



## WHO IS SPARK RENEWABLES?



Spark Renewables develop, own and operate renewable energy generation assets that lead the renewable energy transition in Australia. Spark Renewables has a large and diversified portfolio of operational and development stage wind, solar and storage assets across Australia. Please visit [www.sparkrenewables.com](http://www.sparkrenewables.com) for more information.



Spark Renewables is a member of the Clean Energy Council (CEC) and a signatory to the CEC's Best Practice Charter for Renewable Energy Developments.



Umwelt Environmental and Social Consultants has been engaged by Spark Renewables to develop the Environmental Impact Statement (EIS) and Social Impact Assessment (SIA) for the project. Umwelt is an Australian consultancy with experienced environmental and social impact practitioners that are well-known for leading environmental and social practice across Australia. Umwelt will be consulting the community alongside Spark Renewables to inform the EIS and SIA.



# ASSESSMENT PROCESS



## Wattle Creek Energy Hub Project

- The project is considered **State Significant Development** and will require development consent from the NSW Department of Planning and Environment (DPE) under the *NSW Environmental Planning and Assessment Act* (EP&A Act).
- Two Development Applications (DAs) are proposed to be submitted, one for each component of the project; solar and BESS, which will be accompanied by detailed **Environmental Impact Statements** (EISs), and will include specialist assessments identifying the potential impacts of the Project and how to best manage these impacts.
- A detailed **Social Impact Assessment** (SIA) will be prepared for each component of the Project as part of the EISs. The SIAs are informed through the community consultation process and are prepared following DPE SIA Guideline (2021) and *Undertaking Engagement Guidelines for State Significant Projects* (2021).
- The Project also requires approval under the Federal *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act).

### Specialist Assessment to be undertaken as part of the Environmental Impact Statement

- Noise and vibration
- Social impact assessment
- Visual amenity
- Shadow flicker
- Biodiversity
- Aboriginal heritage
- European heritage
- Traffic and access
- Contamination
- Flooding and hydrology
- Soils
- Bushfire
- Waste
- Electromagnetic interference
- Land use
- Cumulative impacts

## Planning process



# COMMUNITY & ENGAGEMENT

## Community engagement

Spark Renewables is committed to undertaking extensive community consultation to enable all stakeholders to provide feedback on the proposal and identify issues that should be considered through the development process.

Stakeholders and the community will have multiple opportunities to input into the Social Impact Assessment via two rounds of community consultation, and through continuous, ongoing processes with Spark Renewables. Stakeholders will also have opportunities to provide feedback at various stages of the assessment process.

We encourage all stakeholders and community members to be involved in this process.

## Stakeholders to be consulted



## Community benefits



There will be a range of opportunities for the regional community hosting the Wattle Creek Energy Hub to benefit, including a community fund, neighbour benefit fund, and opportunities to provide goods and services for the construction and operational phases should the project proceed.

Spark Renewables is looking to work with the community to co-design a program that meets the unique needs of the wider community, and delivers long-lasting social, economic and environmental benefits for decades to come.

We are keen to hear any ideas from community members as the community benefit scheme is developed. If you wish to have a chat or organise a time to meet, please contact us via email at [info@wattlecreekenergyhub.com](mailto:info@wattlecreekenergyhub.com) or call 1300 271 419.

## Construction and operation



Focus on engaging Aboriginal people and businesses to support the project construction and operation.



Committed to engaging with local workers and services wherever possible and will set targets to measure our achievement of this.



Committed to protecting human rights, responsible sourcing of materials, and upholding high ethical standards in our working practices. We do not tolerate forced labour within our business or our supply chains and have systems and processes in place to address risks.

## How to get involved



Stay informed by signing up to our newsletters at the project website [www.wattlecreekenergyhub.com](http://www.wattlecreekenergyhub.com)



Need more information? Ask us about having a one-on-one meeting or call



E: [info@wattlecreekenergyhub.com](mailto:info@wattlecreekenergyhub.com)  
P: 1300 271 419



[facebook.com/wattlecreekenergyhub](https://facebook.com/wattlecreekenergyhub)

## Consultation



Consulting with the community is in early stages and will inform the Environmental Impact Statement

Scan to provide feedback via survey or go to

[www.research.net/r/wattlecreekenergyhub\\_communityfeedback](http://www.research.net/r/wattlecreekenergyhub_communityfeedback)





# RESEARCH PARTNERSHIP



Shaping the future of NSW  
in science and technology

20-Year R&D Roadmap



As part of the project proposal, a research collaboration will be set up between Spark Renewables and the University of Sydney with a fund for research initiatives focused on supporting the energy transition. Research initiatives will be in line with the Office of the NSW Chief Scientist & Engineers 20 year Research and Development road map titled: *Shaping the future of NSW in science and technology* (May 2022).

This will include the development of a new Research Facility (or ‘Testbed’) which could be used to test innovative technologies such as Gelion batteries, a company of the University of Sydney.

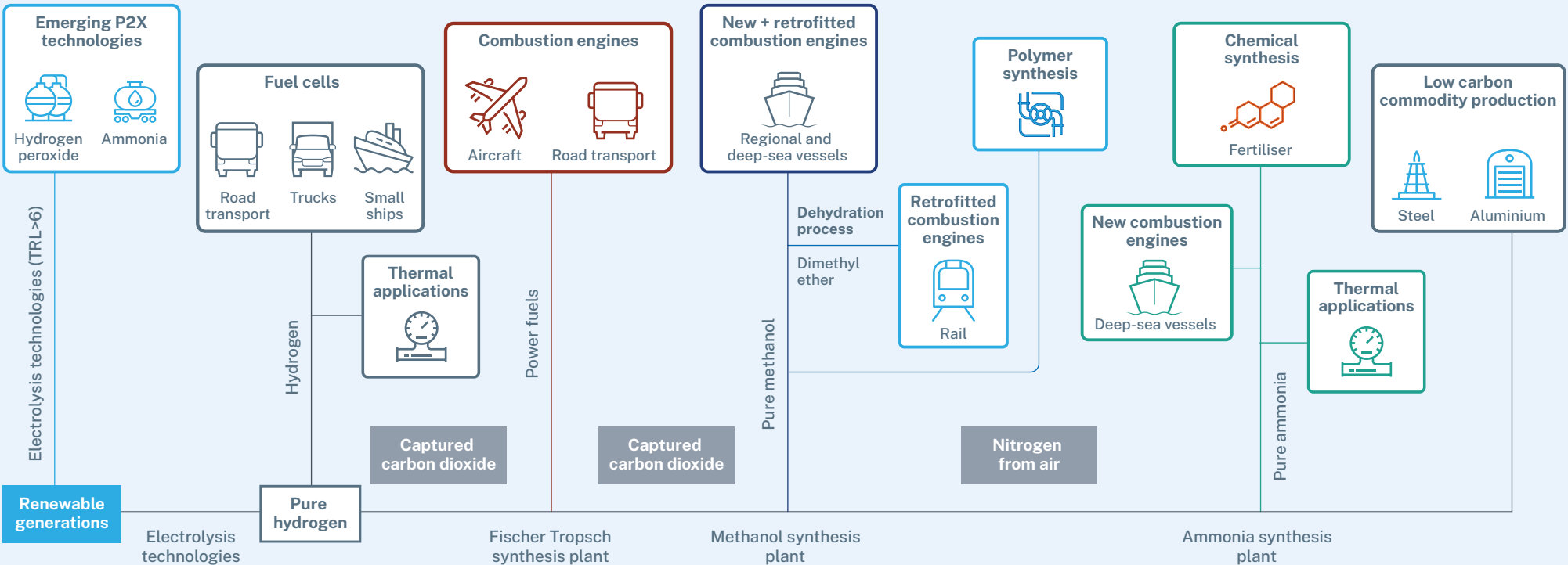
THE FACILITY WILL INCLUDE:

