

Project Rosedale Hydrogen Facility

Application Number: **02535**Commencement Date:
05/08/2024Status: **Locked**

1. About the project

1.1 Project details

1.1.1 Project title *

Project Rosedale Hydrogen Facility

1.1.2 Project industry type *

Energy Generation and Supply (renewable)

1.1.3 Project industry sub-type

Solar Farm

1.1.4 Estimated start date *

01/04/2025

1.1.4 Estimated end date *

01/04/2065

1.2 Proposed Action details

1.2.1 Provide an overview of the proposed action, including all proposed activities. *

The proposed activities are:

- Solar electricity generation – onsite solar array will produce electricity for production facility power
- Hydrogen production by electrolysis
- Liquefaction and compression of hydrogen – once hydrogen is produced it will be processed through either liquefaction or a compression plant prior to storage and distribution.

- Hydrogen storage – hydrogen will be stored in either liquid or gas form.
- Supplementary power supply – this will include a battery energy storage system (BESS) and connection to the grid for when solar power is limited. Additionally, an eight-kilometer transmission line and easement, linking back into an existing 132 kilovolt-amp (kVA) line via a 25 megavolt – amp (MVA) transformer, and substation at the hydrogen production facility will be installed.
- Water supply and treatment – water sourced for the Project will be stored and treated prior to use in hydrogen production. A pumping station at the Murrumbidgee River will be installed and a 300 ML dam will be installed adjacent to the hydrogen production facility.
- Road upgrades – Rosedale Road as the primary access road will be upgraded and widened
- Ancillary facility installations – This will include upgraded and new internal access roads and parking for light and heavy vehicles, site office and facilities including workshops and storerooms, electrical cabling and lighting, stormwater and fire management infrastructure, on-site sewage system, signage, fencing, security systems and landscaping.

Below is a breakdown of the above activities and their relevance to site establishment/enabling works, and then works to be conducted during construction of the facility -

Site establishment and enabling works:

- Vegetation clearing
- Installation of temporary environmental controls such as water management infrastructure
- Installation of temporary construction compounds
- Installation of temporary laydown areas
- Construction of access tracks and temporary fencing
- Establishment of fire safety envelopes
- Surveying and investigation of onsite conditions for detailed design phase of the Project.

Construction works:

- Bulk earthworks
- Construction of ancillary facilities
- Rosedale Road and Hume Highway intersection upgrade, internal access road upgrades
- Construction of water pipeline to Murrumbidgee River and internal dam
- Construction of transmission line and substation
- Installation of permanent fencing and security systems
- Construction of solar arrays, including installation of piles to support solar arrays, installation of frames and mounting of solar arrays, and installation of cabling and electrical works
- Installation of supporting infrastructure including piping for hydrogen and water transfer and electrical cabling.

Operational period:

- Operation of the Green Hydrogen facility, including solar panel array areas

Decommissioning works:

- Removal of all infrastructure associated with the Project
- Key components will be recycled or refurbished as much as possible
- Land may return to agricultural purposes at the completion of the Project

The Project area is shown in the attached maps as 'study area' and the construction/impact footprint is shown as 'development footprint'. Subject land is per the definition of the BAM.

1.2.2 Is the project action part of a staged development or related to other actions or proposals in the region?

No

1.2.6 What Commonwealth or state legislation, planning frameworks or policy documents are relevant to the proposed action, and how are they relevant? *

The proposed action meets the definition of State Significant Development (SSD) with development consent being sought under Part 4, Division 4.7 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). This triggers entry into the NSW Biodiversity Offset Scheme (BOS), preparation of a Biodiversity Development Assessment Report (BDAR), as per the Biodiversity Assessment Method (BAM), developed under the NSW *Biodiversity Conservation Act 2016* (BC Act). As per the NSW Assessment Bilateral Agreement with the Commonwealth minister for the Environment, all Matters of National Environmental Significance (MNES) identified as potentially impacted by the project are being assessed through the BAM.

MNES that are not covered under the BC Act must be assessed separately. There are no threatened species or communities not listed under the BC Act but listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (See Appendix A), so the bilateral agreement covers all MNES known at this time. As the BDAR is not yet complete, assessments against significant impact criteria have been completed (see Appendix D).

1.2.7 Describe any public consultation that has been, is being or will be undertaken regarding the project area, including with Indigenous stakeholders. Attach any completed consultation documentations, if relevant. *

A Community and Stakeholder engagement plan is currently being drafted and will be submitted as part of the EIS for the project. To date, public consultation has consisted of:

- Agency briefings included all relevant local and state government agencies, including Wagga Wagga City Council, and Cootamundra-Gundagai Regional Council, Environment Protection Agency and Environment and Heritage Group (now Biodiversity Conservation and Science) (April and July 2023)
- Landholder consultation has been significant with all relevant neighboring properties being informed and consulted with. The land holding is significant and most sensitive receivers are located adjacent to the site boundary with land owned by related parties.
- First Nations Engagement: to date Registered Aboriginal Parties (RAPs) within the local area have been consulted to inform the Aboriginal Cultural Heritage Assessment Report (ACHAR) which will be provided with the EIS. The RAPs are inputting to the ACHAR and participating in site visits during Aug/September 2024.

Please see the attached summary document on community stakeholder engagement.

1.3.1 Identity: Referring party

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1.3.1.1 Is Referring party an organisation or business? *

Yes

Referring party organisation details	
ABN/ACN	76104485289
Organisation name	ARCADIS AUSTRALIA PACIFIC PTY LTD
Organisation address	2000 NSW
Referring party details	
Name	Kate Mauger
Job title	Ecologist
Phone	0411396591
Email	kate.mauger@arcadis.com
Address	16/580 George St, Sydney, NSW, 2000

1.3.2 Identity: Person proposing to take the action

1.3.2.1 Are the Person proposing to take the action details the same as the Referring party details? *

No

1.3.2.2 Is Person proposing to take the action an organisation or business? *

Yes

Person proposing to take the action organisation details	
ABN/ACN	18643800828
Organisation name	CLARA ENERGY PTY LTD
Organisation address	3000 VIC
Person proposing to take the action details	
Name	Nick Cleary
Job title	CEO CLARA Energy
Phone	+61 414 724 089
Email	nick.cleary@claraenergy.com.au
Address	Level 13, 80 Collins Street, Melbourne, 3000

1.3.2.14 Are you proposing the action as part of a Joint Venture? *

No

1.3.2.15 Are you proposing the action as part of a Trust? *

No

1.3.2.17 Describe the Person proposing the action's history of responsible environmental management including details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the Person proposing to take the action. *

The proponent's representative is a responsible developer who has been active in NSW for at least twenty years. In no time has there been any actions taken against the developer, in particular with regard to environmental actions. It is the intention of the proponent, as demonstrated through the project design and avoid and minimise strategy, to have 'the least harm' impact on the surrounding biodiversity area.

CLARA Energy Pty Ltd has a satisfactory record of responsible environmental management.

1.3.2.18 If the person proposing to take the action is a corporation, provide details of the corporation's environmental policy and planning framework

CLARA Energy is committed to leading the way in the development and deployment of renewable energy solutions, with a particular focus on green hydrogen. CLARA Energy's commitment to environmental sustainability is achieved through:

- **Climate Action and Emissions Reduction:** We are committed to reducing greenhouse gas emissions throughout our operations, particularly through the production and utilization of green hydrogen. Our goal is to minimise our carbon footprint and support global efforts to achieve net-zero emissions by 2050.
- **Sustainable Resource Management:** We will manage our resources responsibly by promoting the efficient use of energy, water, and raw materials. Our projects will prioritise the use of renewable energy sources, reduce waste, and implement circular economy principles wherever possible
- **Biodiversity and Ecosystem Protection:** CLARA Energy is committed to protecting and enhancing biodiversity across all project sites. We will assess and mitigate potential impacts on local ecosystems and strive to enhance the natural environment through our activities
- **Compliance and Continuous Improvement:** We will comply with all relevant environmental legislation, regulations, and standards. Beyond compliance, we are committed to continuous improvement, regularly reviewing and enhancing our environmental management practices.

Furthermore, CLARA Energy will uphold the above commitments by and relevant environmental regulations by:

- Adhering to requirements and guidelines from the relevant legislative frameworks such as the *Environmental Planning and Assessment Act 1979*, *Biodiversity Conservation Act 2016* and the *Environment Protection and Biodiversity Conservation Act 1999*.
- Providing relevant environmental assessment documentation such as Environmental Impact Assessments (EIAs)
- Participating in environmental management and monitoring practices such as environmental management plans, monitoring and reporting to assess effectiveness of mitigation measures and ensure compliance.

Provide early and ongoing consultation, transparent communication and feedback with key environmental and community stakeholders

1.3.3 Identity: Proposed designated proponent

1.3.3.1 Are the Proposed designated proponent details the same as the Person proposing to take the action? *

Yes

Proposed designated proponent organisation details

ABN/ACN	18643800828
Organisation name	CLARA ENERGY PTY LTD
Organisation address	3000 VIC

Proposed designated proponent details

Name	Nick Cleary
Job title	CEO CLARA Energy
Phone	+61 414 724 089
Email	nick.cleary@claraenergy.com.au
Address	Level 13, 80 Collins Street, Melbourne, 3000

1.3.4 Identity: Summary of allocation

Confirmed Referring party's identity

The Referring party is the person preparing the information in this referral.

