Bowmans Creek Wind Farm Stage 2

Application Number: **02108** Commencement Date: **31/10/2023** Status: **Locked**

1. About the project

1.1 Project details

1.1.1 Project title *

Bowmans Creek Wind Farm Stage 2

1.1.2 Project industry type *

Energy Generation and Supply (renewable)

1.1.3 Project industry sub-type

Wind Farm

1.1.4 Estimated start date *

31/12/2025

1.1.4 Estimated end date *

31/12/2055

1.2 Proposed Action details

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

The Bowmans Creek Wind Farm Stage 2 Project (i.e. the Proposed Action) proposed by Bowmans Creek Wind Farm Pty Ltd (the Proponent), a wholly owned subsidiary of Ark Energy, comprises the construction, operation and decommissioning of additional large-scale wind farm infrastructure in the Muswellbrook Shire Council and Singleton Council Local Government Area (LGAs) in the Upper Hunter region of New South Wales (NSW), Australia.

Further information regarding the staging of Bowmans Creek Wind Farm Stage 1 and Stage 2 can be found in Section 1.2.5 of this EPBC Act referral application (i.e. referral).

The Stage 2 development is seeking approval for up to 21 wind turbine generators (WTGs), with a maximum blade-tip height of 250 m above ground level (AGL) and a generating capacity of up to ~120 MW. The power generated by the Proposed Action will feed into the electricity grid (i.e. the National Energy Market, NEM) via connection to the Stage 1 electrical reticulation network

The key components of Stage 2 include:

- up to 21 (3 blade) WTGs, with a maximum blade-tip height of 250 m AGL
- power infrastructure providing connection to the NEM i.e. one (1) on-site collector substation and an overhead transmission line to connect the proposed wind turbines in the south of the Project Area to the Stage 1 project electrical reticulation network
- internal electrical reticulation network i.e. underground, low voltage 33 kV transmission network connecting the northern turbines to the Stage 1 project electrical reticulation network
- other associated permanent infrastructure including hardstands, new access tracks, upgrades to existing access tracks, and access point/s from public roads
- permanent and temporary meteorological monitoring masts

Temporary construction facilities proposed to facilitate the construction of the Stage 1 project will be utilised for the construction of this Project (i.e. Stage 2), including:

- construction compound/s and site office buildings and storage areas, including fencing and screen as required
- on-site concrete batching plants for use during the construction phase
- laydown areas used for wind turbine installation and storage of wind turbine components
- potential construction material areas such as borrow pits, quarry and rock crushing facilities
- operations and maintenance (O&M) facility

Proposed infrastructure would be contained within the Project Area including the turbine blades, refer to the mapping data provided in response to Section 2.1, Location Details, “Project area” of this referral. The proposed layout will allow for micro-siting and will be subject to further detailed design as the environmental and social impact assessments progress.

It is anticipated that works will commence within one year of obtaining all necessary approvals. The timing of construction will be driven by additional permits and authorisations, contractor selection, detailed design and procurement processes and a final investment decision. The construction phase of the Proposed Action is anticipated to be 24 months. The Proposed Action has an estimated operational life of 30 years after which it may be decommissioned or re-powered.

Major turbine components and other Project related materials will be delivered to selected ports being considered by the Proponent. Over-sized, over-mass (OSOM) vehicle transport to the Project Area will occur from the preferred port/s but is subject to a port and transport route assessment, that is to be prepared during future stages of the NSW development application process. Outcomes of the port and transport route assessment will be incorporated into a traffic and transport impact assessment. Amongst other things this will identify a proposed transport route from the preferred port to the Project Area as well as any road upgrades. The type and scale of road upgrades along a transport route and including new intersections and intersection upgrades within the Project Area are yet to be determined. Road upgrades, and potential environmental and social impacts associated with their requirement, will be addressed during future stages of the NSW development application process.