- A 2-acre (8,000m<sup>2</sup>) hardstand area.
- 200kVa power supply and 100kVA dummy load.

The exact research initiatives are yet to be determined but could include:

- **ENERGY STORAGE** - storage of energy for later use to mitigate imbalances between energy demand and supply.
- **ENERGY EFFICIENCY AND OPTIMISATION** - systems to optimise energy generation, transmission, storage, and consumption e.g. demand response and control, virtual power plants, smart appliances and meters, digital energy management and trading.
- **SUSTAINABLE FUELS** - power fuels produced from sustainable feedstocks and renewable energy e.g., biofuels, green hydrogen, synthetic fuels produced from renewable energy and sustainable or waste feedstocks.
- **POWER TO X (P2X)** – P2X is an umbrella term for technologies and processes producing green power fuels and clean chemicals using renewable energy and sustainable materials. P2X products include green hydrogen, ammonia, synthetic hydrocarbons such as methane, methanol and aviation fuels.
- **ELECTRIFICATION** - energy from electricity replacing other direct power sources, especially fossil fuels e.g., electric engines, heat pumps.
- **SMART GRIDS** - advanced electricity grids and localised power systems, especially decentralised grids with advanced control, automation and other digital technologies e.g., smart grids, microgrids, stand-alone power systems that have advanced control and monitoring systems.
- **AG TECH** - use of advanced technologies in agriculture e.g., automated farm equipment, AI-assisted remote sensing, in-field disease testing, real-time soil monitoring, weed control.

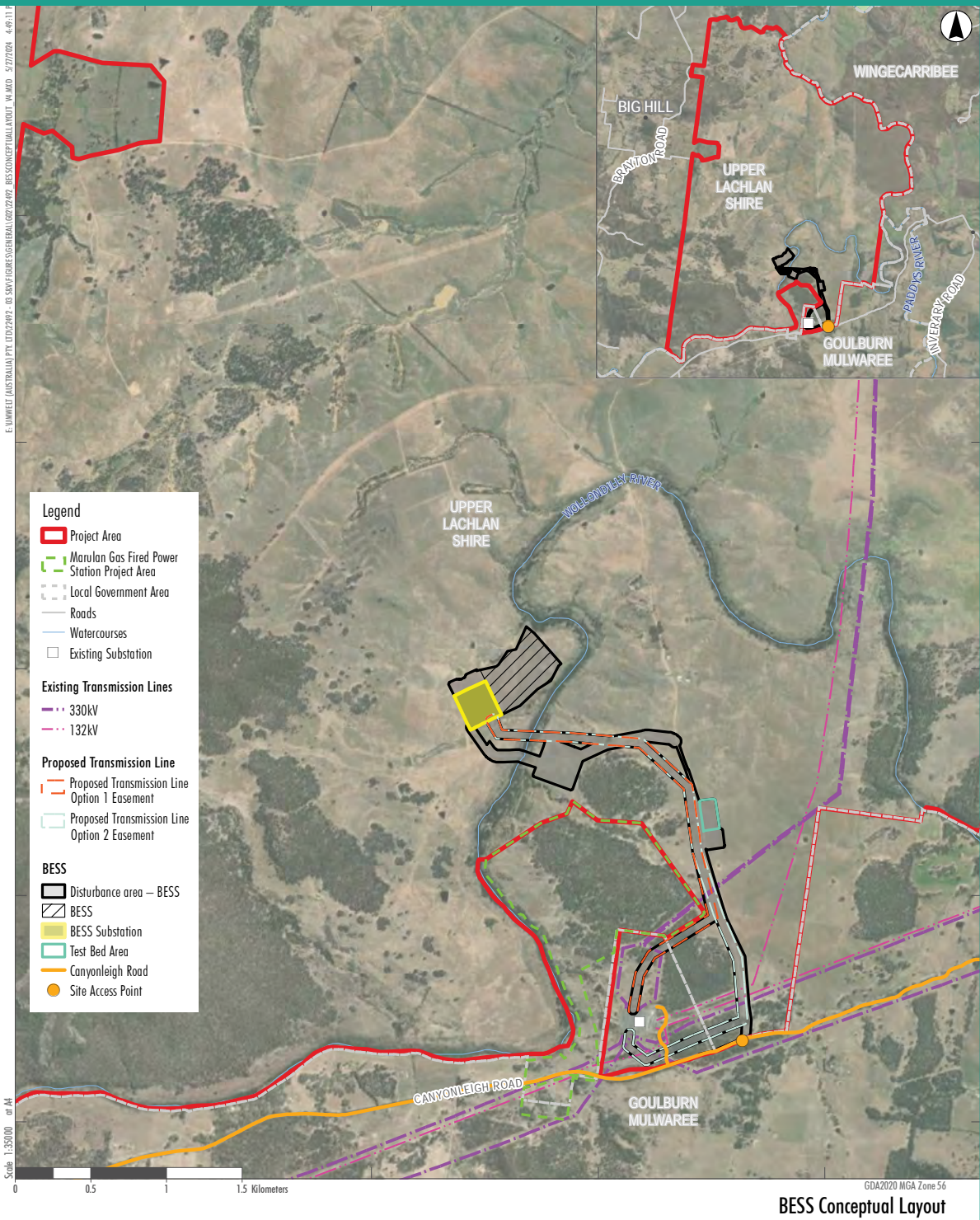
## Pathways to unlock sector coupling and allowing deep-rooted decarbonisation



UNSW Sydney, NSW Power to X (P2X) Pre-Feasibility Study (2021).