ABN/ACN

76104485289

Organisation name	ARCADIS AUSTRALIA PACIFIC PTY LTD
Organisation address	2000 NSW
Representative's name	Kate Mauger
Representative's job title	Ecologist
Phone	0411396591
Email	kate.mauger@arcadis.com
Address	16/580 George St, Sydney, NSW, 2000

Confirmed Person proposing to take the action's identity

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN/ACN	18643800828
Organisation name	CLARA ENERGY PTY LTD
Organisation address	3000 VIC
Representative's name	Nick Cleary
Representative's job title	CEO CLARA Energy
Phone	+61 414 724 089
Email	nick.cleary@claraenergy.com.au
Address	Level 13, 80 Collins Street, Melbourne, 3000

Confirmed Proposed designated proponent's identity

The Person proposing to take the action is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

1.4 Payment details: Payment exemption and fee waiver

1.4.1 Do you qualify for an exemption from fees under EPBC Regulation 5.23 (1) (a)? *

No

1.4.3 Have you applied for or been granted a waiver for full or partial fees under Regulation 5.21A? *

No

1.4.5 Are you going to apply for a waiver of full or partial fees under EPBC Regulation 5.21A?

No

1.4.7 Has the department issued you with a credit note? *

No

1.4.9 Would you like to add a purchase order number to your invoice? *

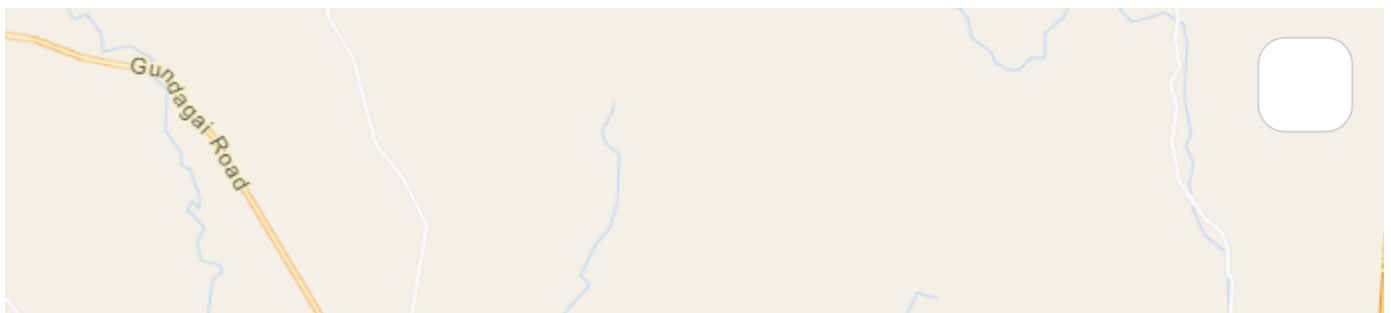
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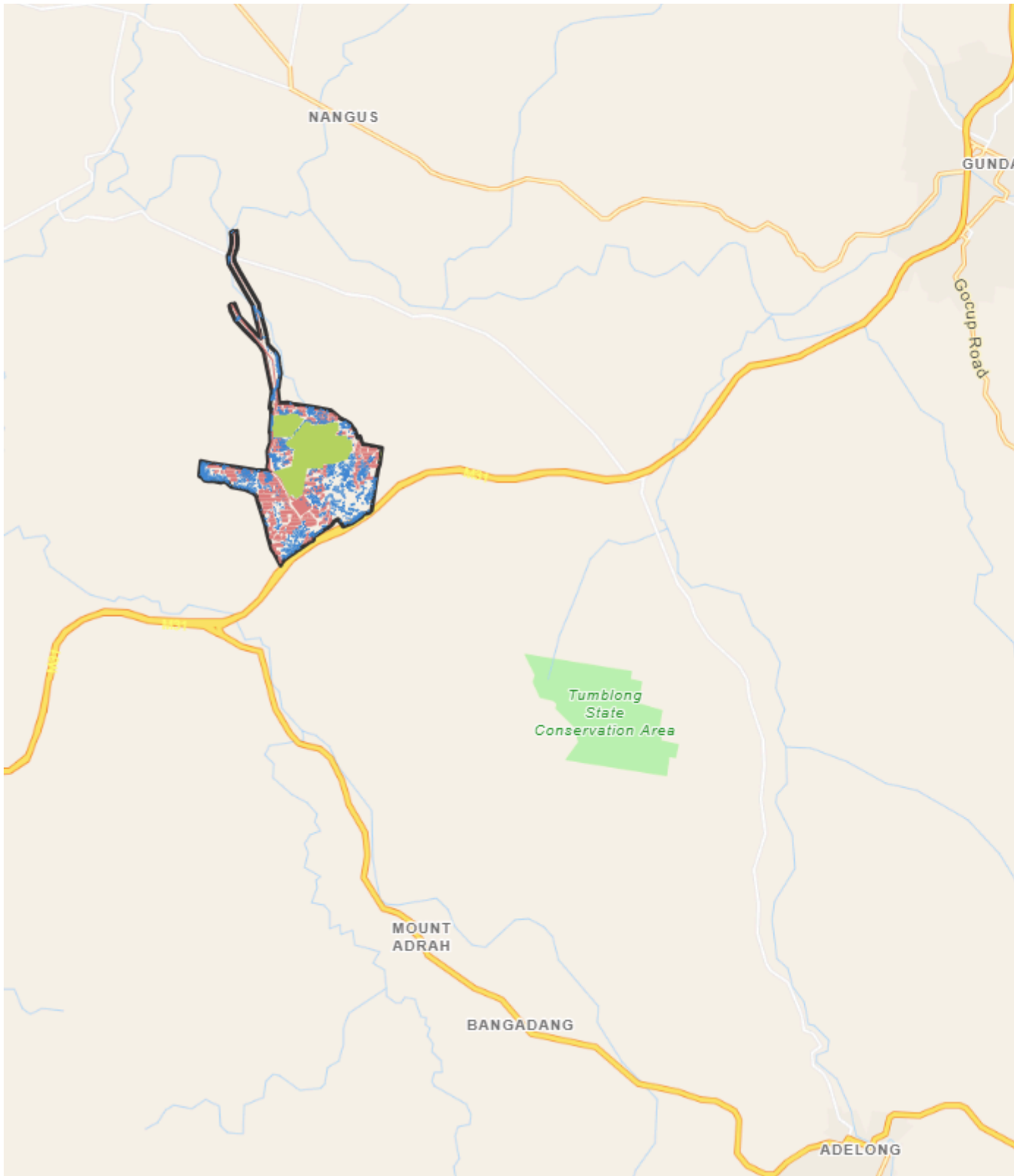
1.4 Payment details: Payment allocation**1.4.11 Who would you like to allocate as the entity responsible for payment? ***

Person proposing to take the action

2. Location

2.1 Project footprint





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Powered By Esri - Sources: Esri, TomTom, Garmin, F...

Project area: 1206.36 Ha
Disturbance footprint: 338.9 Ha
Avoidance area: 270.05 Ha
Retention area: 259.87 Ha

2.2 Footprint details

2.2.1 What is the address of the proposed action? *

232 Rosedale Road, Mundarlo, NSW 2729

2.2.2 Where is the primary jurisdiction of the proposed action? *

New South Wales

2.2.3 Is there a secondary jurisdiction for this proposed action? *

No

2.2.5 What is the tenure of the action area relevant to the project area? *

The project area tenure is freehold.

3. Existing environment

3.1 Physical description

3.1.1 Describe the current condition of the project area's environment.

The project area is comprised of a "Production" area of land where the hydrogen facility and solar arrays will be located, this is the main area of the project and has received the most amount of survey to date. This area is a mosaic of woodland and exotic pasture, currently used for grazing. The Utilities area connects the project to water from the Murrumbidgee River and the electricity grid (see Figure 1). Within the project area is the subject land which is the area being assessed for impacts under the NSW Biodiversity Assessment Method (BAM). The project area also includes an area that has been deliberately avoided as part of the project due to its high biodiversity value. This area is approximately 260 hectares comprised of moderate to high condition woodland It is currently being investigated as a potential biodiversity stewardship site under the BAM (see Figure 1, known as 'avoided area').

Native vegetation within the subject land was classified into six Plant Community Types (PCTs) and separated into a total of 14 condition classes. The condition classes range from low to high and included classes for remnant woodland patches, 'disturbed' areas immediately adjacent to remnant woodland

patches, 'revegetated' for areas that have been revegetated with species that correspond to an endemic PCT, and 'regrowth' for areas that lack a eucalypt dominated canopy and are dominated by regrowth *Acacia* spp (see Figure 2.1 and Figure 2.2).

