banksia woodland recorded in the study area. <b>Unlikely to occur.</b>
Alpine Leafy Liverwort	<i>Pseudocephalozia paludicola</i>		Vulnerable	Subalpine species occurring around the west and on the central highlands and eastern mountains. Prefers wet ground in subalpine grasslands. Frequently found in moorland and sphagnous areas. Other habitat includes damp mineral soil or over peat.	1	1-Jan-80	The study area is not subalpine. <b>Unlikely to occur.</b>
Midland Greenhood	<i>Pterostylis commutata</i>	Endangered	Critically Endangered	Endemic to Tasmania and confined to 75 kilometre area near Tunbridge and Ross. Grows in native grassland and Eucalyptus pauciflora grassy woodland on well-drained sandy soils and basalt loams in small, loose colonies.	None	None	The range of this species is highly restricted, and does not overlap with the boundaries of the study area. <b>Unlikely to occur.</b>
Liawenee Greenhood	<i>Pterostylis pratensis</i>	Vulnerable	Vulnerable	Endemic to Tasmania, specifically in the Central Highlands. Grows in subalpine Poa labillardierei tussock grassland which is very exposed, low and open, with patches of often stunted Olearia algida and Hakea microcarpa scrub on red-brown loamy to clay soils derived from basalt.	None	None	Restricted to the Central Highlands and subalpine areas, which the study area does not enter. <b>Unlikely to occur.</b>

Common name	Scientific name	Conservation status		Habitat	Number of records	Date of last record	Likelihood of occurrence
		TSP	EPBC				
Grassland Greenhood, Cape Portland Greenhood	<i>Pterostylis ziegeleri</i>	Vulnerable	Vulnerable	Endemic to Tasmania. Occurs in a variety of habitats from lowland coastal regions in the northwest, north and east, and in the Midlands. In coastal areas it is found on the slopes of low stabilised sand dunes and in grassy dune swales. In the Midlands, it grows in native grassland or grassy woodland in well-drained clay loams derived from basalt.	None	None	Some grassland and grassy woodland with clay loams in the study area, however soils mainly derived from dolerite. Few records close by. <b>Potential to occur.</b>
Plains Saltmarsh-grass	<i>Puccinellia perlaxa</i>	Rare		Known to only occur from a creek bed in a saline area of a paddock on the Valleyfield Road, Midlands.	18	30-Mar-21	The restricted range of this species occurs along Macquarie River, connected to Lake River. However, the record locations occur several kilometers from where the proposed transmission line options cross Lake River. <b>Unlikely to occur.</b>
Dwarf Bush-pea	<i>Pultenaea humilis</i>	Vulnerable		Species is restricted to Northern Midlands. Prefers grassy <i>Eucalyptus amygdalina</i> dry sclerophyll forest on Cainozoic deposits.	7	7-Nov-07	<i>Eucalyptus amygdalina</i> woodland was recorded extensively throughout the study area, with denser forest areas occurring sporadically. Multiple records in vegetation directly connected to the conservation covenant areas. <b>Likely to occur.</b>
Silky Bush-pea	<i>Pultenaea prostrata</i>	Vulnerable		Occurs in Northern and Southern Midlands within grassy woodlands or grasslands, mostly on Tertiary basalt or Quaternary alluvium.	1	8-Jun-89	Moderate -high quality grassy woodlands and grassland occur throughout the study area. <b>Potential to occur.</b>
Midlands Buttercup, Tunbridge Buttercup	<i>Ranunculus prasinus</i>	Endangered	Endangered	Endemic to Tasmania's Central Midlands from Tunbridge to Campbell Town with low annual rainfall.	None	None	Highly restricted range, east of the study area. <b>Unlikely to occur.</b>
Ferny Small-flower Buttercup	<i>Ranunculus pumilio</i> var. <i>pumilio</i>	Rare		Mostly occurs in wet places from sea level to altitudes of 800-900 metres. On mainland, found all throughout temperate conditions.	2	25-Nov-10	Some nearby records, occurring along Lake River, but further north than the proposed development. Wet areas exist along Lake River where the transmission line options are proposed. <b>Potential to occur.</b>
River Club-sedge	<i>Schoenoplectus tabernaemontani</i>	Rare		Occurs along lake and river shores, marshes and ditches.	9	11-Feb-21	Could occur along the margins of Lake River, but very few records nearby. <b>Unlikely to occur.</b>
Spreading Knawel	<i>Scleranthus fasciculatus</i>	Vulnerable		Occurs in Midlands and south-east. Occurs in silver tussock grassland and grassy woodland. Fire and stock grazing maintain the gaps in vegetation needed for this species to occur.	6	17-Nov-21	<i>Poa</i> grassland occurs in south-east of the central property and conservation covenant areas along access track between the eastern and western properties. <b>Potential to occur.</b>
Swamp Fireweed	<i>Senecio psilocarpus</i>		Vulnerable	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).	None	None	No herb-rich swamps found in the study area, and the soils were not volcanic clays or peat. <b>Unlikely to occur.</b>

