

Land Category Assessment

NGH has been engaged to prepare a Biodiversity Development Assessment Report (BDAR) for the proposed Culcairn Solar Farm, located in the Greater Hume Local Government Area (LGA), approximately 3.8 km south west of Culcairn, NSW. The proposal area includes Lots 9, 10, 11, 45, 46, 47, 53, and 54 DP 753735, Lots 70, 71, 72, 73 and 86 DP 753764, Lot 114 DP 664997, Lot 1 DP 171815, Lot 1 DP 179854, Lot 1 DP 575478, Lot 1 954904 and Lot B DP 972054 and Weeamera Road.

Section 6.8(3) of the Biodiversity Conservation Act 2016 determines that the Biodiversity Assessment Method (BAM) is to exclude the assessment of the impacts of clearing of native vegetation on Category 1-exempt land (within the meaning of Part 5A of the Local Land Services Act 2013) with exception to any impacts prescribed by the regulations under section 6.3 .**Category 1-exempt land** is defined under the LLS act as;

- Land cleared of native vegetation as at 1 January 1990 or lawfully cleared after 1 January 2019
- Low Conservation Grasslands (following commencement of the new framework on 25th August 2017
- Land (not being grasslands) containing only low conservation groundcover (following commencement of the new framework on 25th August 2017)
- Native vegetation identified as regrowth in a Property Vegetation Plan under the repealed Native Vegetation Act 2003
- Land biodiversity certified under the Biodiversity Conservation Act 2016.

This report establishes the methodology, results and conclusions to evaluate the land categorisation for the proposal area. It is requested that Department of Planning, Industry and Environment (DPIE) review the proposed methodology, endorse it if considered appropriate, and provide comment where required for the land categorisation of the proposal area and the proposed Culcairn Solar Farm.

Methodology

An initial desktop assessment and subsequent field assessments were undertaken over the proposal area to determine the ecological constraints and native vegetation communities on site. Assessment of the proposal area as Category 1-Exempt and Category 2- Regulated Land was undertaken using the following data sources:

- Aerial imagery of historical land use (Sourced from Spatial Services unit Department of Finance, Services and Innovation) (Figure 4 to Figure 13);
- 2017 Land Use Dataset (Australian Land Use and Management (ALUM) Classification Version 7 (OEH, 2017) (Figure 14 to Figure 16);
- NSW Woody vegetation extent and FPC 2011 (OEH, 2015) (Figure 18 to Figure 20);
- Sensitive regulated and vulnerable regulated lands on the Native Vegetation Regulatory Map portal (Figure 1 to Figure 3).
- Relevant vegetation mapping layers available from the SEED portal.

The potential of land legally cleared at or since 1 Jan 1990 (woody vegetation only) and/or land significantly disturbed or modified since 1990 (non woody vegetation) was assessed. Where there was any doubt, or where data was conflicting, the precautionary principle was applied, and deferred to Category 2 – Regulated Land. Historical images for 1990 and 2014 were evaluated to determine current and historic land-use (Figure 4 to Figure 13).



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Suite 1, 39 Fitzmaurice Street (PO Box 5464) Wagga Wagga NSW 2650 T. (02) 6971 9696 E. ngh@nghconsulting.com.au W. www.nghconsulting.com.au BEGA • BRISBANE • CANBERRA • GOLD COAST • NEWCASTLE • SYDNEY • WAGGA WAGGA

Results

The analysis of the above sources identified in conjunction with aerial imagery that areas of land within the proposed proposal area for Culcairn Solar Farm have been used continuously for cropping and grazing prior to and post 1990. Although smaller areas of past cropping are clearly evident, the vast majority of the proposal area is identified as having modified pastures in the relevant land use layers, however, conclusive evidence within the supporting historical imagery could not determine the significance of groundcover modification and therefore a precautionary approach was applied. The only exception to this is recent areas of cropping evident during the field surveys (for example most of the open paddocks have been used for cropping, hay production or grazing). The following table (Table 1) demonstrates how the above-mentioned layers were used in determining land category:

| Data Sources | Category 1 – | Category 2– | Excluded Land |
|---|--|--|---------------|
| Data Sources | Exempt Land | Regulated Land | |
| Aerial Imagery Culcairn Locality • 1990 • 2014 | Clear evidence of cropping Clear evidence of significant groundcover modification | • Woody vegetation present at 1990 in conjunction with woody vegetation extent layer | N/A |
| 2017 Land Use Dataset | Land use identified as; Grazing modified pastures (excluding woody vegetation) where clear evidence of significant groundcover modification has occurred post 1990 Cropping Manufacturing and industrial Residential and farm infrastructure | Land use identified as; Managed resource protection Grazing native vegetation Grazing modified pastures Cropping Residential and farm infrastructure Utilities | N/A |
| NSW Woody vegetation extent | Areas of woody vegetation regrowth that has occurred post 1990 following previous clearing events | • Woody vegetation present as at 1990 in conjunction with historic aerial imagery | N/A |
| Native regulatory map • Sensitive regulated land • Vulnerable regulated land • Excluded land | | All areas identified as vulnerable regulated land All areas identified as sensitive regulated land (there were no areas identified as sensitive regulated land) | N/A |

Another determining feature of constant agricultural use is a lack of woody vegetation regrowth in the majority of areas, as represented in the aerial images. The 2011 Woody Vegetation extent data (Figures 18-20) does however demonstrate scattered patches and isolated paddock trees in the proposal area that has been mapped as Category 2 Regulated Land. In areas where it is not 100% conclusive whether the grassland areas

have been previously cropped or significantly modified, a precautionary approach has been applied and mapped as Category 2 – Regulated Land.

The Land Category Map identifies the areas of Vulnerable Regulated Land occurring within the proposal area, as Sensitive Regulated Land does not occur on site, and therefore has been mapped as Category 2 – Regulated land. Refer to Figure 1 Proposal area and land categorisation overview (Source ESRI)

PCTs in various condition states within the proposal area that were recorded during the field surveys undertaken thus far include;

Woodland areas;

- PCT 5 River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion.
- PCT 74 Yellow Box River Red Gum tall grassy riverine woodland of the NSW South Western Slopes Bioregion and the Riverina Bioregion.
- PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes Bioregion and the Riverina Bioregion.
- PCT 277 Blakely's Red Gum Yellow Box Grassy Woodland of the NSW South Western Slopes Bioregion

Patches of derived grassland communities associated with the above PCTs were also identified in low condition throughout the site.

One area identified as Category 2 Regulated Land was not identified as native vegetation during the surveys. No plots were completed in this area as the land had been sown with Oats. Recent aerial evidence provides an indication of this. This comparison is provided below.





Figure 1-1 Recent aerial imagery(Google, 2020) right indicating land disturbance and lack of native vegetation in comparison to Category 2 Land.



ABN 31 124 444 622 ACN 124 444 622



Conclusion

Based on the above data sources, there is evidence to suggest that all of the lots within the proposal area have been under regular rotational cropping, hay production or grazing since 1990.

The 2017 Land Use data presented in Figures 14-16 supports primary land use within the identified areas within these lots as cropping or modified pastures, with smaller areas of grazing native vegetation. There is evidence of revegetation or native regeneration along riparian areas identified as category 2 regulated land within the proposal area shown to have occurred between 1990 and 2014 (Figures 4-13).

The Land Use Map (Figure 14) shows the majority of the site to be 'Cropping', with 'Grazing modified pastures' to the to the east of the proposal area. These areas are considered to meet the definition of Category 1-Exempt Land. Woody vegetation and areas identified as 'Grazing native vegetation' have been included as Category 2 - Regulated land. Where in doubt, or where data sources are conflicting, a precautionary approach has been implemented to areas deemed inconclusive in terms of determining historical land use.

A draft map of areas considered to be Category 1 Exempt Land and Category 2 Regulated Land (Vulnerable and Sensitive) has been produced and shown in Figures 1-3.