# BESS CONCEPTUAL LAYOUT



## Key Project Components



Battery Energy Storage System (BESS) with up to 400 MW capacity (AC coupled)



On-site collector substation to connect the BESS to the existing Marulan substation via overhead transmission line (two options currently being investigated)



Operation and maintenance (O&M) facility – including a site office, O&M buildings, amenities, equipment sheds, storage, and parking areas.



Internal access tracks, minor site intersection upgrades (on Canyonleigh Road) and targeted road network upgrades to road network



A research Test-Bed Facility – comprising of a 2 acre hard standing area, demountable buildings, security fencing, parking, 200kVa power supply and 100kVA dummy load (simulated electrical load for testing purposes).

## Design Changes since Scoping Phase



Refinement to BESS layout to remove second optional BESS location based on results of preliminary studies (particularly noise). The solar layout has been refined to avoid vegetation, heritage and neighbour impacts.



Refinement of related infrastructure layout to accommodate design refinements.



Addition of two transmission line options (proposed for both solar and BESS) are being investigated, to allow for optionality during the assessment process and greater flexibility in the connection design. However, only one transmission option will be constructed.

## Battery Energy Storage System (BESS)



**CHEMISTRY**  
Lithium-iron  
Phosphate or  
similar.

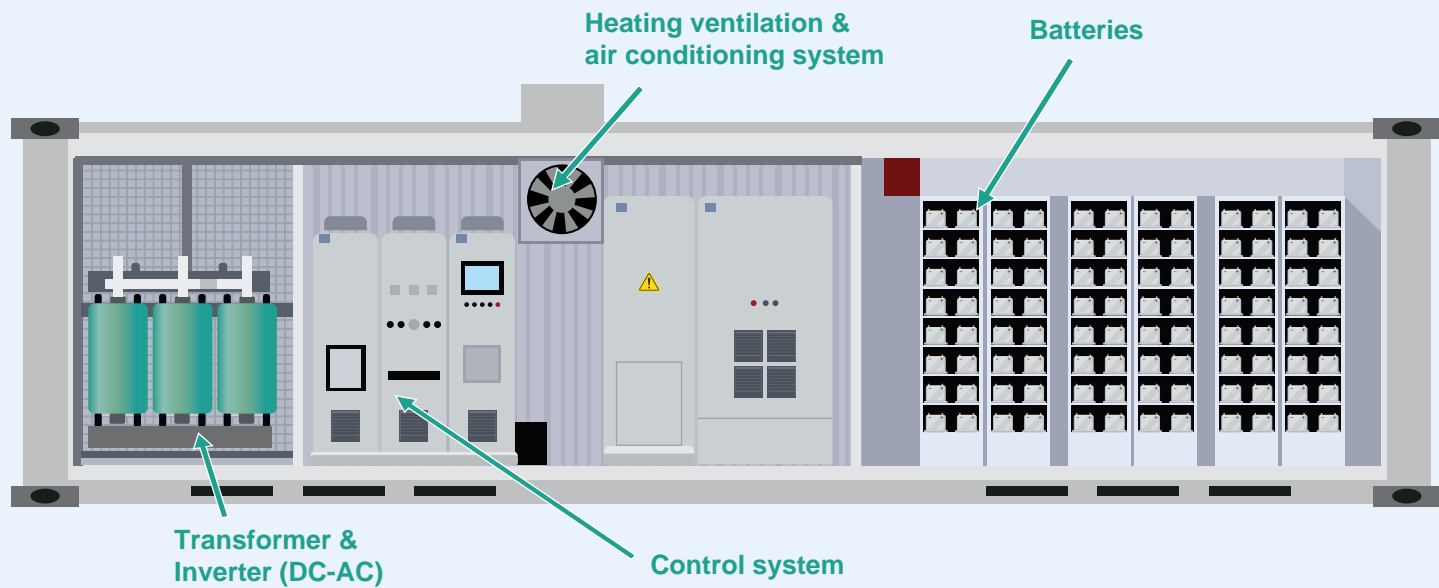


**DIMENSIONS**  
Either 40-foot containers  
in a purpose-built  
compound or smaller DC  
coupled units distributed  
within the solar farm.



**PURPOSE**

- Provides firm generation 'on demand' for the electricity grid, as well as a range of network services such as voltage support.
- Store excess electricity from the solar panels in the middle of the day and then distribute to the electricity grid when demand is at its highest.

