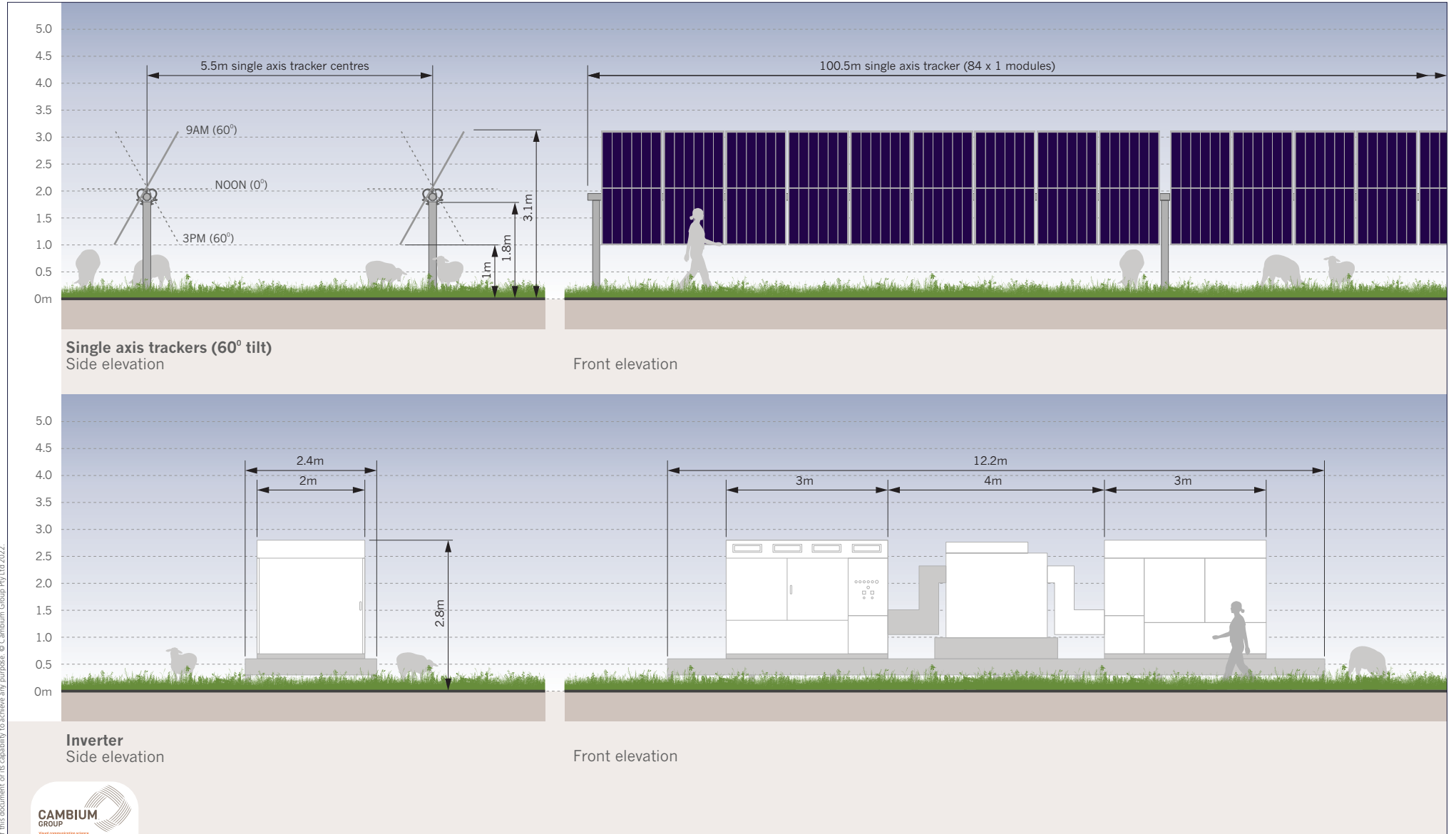


Figure 3-4  
Single axis tracker height comparison

GOULBURN RIVER SOLAR FARM  
VISUAL IMPACT STATEMENT



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The PV solar modules would slowly follow the daily transverse of the sun in a 120 degree turn from the east in the morning, to the west by the afternoon. The movement is very slow and not obvious in short-duration views.