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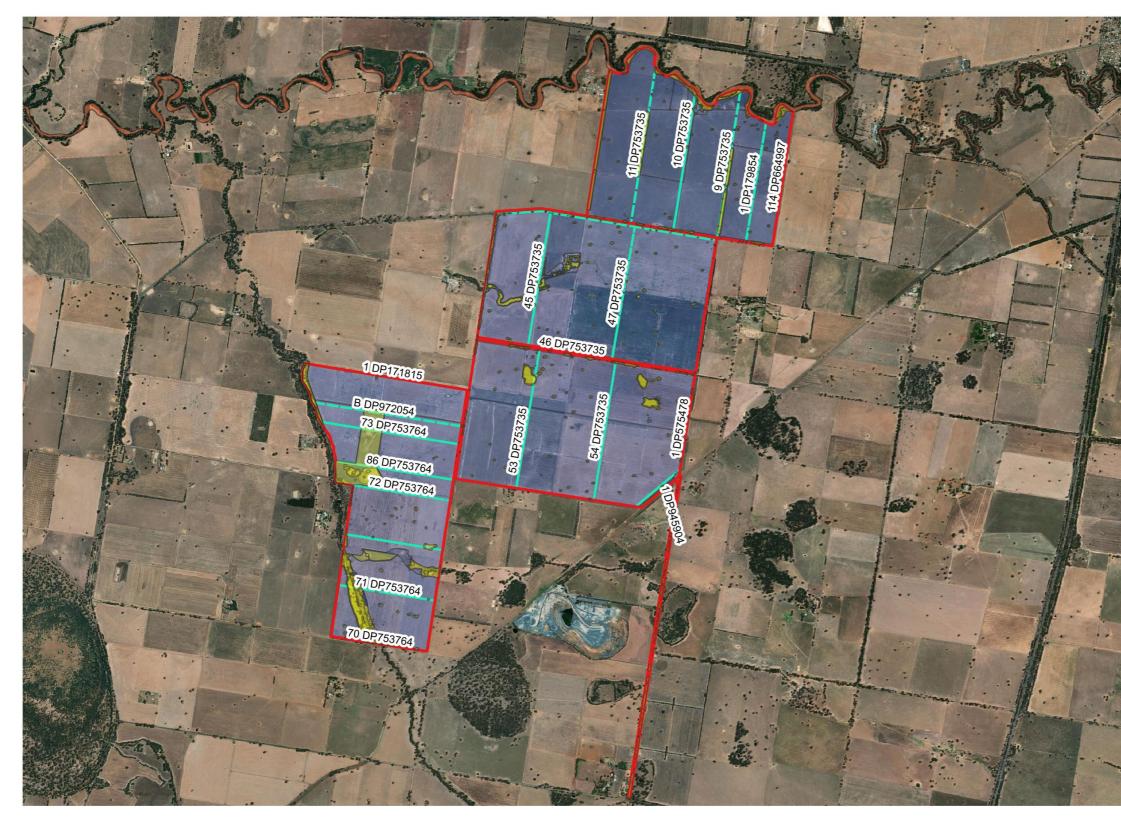


Figure 0-1 Proposal area and land categorisation overview (Source ESRI)

Culcairn Solar Farm Land Category Overview Map

Legend

Proposal Area

- Lot Boundaries
- Cat 2 Vulnerable Regulated Land
- Land
- Cat 1 Exempt Land
- Cat 2 Sensitive Regulated Land



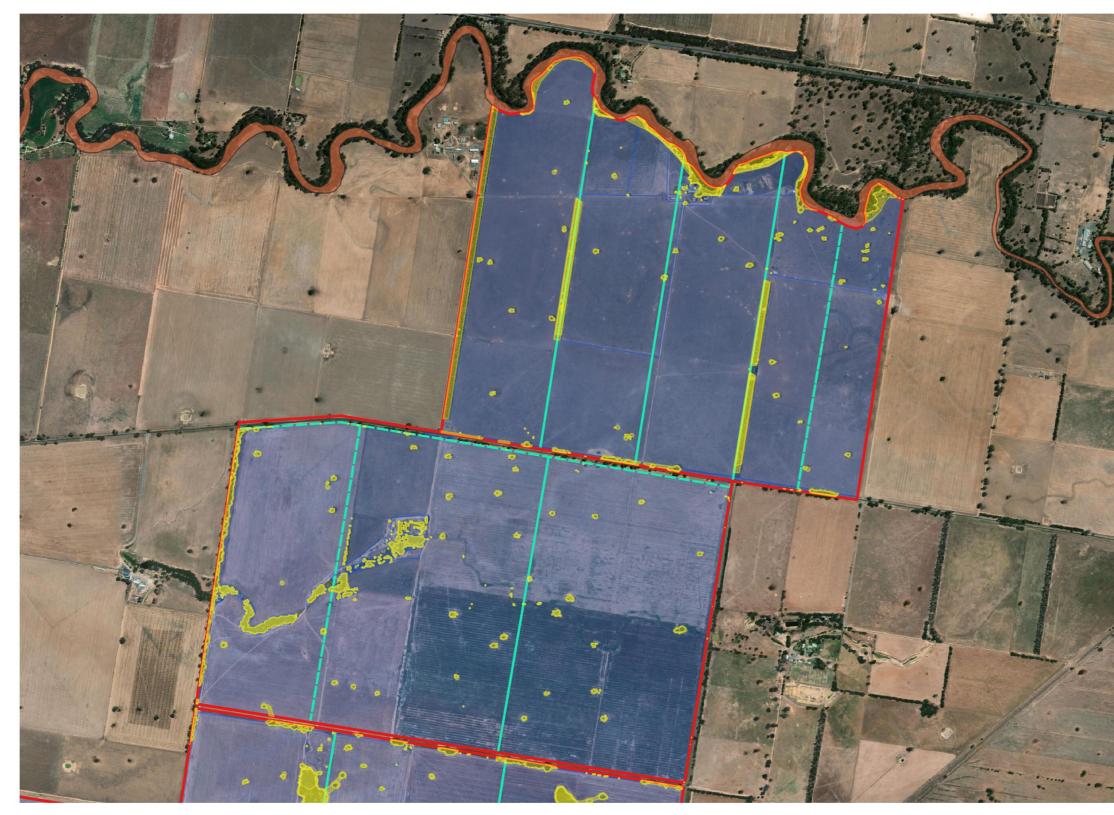


Figure 0-2 Northern half of proposal area and land categorisation (Source ESRI)

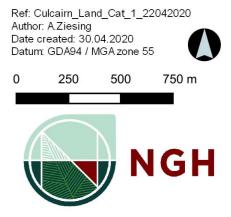
Culcairn Solar Farm Land Category Map 1

| Le | g | e | ٦d |
|----|---|---|----|
| | - | | |

Proposal Area

- Lot Boundaries
- Cat 2 Vulnerable Regulated Land
- Cat 1 Exempt Land
- Cat 2 Sensitive Regulated