Common name	Scientific name	Conservation status		Habitat	Number of records	Date of last record	Likelihood of occurrence
		TSP	EPBC				
Small Wrinklewort	<i>Siloxerus multiflorus</i>	Rare		Predominantly found in the north and north-east of Tasmania on rocks at river mouths, in coastal areas and inland dry forests. On mainland, it occurs in temperate conditions.	7	3-Nov-11	There are records in the conservation covenant along the access road between the eastern and western properties. There is another record just to the North of transmission line option 1. Further suitable habitat exist in the vegetated corridors between the grazing paddocks. <b>Known to occur, with potential for further occurrences.</b>
Propeller Plant	<i>Stenanthemum pimeleoides</i>	Vulnerable	Vulnerable	Endemic to Tasmania. Occurs along the Central East Coast and also in the Northern Midlands. Grows in dry sclerophyll forest or woodland with an open heathy or shrubby understorey. It usually occurs in woodlands dominated by either <i>Eucalyptus amygdalina</i> (black peppermint) or <i>Eucalyptus aff. pulchella</i> (colloquially known as 'half-barked amygdalina'), with <i>Allocasuarina littoralis</i> (black sheoak) and <i>Eucalyptus viminalis</i> (white gum) common co-dominants.	11	1-Feb-07	Dry <i>E. amygdalina</i> woodland with open shrubby understorey occurs throughout the study area, often with <i>E. viminalis</i> also present. Two well-documented populations within 15km of the study area. <b>Likely to occur.</b>
Mountain Dandelion	<i>Taraxacum aristum</i>	Rare		Found in alpine grassland and grassy heath in Central Highlands.	3	1-Jan-89	The study area is not alpine. <b>Does not occur.</b>
Forest Germander	<i>Teucrium corymbosum</i>	Rare		Predominantly found in <i>Allocasuarina verticillata</i> coastal and inland woodland, <i>Eucalyptus viminalis</i> woodland and native grasslands in the east.	3	16-Jun-09	Some <i>E. viminalis</i> in the study area and native grassland. Three recent records within 7 km of the site. <b>Potential to occur.</b>
Yellow Rush-lily	<i>Tricoryne elatior</i>	Vulnerable		Grows in grasslands, heaths and open woodland next the coast and inland in the north-east, Midlands and the East Coast.	1	10-Jan-85	Open woodlands and grasslands recorded in the study area, however, no records within 10 kilometers of the site. <b>Potential to occur.</b>
Common Sunray	<i>Triptilodiscus pygmaeus</i>	Vulnerable		Species has a disjunct distribution, with occurrences in the Northern and Southern Midlands. Grows within grasslands, grassy woodlands or rock plates with the underlying substrate being mostly Tertiary basalt or Jurassic dolerite. The species occurs within native grassland dominated by <i>Themeda triandra</i> (kangaroo grass).	1	3-Nov-73	Grassland and grassy woodland recorded in the study area, with underlying Jurassic dolerite geology. A record nearby transmission line option 2.2, and a well documented population 12km away. <b>Potential to occur.</b>
Trithuria	<i>Trithuria submersa</i>	Rare		Species occurs in the Northern Midlands, near-coastal areas in the east and north-east, King Island, Flinders Island and Cape Barren Island, with an isolated record from the Central Highlands. Habitat includes areas subject to flooding. This includes wetlands, small watercourses, shallow temporary depressions and wet heathlands. In the Northern Midlands <i>Trithuria submersa</i> typically co-occurs with a suite of rare flora species, including <i>Aphelia gracilis</i> , <i>Isoetes drummondii</i> subsp. <i>drummondii</i> , <i>Phyllangium distylis</i> and <i>Stylidium despectum</i> .	2	13-Jan-10	Few areas subject to flooding documented in the study area. Wetlands and watercourses that were documented were of moderate - high quality, and were grassy rather than heathy. <b>Unlikely to occur.</b>
Handsome Hooksedge	<i>Uncinia elegans</i>	Rare		Occurs in a wide range of forest types including wet sclerophyll forest, dry sclerophyll forest and open grassy woodlands. It is most often associated with damp grassy habitats and can occur on disturbed sites.	2	10-Feb-90	Some dry sclerophyll forest and open grassy woodlands within the study area. However, no records within 25km. <b>Potential to occur.</b>
Yellow Bladderwort	<i>Utricularia australis</i>	Rare		Widespread distribution, ranging from the Gordon River in the southwest to the northern part of Flinders Island in the far northeast. It grows in stationary or slow-moving water, including natural lakes, farm dams and reservoirs, where it has been reported as forming 'locally dense swards'.	1	10-Feb-21	Farm dams exist within the study area, including one with some emergent vegetation. <b>Potential to occur.</b>



Common name	Scientific name	Conservation status		Habitat	Number of records	Date of last record	Likelihood of occurrence
		TSP	EPBC				
Eel Grass	<i>Vallisneria australis</i>	Rare		Found in riparian situations in the north, northeast, midlands and southeast.	8	18-Nov-21	Found along the Macquarie River, of which Lake River is a subsidiary. Could occur in the riparian vegetation along Lake River, where all three transmission lines are proposed. <b>Potential to occur.</b>
Round-leaf Wilsonia	<i>Wilsonia rotundifolia</i>	Rare		Found in coastal and inland salt marshes in the eastern part of Tasmania.	4	30-Mar-21	There are no salt marshes in the study area. <b>Unlikely to occur.</b>
Swamp Everlasting	<i>Xerochrysum palustre</i>	Vulnerable	Vulnerable	Grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils. Commonly associated genera include <i>Amphibromus</i> , <i>Baumea</i> , <i>Carex</i> , <i>Chorizandra</i> , <i>Craspedia</i> , <i>Eleocharis</i> , <i>Isolepis</i> , <i>Lachnagrostis</i> , <i>Lepidosperma</i> , <i>Myriophyllum</i> , <i>Phragmites australis</i> , <i>Themeda triandra</i> and <i>Villarsia</i> (DAWE 2020).	1	9-Dec-90	No high quality wetlands within the study area, and the soils generally were not heavy black clay soils. <b>Unlikely to occur.</b>

Notes: EPBC = threatened species status under EPBC Act; TSP = threatened species status under the state TSP Act.



#### 5.4. Fauna habitat

The study area supported the following three fauna habitat types:

- Native treed vegetation;
- Grazing paddocks; and
- Aquatic habitat.

The quality and extent of fauna habitats are mapped in Figure 4 and photos are provided in Appendix 3.

##### **Native Treed Vegetation**

The study area contained a variety of dry wooded habitats varying from moderate to high quality for fauna. This included eucalypt dominated open grassy woodland, woodland, forest and plantation.

Open grassy woodland occurred near the infrastructure study area and was assigned moderate quality. It had been previously cleared resulting in especially sparse distribution of trees with limited habitat options for fauna. Many of the remaining trees were old and provided hollows for nesting. Some areas comprised piles of rocks or dead logs on the ground which could be used for protection by ground-dwelling species.

Woodland occurred throughout the site and was the most common habitat forming the vegetation corridors separating paddocks. It also occurred in the conservation covenants adjacent to the study area. Woodland areas were of moderate to high quality and typically had a dense ground layer made up of native sedges and numerous dead logs, a relatively open mid-layer with some diversity in shrubbery, and a eucalypt dominated open canopy with emerging trees with potential for hollows.

The forested areas occurred in pockets along access roads and through vegetation corridors. They were dry, open forests, with a canopy above 15 meters tall and were of moderate to high quality. Many of these areas also supported old trees with the capacity to have hollows.