Three distinct solar array areas would be located within the Project Area – one being on the elevated central plateau (the largest), one to the north, and the smallest near Wollara Road.

### Inverters

Underground cables would be installed to connect the PV solar modules to inverters. Approximately 67 inverters would be installed across the Project Area, located at the end of a row of solar modules. Each inverter would be approximately 3.7 m wide by 2.3 m high by 2 m deep. An image of a typical inverter unit is shown [Figure 3-5](#). [Figure 3-4](#) shows the relative height of the inverters. The inverters would connect to the on-site substation via underground cables.

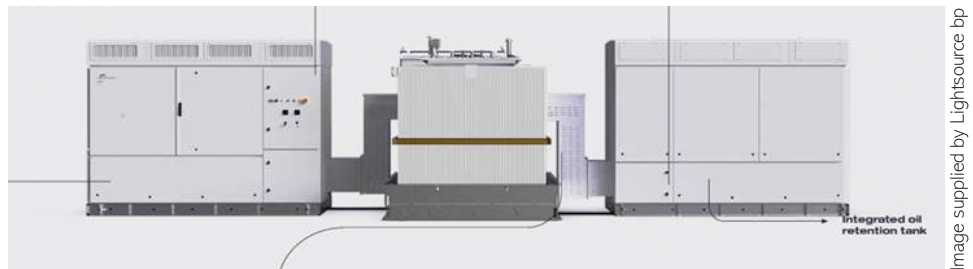


Figure 3-5: Typical inverter

### BESS

The BESS would be housed in outdoor containers, similar to shipping containers. Approximately 33 BESS containers are proposed, each approximately 3.5 m tall x 12.2 m long x 2.5 m wide. A drawing of typical outdoor BESS containers aggregated in a central location adjacent to a typical substation, is illustrated in [Figure 3-6](#).

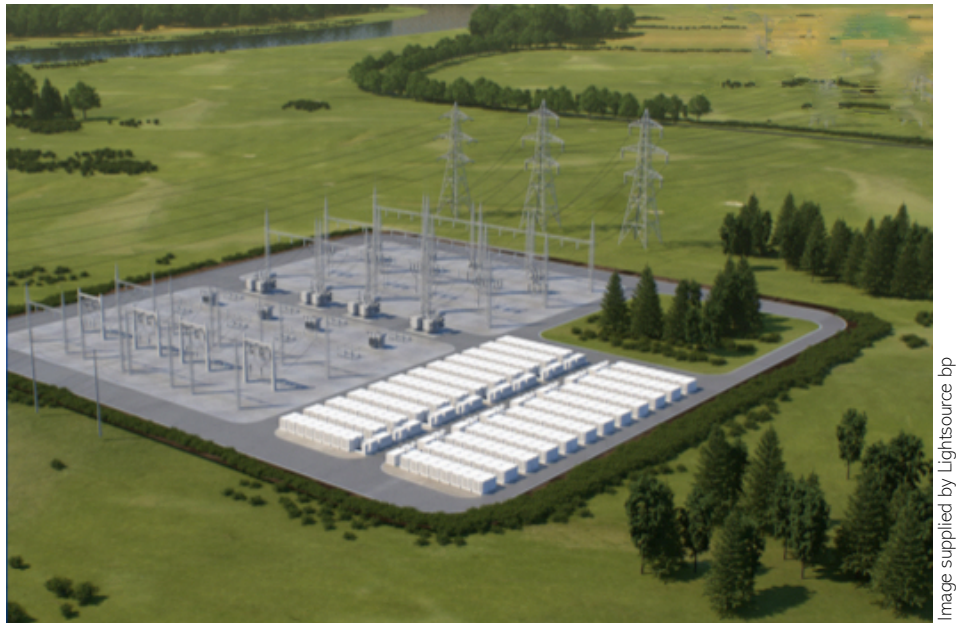


Figure 3-6: Typical BESS housing aggregated adjacent to a substation

### Onsite switchyard and substation

[Figure 3-7](#) shows the typical features of a substation, including the proposed 30 m high communications tower that would be installed at the substation, and other tall components, such as the weather station and lightning mast.