Land



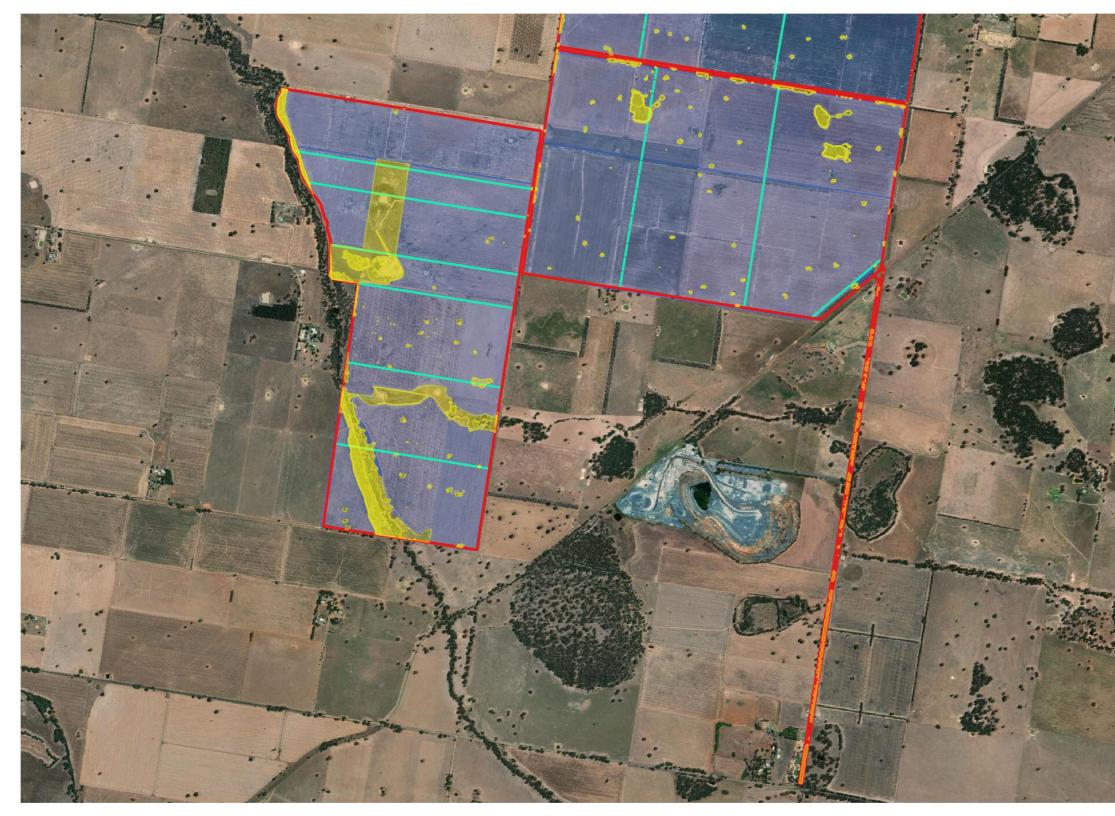


Figure 0-3 Southern half of proposal area and land categorisation (Source ESRI)

Culcairn Solar Farm Land Category Map 2

| Legen | d |
|-------|-------------------------------------|
| | Proposal Area |
| | ot Boundaries |
| | Cat 2 - Vulnerable Regulated and |
| C | Cat 1 - Exempt Land |
| | Cat 2 - Sensitive Regulated .and |
| | |

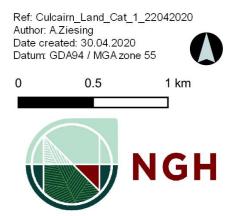


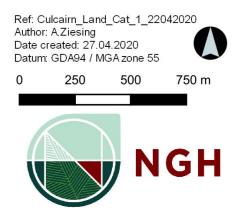


Figure 0.4 Aerial Imagery 1990 showing the northern half of the proposal area (Source: Dept. Spatial Services delivery)

Culcairn Solar Farm 1990 Aerial Image Map 1

Legend
Proposal Area

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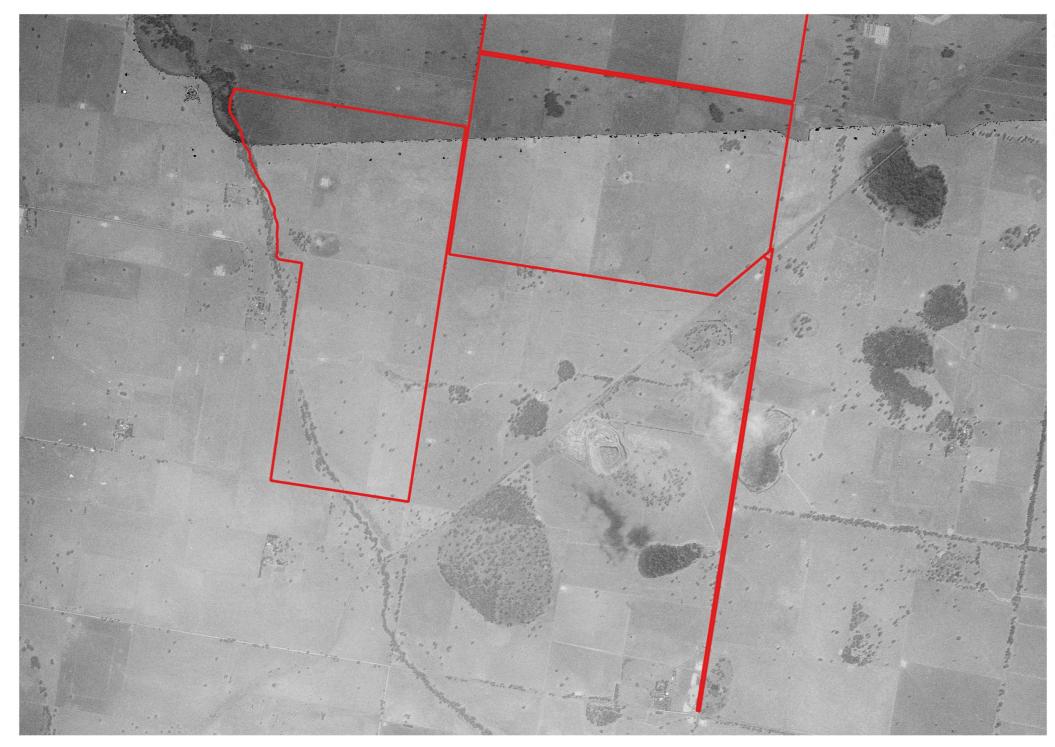
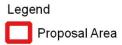


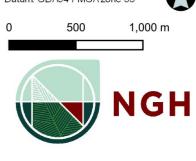
Figure 0-5 Aerial Imagery 1990 showing the southern half of the proposal area (Source: Dept. Spatial Services delivery)

Culcairn Solar Farm 1990 Aerial Image Map 2



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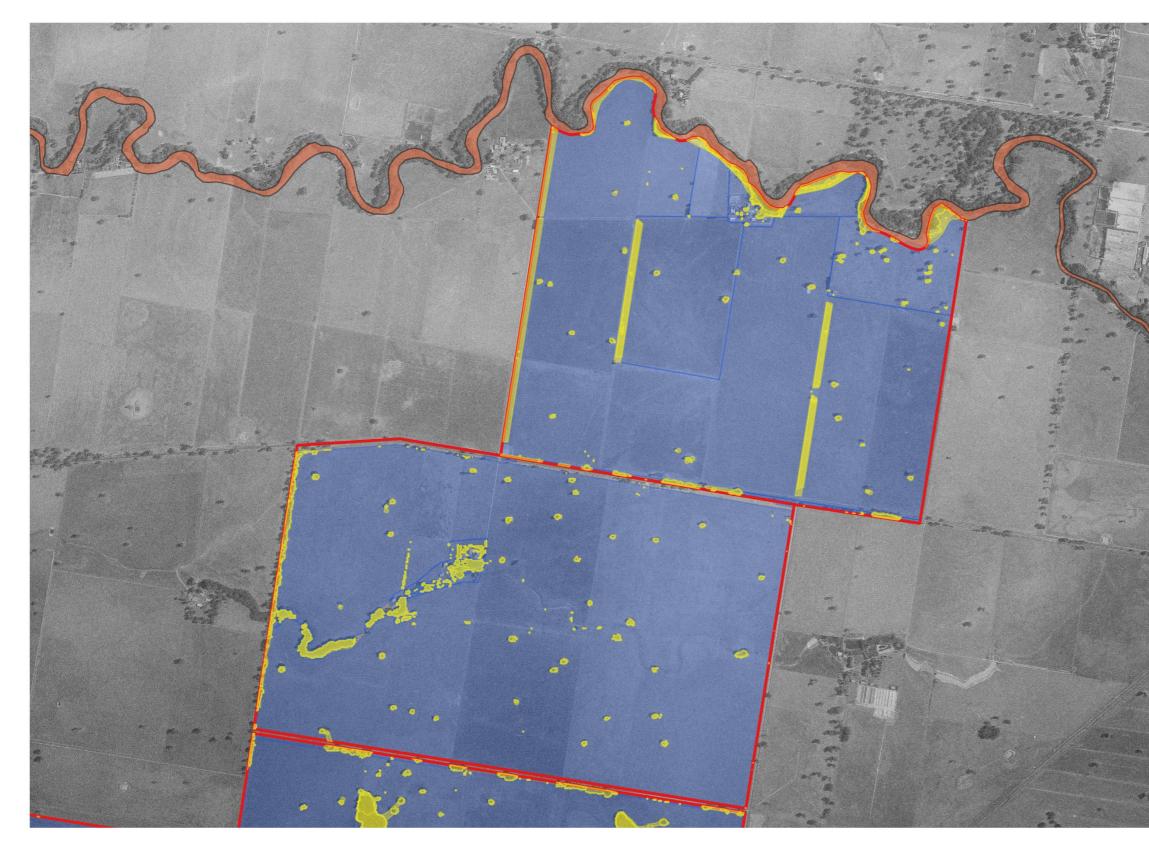