Native eucalypt plantations found in the study area varied from low-moderate quality. Some of these plantations were very young and low providing not much cover for fauna. Particularly plantations found along the transmission line options were taller, very uniform in height and structure and thus of moderate quality. A singular restoration site was found with planted eucalypts and other habitat components, such as fallen timber.

##### **Grazing paddocks**

Grazing paddocks constituted a large proportion of the study area. They were mostly categorised as low quality fauna habitat as they contained little or no habitat structures or cover for fauna. The paddocks were predominantly treeless or contained sparsely dispersed remnant trees. However, the remaining scattered trees through these areas were often old and had potential to support large hollows.

##### **Aquatic habitat**

Several dams existed within the study area with some creeks connecting them. These dams were man made and varied in depth and size. Some had extensive emergent vegetation providing diverse habitat for aquatic species. Lake River, over which all three transmission line options must cross, provided low and dense riparian habitat of high quality as fauna habitat.

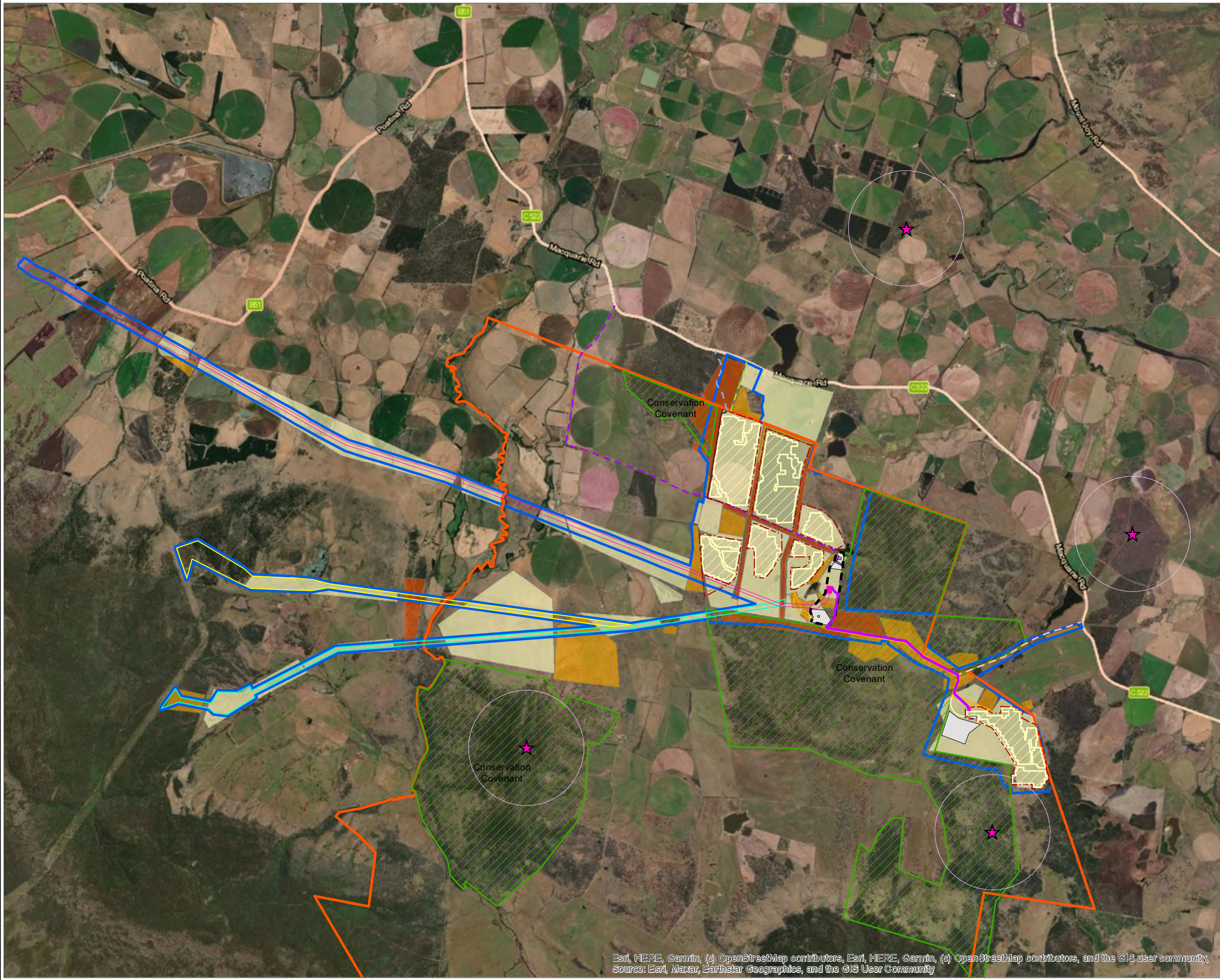
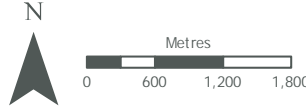


Figure 4: Quality of fauna habitat mapped in the study area

Project: Northern Midlands Solar Farm  
Client: Connorville Estates Pty Ltd  
Date: 16/05/2023

- ▬ Study area
- ▬ Property boundary
- ★ Wedge-tailed Eagle nest
- WTE nest buffer (1km)
- Access routes**
- - - Access route #1
- - - Access route #2
- - - Access route #3
- - - Existing access route #5
- Existing road
- Existing track (low quality)
- Transmission line options**
- Option 1
- Option 2.1
- Option 2.2
- Existing transmission line
- Proposed layout**
- Main infrastructure area
- 33 kV Internal Transmission Line
- - - Fence
- 33 - 220 kV Substation
- Construction Setdown Area
- Solar Farm
- Habitat quality**
- High quality
- Moderate quality
- Low quality
- Conservation covenant



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Esri, HERE, Garmin, (c) OpenStreetMap contributors, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community, Sources: Esri, Maxar, Earthstar Geographics, and the GIS User Community

## 5.5. Fauna species

### 5.5.1. Species recorded

During the field assessment 56 fauna species were recorded. This included 45 bird (5 introduced), 8 mammal (3 introduced), 1 reptile, 2 frog and 1 reptile species (Appendix 2).