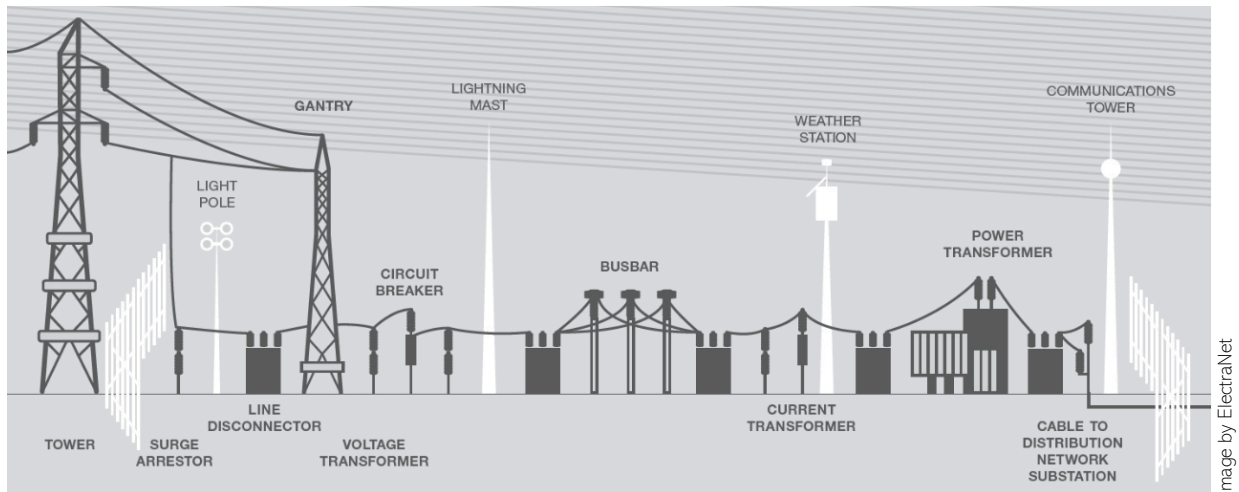


Figure 3-7: Typical features of transmission substation (not to scale)

### Ancillary Infrastructure

Operations and maintenance (O&M) facilities would be constructed to support the ongoing operation of the solar farm. O&M facilities would be located near the onsite substation and include an office with staff amenities (kitchenette, toilets, showers), car park, workshop/shed and laydown/temporary storage area. The O&M facilities would have a footprint of approximately 10 ha.

### Access and parking

The Project Area would have access from Wollara Road, primarily via the Golden Highway to the north (including light, heavy and over-sized vehicles) and Ringwood Road, with some light vehicles possibly using Wollara Road to the south (possibly light vehicles).

The Project would require road repairs and upgrades on Ringwood Road including upgrades to culverts at Bow River and Killoe Creek (located on Ringwood Road), widening and resealing of 1.8 km of Ringwood Road between Bow River and Killoe Creek, and possibly additional signage. From Wollara Road, there would be one primary access point into the Project Area (at the main driveway to the southern homestead. Two secondary access points are proposed off Wollara Road (for emergency and National Parks and Wildlife Service access only), one at an existing access opposite White Box Trail, and one north of the White Box Trail.

During construction, parking would be available within or near the temporary construction compound. The indicative location of the compound is illustrated in the layout plan (Figure 3-2).

### Lighting

Permanent, low-level lighting would be installed at ancillary infrastructure (office, workshop, amenities, substation, BESS and parking). Lighting would not be used at night, except in an emergency.