Figure 0-6 Aerial Imagery 1990 with Land categorisation in the northern half of the proposal area (Source: Dept. Spatial Services delivery)

Culcairn Solar Farm 1990 Aerial Image Land Category Map 1

Legend

- Proposal Area
 - Cat 1 Exempt Land
 - Cat 2 Vulnerable Regulated Land

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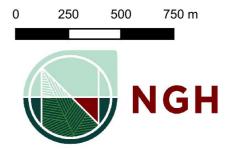




Figure 0-7 Aerial Imagery 1990 with Land categorisation in the southern half of the proposal area (Source: Dept. Spatial Services delivery)

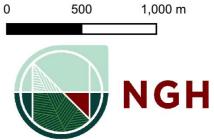
Culcairn Solar Farm 1990 Aerial Image Land Category Map 2

Legend

- Proposal Area
 - Cat 1 Exempt Land
 - Cat 2 Vulnerable Regulated Land

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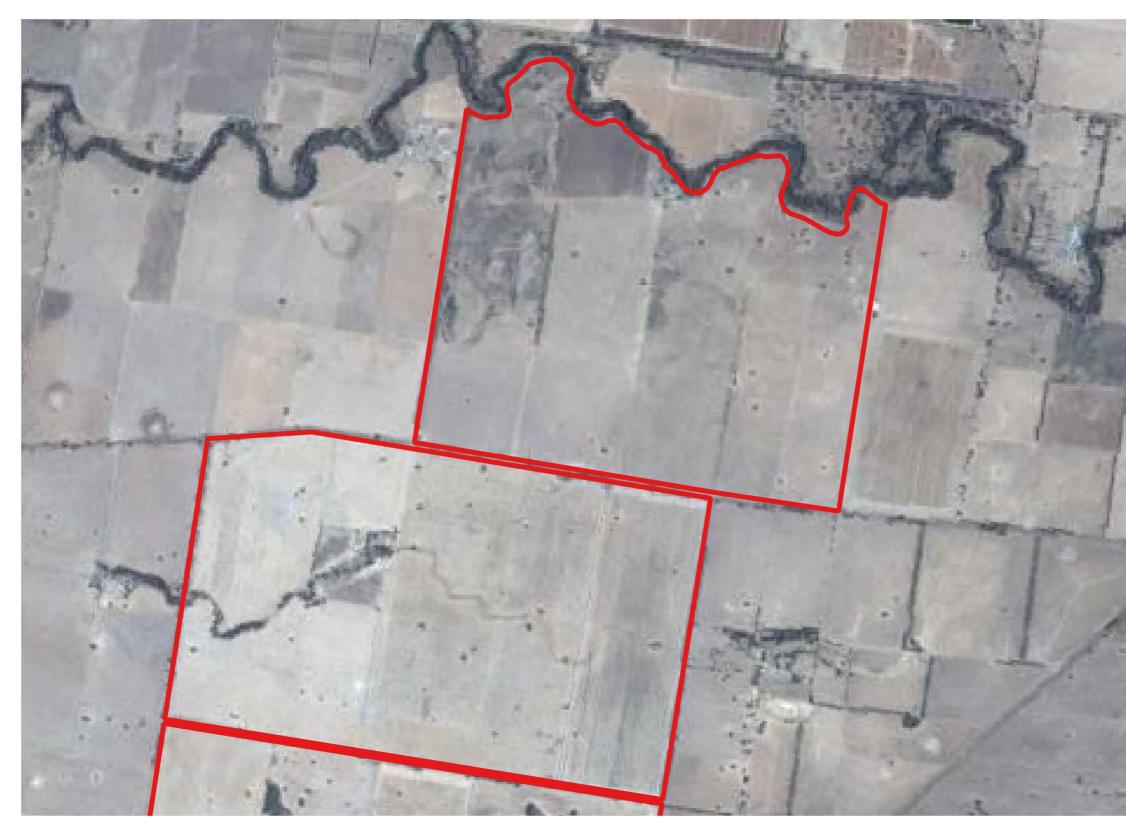


Figure 0-8 Aerial Imagery 2014 of northern half of proposal area (Source: Google Earth Pro)

18-441 Culcairn Solar Farm 28/04/2020

Culcairn Solar Farm 2014 Aerial Image Map 1

Legend

Proposal Area

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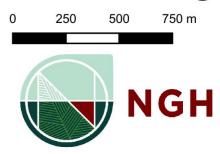




Figure 0-9 Aerial Imagery 2014 of southern half of proposal area (Source: Google Earth Pro)

Culcairn Solar Farm 2014 Aerial Image Map 2

Legend
Proposal Area

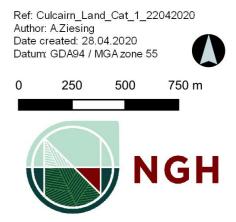
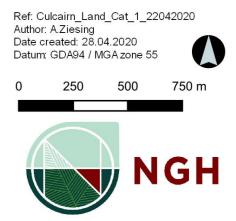




Figure 0-10 Aerial Imagery 2014 of the Weemera Road area (Source: Google Earth Pro)