### 5.5.2. Listed species

The desktop evaluation (including the results of the EPBC Protected Matters Search Tool (DAWE 2022a) and the *Natural Values Atlas*) indicated that within the search region there were records of 27 fauna species listed as threatened or migratory under the Commonwealth EPBC Act or the state TSP Act. The likelihood of occurrence of these species in the study area was assessed and the results are presented in Table 2.

This analysis of potential occurrence of listed fauna species excludes the following:

- Marine fauna given that the study area is inland; and
- Migratory oceanic bird species (such as albatrosses and petrels) and migratory shorebirds given that the study area is inland.

Species considered 'likely to occur' are those that have a very high chance of being in the study area given the existence of numerous records in the search region and suitable habitat in the study area. Using the precautionary approach, species considered to have the 'potential to occur' are those for which suitable habitat exists, but recent records are scarce. This analysis indicates that 14 listed or migratory fauna species are likely to occur or have the potential to occur. These species are listed below.

- Grey Goshawk (TSP Act: Endangered)
- Latham's Snipe (EPBC Act: Migratory)
- Masked Owl (Tasmanian) (EPBC Act: Vulnerable, TSP Act: Endangered)
- Satin Flycatcher (EPBC Act: Migratory)
- Swift Parrot (EPBC Act: Critically endangered)
- Wedge-tailed Eagle (Tasmanian) (EPBC Act: Endangered, TSP Act: Endangered)
- White-bellied Sea-Eagle (TSP Act: Vulnerable)
- White-throated Needletail (EPBC Act: Vulnerable, EPBC Act: Migratory)
- Eastern Barred Bandicoot (Tasmania) (EPBC Act: Vulnerable)
- Eastern Quoll (EPBC Act: Endangered)
- Tasmanian Devil (EPBC Act: Endangered, TSP Act: Endangered)
- Spotted-Tailed Quoll (EPBC Act: Vulnerable, TSP Act: Rare)
- Tiger Quoll (EPBC Act: Vulnerable, TSP Act: Rare)
- Growling Grass Frog (EPBC Act: Vulnerable, TSP Act: Vulnerable)

The susceptibility of these species to impacts from development is discussed in Section 5.5.3.



Table 2: Listed fauna species and their likelihood of occurrence in the study area

Common Name	Scientific name	TSP	EPBC -Thrt	EPBC - Mig	Habitat	Date of last record	Likelihood of occurrence
<b>Birds</b>							
Australasian Bittern	<i>Botaurus poiciloptilus</i>		Endangered		Terrestrial wetlands, including a range of wetland types but prefers permanent water bodies with tall dense vegetation, particularly those dominated by sedges, rush, reeds or cutting grass (Marchant & Higgins 1990).	None	Vegetation near on-site dams is not dense or tall enough to be appropriate, and no nearby records. <b>Unlikely to occur.</b>
Common Greenshank	<i>Tringa nebularia</i>			M (Bonn A2H, ROKAMBA, JAMBA, CAMBA)	Inhabits wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Higgins & Davies 1996).	None	No suitable habitat and no nearby records. <b>Unlikely to occur.</b>
Common Sandpiper	<i>Actitis hypoleucos</i>			M (Bonn A2H, ROKAMBA, JAMBA, CAMBA)	Inhabits a wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Higgins & Davies 1996).	None	No suitable habitat on dam edges, but no nearby records. <b>Unlikely to occur.</b>
Curlew Sandpiper	<i>Calidris ferruginea</i>		Critically Endangered	M (Bonn A2H, ROKAMBA, JAMBA, CAMBA)	Inhabits wide range of coastal or inland wetlands with varying levels of salinity; mainly muddy margins or rocky shores of wetlands (Higgins & Davies 1996).	None	No suitable habitat and no nearby records. <b>Unlikely to occur.</b>
Fork-tailed Swift	<i>Apus pacificus</i>			M (CAMBA, ROKAMBA, JAMBA)	The species can occur in wet sclerophyll forest but mainly prefers open forest or plains. It is almost exclusively aerial and feeds up to hundreds of metres above the ground, but can feed among open forest canopy. The species breeds internationally and seldom roosts in trees (Higgins 1999).	None	No recent records, and outside of typical distribution. <b>Unlikely to occur.</b>
Grey Goshawk	<i>Accipiter novaehollandiae</i>	Endangered			Inhabit rainforests, open forests, swamp forests, woodlands and plantations; most abundant where forest or woodland provide cover for hunting from perches (Marchant & Higgins 1993).	29-Mar-99	Suitable woodland and forest habitats on site, and some nearby records. <b>Potential to occur.</b>
Latham's Snipe	<i>Gallinago hardwickii</i>			M (Bonn A2H, ROKAMBA, JAMBA)	Occurs in wide variety of permanent and ephemeral wetlands; it prefers open freshwater wetlands with dense cover nearby, such as the edges of rivers and creeks, bogs, swamps, waterholes. The species is wide spread in southeast Australia (Naarding 1983; Higgins & Davies 1996).	None	Some suitable habitat in gullies and around dam edges, and few nearby records. <b>Potential to occur.</b>
Masked Owl (Tasmanian)	<i>Tyto novaehollandiae subsp. castanops</i>	Endangered	Vulnerable		Inhabits diverse habitat mosaics comprised of forests, woodlands, native vegetation and pastoral land (Higgins 1999). Usually found below 600m altitude. Pairs occupy a permanent territory, requiring old-growth trees to provide nesting hollows (Threatened Species Section 2022). This species is widespread in Tasmania, occurring at the highest densities in the north and the east.	26-Mar-15	Suitable foraging habitat, and old trees for nesting. Some nearby records. <b>Likely to occur.</b>
Satin Flycatcher	<i>Myiagra cyanoleuca</i>			M (Bonn A2H)	Mostly found in eucalypt forest, particularly tall wet forests and woodland within gullies (Higgins et al. 2006). Also inhabits eucalypt woodland comprising an open understorey and a grassy ground layer (Higgins et al. 2006). Generally absent from rainforest (Higgins et al. 2006).	None	Some suitable habitat corridors, but few recent records nearby. <b>Potential to occur.</b>
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>			M (Bonn A2H, ROKAMBA, JAMBA, CAMBA)	Inhabit shallow fresh to saline wetlands, usually coastal to near-coastal, but occasionally farther inland. Wetlands often have open fringing mudflats and low emergent or fringing vegetation (Higgins & Davies 1996).	None	No suitable habitat and no nearby records. <b>Unlikely to occur.</b>