The remainder of the project area comprises of exotic vegetation as either planted *Pinus radiata* plantations, or exotic pastures classified as 'category-1 (exempt) land' under the NSW *Local Land Services Act 2013*. The category-1 land has low biodiversity value due to the cleared native canopy and shrub layers, and the degraded ground cover dominated by pasture species, or paddock weeds such as *Vulpia* sp., *Bromus* sp., *Avena* sp., *Echium plantagineum*, *Xanthium spinosum*, *Cirsium vulgare* etc. (see Figure 3.1 and 3.2 for areas of category-1 land).

Three mapped watercourses occur in the study area: Diggers Creek, Jellingro Creek and the Murrumbidgee River. All three are mapped as Key Fish Habitat (KFH) under the NSW *Fisheries Management Act 1994*. Approximately 22 farm dams are within the project area, and ephemeral creek lines and drainage channels also occur.

Approximately 8.75 hectares of rocky habitat occurs in the subject land in native vegetation, with a further 2.05 hectares occurring in exotic grasslands. A total of 111 hollow-bearing trees were recorded in the subject land, many as single paddock trees in exotic pasture. Hollows varied in size from large, suitable for nocturnal birds and cockatoos, to small fissures suitable for microbats. Over 180 species of fauna were located within the project area during surveys, including hollow-dependent fauna.

The project location is in Mundarlo, NSW, approximately 25 kilometres west of Gundagai and approximately 23 kilometres north-east of Tarcutta. The Project is located within Cootamundra-Gundagai Regional Council Local Government Area (LGA) and is zoned 'RU1 – Primary Production'. Minimum lot size for this zone is 40 hectares. Much of the Project location is comprised of historically cleared paddocks currently used for cattle grazing and other agricultural uses. The remainder of the site is comprised of patches of remanent native vegetation, planted native and exotic trees along Rosedale Road, planted exotic pine plantations and numerous farm dams.

Land surrounding the Project location is also zoned 'RU1 – Primary Production' and is subject to similar practices including historical clearing for agricultural use with the retention of patches of remnant native vegetation, especially in riparian areas and on higher ground where grazing is less intensive. Further afield, there are areas reserved for conservation within the vicinity (Ellerslie Nature Reserve, Tarcutta Hills Reserve, Tumblong State Conservation Area and Minjary National Park).

Rosedale Road will be the primary access road into the project area. It will be accessed from the Hume Highway with the crossover intersection being widened to accommodate two-way traffic, addition of deceleration and acceleration lane off the Hume Highway into/out of Rosedale Road. In the project area, Rosedale Road will be widened, sealed, and passing bays will be installed into appropriate areas. One ring road through the solar panel array area will be installed. This will be based on the existing farm tracks currently utilised in the project area. All these areas will be utilised during the construction and operational phases of the development (see Figure 3.1 and 3.2 for road infrastructure).

3.1.2 Describe any existing or proposed uses for the project area.

The existing use of the project area (approximately 1,200 ha) is agricultural, with approximately 680 ha of category-1 land that is currently being used as grazing land for cattle and sheep. Approximately 6.10 hectares is planted *Pinus radiata* plantations. The remaining areas consist of remanent or revegetated native vegetation (approximately 337 ha). The remaining land is dirt/gravel tracks throughout the property and about six buildings, with two currently occupied. The buildings are generally surrounded by grassed yards some with domestic animals kept within them.

The proposed future use of the site is a combination of low intensity agriculture (sheep or cattle farming, the green hydrogen facility and areas of retained native vegetation for conservation. Alternatives if this project was not to go ahead are likely to be rural subdivision of the land.

The project area has been used for agricultural uses within the same family for many generations. This has mainly comprised cattle, but small areas of pine plantation has also been established.

3.1.3 Describe any outstanding natural features and/or any other important or unique values that applies to the project area.

Three mapped watercourses occur in the study area: Diggers Creek, Jellingro Creek and the Murrumbidgee River. All three are mapped as Key Fish Habitat (KFH) under the NSW *Fisheries Management Act 1994*. The Murrumbidgee River is mapped habitat for four threatened aquatic species - the vulnerable Silver Perch (*Bidyanus bidyanus*), and Murray Crayfish (*Euastacus armatus*), the endangered Trout Cod (*Maccullochella macquariensis*), and the critically endangered Flathead Galaxias (*Galaxias rostratus*) (listed under the BC Act).

The project area contains 22 man made dams and a number of ephemeral waterways, that are typical of those in areas used for livestock grazing, with little native vegetation surrounding them. Many of the waterways have been subject to erosion, although in recent years native vegetation plantings to protect these areas and increase biodiversity value have been undertaken.

The project footprint does not contain any areas of geological significance, including karst, caves, crevices, cliffs, rocks, and other geological features of significance. The nearest area of geological significance is the karst environments at Jeremiah Creek, approximately 70 kilometres NNW of the project area.

The project area does not support any significant wetlands, including Nationally Important Wetlands or RAMSAR wetlands listed in the Directory of Important Wetlands in Australia (DIWA). The closest listed wetland is Micalong Swamp in Bondo State Forest, approximately 57 kilometres east of the project.

The vegetation and biodiversity values of the project area are like those in the broader locality in that they are fragmented by clearing in the lower slopes and flats. Areas along hill slopes and crests have greater vegetation cover and connectivity. The project area contains a large area of remnant native vegetation in the centre that will not be impacted by the Project. This area has an intact and mature native canopy, shrub and ground cover layers. This provides good habitat for native species relative to the fragmented patches in the majority of the project area.

3.1.4 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

The project area contains low hill slopes grading down to valley flats towards watercourses. Either side of the hillslopes the project area increases in gradient to higher hillcrests and ridges, particularly in the south-eastern portion of the project area. Areas currently grazed are lower gradient areas.

Elevation within the project area varies from approximately 200m around the Murrumbidgee River, to 390m along the highest ridges of the project area in the south-east. The project is mostly located in the Carbost Hills and Ranges Mitchell Landscape. The Carbost Hills and Ranges Mitchell Landscape is characterised by steep dipping Lower Ordovician chert, slate, lithic sandstone, shale, phyllite schist and minor basic volcanic rocks. Elevation is generally between 250 and 750 metres, with local relief to 250 metres.

In the south-east of the project, adjacent to the Hume Highway and running parallel to Diggers Creek is the Murrumbidgee - Tarcutta Channels and Floodplains Mitchell Landscape. This landscape is characterised by channels, floodplain and terraces of Murrumbidgee tributaries and Quaternary alluvium. Elevation is

generally between 200 and 400 metres, with local relief to 25 metres.

Areas of shallow water are not abundant within the project area. There are numerous ephemeral streams throughout, that can contain water only a few centimetres deep. The Murrumbidgee River is the most significant waterbody in the project area, which has depths between 1-2m.

3.2 Flora and fauna

3.2.1 Describe the flora and fauna within the affected area and attach any investigations of surveys if applicable.

Surveys in the project area were conducted from September 2022 to May 2024. Surveys were undertaken for candidate species under the BAM and EPBC Act listed flora and fauna. Landscape is characterized by a mix of exotic pastures and remnant woodland, with scattered paddock trees, occasional ephemeral waterways and dams (See Figure 2 series and Figure 3 series).

The following EPBC Act listed species were surveyed for however none were identified in the project area's impact area ('development footprint'), or were assumed as 'present' (as per Section 5.1 of the BAM):

- *Ammobium craspedioides* (Yass Daisy)
- *Amphibromus fluitans* (Floating Swamp Wallaby-grass)
- *Bossiaea fragrans*
- *Caladenia concolor* (Crimson Spider Orchid)
- *Euphrasia arguta*
- *Grevillea wilkinsonii* (Tumut Grevillea)
- *Leucochrysum albicans subsp. tricolor* (Hoary Sunray)
- *Prasophyllum petilum* (Tarengo Leek Orchid)
- *Prasophyllum sp. Wybong*
- *Swainsona recta* (Small Purple-pea)
- *Tylophora linearis*
- *Zieria obcordate* (Granite Zieria)

Approximately 180 fauna species were recorded during surveys, including ten threatened species (five of which are listed under both EPBC and BC Acts), none are only listed under the EPBC Act.

Five EPBC Act listed fauna species were identified in the project area:

- Brown Treecreeper (*Climacteris picumnus victoriae*) – Vulnerable under the EPBC Act
- Diamond Firetail (*Stagonopleura guttata*) – Vulnerable under the EPBC Act
- Southern Whiteface (*Aphelocephala leucopsis*) – Vulnerable under the EPBC Act
- South-eastern Hooded Robin (*Melanodryas cucullata cucullata*) – Endangered under the EPBC Act
- Superb Parrot (*Polytelis swainsonii*) – Listed as Vulnerable under the EPBC Act

The species polygon for Superb Parrot is 0.72 hectares. The other listed fauna species are considered 'ecosystem credits' under the BAM and therefore do not have calculated species polygons. Appendix A contains a table which summarises the impacts to woodland birds in the project area.

No migratory species were recorded in the project area.

Three EPBC Act listed Threatened Ecological Communities (TECs)s had the potential to occur:

- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia – listed as Endangered under the EPBC Act

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – listed as Critically Endangered under the BC Act and the EPBC Act
- Natural Temperate Grasslands of the South Eastern Highlands – listed as Critically Endangered under the EPBC Act.