Culcairn Solar Farm 2014 Aerial Image Weeamera Road Map

Legend
Proposal Area



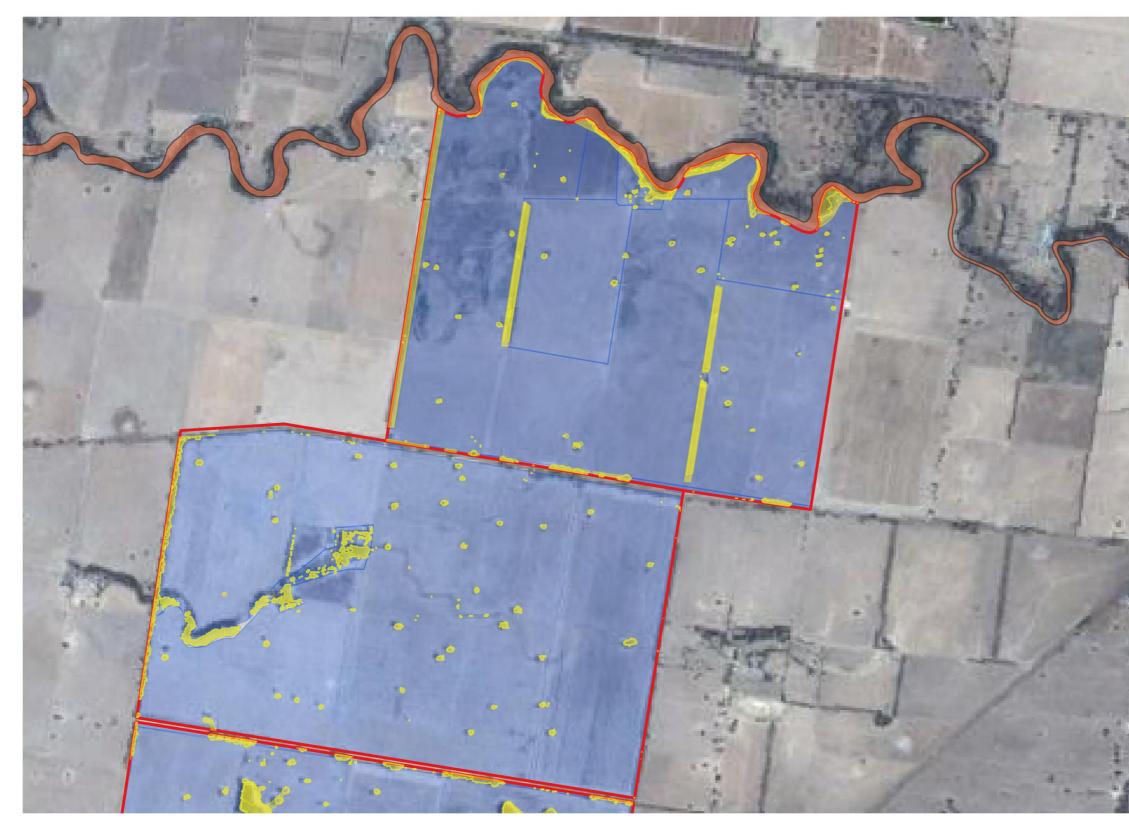


Figure 0-11 Aerial Imagery 2014 with Land categorisation of northern half of proposal area (Source: Google Earth Pro)

Culcairn Solar Farm 2014 Aerial Image Land Category Map 1

Legend

Proposal Area

- Cat 1 Exempt Land
- Cat 2 Vulnerable Regulated
- Land Cat 2 - Sensitive Regulated Land

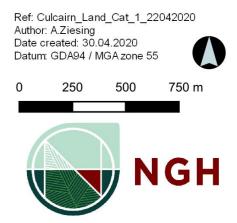




Figure 0-12 Aerial Imagery 2014 with Land categorisation of southern half of proposal area (Source: Google Earth Pro).

Culcairn Solar Farm 2014 Aerial Image Land Category Map 2

Legend

Proposal Area

- Cat 1 Exempt Land
- Cat 2 Vulnerable Regulated
- Land Cat 2 - Sensitive Regulated
- Land

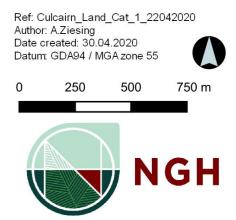




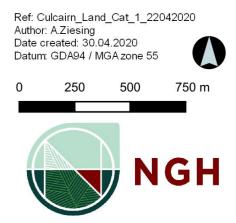
Figure 0-13 Aerial Imagery 2014 with Land categorisation of Weetmera Road (Source: Google Earth Pro)

Culcairn Solar Farm 2014 Aerial Image Land Category Weeamera Road Map

Legend

Proposal Area

- Cat 1 Exempt Land
- Cat 2 Vulnerable Regulated
- Land Cat 2 - Sensitive Regulated Land



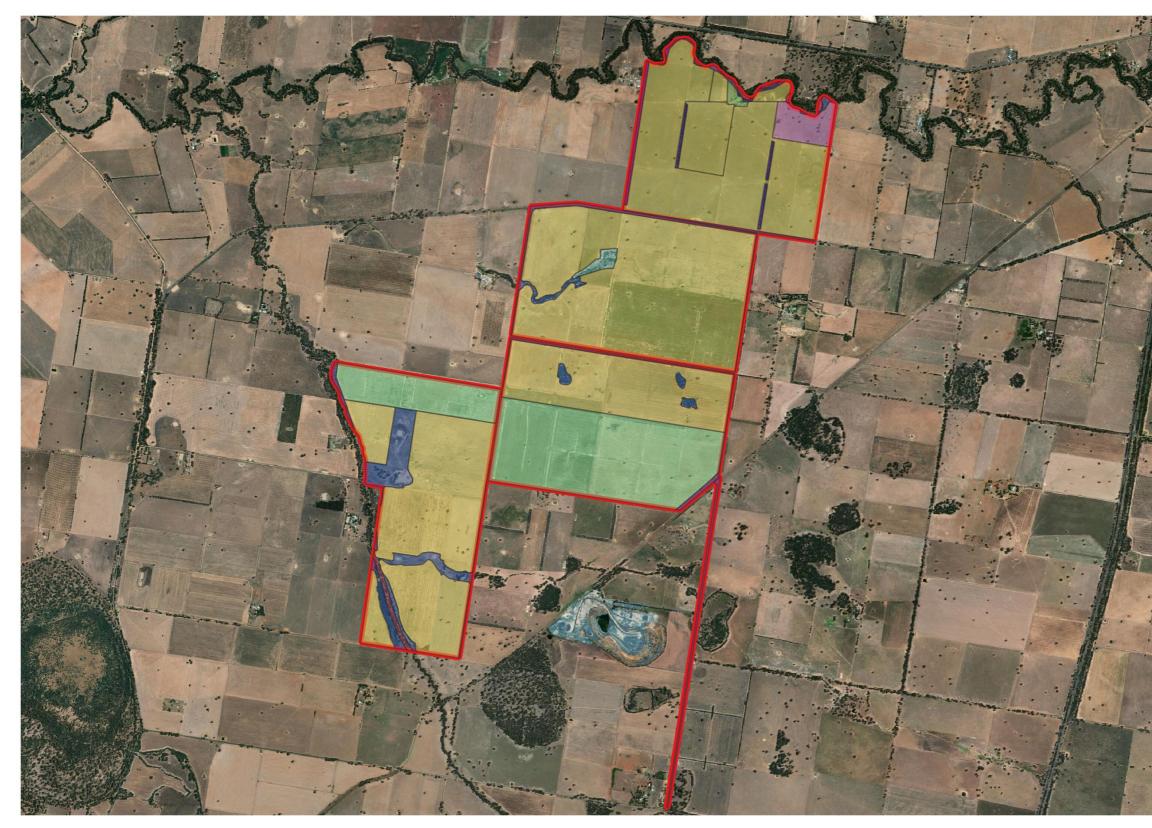


Figure 0-14 Landuse overview map (Source ESRI)

Culcairn Solar Farm Land Use Overview Map

Legend

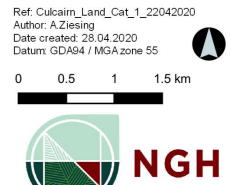
Proposal Area

Land Use

- 1.2.0 Managed resource protection
- 2.1.0 Grazing native

vegetation

- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 4.3.0 Irrigated cropping
- 5.3.0 Manufacturing and
- industrial
- 5.4.0 Residential and farm infrastructure
- Infra
 - 6.3.0 River