Common Name	Scientific name	TSP	EPBC -Thrt	EPBC - Mig	Habitat	Date of last record	Likelihood of occurrence
Swift Parrot	<i>Lathamus discolor</i>		Critically Endangered		Prefers a select range of eucalypts, including Yellow Gum, Grey Box, White Box, Red Ironbark and Yellow Box, as well as River Red-gum when this species supports abundant 'lerp' (Saunders & Tzaros 2011). The species is also known to forage within planted stands of Spotted Gum and Sugar Gum (Nature Advisory; unpublished data). Breeds in Tasmania and migrates to the mainland of Australia in autumn, returning in early spring. Breeds in old-growth eucalyptus bearing hollows, usually Tasmanian blue gums. Their foraging habitat in Tasmania is flowering eucalypts, with preference for blue gums or black gums (Threatened Species Section 2022).	None	Some pockets of Black Gum Woodland near the site, and corridors of other eucalypt species, which could be used for foraging if flowering. Corridors may be used for birds migrating south to breeding grounds in the south. A small number of recent records within 10km. <b>Potential to occur.</b>
Azure Kingfisher (Tasmania)	<i>Ceyx azureus subsp. diemenensis</i>	Endangered	Endangered		Forested margins of major rivers, containing shaded and overhanging vegetation, dominated by wet sclerophyll or mixed forest. In Tasmania, the population core range is on the river systems along the south, west and north coasts (Threatened Species Section 2022).	1-Jan-02	No major rivers on site, and few nearby records. <b>Unlikely to occur.</b>
Wedge-tailed Eagle (Tasmania)	<i>Aquila audax subsp. fleayi</i>	Endangered	Endangered		Inhabits a wide range of open to lightly timbered habitats suitable for foraging and where there are trees suitable for nesting (Marchant & Higgins 1993).	18-Jun-22	<b>Recorded on site.</b>
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Vulnerable			Maritime habitats, terrestrial large wetlands and coastal lands of tropical and temperate Australia and offshore islands, ranging far inland only over large rivers and wetlands. The eagles usually breed on coast and offshore islands and inland beside large lakes or rivers, usually in tall trees in or near water, also in cliffs, rock pinnacles and escarpments (Marchant & Higgins 1993).	14-Nov-17	<b>Recorded on site.</b>
White-throated Needle-tail	<i>Hirundapus caudacutus</i>		Vulnerable	M (CAMBA, ROKAMBA, JAMBA)	Aerial, over all habitats, but probably more over wooded areas, including open forest and rainforest. Often over heathland and less often above treeless areas such as grassland and swamps or farmland (Higgins 1999).	30-Nov-80	Could fly over the site, although no recent records nearby. <b>Potential to occur.</b>
<b>Mammals</b>							
Eastern Barred Bandicoot (Tasmania)	<i>Perameles gunnii gunnii</i>		Vulnerable		Mosaic habitats with agricultural land and remnant native forest/woodland, often with dense ground-cover plants. Some population occupy remnant native grassland (Threatened Species Section 2022)	None	Suitable habitat, but few recent records nearby. <b>Potential to occur.</b>
Eastern Quoll	<i>Dasyurus viverrinus</i>		Endangered		Inhabits a range of open forest, open grassland, scrubland and heath (Menkhorst 1995).	19-Aug-04	Suitable habitat on site and nearby, and some records close by. <b>Potential to occur.</b>
Spot-tailed Quoll	<i>Dasyurus maculatus subsp. maculatus</i>	Rare	Vulnerable		Inhabits a wide range of habitats in Tasmania, including rainforest, wet and dry eucalypt forest. They also inhabit modified land and coastal scrub. They are widely distributed across Tasmania, but at low densities (Threatened Species Section 2022).	21-Jul-15	Suitable habitat likely, and some recent records. <b>Potential to occur.</b>
Tasmanian Devil	<i>Sarcophilus harrisii</i>	Endangered	Endangered		Habitat is variable, but must contain certain features within several square kilometres. This includes areas to shelter during the day such as dense vegetation, hollow logs, burrows or caves. The need areas to hunt, with an open understorey mixed with patches of dense vegetation. The need habitat features to make breeding dens, such as well-drained soil or sheltered overhangs such as cliffs, rocky outcrops, knolls, caves and earth banks (Threatened Species Section 2022).	3-Apr-22	Suitable habitat and numerous nearby records. <b>Likely to occur.</b>