The Project Area for the purposes of the EPBC Referral includes portions of Albano Road and Bowmans Creek Road that pass through the central portion of the Project Area, and encompasses an area of approximately **3566** hectares (ha). These roads span an area of approximately 14 ha and will not be impacted

as a result of the Proposed Action. The Project Area in which the Proponent is seeking development approval for under the State Significant Development Application (SSDA) is approximately **3552** ha.

The Disturbance Footprint is located within the Project Area, is defined as the area within which all WTG and associated infrastructure will be placed, providing the necessary flexibility for the detailed design of the Project whilst also allowing a detailed environmental assessment process to be completed. The proposed Disturbance Footprint associated with the Proposed Action is approximately **428** ha based on the current indicative Project layout, which will be subject to further design refinement and revision as the Project progresses. The Disturbance Footprint mapping data has been provided in Section 2.1 of this referral.

An actual Disturbance Area for the Project i.e., the area proposed to be disturbed as a result of the Project, will be within the Disturbance Footprint and is subject to further detailed design as the assessment process progresses. Currently, the actual Disturbance Area is approximately **168** ha, or approximately 5% of the total Project Area.

It is noted that the indicative 'Development Footprint' is a conservative area for early assessment purposes and the actual Disturbance Area will be significantly smaller, but is subject to further detailed assessments and design. Direct impacts associated with the Proposed Action would be contained to a refined impact area within the broader Disturbance Footprint (i.e. the actual Disturbance Area) but the total extent of this area has not yet been determined. This is because the design work for the Proposed Action is ongoing and will be finalised upon completion of additional detailed design work and further environmental surveys.

The Proposed Action is expected to involve the following activities that may have a direct or indirect impact on the environment:

- Geotechnical studies at proposed turbine locations
- Construction works to enable the installation, operation, maintenance and decommissioning of WTGs, ancillary infrastructure and establishment of any temporary facilities
- Upgrade and construction of access tracks and access points, substation/switchyard and other parts of the Proposed Action, where required
- Cut and fill works to create level areas for crane hardstands and turbine laydown areas at each WTG location
- Installation of underground and overhead transmission lines and cabling
- Delivery of wind turbines that may require targeted road network upgrades
- Clearance of vegetation associated with the abovementioned works within the Project Area and Disturbance Footprint.
- Delivery of other materials, including but not limited to, concrete and gravel
- Delivery of the substation and transformers
- Testing and commissioning activities
- Removal of construction equipment and rehabilitation of construction areas.

For the purposes of this referral direct impacts may include removal of native vegetation, removal of threatened species and their habitat and fauna mortality. Indirect impacts may include reduced viability of adjacent habitat due to edge effects, reduced viability of adjacent habitat due to noise, dust, or light spill, transport of weeds and pathogens from the site to adjacent vegetation and changed fire regimes. Further information regarding potential direct and indirect impacts is provided in Attachment 'Report 23065RP2_MNES_20240527' (refer to Sections 3-4, pages 14-22).

Wind energy analysis undertaken by Ark Energy to support Bowmans Creek Wind Farm Stage 1 can be applied to the Project Area for Stage 2. This information, alongside consultation with community and other stakeholders, and preliminary environmental studies prepared to support a Scoping Report, have guided the development of the indicative turbine layout for the Proposed Action (contained within the above-mentioned indicative Disturbance Footprint). This analysis, assessment and design will continue during the EIS phase.

The Proposed Action will contribute to meeting Commonwealth and NSW Government objectives, in an environmentally sensitive and sustainable manner and will provide significant renewable energy generation capacity within an area planned for renewable energy development by the NSW Government, being the

Hunter-Central Coast Renewable Energy Zone (REZ). The REZ is expected to play a vital role in the delivery of affordable energy to the community across NSW. The Project is therefore strategically located in an area identified as suitable for renewable energy projects by the NSW Government.