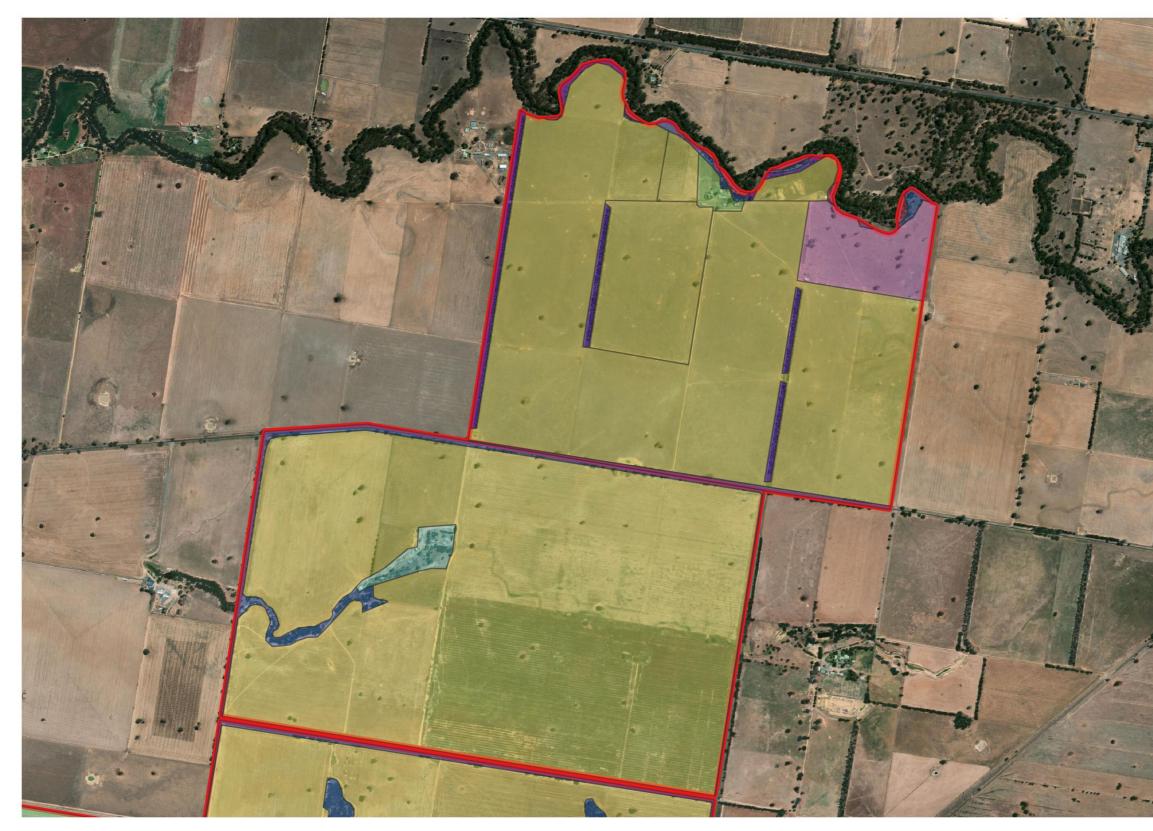


Figure 0-15 Landuse in the northern half of the proposal area (Source ESRI)

Culcairn Solar Farm Land Use Map 1

Legend

Proposal Area

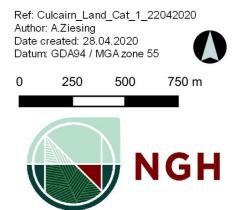
Land Use

- 1.2.0 Managed resource protection
- 2.1.0 Grazing native

vegetation

- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 4.3.0 Irrigated cropping
- 5.3.0 Manufacturing and
- industrial
- 5.4.0 Residential and farm infrastructure

6.3.0 River



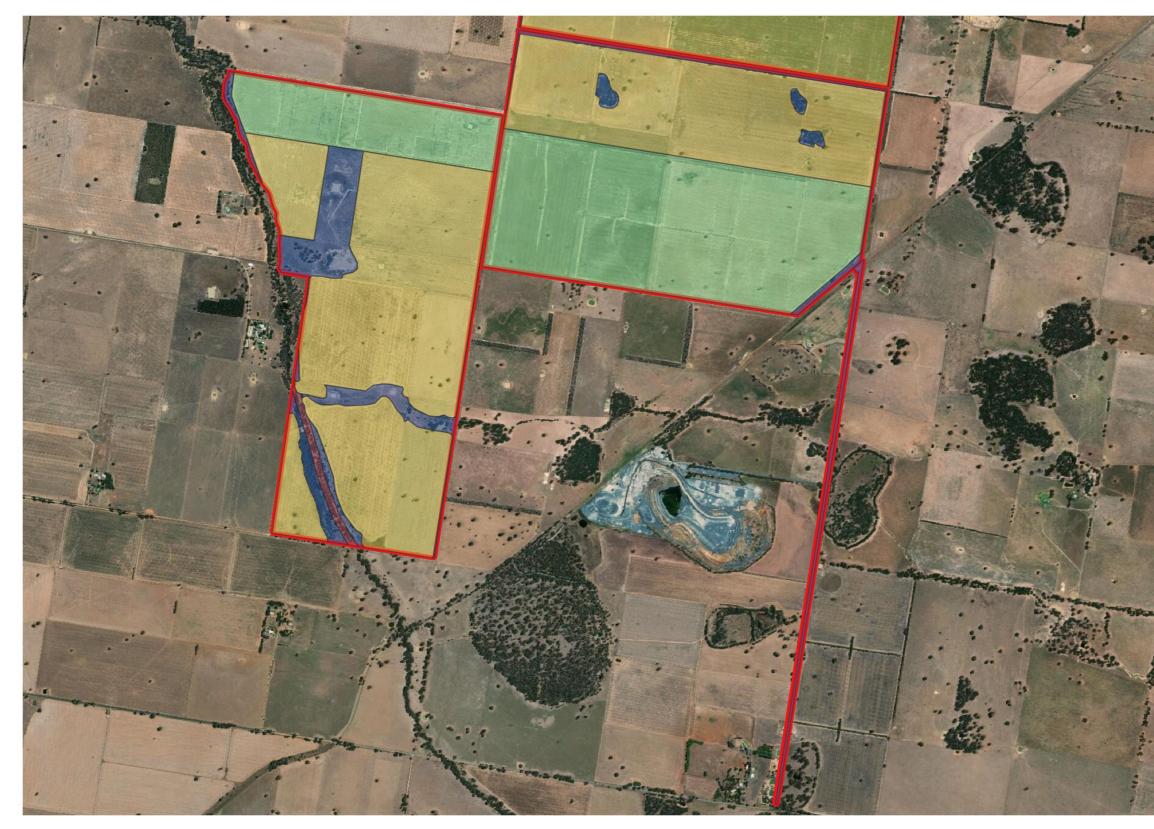


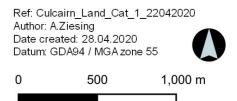
Figure 0-16 Landuse in the southern half of the proposal area (Source ESRI)

Culcairn Solar Farm Land Use Map 2

Proposal Area

Land Use

- 1.2.0 Managed resource protection
- 2.1.0 Grazing native
- vegetation
- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 4.3.0 Irrigated cropping
- 5.3.0 Manufacturing and
- industrial
- 5.4.0 Residential and farm infrastructure
- _____
- 6.3.0 River