Common Name	Scientific name	TSP	EPBC-Thrt	EPBC - Mig	Habitat	Date of last record	Likelihood of occurrence
Tiger Quoll	<i>Dasyurus maculatus</i>	Rare	Vulnerable		Inhabits a wide range of habitats in Tasmania, including rainforest, wet and dry eucalypt forest. They also inhabit modified land and coastal scrub. They are widely distributed across Tasmania, but at low densities (Threatened Species Section 2022).	21-Jul-18	Suitable habitat likely, and some recent records. <b>Potential to occur.</b>
<b>Fish</b>							
Dwarf Galaxias	<i>Galaxiella pusilla</i>		Vulnerable		Vegetated margins of still water, ditches, swamps and backwaters of creeks, both ephemeral and permanent (Allen et al. 2002). Some wetlands where it occurs may partially or completely dry up during summer, with such wetlands reliant on seasonal flooding plus linkages to other sites where the species occurs, for habitat and population replenishment (Saddler, Jackson & Hammer 2010). Dwarf Galaxias is also often found in association with burrowing freshwater crayfish ( <i>Engaeus</i> spp.), with the crayfish burrows reportedly providing refuge from predators and dry conditions for the species (Saddler, Jackson & Hammer 2010).	None	Some habitat on site, with low connectivity to other suitable habitat, no nearby records. <b>Unlikely to occur.</b>
Saddled Galaxias	<i>Galaxias tanycephalus</i>	Vulnerable	Vulnerable		This species is found only in Arthurs Lake, Woods Lake and in nearby sections connected to Lake River in Tasmania's Central Highlands (Threatened Species Section 2022).	2-Jun-17	These lakes do not exist within the site boundaries, and the site has no connecting rivers with these waterbodies. <b>Unlikely to occur.</b>
Swan Galaxias	<i>Galaxias fontanus</i>	Endangered	Endangered		Found only in the Swan River and Macquarie River catchments in east Tasmania. The distribution is fragmented and does not cross-over with the distribution of the introduced brown trout ( <i>Salmo trutta</i> ) (Threatened Species Section 2022).	9-Jan-21	These lakes do not exist within the site boundaries, and the site has no connecting rivers with these waterbodies. <b>Unlikely to occur.</b>
<b>Invertebrates</b>							
Catadromus Carabid Beetle	<i>Catadromus lacordairei</i>	Vulnerable			The species occurs at 8 known locations in Tasmania, characterised by in open grassy woodland associated with wetlands at low elevations (Threatened Species Section 2022).	3-Sep-07	No suitable habitat and low connectivity with nearby records. <b>Unlikely to occur.</b>
Miena Jewel Beetle	<i>Castiarina insculpta</i>	Endangered			Open subalpine woodland and heath above 900 m elevation where it feeds on <i>Ozothamnus hookeri</i> (Threatened Species Section 2022).	12-Jan-20	No suitable habitat and no nearby records. <b>Unlikely to occur.</b>
Brown Butterfly, Ptunarra Xenica	<i>Oreixenica ptunarra</i>		Endangered		Generally found above 400 m. Habitat must have a significant cover of <i>Poa</i> tussock, ranging from grassland or grassy woodland (Threatened Species Section 2022).	None	No suitable habitat and no nearby records. <b>Unlikely to occur.</b>
<b>Frogs</b>							
Growling Grass Frog	<i>Litoria raniformis</i>	vulnerable	Vulnerable		Permanent, still or slow flowing water with fringing and emergent vegetation in streams, swamps, lagoons and artificial wetlands such as farm dams and abandoned quarries (Clemann & Gillespie 2004).	22-Mar-07	Suitable dams present with permanent water and emergent vegetation, but few recent records nearby. <b>Potential to occur.</b>

**Notes:** EPBC-T = threatened species status under EPBC Act; EPBC-M = migratory status under the EPBC Act (M = listed migratory taxa; Bonn Convention (A2H) - Convention on the Conservation of Migratory Species of Wild Animals – listed as a member of a family; Bonn Convention (A2S) - Convention on the Conservation of Migratory Species of Wild Animals - species listed explicitly; CAMBA - China- Australia Migratory Birds Agreement; JAMBA - Japan-Australia Migratory Birds Agreement; ROKAMBA - Republic of Korea Australia Migratory Birds Agreement); TSP= threatened species status under the TSP Act.

### 5.5.3. Susceptibility of listed fauna to impacts

The following analysis identifies the susceptibility of listed fauna species that may utilise the study area to development. This analysis includes consideration of the following factors:

- Mobility of the species;
- Availability and extent of other suitable habitat in the region and degree to which each species may rely on habitat in the study area; and

#### *Birds (non-migratory)*

Five listed non-migratory bird species are considered to have the potential to occur in the study area. The susceptibility of these species to possible impacts from any development in the study area is discussed below.

- **Grey Goshawk** (TSP Act: Endangered)

This species may use the site for foraging. The lack of taller, wet forest makes it unlikely the study area is used for nesting. Given this species has a large home range (Threatened Species Section 2022) and the similarity of the site to nearby habitat, the proposed development is not likely to impact this species.

- **Masked Owl (Tasmanian)** (EPBC Act: Vulnerable; TSP Act: Endangered)

This species uses agricultural mosaic habitats to hunt, adjacent to eucalypt forest and woodland. Thus, the site provides a suitable habitat mosaic for this species to use for foraging. The site may also provide nesting habitat, containing old-growth trees potential to support hollows large enough for a nesting pair. The development of a solar farm may reduce access to some key foraging areas, however, given the large amount of similar foraging habitat in the surrounding area, this is unlikely to have an impact. Masked Owls nesting in the study may be affected by extra disturbance associated with building and maintaining infrastructure, if their hollow was in close vicinity to the works.

- **Wedge-tailed Eagle** (EPBC Act: Endangered; TSP Act: Endangered) and
- **White-bellied Sea Eagle** (EPBC Act: Vulnerable)

These species are likely to use the site as a foraging area due to the large open paddocks. Given that similar foraging grounds are common in the surrounding area, any development is unlikely to impact these species.

Known Wedge-tailed Eagle nests from the Natural Values Atlas are mapped on Figure 4 and buffered by a 1 km non-disturbance buffer. No disturbance of breeding activity is expected from construction works or operation of the solar farm as works will take place outside the 1 km buffers.

- **Swift Parrot** (EPBC Act: Critically Endangered)

Swift Parrots may move through the site on their migration south to breed, as the site has good connectivity, and supports Eucalypt species which could be used for feeding during flowering. If Swift Parrots were to occur, they would likely be moving through. If habitat corridors remain intact, development is unlikely to affect this behaviour.

#### *Migratory Birds*

Three listed migratory bird species (excluding oceanic species and shorebirds) have the potential to occur in the study area. The susceptibility of these species to possible impacts from any development in the study area is discussed below.

- **Satin Flycatcher** (EPBC Act: Migratory)

Suitable habitat for this species exists in grassy wooded area that exist in the habitat corridors between paddocks, and in areas of the conservation covenant which may need to be impacted for access roads and a transmission line. Given the similarity of these habitats to those in the surrounding area, this species is unlikely to be affected by the development.

- **Latham's Snipe** (EPBC Act: Migratory)

This species may use banks of some dams and potentially the creek lines connecting these dams. Due to the presence of similar dams and creek lines in the surrounding area, the proposed development is unlikely to impact this species.

- **White-throated Needletail** (EPBC Act: Migratory)

This species may fly over the airspace above the site occasionally. It will not be affected by the proposed development.

### *Mammals*

Four listed mammal species are considered to have the potential to occur in the study area. The susceptibility of these species to possible impacts from any development in the study area is discussed below.