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland was observed to occur in the project area in condition classes A and C. Of the PCTs present on site, PCTs 266, 268, 277, and 347 all correspond to this TEC (see Figure 7.1 and Figure 7.2). Appendix F summarises the consistency of the above PCTs against the key diagnostic characteristics and condition classes and thresholds for the above CEEC.

The condition classes for each polygon of EPBC Act listed communities were confirmed using Table 1 of the Approved Conservation Advice, and comparing adjacent floristic plots (BAM plots), with the criteria listed in Table 1 and the important species list in Appendix A of the Approved Conservation Advice.

The polygon areas of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the project area, and then any corresponding impact (if relevant), are as follows:

- Condition Class A
 - 9.59 hectares - 0 hectares of impact
 - 2.95 hectares - 0.02 hectares of impact
 - 13.75 hectares - 0 hectares of impact
- Condition Class C
 - 1.94 hectares - 0 hectares of impact
 - 0.75 hectares - 0 hectares of impact
 - 2.20 hectares - 0 hectares of impact

Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia was not observed in the project area as *Eucalyptus microcarpa* (Grey Box) is not considered a dominant or co-dominant canopy species in any vegetation within the project area. Additionally, the TEC Natural Temperate Grasslands of the South Eastern Highlands was not observed in the project area as no remnant grassland vegetation occurs, only derived grassland which support a lower diversity of native grass species to meet the key diagnostic characteristics for this TEC.

Survey effort for all flora species (including BAM plots) is attached as Figure 5.1 (for Production area) and Figure 5.2 (for Utilities area), and for all fauna species is attached as Figure 6.1 (for Production area) and Figure 6.2 (for Utilities area).

3.2.2 Describe the vegetation (including the status of native vegetation and soil) within the project area.

The project area is comprised of six Plant Community Types (PCTs) – 79, 266, 268, 277, 343 and 347 which are further divided into one of four condition classes. Remnant patches of woodland vegetation are one condition class, which comprises of an intact canopy and moderate native diversity of shrubs, forbs and grasses. The areas immediately adjacent to woodland areas are categorised as 'disturbed' condition class. These areas lack an intact canopy, however, still contain a moderate diversity of grasses and forbs. This condition class is not considered a Derived Native Grassland (DNG), but rather an extension of the grassy woodlands. Areas that have no intact canopy but are dominated by *Acacia* spp. regrowth are categorised as 'regrowth' condition class. Finally, some areas have been revegetated with species that correspond with PCT 277 and have been categorised as 'revegetated'.

A justification for each PCT chosen in the project area is provided below:

- PCT 79 - River Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes sub-region of the NSW South Western Slopes Bioregion and western South Eastern

Highlands Bioregion

- This vegetation has been identified as PCT 79 due to the associated characteristic species, particularly the dominant canopy species *Eucalyptus camaldulensis* subsp. *camaldulensis* and *Casuarina cunninghamiana* which are strongly associated with PCT 79. The landscape position of this vegetation along alluvial flats and river banks and PCT 79 grading into PCT 277 on adjoining hillslopes and flats are characteristic of the vegetation in the project area.
- PCT 266 – White Box grassy woodland in the upper slopes sub-region of the NSW Southwestern Slopes Bioregion
 - This vegetation has been identified as PCT 266 due to the associated characteristic species, particularly the dominant canopy species *E. albens*, which is strongly associated with PCT 266. Additionally, the landscape position of this vegetation in the project area occurs on hillslopes and low hill on lithic sandstone, shale, phyllite schist lithologies which are characteristic of PCT 266.
- PCT 268 – White Box - Blakely's Red Gum - Long-leaved Box - Nortons Box - Red Stringybark grass-shrub woodland on shallow soils on hills in the NSW Southwestern Slopes Bioregion
 - This vegetation has been identified as PCT 268 due to the associated characteristic species, particularly the dominant canopy species of *E. blakelyi* and *E. albens*. Additionally, the landscape position of this vegetation in the project area occurs on higher elevations on hillcrests and hillslopes on soils derived from metamorphic or sedimentary substrates. These lithologies are common along the ridgetop areas of the project area, where PCT 268 has predominantly been mapped.
- PCT 277 – Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW Southwestern Slopes Bioregion
 - This vegetation has been identified as PCT 277 due to the associated characteristic species, particularly the dominant canopy species of *E. blakelyi* and *E. melliodora*. Additionally, the landscape position of this vegetation in the project area occurs on the flats and foot slopes, often adjacent to watercourses/emphermal areas, on sandy loam soils. These lithologies are common along the flats and creek lines where PCT 277 is mapped.
- PCT 343 – Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW Southwestern Slopes Bioregion
 - This vegetation has been identified as PCT 343 due to the associated characteristic species, particularly the dominant canopy species of *E. sideroxylon*, *E. polyanthemos*, and *E. macrorhyncha*. *Eucalyptus sideroxylon* is the most defining species of PCT 343 in the project area, as it is not associated with the other PCTs mapped in the project area. Additionally, the landscape position of this vegetation in the project area occurs on clay soils derived from metamorphic rocks, which occur along the hillslopes that PCT 343 is mapped.
- PCT 347 – White Box - Blakely's Red Gum shrub/grass woodland on metamorphic hillslopes in the mid-southern part of the upper slopes sub-region of the NSW Southwestern Slopes Bioregion
 - This vegetation has been identified as PCT 347 due to the associated characteristic species, particularly the dominant canopy species *E. blakelyi*, *E. macrorhyncha* and *E. albens*, which is strongly associated with PCT 347. Additionally, the landscape position of this vegetation in the project area occurs on hillslopes and into low gullies which is characteristic of PCT 347.

Ten exotic species are listed as High Threat Weeds and/or priority weeds under the *Riverina Regional Strategic Weed Management Plan 2023-2027*.

Please see Appendix A for flora and fauna species recorded in the study area.

The Project is mostly located in the Carbost Hills and Ranges Mitchell Landscape. The Carbost Hills and Ranges Mitchell Landscape is characterised by steep dipping Lower Ordovician chert, slate, lithic sandstone, shale, phyllite schist and minor basic volcanic rocks. In the south-east of the project, adjacent to

the Hume Highway and running parallel to Diggers Creek is the Murrumbidgee - Tarcutta Channels and Floodplains Mitchell Landscape. This landscape is characterised by channels, floodplain and terraces of Murrumbidgee tributaries and Quaternary alluvium.

Cleared areas used for agricultural uses generally occur along the valley flats and hill slopes, where access to clear native vegetation would have been relatively easier than the steeper sections of the project area. Consequently, the improved pasture, continued cattle grazing and therefore degraded vegetation is concentrated in these areas. The steeper sections, particularly in the south-east of the project area contain remnant patches of vegetation, and higher diversity of native ground cover species in the 'disturbed' vegetation zones surrounding the woodland areas. There are no significant weed infestations in the project area, besides the areas that have been mapped as category-1 land which have a high cover of pasture species and pasture weeds. Additionally, three areas of planted *Pinus radiata* plantations occur in the Production project area.

Production project area –

The lower elevations of the production project area, along the flats and low hillslopes are where extensive clearing for agriculture and consequently areas of improved pasture have been mapped. Areas of native vegetation are more common along steeper hill slopes, ridges and gullies. The remnant woodland areas are all in moderate condition due to the composition of these patches. They have an intact canopy, with DBHs from 20 centimetres to 80+ centimetres. Hollows are often present. The shrub layer is intact for some patches; however others are not (which is often characteristic of that PCT, i.e. PCT 266). The ground cover is moderately diverse with native grasses and forbs, commonly *Austrostipa* spp., *Rytidosperma* spp., *Aristida* sp., *Bothriochloa macra*, *Xerochrysum viscosum*, *Wahlenbergia luteola*, and *Vittadinia gracilis* are found (see Figure 3.1 and 3.2 for areas of exotic/category-1 land).

Utilities project area –

The most northern section of the project area comprises of small remnant patches of PCT 79 adjacent to the Murrumbidgee River dominated by *Casuarina cunninghamiana* and *Eucalyptus camaldulensis*, and PCT 266 and 277 further south. These remnant patches only have intact canopies dominated by *Eucalyptus blakelyi*, *E. melliodora* or *E. albens*. The shrub layer is completely absent, and the ground cover is predominantly exotic grasses/forbs such as *Bromus* sp., *Vulpia* sp., *Trifolium* sp., *Xanthosia spinosum*, *Eragrostis* sp. Along the creek lines and drainage channels there are areas that have been revegetated to resemble PCT 277. These areas are in moderate condition, with intact canopies, and shrub layer consisting of *Acacia mearnsii* and *A. dealbata*. The ground cover contains fewer exotic species and is dominated by *Microlaena stipoides*, *Anthosachne scaber*, *Rytidosperma racemosum*, *Carex appressa* and *Rumex brownie* (see Figure 2.2).

A soil description survey was completed on a foot slope on Rosedale Road. It was noted that the foot slope was in low hills on metamorphic, sedimentary lithology with a slope of four degrees and a low local relief of between 30-90 metres. The soil type was described as "Bleached-Mottled Class Undetermined Red Chromosol; thick, clayey" (DPE, 2022 SW Soil and Land Information. Retrieved from eSPADE).