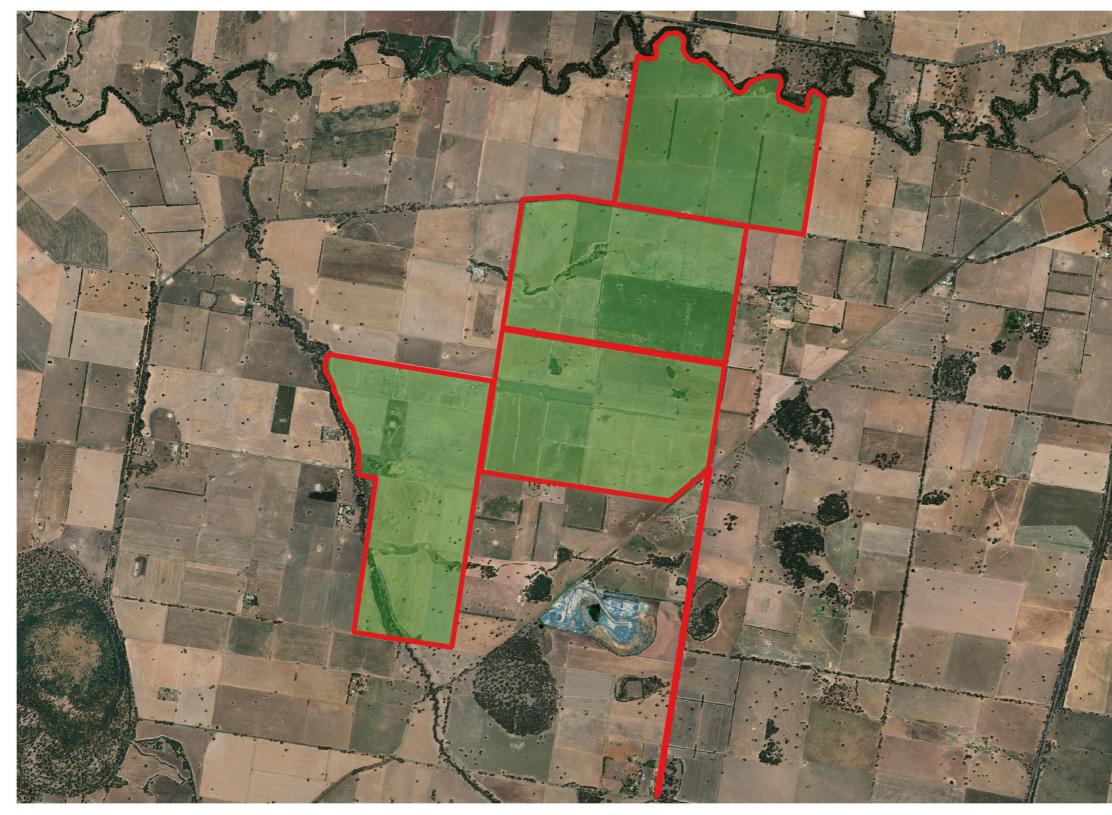


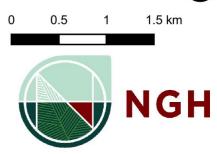
Figure 0-17 Land Zoning (Source ESRI)

Culcairn Solar Farm Land Zoning Map

Legend Proposal Area Land Zone RU1

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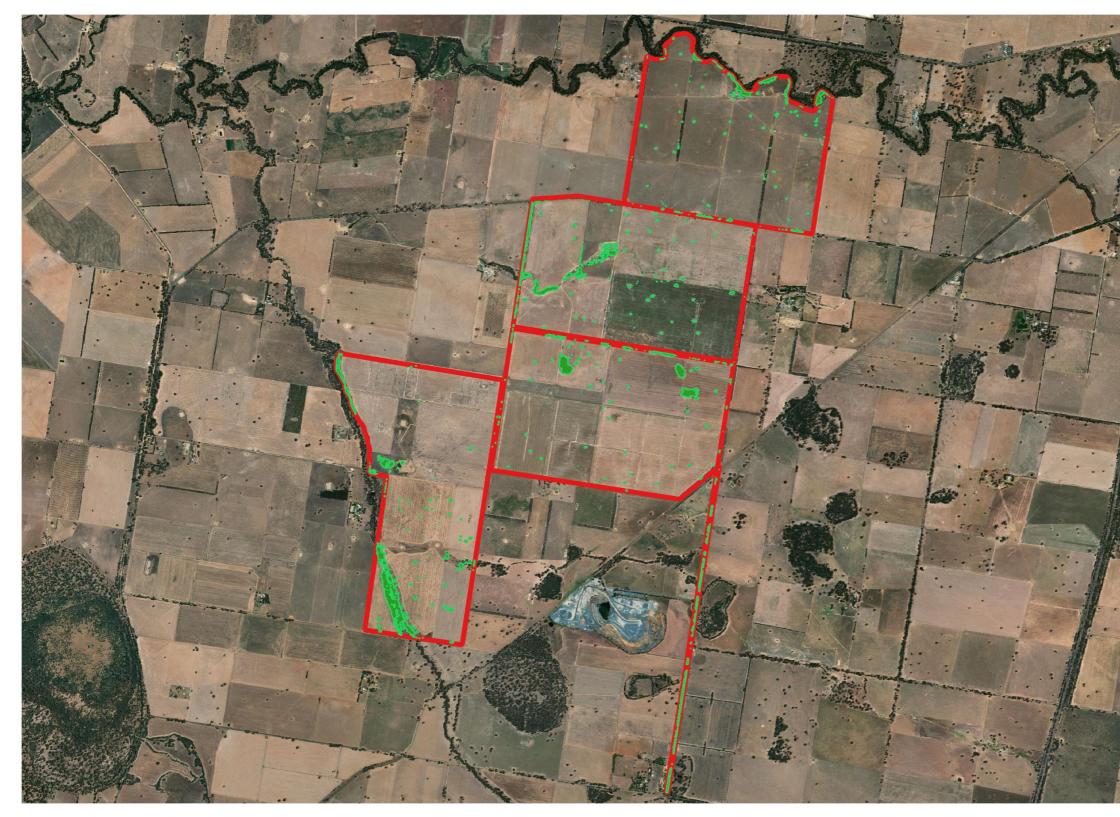
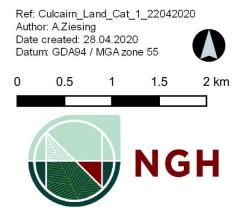


Figure 0-18 NSVVV cody vegetation extent 2011

Culcairn Solar Farm Woody Vegetation Overview Map

Legend Proposal Area Woody Vegetation 2011



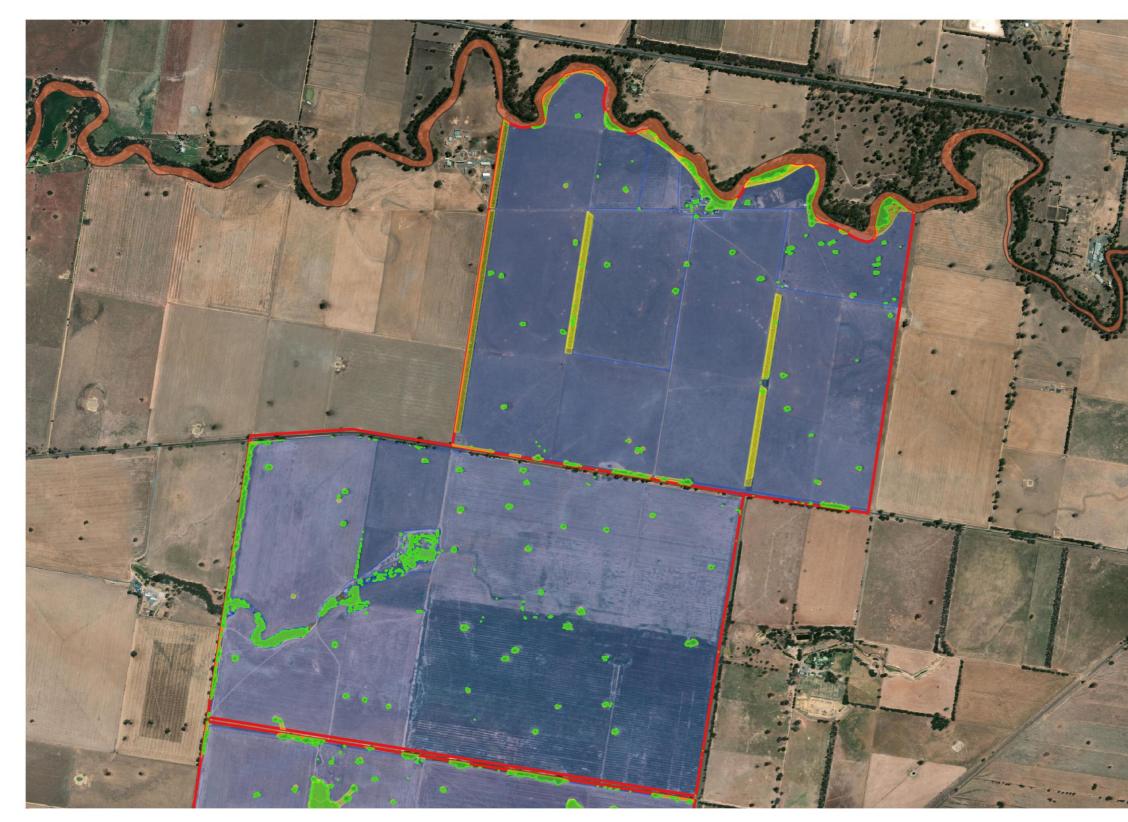


Figure 0-19 NS/W/cody vegetation extent 2011 with land categorisation in the northern half of the proposal area