- **Tasmanian Devil** (EPBC Act: Endangered; TSP Act: Endangered)
- **Eastern Quoll** (EPBC Act: Endangered)
- **Tiger Quoll** (EPBC Act: vulnerable, TSP Act: rare)
- **Spot-tailed Quoll** (EPBC Act: vulnerable, TSP Act: rare)

All of these species are wide-ranging and use a variety of habitat including those in the surrounding areas. Thus, the proposed development is likely to have negligible impacts on the habitat of these species.

- **Eastern Barred Bandicoot (Tasmania)** (EPBC Act: Vulnerable)

This species uses mosaic habitats including woodland with dense ground-cover plants. This habitat is provided on the edges of conservation covenants, and in the habitat corridors. If the habitat corridors remain intact, this species is unlikely to be affected by the proposed development.

### *Frogs*

One listed frog species is considered to have the potential to occur in the study area.

- **Growling Grass Frog** (EPBC Act: vulnerable, TSP Act: vulnerable)

This species may utilise habitat areas in and around dams. If the quality of emergent vegetation in the dams are not affected, the development is unlikely to have an impact on this species.

## **5.6. Listed ecological communities**

The EPBC Protected Matters Search Tool (DAWE 2020a) indicated that four ecological communities listed under the EPBC Act and five communities listed under the Nature Conservation Act had the potential to occur in the search region (Table 3). Occurrence of these communities in the study area was determined based on an assessment of the native vegetation present against published descriptions and condition thresholds for these communities and is detailed in Table 3.

**Table 3: Listed ecological communities and likelihood of occurrence in the study area**

Ecological Community	EPBC	NC	Occurrence in the study area
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum ( <i>Eucalyptus ovata</i> / <i>E. brookeriana</i> )	Critically Endangered		Four patches of the Black Gum dominated ecological community <i>Eucalyptus ovata</i> forest and woodland (DOV) are modelled to occur in the study area by TASVEG 4.0, but these areas were found to support no native vegetation during the field survey, being dominated by dense stands of Gorse. Black Gum was observed to occur throughout the study area, but was not found to be a dominant or co-dominant species. However, the presence or absence of these communities cannot be confirmed without a detailed assessment. Suitable habitat may exist in gullies and poorly drained flats throughout the study area, as well as the sheltered slopes of the western extend of transmission line options 2.1 and 2.2. <b>Potential to occur.</b>
<i>Eucalyptus ovata</i> forest and woodland		Listed	
Alpine Sphagnum Bogs and Associated Fens	Endangered		Associated TASVEG 4.0 communities are not modelled to occur within the study area. Primarily occurs within the Tasmanian Central Highlands and Tasmanian Southern Ranges IBRA bioregions. <b>Unlikely to occur.</b>
Lowland Native Grasslands of Tasmania	Critically Endangered		Grassland throughout the study area consists mainly of Wallaby and Spear grasses, and is not dominated by either characteristic species of this community (Kangaroo Grass and Silver Tussock Grass), other than a single patch in the conservation area to the north-west of the eastern property. This patch, however, is heavily infested with Gorse (>20% cover), disqualifying the patch from listing. Silver Tussock Grass forms the majority of the ground layer in several grassy woodland and <i>Acacia - Bursaria</i> Shrubland areas adjacent to the access track between the eastern and western properties, but these areas either have a solid tree canopy cover of >10% or a solid shrub cover of >30%. A detailed assessment is required to determine if any sections of these areas of woodland or shrubland are sparse enough to qualify as the listed community. <b>Potential to occur.</b>
Tasmanian white gum ( <i>Eucalyptus viminalis</i> ) wet forest	Critically Endangered		Tasmanian White Gum occurs sporadically throughout the study area, only occurring as a dominant canopy species of vegetation along Lake River in transmission line options 2.1 and 2.2. This vegetation is modelled as <i>Eucalyptus viminalis</i> wet forest (WVI) in TASVEG 4.0, but

Ecological Community	EPBC	NC	Occurrence in the study area
<i>Eucalyptus viminalis</i> wet forest		Listed	was observed to more closely resemble <i>Eucalyptus viminalis</i> grassy forest and woodland (DVG), with an understory consisting largely of narrow-leaved shrubs and grasses. However, the presence or absence of the associated communities cannot be confirmed without a detailed assessment. Suitable habitat may exist in sheltered aspects of the river gully. <b>Potential to occur.</b>
<i>Eucalyptus amygdalina</i> forest and woodland on sandstone		Listed	Two stands of this community occur in the study area: one occurs in the vegetation corridor between the central properties on a sandstone rise, and another occurs in the southeast of the northern property. <b>Does occur.</b>
<i>Eucalyptus amygdalina</i> inland forest and woodland on cainozoic deposits		Listed	This community occurs throughout the study area, dominating the treed corridors and occurring in patches in the central properties. <b>Does occur.</b>
Riparian Scrub		Listed	Characteristic species were not recorded along Lake River, which was largely dominated by treed vegetation or exotic shrubs. <b>Unlikely to occur.</b>

**Notes:** EPBC = status under the EPBC Act. TSP = Status under the NC Act

Seven of these listed communities have the potential to occur or do occur especially within woodland and forested areas and shelterbelts adjacent to and in between the Solar East and Solar West sites. These areas were mostly mapped as high to very high flora habitat quality (Figure 2) and should be avoided through careful siting of the solar facility.

## 6. Assessment of potential impacts

### 6.1. Proposed Development

A solar farm with a potential yield of 288 MW is proposed within the paddocks of the study area. Connecting access tracks will be required and a 15.4km long transmission line connecting to a substation to the west. Three transmission line options and an infrastructure study area have been considered, with option 1 following an existing transmission line corridor. The development area for these components comprises 543 hectares.

### 6.2. Design Recommendations

The solar farm does not currently have a finalised detailed development layout. Development on the agricultural land is likely to have little effect on the quality of flora and fauna habitat in the study area.

The solar farm and infrastructure has been generally designed and sited so as to avoid any moderate, high and very high flora and fauna habitat. Especially, high quality shelterbelts, woodland and forest areas should be avoided, where possible. Removal of the moderate and high quality habitat found in the vegetation corridors may impact the connectivity of the site and thus impact some of the listed species that are likely to occur or have potential to occur within the study area.

Impacts on aquatic habitat such as dams and drainage lines have been avoided through the design of the solar farm. Where possible landscape buffers, screening and appropriate setbacks from waterways should be incorporated.