On NSW eSPADE, the study area is classified as having moderate to severe and severe limitations due to the hazard acidification. There was a very slight to negligible limitation for mass movement hazards. Shallow soils and rockiness scored in a range between 1 – very slight to negligible limitations to 6 – very severe hazard limitations, while water erosion hazards measured between 1 and 7 – extremely severe limitations. Water logging and wind erosion hazards were mainly limited to 1 and 2 – slight but significant limitations

3.3 Heritage

3.3.1 Describe any Commonwealth heritage places overseas or other places recognised as having heritage values that apply to the project area.

No areas of Commonwealth heritage are within the project area.

3.3.2 Describe any Indigenous heritage values that apply to the project area.

Field surveys conducted with Registered Aboriginal Parties (RAPs), did not identify any Aboriginal cultural sites or artefacts of high cultural significance within the project area, largely due to the low ground surface visibility during the survey. However, four areas of Potential Archaeological Deposits (PADs) were identified, indicating potential for subsurface Aboriginal objects, and two isolated finds were recorded during the survey of the Utilities project area.

Recommendations have been made to develop an Aboriginal Cultural Heritage Management Plan (ACHMP), which will include strategies for handling unanticipated finds, long-term management of any discovered artefacts, and protocols for cultural heritage inductions and monitoring. In summary, while no significant Aboriginal cultural heritage values were directly identified in the current stage of the assessment, the presence of PADs suggests potential for future findings that may carry cultural importance, pending further investigations and excavations. Recommendations focus on protecting potential archaeological deposits and ensuring continued consultation with RAPs throughout the development process.

Please see attached summary of Aboriginal Cultural Heritage Assessment Report (ACHAR).

3.4 Hydrology

3.4.1 Describe the hydrology characteristics that apply to the project area and attach any hydrological investigations or surveys if applicable. *

Within the Production project area, Jellingro Creek is highly modified, with eroded and deeply incised banks in some places. Waterflow is low, ephemeral and pools along the length of the creek line. Riparian vegetation is sparse in most places, however adjacent to the homestead on Rosedale Road some areas of riparian vegetation (i.e., *Carex appressa*, *Rumex brownii*, *Juncus* sp.) are still intact. Remaining areas have been modified for agricultural uses and grazing.

Diggers Creek is classified as a first order stream and begins in the north-east of the project area, flows under Rosedale Road and meets Hillas Creek in the south-west approximately two kilometres downstream. Diggers Creek has a higher flow rate than Jellingro Creek however does experiences similar issues of erosion, incised banks and weed incursion (particularly that of willows [*Salix* spp.]). Diggers Creek is mapped as KFH under the *Fisheries Management Act 2015*.

Jellingro Creek crosses the Utilities area intermittently and has more pooling water than the Production project area. Common riparian species such as *Juncus* sp. line the banks. A tributary of the Murrumbidgee River also cross this project area, which is severely eroded with at a least four-metre-high bank.

Twenty-two farm dams occur within the project area along with numerous low-lying drainage lines and soaks. These areas of aquatic habitat provide suitable sheltering, dispersal, foraging and/or breeding habitat for amphibians, and foraging/roosting habitat for birds and certain microbat species. These aquatic habitats provide potential habitat for common terrestrial and aquatic species, they are not considered suitable habitat for threatened species.

The Project will involve the extraction of water from the Murrumbidgee River. This will be sourced using a Water Access License (WAL) to extract water via a new pipeline and pump station. Recycled water from production processes will be used to reduce net water use with significant recycling rates contributing substantially to the minimum water use strategy. The daily water demand estimates for the Project is estimated to be 2.2 ML/day, with these estimates based on the Water for Hydrogen report (Australia Hydrogen Council, 2022).

Water for the Project will be sourced from the Murrumbidgee River and will be pumped up to the project area and stored in a 300 ML turkeys nest dam, for use in the hydrogen production process. Five pumps will also be installed at the Murrumbidgee River to pump water through the water pipeline. Four of the five pumps will be on duty, while one pump will be on standby. The water pipeline will be DN800 high density polyethylene pipe within a 20 metre easement. The water pipeline will be installed progressively by a combination of open trench and trenchless construction techniques, such as horizontal directional drilling (HDD) which will be employed where crossing waterways to minimise disturbance and avoid impacts to the waterways.

Based on the conservative assumptions made, proposed operation is for water abstraction from the Murrumbidgee River approximately 30 days a year. Each day will consist of approximately 20 hours of pumping. It is possible that during summer excess power will be generated by the photovoltaic panels which is not needed onsite for hydrogen production and could be used for pumping. It is anticipated that the pumping system will include SCADA control with a control panel sitting within the operational plant room at the hydrogen production site enabling remote operation of the pump station.

Appropriate mitigation measures for erosion and sediment control will be in place during the upgrade of the pipeline and pumphouse.

4. Impacts and mitigation

4.1 Impact details

Potential Matters of National Environmental Significance (MNES) relevant to your proposed action area.

EPBC Act section	Controlling provision	Impacted	Reviewed
S12	World Heritage	No	Yes
S15B	National Heritage	No	Yes
S16	Ramsar Wetland	No	Yes
S18	Threatened Species and Ecological Communities	Yes	Yes
S20	Migratory Species	No	Yes
S21	Nuclear	No	Yes
S23	Commonwealth Marine Area	No	Yes
S24B	Great Barrier Reef	No	Yes
S24D	Water resource in relation to large coal mining development or coal seam gas	No	Yes
S26	Commonwealth Land	No	Yes
S27B	Commonwealth Heritage Places Overseas	No	Yes
S28	Commonwealth or Commonwealth Agency	No	Yes

4.1.1 World Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.1.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.1.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact.

*

There are no World Heritage areas in the project area.

4.1.2 National Heritage

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.2.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.2.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact.

*

There are no areas of National Heritage in the project area.

4.1.3 Ramsar Wetland

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Direct impact	Indirect impact	Ramsar wetland
No	No	Banrock Station Wetland Complex
No	No	Hattah-Kulkyne Lakes
No	No	Riverland
No	No	The Coorong, and Lakes Alexandrina and Albert Wetland

4.1.3.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.3.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact.

*

No listed Ramsar Wetlands occur in the project area. The closest Ramsar wetland is Ginini Flats Wetland Complex approximately 93 km south-west of the project area.

4.1.4 Threatened Species and Ecological Communities

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Threatened species

Direct impact	Indirect impact	Species	Common name
No	No	<i>Amphibromus fluitans</i>	River Swamp Wallaby-grass, Floating Swamp Wallaby-grass
No	No	<i>Anthochaera phrygia</i>	Regent Honeyeater
Yes	Yes	<i>Aphelocephala leucopsis</i>	Southern Whiteface
Yes	Yes	<i>Aprasia parapulchella</i>	Pink-tailed Worm-lizard, Pink-tailed Legless Lizard
No	No	<i>Bidyanus bidyanus</i>	Silver Perch, Bidyan
No	No	<i>Botaurus poiciloptilus</i>	Australasian Bittern
No	No	<i>Caladenia arenaria</i>	Sand-hill Spider-orchid
No	No	<i>Caladenia concolor</i>	Crimson Spider-orchid, Maroon Spider-orchid
No	No	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper
No	No	<i>Calidris ferruginea</i>	Curlew Sandpiper
Yes	Yes	<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo
Yes	Yes	<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (south-eastern)
No	No	<i>Crinia sloanei</i>	Sloane's Froglet
No	No	<i>Dasyurus maculatus maculatus</i> (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)
Yes	Yes	<i>Delma impar</i>	Striped Legless Lizard, Striped Snake-lizard
No	No	<i>Falco hypoleucos</i>	Grey Falcon
No	No	<i>Galaxias rostratus</i>	Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow
No	No	<i>Gallinago hardwickii</i>	Latham's Snipe, Japanese Snipe
No	No	<i>Grantiella picta</i>	Painted Honeyeater
No	No	<i>Hirundapus caudacutus</i>	White-throated Needletail
No	No	<i>Lathamus discolor</i>	Swift Parrot
No	No	<i>Lepidium aschersonii</i>	Spiny Peppergrass

Direct impact	Indirect impact	Species	Common name
No	No	<i>Litoria booroolongensis</i>	Booroolong Frog
No	No	<i>Litoria raniformis</i>	Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog
No	No	<i>Lophochroa leadbeateri leadbeateri</i>	Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo
No	No	<i>Maccullochella macquariensis</i>	Trout Cod
No	No	<i>Maccullochella peelii</i>	Murray Cod
No	No	<i>Macquaria australasica</i>	Macquarie Perch
Yes	Yes	<i>Melanodryas cucullata cucullata</i>	South-eastern Hooded Robin, Hooded Robin (south-eastern)
No	No	<i>Neophema chrysostoma</i>	Blue-winged Parrot
No	No	<i>Nyctophilus corbeni</i>	Corben's Long-eared Bat, South-eastern Long-eared Bat
Yes	Yes	<i>Phascolarctos cinereus</i> (combined populations of Qld, NSW and the ACT)	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)
Yes	Yes	<i>Polytelis swainsonii</i>	Superb Parrot
No	No	<i>Prasophyllum petilum</i>	Tarengo Leek Orchid
Yes	No	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox
No	No	<i>Rostratula australis</i>	Australian Painted Snipe
Yes	Yes	<i>Stagonopleura guttata</i>	Diamond Firetail
No	No	<i>Swainsona recta</i>	Small Purple-pea, Mountain Swainson-pea, Small Purple Pea
No	No	<i>Synemon plana</i>	Golden Sun Moth