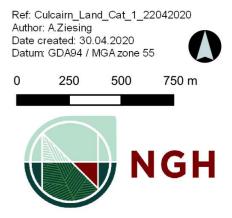
Culcairn Solar Farm Land Category with Woody Vegetation Map 1

Legend

Proposal Area

Cat 2 - Vulnerable Regulated Land

- Cat 1 Exempt Land
- Cat 2 Sensitive Regulated Land
- Woody Vegetation 2011



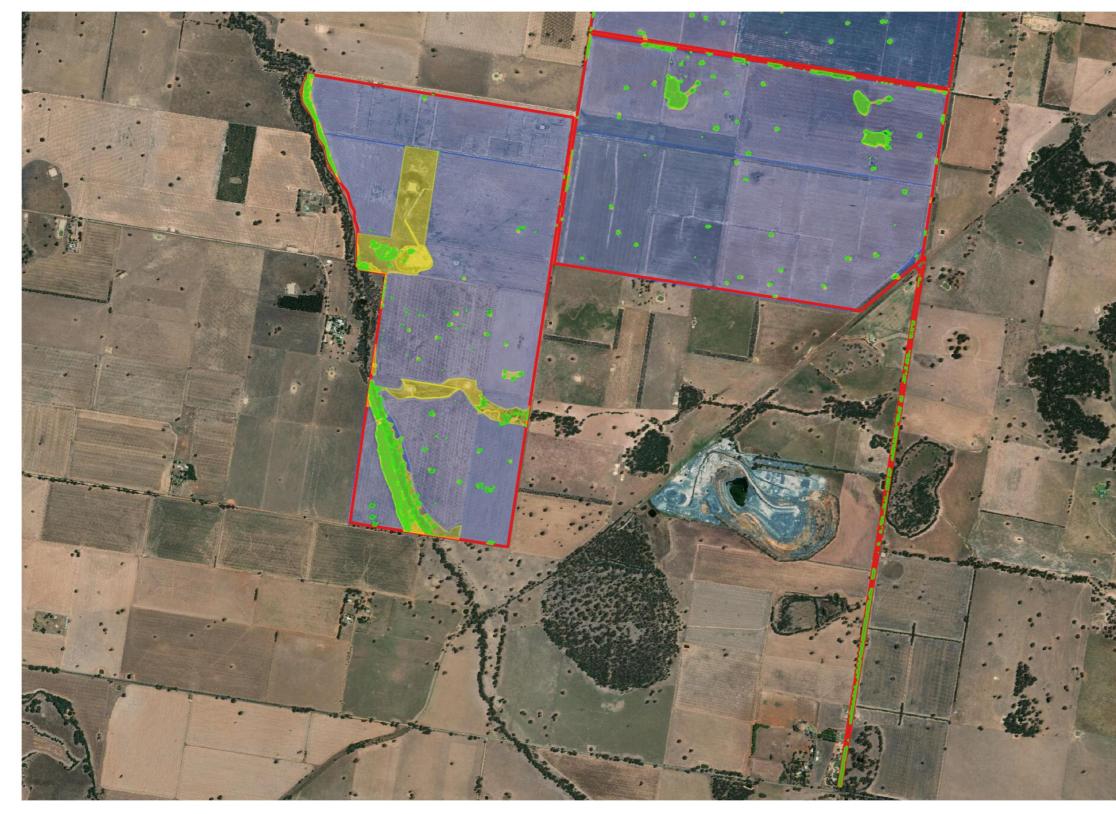


Figure 0-20 NS/W/cody vegetation extent 2011 in the southern half of the proposal area

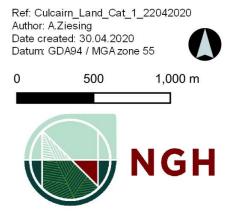
Culcairn Solar Farm Land Category with Woody Vegetation Map 2

Legend

Proposal Area

Cat 2 - Vulnerable Regulated Land

- Cat 1 Exempt Land
- Cat 2 Sensitive Regulated Land
- Woody Vegetation 2011



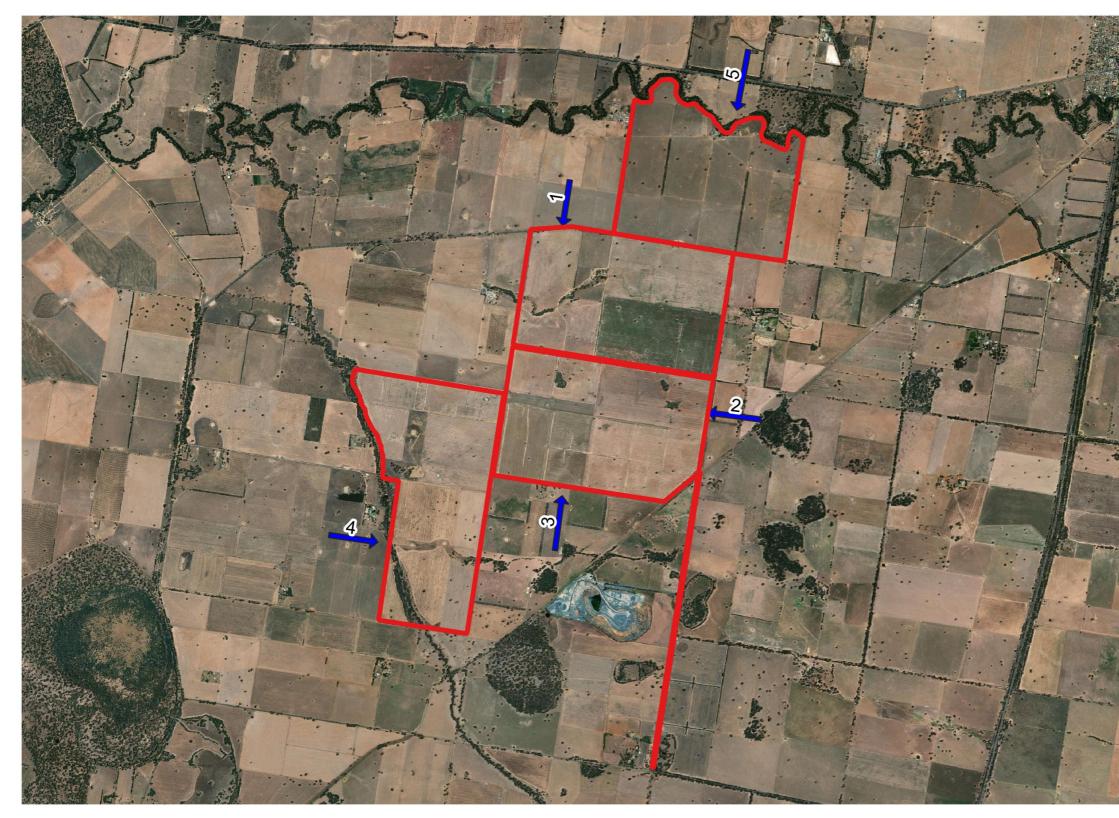


Figure 0-21 Photo points across the proposal area

Culcairn Solar Farm Photo Points Map

Legend Proposal Area Photo Points

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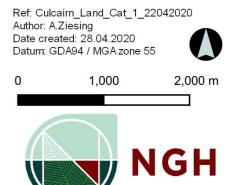


Table 2 – Photographs showing current land use (Figure 17)

| Photo Points | Summary | Image |
|---|--------------------------------------|-------|
| Photo point 1 Cumming Road, north | Evidence of grazing | |
| Photo point 2 Southern area of development site | Evidence of cropping in the south | |
| Photo point 3 | Evidence of grazing and cropping | |

| Photo Points | Summary | Image |
|--------------------------------------|--|-------|
| Photo point 4 Cumming Road, north | Hay production and grazing paddocks to the north | |