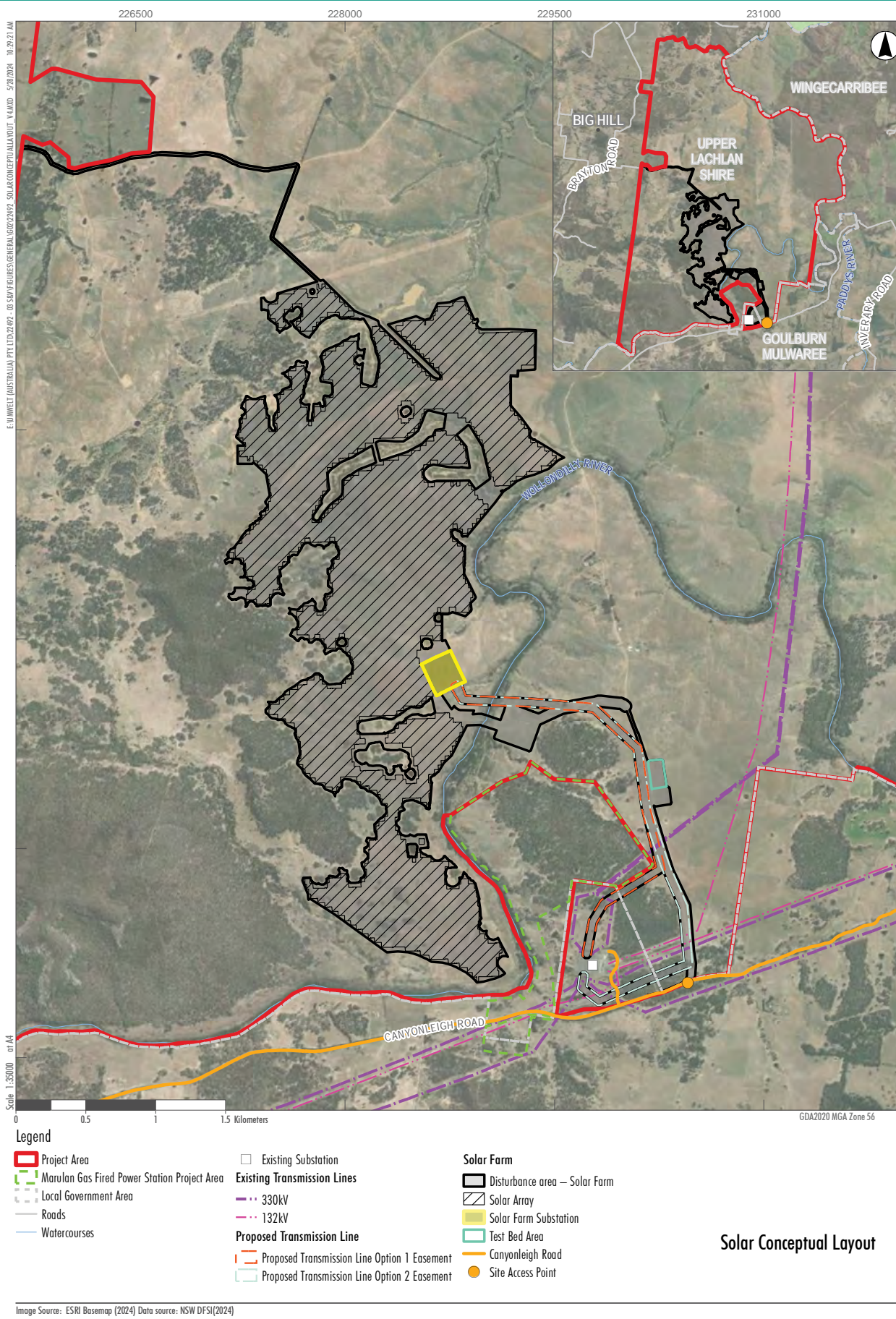


## Battery packs (smaller units) and containerised battery design

**FIRE HAZARDS & RISK MITIGATION**  
Integrated within the battery design will be an Asset Protection Zone serving as a fire break, as well as a heating, ventilation and air conditioning system.



# SOLAR FARM CONCEPTUAL LAYOUT



## Key Project Components



~490,000 photovoltaic modules mounted on single axis tracking system with power conversion units and internal electrical cable network to connect the solar farm to the on-site collector substation



On-site collector substation to connect the solar farm to the existing Marulan substation via overhead transmission line (two options currently being investigated)



Operation and maintenance (O&M) facility – including a site office, O&M buildings, amenities, equipment sheds, storage, and parking areas.



Internal access tracks, minor site intersection upgrades (from Canyonleigh Road) and targeted road network upgrades to road network



A research Test-Bed Facility – comprising a 2 acre hard standing area, demountable buildings, security fencing, parking, 200kVa power supply and 100kVA dummy load (simulated electrical load for testing purposes).

## Design Changes since Scoping Phase



Refinement to solar layout to avoid vegetation removal (where possible).



Refinement of related infrastructure layout to accommodate design refinements and revised BESS Project Design.



Targeted refinements to the solar layout following completion of Aboriginal Archaeology survey to avoid areas identified as archaeologically sensitive.

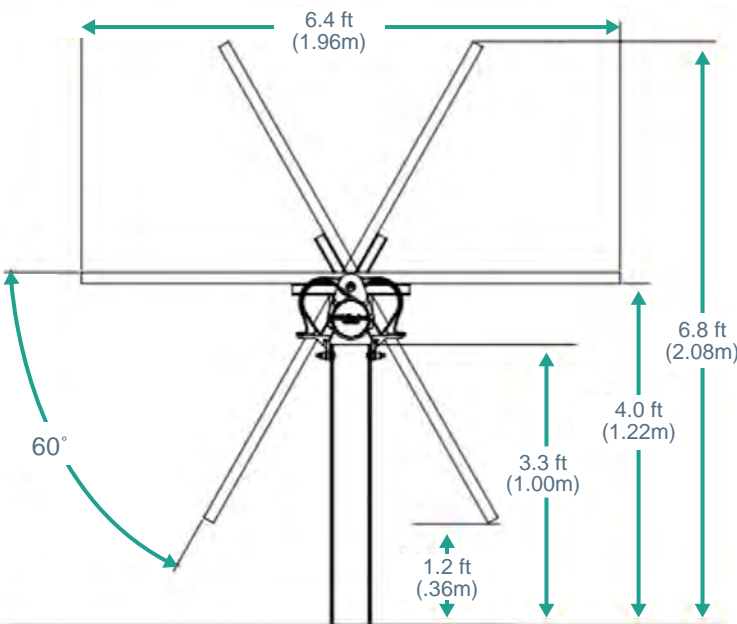


Addition of two transmission line options (proposed for both solar and BESS) are being investigated, to allow for optionality during the assessment process and greater flexibility in the connection design. However, only one transmission option will be constructed.

- Australia has the highest average solar radiation per square metre of any continent in the world which makes it an attractive location for solar energy development.
- Solar farms use solar photovoltaic technology that converts sunlight directly into electricity using a system known as a semiconductor cell or solar PV cell.
- Areas associated with solar within the Project area will operate as an agrisolar system, through the integration of grazing during operation and agricultural rehabilitation following decommissioning.

Panels	~490,000 bifacial modules (~600 watts each) which are ~2 x 1 metres in size.
Panel Mounting	Single axis trackers ~90 metres long and 80-90 modules per tracker.
Inverters	Containerised power conversion stations to convert direct current (DC) to alternating (AC) power.
Materials	Responsibly chosen low-impact materials and environmentally safe maintenance.

## Approximate tracker directions:





# BIODIVERSITY



Ecological surveys have included:

- Vegetation survey, including threatened Ecological Community Delineation and Threatened flora species survey transects October and November 2022, February and October 2023 and February 2024.
- Threatened fauna surveys conducted (October and November 2022, January/February, October and November 2023 and February 2024.



Four different plant community types (PCTs) are present within the Disturbance Area with large areas of exotic flora species also present. Threatened Ecological Communities have largely been avoided through detailed design with impact to <2 ha of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.



A total of 9 threatened species have been recorded within the Project Area - Diamond firetail, Squirrel Glider, Dusky woodswallow, Gang-gang Cockatoo, Glossy black-cockatoo, Scarlet Robin, Speckled warbler, Spotted Harrier, Varied sittella



A range of mitigation measures are proposed to reduce any potential impact to biodiversity through the development and implementation of a Biodiversity Management Plan (BMP).



Spark Renewables will also be required to provide appropriate offsets to compensate for any unavoidable biodiversity impacts associated with the Project.