Transmission line options 2.1 and 2.2 were considered sub-optimal as they would impact on high quality flora and fauna habitat. As such transmission line option 1 is the preferred option to avoid impacts on native vegetation and habitat as it had the least interaction with higher quality vegetation and fauna habitat.



## 7. Implications under legislation and policy

### 7.1. EPBC Act

The EPBC Act protects a number of threatened species and ecological communities that are considered to be of national conservation significance. Any significant impacts on these species require the approval of the Australian Minister for the Environment.

The following EPBC Act listed flora species and communities have potential to occur, and may be impacted by the proposed development if present and if moderate, high or very high quality habitat is impacted:

- **Ecological communities**
  - Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (*Eucalyptus ovata* / *E. brookeriana*) (EPBC Act: Critically Endangered)
  - Lowland Native Grasslands of Tasmania (EPBC Act: Critically Endangered)
  - Tasmanian white gum (*Eucalyptus viminalis*) wet forest (EPBC Act: Critically Endangered)
- **Flora**
  - ***Grassy Woodland Shelterbelts***
    - Clover Glycine (EPBC Act: Vulnerable, TSP Act: Vulnerable)
    - Matted Flax-lily (EPBC Act: Endangered, TSP Act: Rare)
    - Soft Peppergrass (EPBC Act: Endangered, TSP Act: Endangered)
    - White Sunray (EPBC Act: Endangered, TSP Act: Endangered)
    - Grassland Greenhood, Cape Portland Greenhood (EPBC Act: Vulnerable, TSP Act: Vulnerable)
  - ***Only along Lake River***
    - Midlands Wattle (EPBC Act: Vulnerable, TSP Act: Vulnerable)

Targeted surveys would be required in early to mid- Spring if the habitat of these listed matters is to be affected by the development.

### 7.2. TSP Act

The Tasmanian *Threatened Species Protection Act 1995* (TSP Act) lists threatened species in Tasmania (Department of National Resources and Environment 2022). A permit is required under this act to knowingly take, keep, trade, or process any specimen of a listed species. To 'take' under the TSP involves killing, injuring, catching, damaging, destroying, or collecting a specimen.

The following TSP listed flora species and communities were found to potentially to occur, and may be impacted by the proposed development if present and if moderate, high or very high quality habitat is impacted:

- **Ecological communities**
  - *Eucalyptus ovata* forest and woodland
  - *Eucalyptus viminalis* wet forest

- Eucalyptus amygdalina forest and woodland on sandstone
- Eucalyptus amygdalina inland forest and woodland on cainozoic deposits
- **Flora Species**
  - Only along Lake River***
    - Dagger Wattle (TSP Act: Rare)
    - Inland Sickle-fern (TSP Act: Rare)
    - Slender Knotweed (TSP Act: Vulnerable)
    - Ferny Small-flower Buttercup (TSP Act: Rare)
    - Eel Grass (TSP Act: Rare)
  - Along Lake River, creeks, drainage lines***
    - Long-nosed Swamp Wallaby-grass (TSP Act: Endangered)
  - Wetland species within low lying wet areas and drainage lines***
    - Slender Aphelia (TSP Act: Rare)
    - Dwarf Aphelia (TSP Act: Rare)
    - Slender Twig-sedge (TSP Act: Rare)
    - Salt Club-sedge (TSP Act: Rare)
    - Swamp Sedge (TSP Act: Rare)
    - Poison Lobelia (TSP Act: Vulnerable)
  - Within Grassy Woodlands of Shelterbelts and Conservation Covenant areas***
    - Blue Pincushion (TSP Act: Rare)
    - Blue Grass-lily (TSP Act: Rare)
    - Small-leaf Glycine (TSP Act: Vulnerable)
    - Moss Sunray (TSP Act: Endangered)
    - Pretty Pearlflower (TSP Act: Endangered)
    - Dwarf Bush-pea (TSP Act: Vulnerable)
    - Dwarf Bush-pea (TSP Act: Vulnerable)
    - Silky Bush-pea (TSP Act: Vulnerable)
    - Spreading Knawel (TSP Act: Vulnerable)
    - Small Wrinklewort (TSP Act: Rare)
    - Propeller Plant (TSP Act: Vulnerable)
    - Forest Germander (TSP Act: Rare)
    - Yellow Rush-lily (TSP Act: Vulnerable)
    - Common Sunray (TSP Act: Vulnerable)

- Handsome Hooksedge (TSP Act: Rare)

***Low-lying areas of the central properties, as well as in conservation covenant areas***

- Varied Raspwort (TSP Act: Rare)

***Farm Dams***

- Yellow Bladderwort (TSP Act: Rare)

A permit to apply for the taking of native flora would be required from the Department of Natural Resources and Environment if impacting plant taxa comprising the abovementioned threatened flora species.

Targeted surveys would be required in early to mid-Spring to determine the status of these species if suitable habitat is to be impacted to assess any impacts to these species and communities. This could be undertaken as a planning permit condition.

### 7.3. Recommendations and future surveys

As demonstrated in the masterplan, the solar farm layout is proposed to be built on predominantly low quality agricultural land, leaving the native vegetation corridors intact. Furthermore, the proposal sees to utilise existing access tracks or tracks through farmland where possible to avoid impacts on treed shelterbelts or woodland areas. This approach would result in the proposal having the least impact on native vegetation and listed matters. The Conservation Covenant areas adjacent to the proposed solar farm have been avoided and it is recommended that these not be impacted where possible. The infrastructure is proposed to be located within areas of no mapped native vegetation or low quality habitat.

Three transmission line options were assessed. Transmission line option 1 had the least interaction with higher quality vegetation and fauna habitat and is thus the preferred option.

Targeted surveys for threatened flora and listed ecological communities would be required in early to mid-Spring to determine the status of threatened flora species to assess any impacts to these species and communities if suitable habitat is to be impacted. An earlier survey in autumn 2023 can be considered if only small areas of higher quality habitat are proposed to be impacted to check if these can be avoided through micro-siting.

An EPBC Act Referral would be required if EPBC Act listed flora species or ecological communities were found to be present within impacted areas during further surveys and if a significant impact to these values is expected. The current layout aims to avoid any suitable habitat for EPBC Act listed values through further surveys and micro-siting of access tracks and solar farm elements, in which case an EPBC Referral would not be required.

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