Ecological communities

Direct impact	Indirect impact	Ecological community
No	No	Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia

Direct impact	Indirect impact	Ecological community
Yes	Yes	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

4.1.4.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

Yes

4.1.4.2 Briefly describe why your action has a direct and/or indirect impact on these protected matters. *

The Project has been located deliberately to avoid impacts on native vegetation. Several processes have been applied to minimise this impact. The initial design of the hydrogen facility and solar array prioritised areas of exotic grassland and pine plantation, over native vegetation. Detailed surveys to BAM guidelines were then undertaken to map the Plant Community Types (PCTs) within the Production subject land (Figure 5.1 and Figure 5.2). The Utilities subject land connecting the facility to the transmission grid and to the Murrumbidgee River was added later, and designed to avoid native vegetation, primarily impacting paddocks currently used for grazing. Grazing will continue in these areas since the potential impact of the Utilities subject land is small.

Once the PCTs were mapped for the Production subject land, a “traffic light” map was developed by the ecologists to show areas of high, medium and low ecological value for the solar array designers to use in the refinement of their design. This iterative process has resulted in minimal impact to high ecological value areas, and low to moderate for lower value areas. However, the project still requires the removal of native vegetation, and this removal is detailed in Table 2 of Appendix A.

For the entire project, 38.83 hectares of native vegetation will be cleared, when the Utilities and Production area footprints are combined. The majority of this clearing is PCT 343 *Mugga Ironbark - Red Box - Red Stringybark - Western Grey Box grass/shrub woodland on metamorphic substrates in the Tarcutta - Gundagai region, NSW Southwestern Slopes Bioregion*. This community is not listed as threatened under either the BC or EPBC Acts, however it does provide habitat for fauna species listed under the EPBC Act. Potential impacts to these species are discussed below. As a critically endangered ecological community (CEEC), White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland was avoided as much as possible. Approximately 0.08 hectares will be impacted by the Project. This impact is mostly coming from the installation of new access tracks throughout within the solar array area, These clip edges of the CEEC. This impact is minimal, as the access tracks will not require hardstand to be installed, instead they will be dirt tracks and mostly based on the existing farm tracks that are currently utilised in within the Production subject land.

Nine fauna species listed under the EPBC Act were assessed for potential impact against significant impact criteria guidelines (DEC 2013) (Appendix D). These species were derived from a list of over 30 EPBC Act listed species that could potentially occur. A likelihood of occurrence table was used to determine which species should receive further assessment. Any species with a moderate or higher likelihood of occurrence was assessed further (Appendix B and Appendix C).

The nine species assessed include five recorded within the Production subject land during surveys:

- Brown Treecreeper (*Climacteris picumnus victoriae*)
- Diamond Firetail (*Stagonopleura guttata*)
- Southern Whiteface (*Aphelocephala leucopsis*)

- South-eastern Hooded Robin (*Melanodryas cucullata cucullata*)
- Superb Parrot (*Polytelis swainsonii*)

The remaining four species assessed against significant impact guidelines due to being assessed as having a moderate or higher likelihood of occurrence were:

- Pink-tailed worm lizard (*Aprasia parapulchella*)
- Striped Legless Lizard (*Delma impar*)
- Koala (*Phascolarctos cinereus*)
- Grey-headed Flying-fox (*Pteropus poliocephalus*)

Impacts associated with the construction of the solar panel areas will be full clearing to allow for construction works to take place. During the operation of the facility, the ground cover will have opportunities to re-establish, however the shrub and canopy layers will be maintained and are unlikely to naturally regenerate. This ultimately reduces the habitat coverage for the listed threatened species that are specifically woodland birds. Impacts associated with the construction of new access roads will also involve full clearing. This will also create new edges in the ground cover layer. This may be beneficial to some species, as edges increases competition and some native grass/forb species are known to respond well to disturbance. Likewise, weed incursion is also possible especially via the introduction from vehicles using the site during construction and operation.

4.1.4.4 Do you consider this likely direct and/or indirect impact to be a Significant Impact?

*

No

4.1.4.6 Describe why you do not consider this to be a Significant Impact. *

Key impacts from the project include direct and indirect impacts. Direct impacts are from clearing of native vegetation and indirect impacts are associated with remaining vegetation and habitat. The main impact is from the clearing of approximately 39 ha of woodland vegetation, in condition from low (no tree layer) to high value box gum woodland. Vegetation clearing has been minimised during design, especially on box gum CEEC. The majority of the existing woodland within the project area will be retained, with a significant intact area (~260 ha) avoided due to its conservation value.

Indirect impacts from the project are expected to be minimal, given that no additional sealed roads will be added, and solar arrays do not create noise or dust issues during operation. There will be some short term construction impacts, but these will be managed and mitigated according to an approved Construction Environmental Management Plan for the project.

Impacts on each threatened species or CEEC are described in greater detail below.

Woodland birds

Four woodland bird species listed under the EPBC Act that were recorded within the Production subject land were assessed against *Matters of National Environmental Significance: significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (DEC 2013). These were:

- **Brown Treecreeper (*Climacteris picumnus victoriae*) (recorded)**
- **Diamond Firetail (*Stagonopleura guttata*) (recorded)**
- **Southern Whiteface (*Aphelocephala leucopsis*) (recorded)**
- **South-eastern Hooded Robin (*Melanodryas cucullata cucullata*) (recorded)**

The project requires the removal of 18.03 hectares of moderate or above condition woodland which provides foraging and breeding habitat for these species. This will have an impact on the populations of these species, reducing their resources. However, the project has been designed to reduce impacts on native vegetation and retain approximately 500 ha of woodland habitat.

Solar panels, which cover most of the area for the Project have been deliberately located in exotic grassland, reducing impacts to woodland habitat. When operational, the project consists primarily of solar panels throughout which is a very low disturbance use of the land for fauna and similar to the existing use of the property for grazing of cattle. There is no noise, emissions and minimal changes to run off associated with these components of the project. The green hydrogen facility has been deliberately positioned in an area of exotic grassland, away from areas of fauna habitat to reduce native vegetation clearing and disturbance to existing fauna.

Superb Parrot (*Polytelis swainsonii*)

Impacts of the project on Superb Parrots were assessed against *Matters of National Environmental Significance: significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (DEC 2013) and this assessment is provided in Attachment D.

It is not anticipated that the clearing required for the Project is sufficient to interfere with the recovery of the species, nor cause significant impacts to their habitat or breeding capacity. As above for woodland birds, much of the direct impacts have been reduced where possible, limiting the impact on hollow-bearing trees to removal of under 20% (31 of total 162 recorded).

The project has been designed to reduce impacts on native vegetation, particularly box gum woodland and hollow-bearing trees which are habitat for this species. As such, it is considered that the project will not have a significant initial or lasting impact on this species.

Pink-tailed Legless Lizard (*Aphrasia parapulchella*)

A total of 0.19 ha of potential foraging and breeding rocky habitat for the Pink-tailed Legless Lizard will be removed, of a total 6.16 ha of rocky habitat. This impact was assessed against *Matters of National Environmental Significance: significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (DEC 2013) and this assessment is provided in Attachment D.

Indirect impacts on this reptile include increased vehicle movement, increased light and dust and increased fragmentation of existing native vegetation. However, as no sealed roads are proposed, and this species can inhabit exotic grasslands, the impacts are expected to be minimal.

The project has been designed to reduce impacts on native vegetation as well as rocky outcrop habitat, which is key habitat for this species. As such, it is considered that the project will not have a significant initial or lasting impact on this species.

Striped Legless Lizard (*Delma impar*)

The Project requires the removal of 3.10 hectares of potential foraging and breeding habitat for Striped Legless Lizards. This impact was assessed against *Matters of National Environmental Significance: significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (DEC 2013) and this assessment is provided in Attachment D.

The project has been designed to reduce impacts on native vegetation, particularly box gum woodland which is habitat for this species. As such, it is considered that the project will not have a significant initial or lasting impact on this species.

Grey-headed Flying-fox (*Pteropus poliocephalus*)

The Project requires the removal of approximately 18 hectares of potential foraging habitat for the Grey-headed Flying-fox. This impact was assessed against *Matters of National Environmental Significance: significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (DEC

2013) and this assessment is provided in Appendix D.

The project has been designed to reduce impacts on native vegetation, particularly box gum woodland which is foraging habitat for this species. As such, it is considered that the project will not have a significant initial or lasting impact on this species.

Koala (*Phascolarctos cinereus*)

Within the Utilities subject land includes 1.92 hectares of marginal Koala habitat that will be directly impacted by the Project. This impact was assessed against *Matters of National Environmental Significance: significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (DEC 2013) and this assessment is provided in Appendix D.