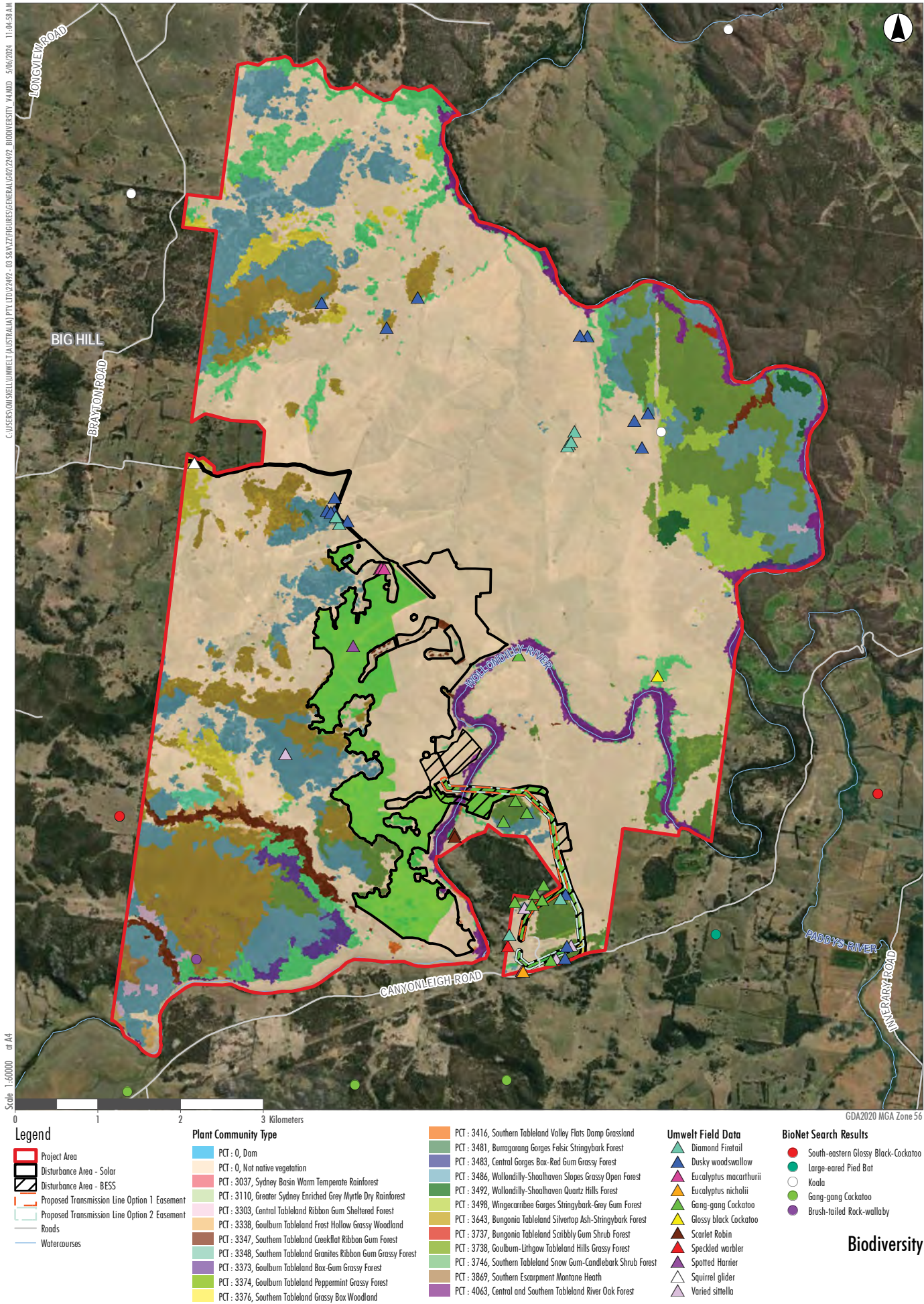


Image Source: ESRI Basemap 2020 Data source: NSW DFSI(2024), SVTM (2022), Umwelt (2023)



# HERITAGE



Prior to the assessment commencing, there were 17 recorded sites located within the Project Area.



Field surveys conducted in January 2024 identified 15 new sites within the proposed Development Corridor.



A test excavation program has commenced with a total of 56 test pits completed and 13 artefacts recovered. Testing is currently paused due to weather however will continue once site conditions allow.



The results of the initial surface survey indicate large parts of the Project Area are of low archaeological potential due to steep landforms unsuitable for campsites, disturbance from clearing, grazing, farming infrastructure and areas where soil disturbance had taken place following large-scale replanting activities.



Areas of higher archaeological potential were identified along the Wollondilly River and other watercourses within the Project Area; however, these are protected by an exclusion zone of 100 metres and will not be subject to any development.



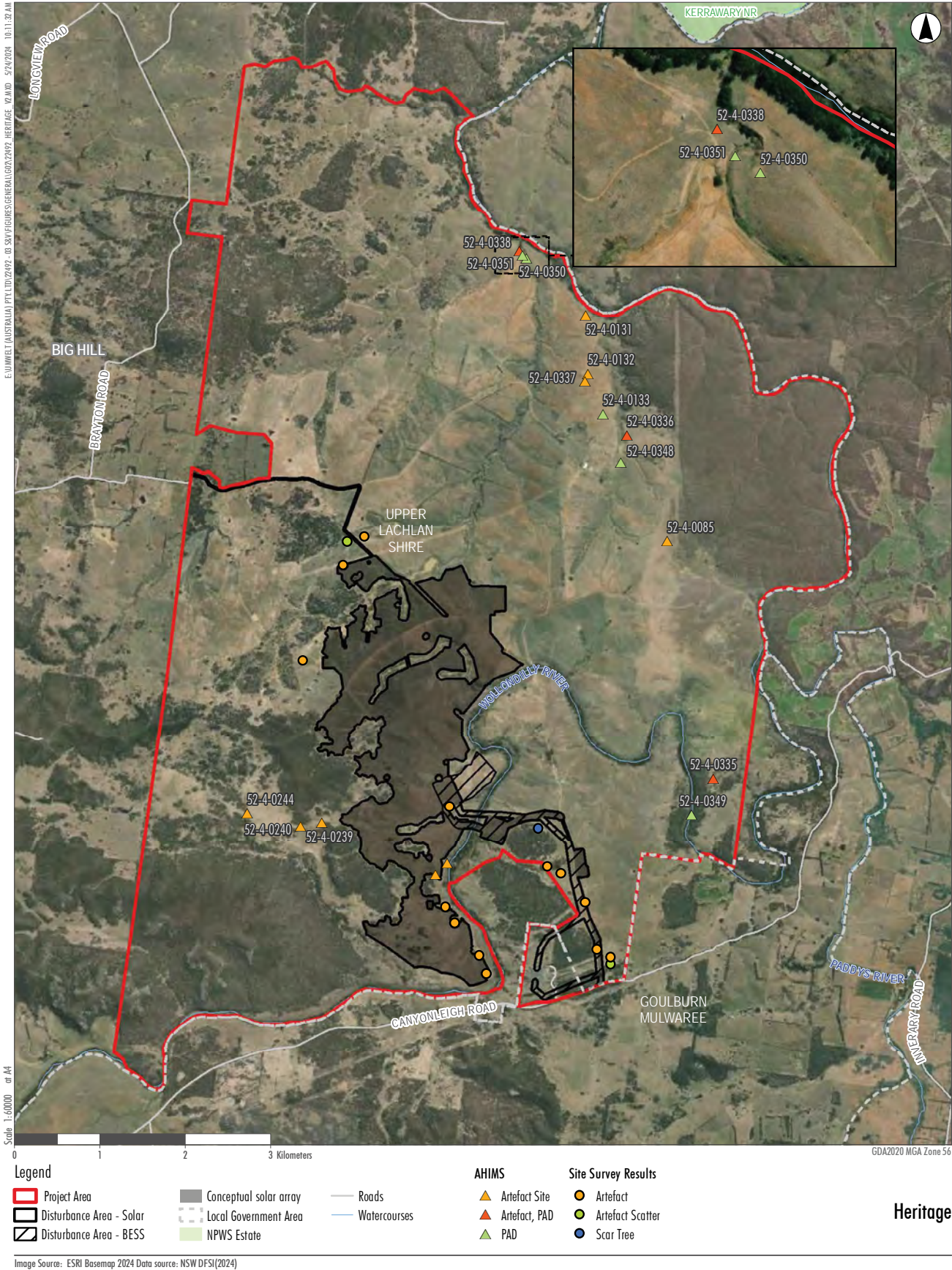
The initial results suggest low archaeological sensitivity in locations more than 100 metres from the Wollondilly River and other water courses. The low sensitivity is most likely due to the high levels of water movement downhill from ridgelines, and extensive vegetation clearing of the area for agricultural purposes.