All permanent external lighting would be low intensity lighting (except where required for safety or emergency purposes); would not shine above the horizontal; and would comply with Australian/New Zealand Standard *AS/NZS 4282:2019 – Control of Obtrusive Effects of Outdoor Lighting* and the *Dark Sky Planning Guideline* (DPE 2016). Lighting is discussed further at SECTION 7.

### Security Fencing

Chain mesh security fencing, approximately 2.3 m high (subject to final design) would be installed around each of the three distinct solar array areas within the Project Area to minimise impact on fauna.

### Road upgrades

The Project would require road repairs and upgrades on Ringwood Road including:

- A 1.8 km section of Ringwood Road would be widened and resealed between Bow River and Killoe Creek.
- Upgrades to culverts at Bow River and Killoe Creek. The culvert upgrades would include:
  - Installing culverts designed to accommodate two-way heavy vehicles, including various farm machinery
  - Culvert width 7 m (3.5 m lane width) sealed carriageway with suitable guardrail and signage and associated drainage works
  - Stockpile site to be located on disturbed land within the road reserve in consultation with Upper Hunter Council
  - Temporary side track at both locations to facilitate access during construction.

The proposed road upgrades are ancillary to the Project. Visual impacts associated with the proposed road upgrades are not included in this assessment of visual impacts.

### Vegetation removal

Most existing vegetation within the Project Area would be retained, including dense vegetation covering slopes and along creek lines. The Project may result in small tree and shrub removal from within the solar array footprint of the Project Area.

## 3.5 Construction

### Timing

Construction is anticipated to commence early 2024 and last around 27 months (just over two years). Construction activities would be undertaken during standard daytime construction hours (6am – 6pm Monday to Saturday). Night construction works are not anticipated. In general, no construction activities would occur on Sundays or public holidays.

### Construction Activities

Visible construction activities include:

- Installation of temporary construction compound areas (including laydown areas, security hut and temporary parking)
- Delivery of materials via heavy vehicles
- Site access via light construction worker vehicles
- Installation of environmental controls including erosion and sediment management structures
- Installation of perimeter fencing
- Establishment of no-go zones around watercourses to be avoided, and vegetation to be retained
- Minor site grading and levelling, including construction of internal access tracks
- Articulated and over-size vehicles that would transport larger plant such as the PV modules and substation transformers
- Installation of PV mounting system and solar modules.

Following construction, temporary construction facilities would be removed, and disturbed, exposed surfaces would be revegetated or stabilised.

## 3.6 Operation

The Project is expected to operate for 40 years or more, with operations commencing in April 2026. At operation, the key **visible** components of the Project would be:

- The proposed solar array area closest to Wollara Road (one of the three distinct solar array areas within the Project Area). The solar array would include around 80 ha of solar modules, and be located on mostly cleared, lower-lying land adjacent to Wollara Road

(which is lightly trafficked through Goulburn River National Park). On average the solar modules would be between 2.6 m and 2.98 m high, in rows spaced around 5.5 m apart.

- A section of the perimeter security fence that surrounds the Wollara Road solar array would be visible along a small section of Wollara Road adjacent to the solar modules.
- Lighter coloured inverters among the rows of solar modules.
- One primary Project site access point off Wollara Road, and two emergency access points
- A site office near the former southern homestead.

Project components such as the BESS and substation would be located in visually isolated parts of the Project Area and would not be visible from surrounding receivers, including from Wollara Road.

The Project Area may continue to support livestock, with grazing sheep on site within the development footprint, and potentially cattle outside of the development footprint.

There would be ongoing access to the Project Area by workers undertaking planned maintenance activities, including:

- Daily inspections
- Cleaning of solar modules, inverters and meteorological stations
- Vegetation management
- Preventative and corrective maintenance activities of Project components
- Weed and pest control.

During operations regular lightweight vehicle access would be required with rare heavy vehicles access (i.e., replacing inverters, transformers, or components of the BESS).

### 3.7 Decommissioning

After the Project reaches the end of its operational life, it would either be decommissioned removing all infrastructure (above and below ground) or repurposed with new PV equipment.