The project has been designed to reduce impacts on native vegetation, particularly box gum woodland which is foraging and breeding habitat for this species. As such, it is considered that the project will not have a significant initial or lasting impact on this species. It is likely that future surveys will rule this species out of this area.

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

The impacts to White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland are considered not significant due to the total amount of clearing required (0.08 hectares), the relation of this area to the total amount of Box Gum Woodland in the project area and locality, and the nature of the impacts being minimal to each patch.

The total amount of EPBC Act listed TEC in the project area is approximately 42 hectares. Moreover, the total amount of Box Gum woodland within 1500 metres of the project area is approximately 526 hectares, and 6450 hectares within 10 kilometres of the project area. The impacts associated with the Project are consequently 0.1% of the total coverage of EPBC Act TEC within the local area. Furthermore, the impacts are largely associated with the widening or construction of dirt access tracks across the site and are concentrated on edges of patches rather than bisecting them, maintaining patch integrity as much as possible.

The impacts associated with this TEC will not reduce the extent of this CEEC. As demonstrated previously, the impacts (0.08 hectares) are 0.1% of the total extent of the TEC in the project area, and 0.007% in 1500 metres of the project area, 0.0006% within 10 kilometres of the project area. This also supports that the Project will not adversely affect any habitat critical for the survival of this TEC, as there is an abundance within the study area and locality that will not be impacted by the Project.

The impacts may increase fragmentation of the CEEC marginally, as edges will be removed to facilitate the construction of the access roads. Additionally, invasive species incursion may increase along the newly created edges due to the disturbance and decreased competition. Native species associated with the TEC will be removed due to the Project, however the diversity of the patches is high enough that the minor impacts associated with the Project will be cause a substantial change in the species composition of the TEC. Weed and pest incursion will be managed through a CEMP.

The main objectives of the recovery plan for this TEC involve no not less in extent and condition of the TEC, increasing protection in high recovery potential areas, increasing transitional areas around remnant patches, and increase landscape functionality through management of degraded sites. As the Project will remove vegetation associated with this TEC, not matter the size, goes against the main objectives of the recovery plan. However, given the areas to be impacted are along edges of patches, and the higher quality (Class A) patches are mostly avoided, the Project should not be considered to substantially interfere with the recovery plan of this TEC.

Please see the attached SIC assessments (Appendix D) for the listed threatened species and ecological communities.

4.1.4.7 Do you think your proposed action is a controlled action? *

No

4.1.4.9 Please elaborate why you do not think your proposed action is a controlled action.

*

As per Section 4.1.4.6, the project has been designed to minimise impacts on native vegetation and therefore on threatened flora and fauna. While there will be some impacts, primarily to foraging resources for birds, the project has been designed to retain as much vegetation as possible, and the site as a whole will maintain 200 hectares (72% of the total native vegetation within the project area). Furthermore, most of the Project infrastructure will be constructed in areas that are classified as category 1-land, with approximately 292 ha (85%) of impacted vegetation being exotic grasslands, identified as category 1 land under the LLS Act 2015. A large area of intact native vegetation within the project area will be avoided entirely by the Project. This area is currently being investigated as a potential biodiversity stewardship site under the BAM.

4.1.4.10 Please describe any avoidance or mitigation measures proposed for this action and attach any supporting documentation for these avoidance and mitigation measures. *

Impacts to listed threatened species and ecological communities have been avoided and minimised as much as possible, through Project design. The NSW State Vegetation Type Mapping (SVTM) was used initially to design for the infrastructure design of the project. As vegetation mapping for the study area progressed, areas of TEC were identified as highest priority for retainment and were avoided as much as possible for the final design layer. Areas of exotic vegetation were prioritized for impact, followed by non-TEC native vegetation.

Where impacts cannot be avoided, relevant mitigation measures have been provided to ensure that any adverse indirect or compounding impacts do not occur for the listed threatened species and ecological communities. These have been provided in a separate mitigations measure document as Appendix E.

4.1.4.11 Please describe any proposed offsets and attach any supporting documentation relevant to these measures. *

Offsets for the project are being assessed as part of the Biodiversity Development Assessment Report (BDAR) under the BAM. Offset obligations will be met either by the establishment of a biodiversity stewardship site within the project area, or nearby, or the purchase and retirement of the appropriate number and class of like-for-like biodiversity credits, as required under the Biodiversity Offsets Scheme (BOS).

4.1.5 Migratory Species

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Direct impact	Indirect impact	Species	Common name
No	No	Actitis hypoleucos	Common Sandpiper
No	No	Apus pacificus	Fork-tailed Swift
No	No	Calidris acuminata	Sharp-tailed Sandpiper
No	No	Calidris ferruginea	Curlew Sandpiper
No	No	Calidris melanotos	Pectoral Sandpiper
No	No	Gallinago hardwickii	Latham's Snipe, Japanese Snipe
No	No	Hirundapus caudacutus	White-throated Needletail
No	No	Motacilla flava	Yellow Wagtail
No	No	Myiagra cyanoleuca	Satin Flycatcher
No	No	Rhipidura rufifrons	Rufous Fantail

4.1.5.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.5.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact.

*

No migratory species were identified during field surveys, and none were considered to have a likelihood of occurrence of greater low. See Appendix C for the likelihood of occurrence table, for more information.

4.1.6 Nuclear

4.1.6.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.6.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact.

*

Nuclear is not associated with this project.

4.1.7 Commonwealth Marine Area

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.7.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.7.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact.

*

No Commonwealth Marine Areas occur in the project area.

4.1.8 Great Barrier Reef

4.1.8.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.8.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact.

*

The Great Barrier Reef is not in the project area.

4.1.9 Water resource in relation to large coal mining development or coal seam gas

4.1.9.1 Is the proposed action likely to have any direct and/or indirect impact on this protected matter? *

No

4.1.9.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact.

*

The Project is not a large coal mining development or for coal seam gas.

4.1.10 Commonwealth Land

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

Direct impact	Indirect impact	Commonwealth land area
No	No	Commonwealth Land - Australian Telecommunications Commission

4.1.10.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.10.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact.

*

No Commonwealth Land is within the project area.

4.1.11 Commonwealth Heritage Places Overseas

You have identified your proposed action will likely directly and/or indirectly impact the following protected matters.

A direct impact is a direct consequence of an action taken – for example, clearing of habitat for a threatened species or permanent shading on an ecological community as the result of installing solar panels.

An indirect impact is an 'indirect consequence' such as a downstream impact or a facilitated third-party action.

—

4.1.11.1 Is the proposed action likely to have any direct and/or indirect impact on any of these protected matters? *

No

4.1.11.3 Briefly describe why your action is unlikely to have a direct and/or indirect impact.

*

No Commonwealth Heritage Places Overseas occur in the project area.

4.1.12 Commonwealth or Commonwealth Agency

4.1.12.1 Is the proposed action to be taken by the Commonwealth or a Commonwealth Agency? *

No

4.2 Impact summary

Conclusion on the likelihood of significant impacts

You have indicated that the proposed action will likely have a significant impact on the following Matters of National Environmental Significance:

None

Conclusion on the likelihood of unlikely significant impacts

You have indicated that the proposed action will unlikely have a significant impact on the following Matters of National Environmental Significance:

- World Heritage (S12)
- National Heritage (S15B)
- Ramsar Wetland (S16)
- Threatened Species and Ecological Communities (S18)
- Migratory Species (S20)
- Nuclear (S21)
- Commonwealth Marine Area (S23)
- Great Barrier Reef (S24B)
- Water resource in relation to large coal mining development or coal seam gas (S24D)
- Commonwealth Land (S26)
- Commonwealth Heritage Places Overseas (S27B)
- Commonwealth or Commonwealth Agency (S28)

4.3 Alternatives

4.3.1 Do you have any possible alternatives for your proposed action to be considered as part of your referral? *

No

4.3.8 Describe why alternatives for your proposed action were not possible. *

Any alternative timeline was not applicable for the Project as the timeline is dependent on the Proponent. An alternative timeline would not change the impacts to biodiversity from the Project.

Green Hydrogen was decided as the preferred activity for the Project as liquid hydrogen is the optimal choice for Project Rosedale's large-scale hydrogen production for the heavy haulage industry due to its efficiency and scalability. Given the goals of CLARA Energy to supply hydrogen along critical freight corridors, liquid hydrogen's ability to store and transport up to 4.3 times more hydrogen per load compared to gaseous alternatives makes it ideal for reducing the frequency of deliveries and infrastructure costs. For Project Rosedale, where efficient fuel distribution is key, the smaller storage requirements and faster refueling times of liquid hydrogen ensure a streamlined, cost-effective supply chain.

The project area was selected for its strategic location along the Hume Highway, the land can accommodate the ideal number of solar arrays, has access to water, and the land ownership is consolidated and practical. Other reasons include it not being prime agricultural land, large, and intact areas of biodiversity can be avoided and maintained.

Please see attached summaries of reasons for selecting the project area and project activity.