The impact of water movement has been evident in the soil profiles of test pits, which have been largely similar (sandy/silty/loam) across all areas and have had very diffuse (blurry/unclear) divisions between layers (horizons).



Appropriate Aboriginal Cultural Heritage Management controls will be developed in consultation with the Registered Aboriginal Parties.





# TRAFFIC AND TRANSPORT



Traffic movements will be dependent on the construction schedule with the assessment covering construction of the solar and BESS components both separately and concurrently.



There is an anticipated construction workforce of ~100 employees, and up to 7 employees during operations.



Traffic during operations will be minimal with an average of 3-4 movements per day.



All heavy vehicle movements will follow Red Hills Road, Ambrose Road, Brayton Road and Canyonleigh Road route. An alternate route is also being investigated via access to Brayton Road directly from Hume Highway.



Minor upgrade works will be undertaken along Canyonleigh Road and at the main site access point.



Traffic and Transport associated with the Project will be managed in accordance with a Traffic Management Plan, to be prepared and implemented prior to construction.

Estimated Traffic Movements			
Vehicle Movements	Solar Only	BESS Only	Solar + BESS
Total Light Vehicles	~15 per day	~17 per day	~33 per day
Total Heavy Vehicles	~15 per day	~13 per day	~29 per day
Total Over Size Over Mass deliveries	12 over 18 months	24 over 18 months	36 over 18 months





# HAZARDS



## Bushfire

- The Project Area is identified as Bushfire Prone Land.
- Vegetation within the Project Area is managed to reduce associated fuel load.
- Appropriate bushfire management measures will be implemented including:
  - appropriate separation distances to vegetation
  - dedicated fire-fighting water supply
  - all weather access across the Project Area
  - appropriate onsite firefighting equipment
  - grazing and mechanical management of vegetation height
- Spark Renewables will develop and implement a Fire Management and Emergency Response Plan in consultation with the local Rural Fire Service.