## 4.1 Existing landscape character

### 4.1.1 Regional landscape and broad landscape character zones

The study area for landscape character assessment is approximately 5 km from the proposed development<sup>6</sup>. Within this local area, there are two distinct landscape character zones:

- Dense, forested landscape, distinguished by tall, native vegetation, including the Goulburn River National Park.
- Open, agricultural landscape, distinguished by grazing pastures, rural infrastructure and agricultural land use, including the project site.

The approximate extent of the two landscape character zones is illustrated in [Figure 4-1](#). The project site development footprint is located wholly within the open, agricultural landscape, which is surrounded by the dense forested landscape.

The forested areas are within the northern extent of the 'Sydney Basin' biogeographic region<sup>7</sup>, and associated with the 'Lees Pinch Soil Landscape'<sup>8</sup>. This soil landscape covers rolling to steep mountains (elevation ranges from 180 – 800 m), with rounded summits, narrow valleys and gorges, and large sandstone outcrops on some hills. Soils are shallow. Vegetation around the Goulburn River is a woodland of brown bloodwood and scribbly gum. Black cypress pine is also common. The primary land use is nature conservation.

The agricultural areas are predominantly located within the 'Brigalow Belt South' biogeographical region<sup>9</sup>, and associated with darker, deeper soils. The project site is located on 'Bald Hill Soil Landscape' and 'Roscommon Soil Landscape' lies to the north. These areas have been extensively cleared for the primary land uses of dryland cropping, and modified pasture grazing.

### 4.1.2 Visual characteristics of the local landscape

[Figure 4-2](#) illustrates the main visual characteristics of the local landscape, including the open, undulating pastures and dense native forest.

The agricultural areas (including the Project Area) are characterised by mostly cleared, undulating to hilly lands with crops, pasture grasses and scattered timber. The agricultural setting includes one partly sealed local through road (Wollara Road), and other unsealed local access roads, post and wire fencing, signposting within the road corridor, and occasional farm sheds. Wide views are sometimes available across the rolling farmed land with dense native vegetation in the background, and elevated ranges in the distance. There are few homesteads within sight of Wollara Road, with those setback and sited among scattered trees.

Goulburn River National Park adjoins the agricultural pastures and surrounds the Project Area. The dense forest provides a deep green, vegetated backdrop to the agricultural setting. It is characterised by tall native trees, shrubs and grasses. Distinctive natural features within the National Park include elevated rocky outcrops and vegetated steep slopes. From some limited elevated locations, wide views of the surrounding native forest are available. At ground level, the density of trees encloses and limits views to the immediate surroundings.

Detracting features within the local landscape include several transmission towers which are visible above the tree canopy, and a small mine/quarry (around 0.5 ha in size) adjacent to Wollara Road, around 4 km north of the Project Area (shown [Figure 4-3](#)).

<sup>6</sup> Section 2, *Technical Supplement*, p8

<sup>7</sup> Interim Biogeographic Regionalisation for Australia, Version 7, Geospatial & Information Analytics Branch, Australian Government Department of Agriculture, Water and the Environment. © Commonwealth of Australia, March 2021

<sup>8</sup> Lees Pinch Soil Landscape, eSPADE Spatial Viewer for soil landscape mapping, NSW Environment, Energy and Science.

<sup>9</sup> Interim Biogeographic Regionalisation for Australia, Version 7, Geospatial & Information Analytics Branch, Australian Government Department of Agriculture, Water and the Environment. © Commonwealth of Australia, March 2021

Figure 4-1  
Landscape character zones (approximate extent)