5. Lodgement

5.1 Attachments

1.2.7 Public consultation regarding the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Summary Report on Community stakeholder engagement.pdf Summary of community and stakeholder engagement - provided by CLARA Energy	03/10/2024	No	High

1.3.2.18 (Person proposing to take the action) If the person proposing to take the action is a corporation, provide details of the corporation's environmental policy and planning framework

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	CLARA Energy Environmental Planning Framework.pdf CLARA Energy's environmental planning framework	01/07/2024	No	High
#2.	Document	CLARA Energy Environmental Policy.pdf CLARA Energy's environmental policy	01/07/2024	No	High

3.1.1 Current condition of the project area's environment

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	EPBC-Act-Referral_CLARA-Energy_Figure1.pdf Project area	30/09/2024	No	High
#2.	Document	EPBC-Act-Referral_CLARA-Energy_Figure-2.1.pdf Ground-truthed vegetation, threatened species results - Production area	30/09/2024	Yes	High
#3.	Document	EPBC-Act-Referral_CLARA-Energy_Figure-2.1_REDACTED .pdf Ground-truthed vegetation, threatened species results - redacted	30/09/2024	No	High
#4.	Document	EPBC-Act-Referral_CLARA-Energy_Figure-2.2 .pdf Ground-truthed vegetation, threatened species results - Utilities area	30/09/2024	Yes	High

#5.	Document EPBC-Act-Referral_CLARA-Energy_Figure-2.2_REDACTED .pdf Ground-truthed vegetation, threatened species results - Utilities area REDACTED	30/09/2024	High
#6.	Document EPBC-Act-Referral_CLARA-Energy_Figure-3.1.pdf Exotic vegetation in the production project area	30/09/2024	High
#7.	Document EPBC-Act-Referral_CLARA-Energy_Figure-3.2.pdf Exotic vegetation in the utilities project area	30/09/2024	High
#8.	Document EPBC-Act-Referral_CLARA-Energy_Figure-4.1 .pdf Vegetation condition in the production project area	30/09/2024	High
#9.	Document EPBC-Act-Referral_CLARA-Energy_Figure-4.2 .pdf Vegetation condition in the utilities project area	30/09/2024	High

3.2.1 Flora and fauna within the affected area

Type	Name	Date	Sensitivity	Confidence
#1.	Document EPBC-Act-Referral_CLARA-Energy_Figure-5.1.pdf Flora survey effort - Production area	30/09/2024	High	High
#2.	Document EPBC-Act-Referral_CLARA-Energy_Figure-5.2 .pdf Flora survey effort - Utilities area	30/09/2024	High	High
#3.	Document EPBC-Act-Referral_CLARA-Energy_Figure-6.1.pdf Fauna survey effort - Production area	30/09/2024	High	High
#4.	Document EPBC-Act-Referral_CLARA-Energy_Figure-6.2 .pdf Fauna survey effort - Utilites area	30/09/2024	High	High
#5.	Document EPBC-Act-Referral_CLARA-Energy_Figure-7.1.pdf TECs and species polygons within the Production project area	30/09/2024	High	High
#6.	Document EPBC-Act-Referral_CLARA-Energy_Figure-7.2 .pdf TECs and species polygons within the Utilities project area	30/09/2024	High	High
#7.	Document EPBC-referral-Appendix F_CEEC_key-diagnostic-characteristics.pdf Key diagnostic characteristics and condition class thresholds for CEEC	16/10/2024	High	High
#8.	Document EPBC-referral-Appendix A.pdf PCTs and PCT impacts in study area + species recorded in study area	30/09/2024	High	High

3.2.2 Vegetation within the project area

Type	Name	Date	Sensitivity	Confidence
#1.	Document EPBC-Act-Referral_CLARA-Energy_Figure-2.1.pdf Ground-truthed vegetation, threatened species results - Production area	29/09/2024	High	High

#2.	Document	EPBC-Act-Referral_CLARA-Energy_Figure-2.2 .pdf Ground-truthed vegetation, threatened species results - Utilities area	29/09/2024	High
#3.	Document	EPBC-Act-Referral_CLARA-Energy_Figure-3.1.pdf Exotic vegetation in the production project area	29/09/2024	High
#4.	Document	EPBC-Act-Referral_CLARA-Energy_Figure-3.2.pdf Exotic vegetation in the utilities project area	29/09/2024	High

3.3.2 Indigenous heritage values that apply to the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Summary Report on Aboriginal Cultural Heritage Assessment Report.pdf Summary of Aboriginal Cultural Heritage Assessment Report (ACHAR) - provided by CLARA Energy	03/10/2024	No	High

4.1.4.2 (Threatened Species and Ecological Communities) Why your action has a direct and/or indirect impact on the identified protected matters

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	EPBC-Act-Referral_CLARA-Energy_Figure-5.1.pdf Flora survey effort - Production area	29/09/2024		High
#2.	Document	EPBC-Act-Referral_CLARA-Energy_Figure-5.2 .pdf Flora survey effort - Utilities area	29/09/2024		High
#3.	Document	EPBC-referral-Appendix A.pdf PCTs and PCT impacts in study area + species recorded in study area	29/09/2024	No	High

4.1.4.6 (Threatened Species and Ecological Communities) Why you do not consider the direct and/or indirect impact to be a Significant Impact

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	EPBC-Act-Referral_CLARA-Energy_Figure-7.1.pdf TECs and species polygons within the Production project area	29/09/2024		High
#2.	Document	EPBC-Act-Referral_CLARA-Energy_Figure-7.2 .pdf TECs and species polygons within the Utilities project area	29/09/2024		High
#3.	Document	EPBC-referral-Appendix D-SIC.pdf SIC assessments for MNES in study area	16/10/2024	No	High
#4.	Document	EPBC-referral-Flora_LoO_Appendix B.pdf Likelihood of occurrence table for Flora	16/10/2024	No	High

4.1.4.9 (Threatened Species and Ecological Communities) Why you do not think your proposed action is a controlled action

	Type	Name	Date	Sensitivity	Confidence

#1.	Document EPBC-referral-Appendix D-SIC.pdf SIC assessments	30/09/2024	No	High
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4.1.4.10 (Threatened Species and Ecological Communities) Avoidance or mitigation measures proposed for this action

Type	Name	Date	Sensitivity	Confidence
#1.	Document EPBC-referral-Appendix E.pdf Mitigation measures	30/09/2024	No	High

4.1.5.3 (Migratory Species) Why your action is unlikely to have a direct and/or indirect impact

Type	Name	Date	Sensitivity	Confidence
#1.	Document EPBC-referral-Fauna_LoO_Appendix C.pdf Likelihood of occurrence table for Fauna	16/10/2024	No	High

4.3.8 Why alternatives for your proposed action were not possible

Type	Name	Date	Sensitivity	Confidence
#1.	Document Project Rosedale Site Selection Report.pdf Summary of site selection - provided by CLARA Energy	03/10/2024	No	High
#2.	Document Why Liquid Hydrogen Summary.pdf Summary of chosen activity - provided by CLARA Energy	03/10/2024	No	High

5.2 Declarations

Completed Referring party's declaration

The Referring party is the person preparing the information in this referral.

ABN/ACN	76104485289
Organisation name	ARCADIS AUSTRALIA PACIFIC PTY LTD
Organisation address	2000 NSW
Representative's name	Kate Mauger
Representative's job title	Ecologist
Phone	0411396591
Email	kate.mauger@arcadis.com
Address	16/580 George St, Sydney, NSW, 2000

- Check this box to indicate you have read the referral form. *
- I would like to receive notifications and track the referral progress through the EPBC portal. *
- By checking this box, I, **Kate Mauger of ARCADIS AUSTRALIA PACIFIC PTY LTD**, declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. *
- I would like to receive notifications and track the referral progress through the EPBC portal. *

Completed Person proposing to take the action's declaration

The Person proposing to take the action is the individual, business, government agency or trustee that will be responsible for the proposed action.

ABN/ACN	18643800828
Organisation name	CLARA ENERGY PTY LTD
Organisation address	3000 VIC
Representative's name	Nick Cleary
Representative's job title	CEO CLARA Energy
Phone	+61 414 724 089
Email	nick.cleary@claraenergy.com.au
Address	Level 13, 80 Collins Street, Melbourne, 3000

- Check this box to indicate you have read the referral form. *
- I would like to receive notifications and track the referral progress through the EPBC portal. *
- I, **Nick Cleary of CLARA ENERGY PTY LTD**, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf or for the benefit of any other person or entity. *

I would like to receive notifications and track the referral progress through the EPBC portal. *

Completed Proposed designated proponent's declaration

The Proposed designated proponent is the individual or organisation proposed to be responsible for meeting the requirements of the EPBC Act during the assessment process, if the Minister decides that this project is a controlled action.

Same as Person proposing to take the action information.

Check this box to indicate you have read the referral form. *

I would like to receive notifications and track the referral progress through the EPBC portal. *

I, **Nick Cleary of CLARA ENERGY PTY LTD**, the Proposed designated proponent, consent to the designation of myself as the Proposed designated proponent for the purposes of the action described in this EPBC Act Referral. *

I would like to receive notifications and track the referral progress through the EPBC portal. *