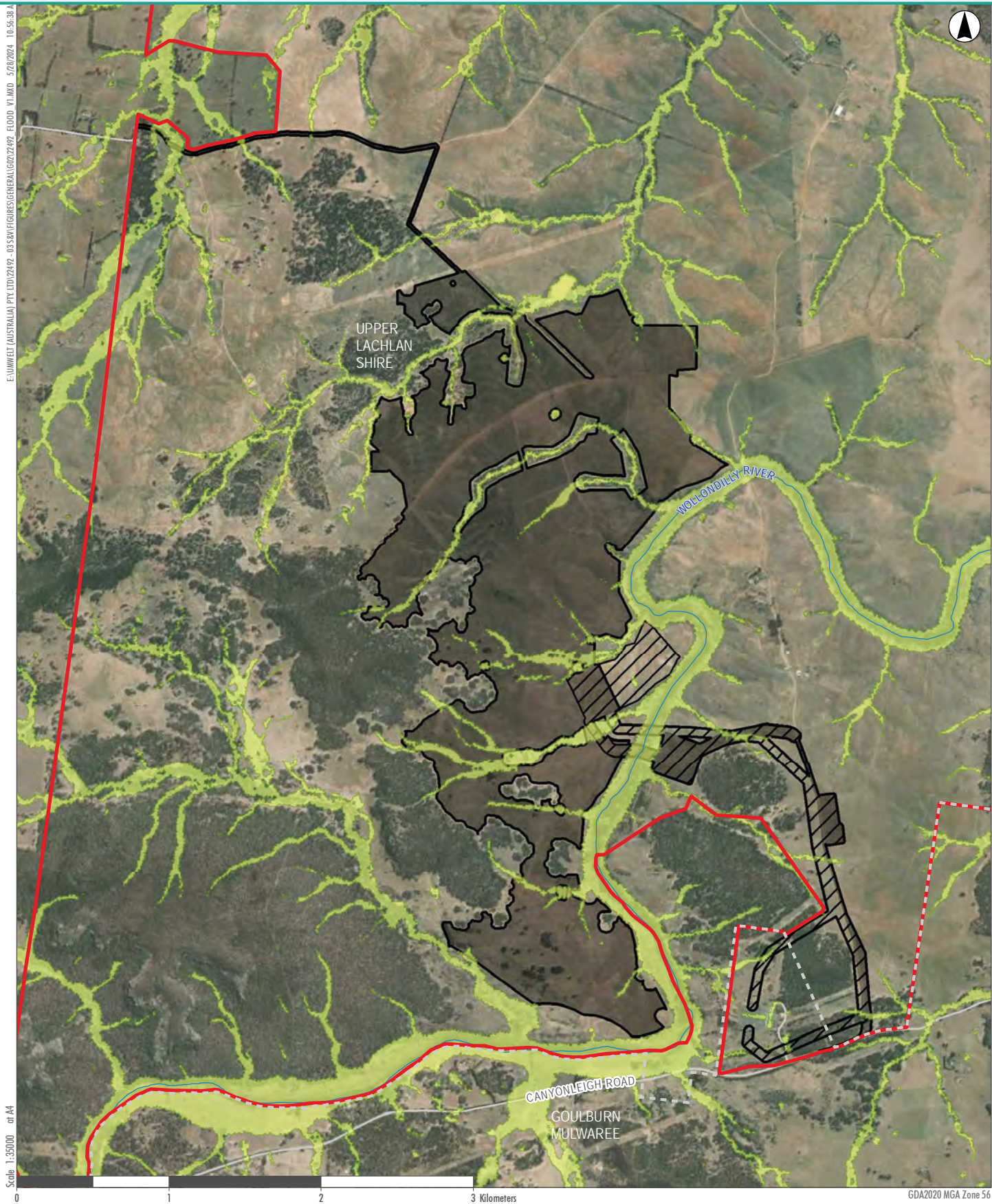
## Fire Hazard

- The central location of BESS maximises separation distances to adjoining properties.
- Appropriate separation distances between infrastructure to prevent fire propagation.
- Appropriate operational controls (such as venting and cooling systems) and operational monitoring (on site and remote monitoring) will be implemented.
- Detailed design and construction in accordance with relevant construction standards and manufacturers specifications.
- Appropriate operational procedures relating to management of hazards will be developed and implemented.



## Flooding, Erosion and Water Management

- Preliminary flood modelling has estimated the flood extents, depths and velocities for the 1% Annual Exceedance Probability (AEP) (1 in 100 year) event to inform the conceptual layout.
- Key infrastructure (BESS and Solar Array) are located within tolerable depths and velocities.
- Appropriate water management structures and erosion and sediment control measures will be implemented during construction and operation.
- Potential impacts to the downstream watercourse are unlikely through the implementation of water management measures.



## Flood Extent (1% AEP)

### Legend

- Project Area
- Disturbance Area - Solar
- Disturbance Area - BESS
- Conceptual solar array
- Local Government Area
- Flood Extent (1% AEP)
- Roads
- Watercourses



# NOISE



A detailed noise assessment is currently being prepared for the construction and operation of the solar farm and BESS to assess the potential noise impacts on surrounding sensitive receivers.



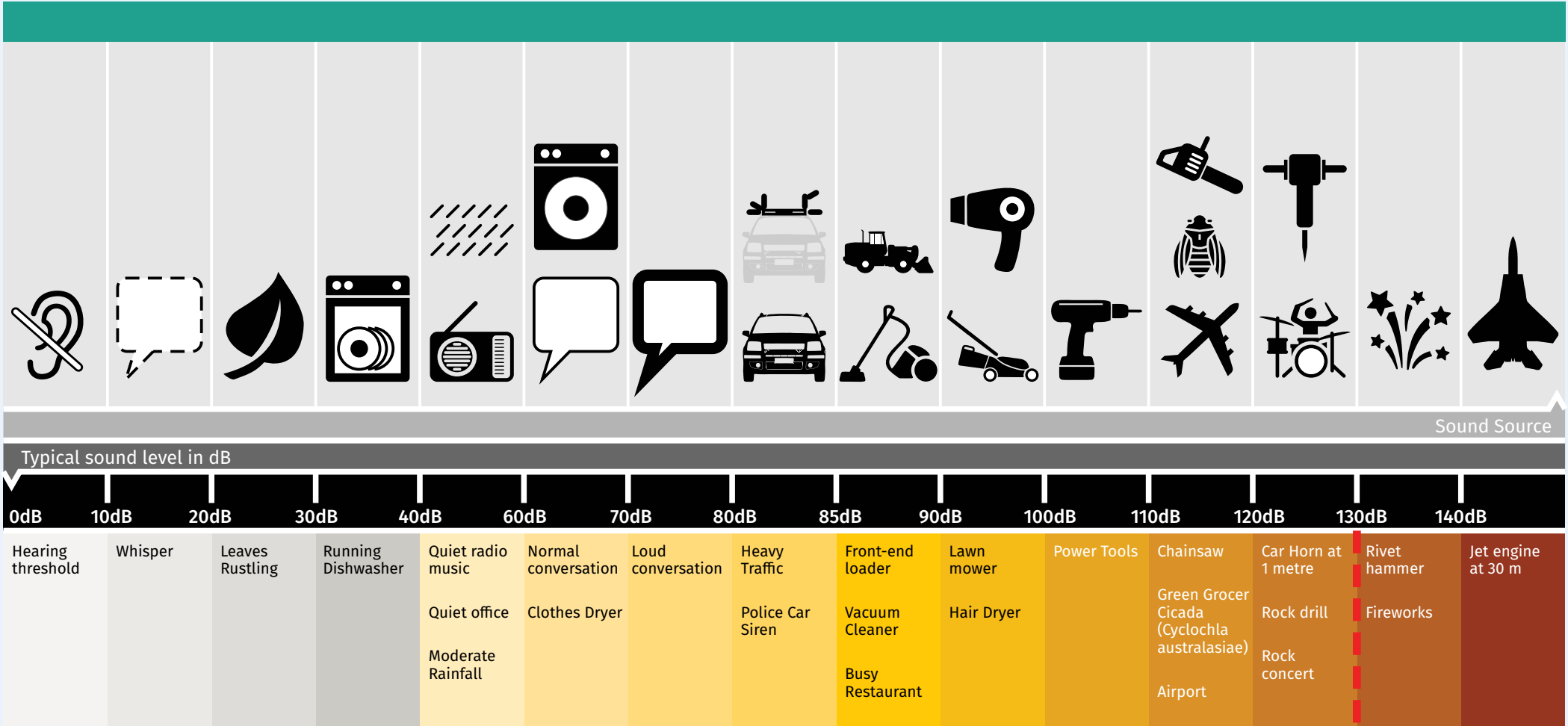
Modelling results indicate the operation of the solar farm can achieve the evening period noise criteria of 35 dB Laeq, 15 min at all identified receivers, including the host receivers associated with the University (located within the Project Area).



Spark Renewables are currently investigating potential BESS technology options and propose presenting multiple operational scenarios in the EIS to provide flexibility during detailed design to assist with determination of most suitable technology. This process is being informed by noise modelling and is currently in progress. The modelling results will be used to refine the proposed BESS technology and proposed management and mitigation achieve compliance at all potential residential receivers.



The noise assessment will also identify any required noise management and mitigation measures (including required monitoring) to be implemented on site during construction and operation.