GOULBURN RIVER SOLAR FARM  
LANDSCAPE CHARACTER AND VISUAL IMPACT ASSESSMENT

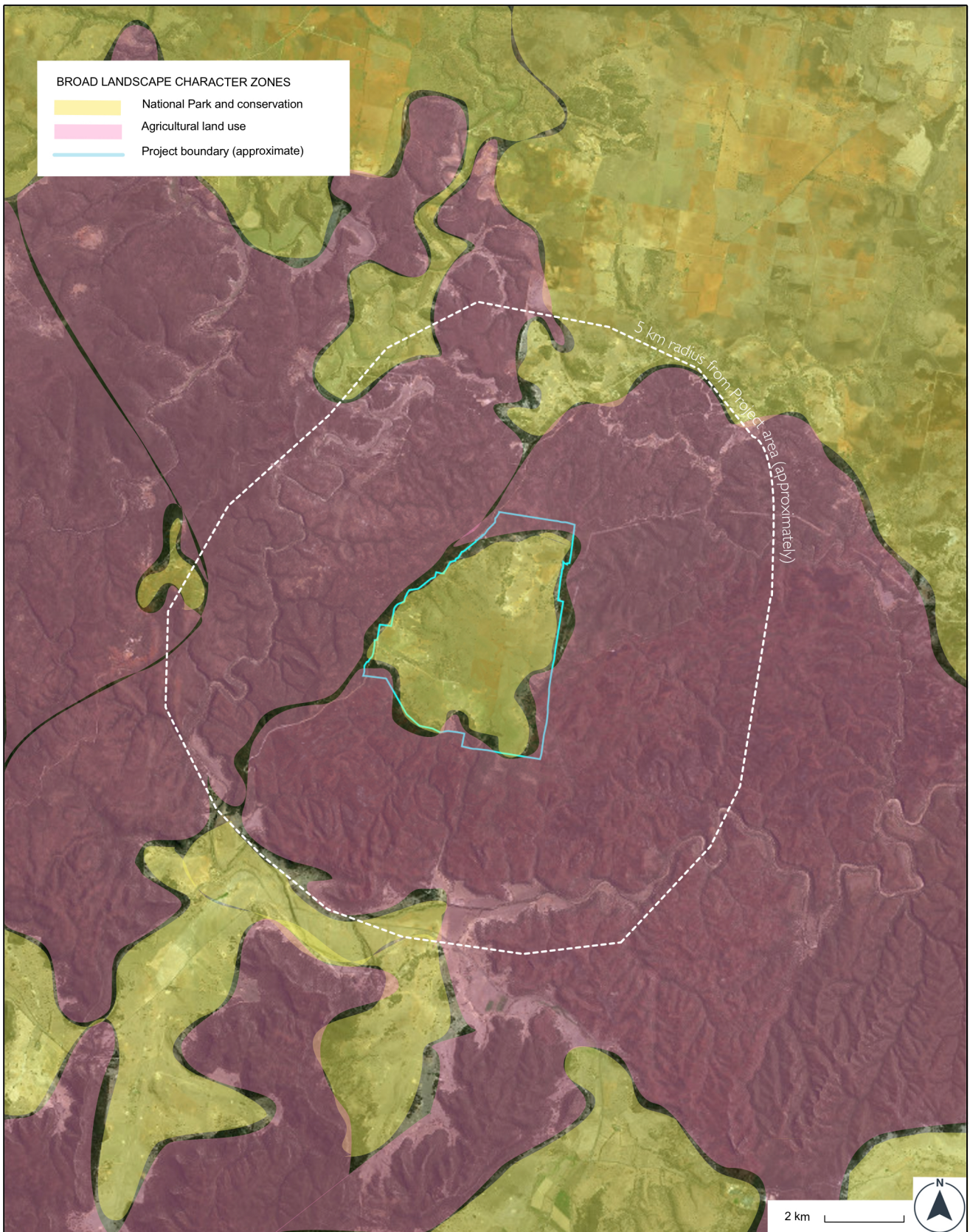


Figure 4-2  
Photographs illustrating local landscape character

GOULBURN RIVER SOLAR FARM  
LANDSCAPE CHARACTER AND VISUAL IMPACT ASSESSMENT



Figure 4-3  
Local quarry

GOULBURN RIVER SOLAR FARM  
LANDSCAPE CHARACTER AND VISUAL IMPACT ASSESSMENT