Source: Safework Australia (2018)

Hearing threshold of pain is 130db



# LANDSCAPE AND VISUAL IMPACT ASSESSMENT

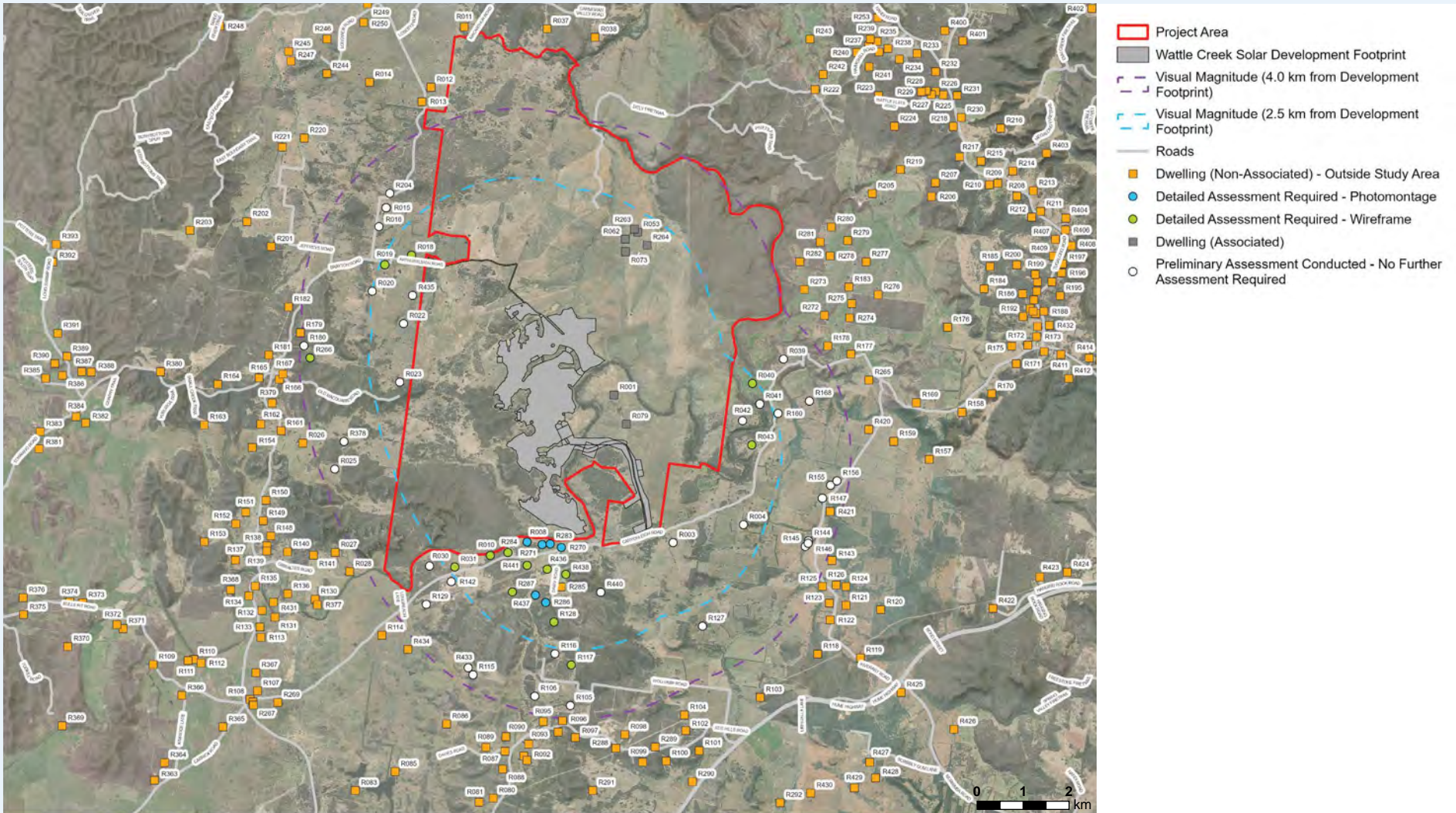
A Landscape and Visual Impact Assessment (LVIA) has been prepared to assess the potential visual impact of the Project.

A total of 42 dwellings are located within 4 km of the Project Area, with 24 dwellings requiring detailed assessment following the preliminary desktop assessment (based on topography)

Wireframes were prepared for all 24 dwellings, resulting in three dwellings requiring the development of photomontages.

Of the three dwellings, two dwellings will require mitigation in the form of on-site screening (perimeter planting), due to predicted moderate visual impact.

View of the Project from Canyonleigh Road





# SOCIAL IMPACT ASSESSMENT

A key component of the assessment of the Project is the Social Impact Assessment (SIA) which is being conducted by Umwelt Environmental and Social Consultants.

Social impacts are the consequences that people experience when a new project brings change to their lives. Social impacts can be grouped into several categories and may involve changes to people's way of life, community, accessibility, culture, health and wellbeing, surroundings, livelihoods and decision-making systems.

Following the lodgement of the SIA Scoping Report in September 2023, Umwelt has begun preparing the SIA. The figure below shows the social impacts raised by those involved in consultation during March and April 2023 to inform the SIA Scoping Report in March and April 2023.

## What we have heard to date

### SURROUNDINGS

- Changes in visual amenity due to Project infrastructure
- Social amenity impacts due to noise and vibration associated with construction activities
- Loss of important environmental values on the site e.g. flora and fauna due to site clearing
- Safety concerns due to heightened bushfire risk
- Increased travel time and safety issues associated with deterioration of local road
- Decreased pedestrian and road user safety due to increased traffic during construction

### HEALTH AND WELLBEING

- Increased stress and anxiety due to uncertainty associated with project development and changes to way of life

### LIVELIHOODS

- Provision of local employment opportunities (+ve)
- Opportunity for the Project to increase training and of local residents (+ve)
- Procurement of local suppliers, services and contractors (+ve)
- Potential property devaluation
- Reduced community cohesion due to differing attitudes towards renewable energy development
- Inequitable distribution of costs and benefits associated with the project

### ACCESSIBILITY

- Use of the site for ongoing research and education associated with renewable energy (+ve)
- Reduced access to housing and accommodation due to influx of cumulative workforces
- Loss of access and connectivity to telecommunications

### CULTURE

- Impact on Aboriginal cultural values due to land clearing associated with development of project infrastructure
- Impacts to historic cultural values due to land clearing associated with the development of project infrastructure

### DECISION MAKING SYSTEMS

- Perceived inability to influence planning and decision-making in relation to the Project
- Perceived inability to influence planning and decision-making in relation to the Project

**Umwelt will continue to engage with landholders and key stakeholders to seek to minimise, mitigate and enhance social impacts of the Project.**

## The SIA process