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

Yes

1.2.3 Is the proposed action the first stage of a staged development (or a larger project)?

No

1.2.4 Related referral(s)

EPBC Number	Project Title
2020/8631	Bowmans Creek Wind Farm

1.2.5 Provide information about the staged development (or relevant larger project).

The additional wind farm infrastructure associated with the Project (described in Section 1.2.1) is proposed to increase capacity of the 'Bowmans Creek Wind Farm' (SSD-10315) (i.e., Stage 1) already approved through the NSW planning and approvals pathway. Because of the scale of additional infrastructure, and other requirements under the NSW planning system, the Project is proposed as a separate State Significant Development (SSD) to that already advanced under "Stage 1". EPBC Act approval for Stage 1 was received in 5 July 2024 (2020-8631), and separate EPBC Act approval is being sought for Stage 2.

Staging of the Bowmans Creek Wind Farm was not proposed within the SSD-10315 approvals documentation, however for simplicity and to assist differentiation between the two (2) projects, all wind turbines and ancillary infrastructure associated with SSD-10315 are referred as "Bowmans Creek Wind Farm Stage 1", or simply "Stage 1" throughout the referral. All wind turbines and ancillary infrastructure associated with the proposed works is referred to as "Bowmans Creek Wind Farm Stage 2" or "Stage 2" throughout this referral.

Bowmans Creek Wind Farm Stage 1 (SSD-10315) involves the construction, operation, maintenance and decommissioning of the following key project components.

- Up to 54 WTGs with a maximum tip height of 220 m, consisting of:
  - A three (3) blade rotor and nacelle mounted onto a tubular tower.
  - Crane hardstand area.
  - Laydown areas.
- Electrical infrastructure, including:
  - Up to two (2) collector substations and associated transmission line(s) to transmit the generated electricity into the existing high voltage network.
  - Connections between the WTGs and the collector substation/s, which will include a combination of underground cables and overhead powerlines.
- Operations and Maintenance Facility (O&M Facility).
- Storage facilities and laydown areas.
- Unsealed access tracks.

- Ongoing use of two (2) temporary wind monitoring masts and the installation of up to four (4) permanent monitoring masts.
- Temporary construction facilities (including concrete batching plant and rock crushing facilities).
- Minor upgrades to the road network to facilitate delivery of oversize or overmass (OSOM) loads to the Stage 1 project site, and to facilitate the construction of the transmission line.
- Administrative activities (including boundary adjustments and subdivisions).

Select Stage 1 project components are proposed to be used to facilitate the construction of the Stage 2 Project, as well as the connection to the grid following construction, including:

- Up to two (2) substations and select overhead and underground reticulation network infrastructure to facilitate connection to the Stage 1 project, and ultimately the grid (via the Liddell 330 kV Substation).
- Construction compound/s and site office buildings and storage areas, including fencing and screen as required.
- On-site concrete batching plants for use during the construction phase.
- Laydown areas used for WTG installation and storage of WTG components.
- Potential construction material areas such as borrow pits, quarry and rock crushing facilities.
- O&M Facility.

Each of these Stage 1 infrastructure components and facilities are within areas already assessed for impact, as per the SSD-10315 project information and development consent granted on 6 February 2024, as well as the EPBC Act approval (2020-8631) granted on 5 July 2024.

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 requires approval under Part 4 of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act). Being development for the purpose of electricity generation with a capital investment value of more than $30 million, the Project is declared to be State Significant Development (SSD) under the provisions (Schedule 1, Section 20) of the NSW State Environmental Planning Policy (Planning Systems) 2021.

A State Significant Development Application (SSDA) will be lodged with the NSW Department of Planning, Housing and Infrastructure (DPHI), along with an Environmental Impact Statement (EIS). A range of other NSW environmental legislation will also apply and will be considered in the assessment process. It is assumed that if the Proposed Action is deemed a controlled action, the Project would be subject to the Assessment Bilateral Agreement between the NSW and Commonwealth governments.

In addition to the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), the Commonwealth Civil Aviation Regulations 1988 and Heavy Vehicle National Law will also apply to the Proposed Action.

Under the Civil Aviation Regulations 1988, a detailed assessment in accordance with the regulations and consultation with the relevant agencies will be undertaken as part of the preparation of the EIS.

Approvals would be required for the transport of wind turbines and associated infrastructure by OSOM vehicles under the Heavy Vehicle National Law.

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. *

Ark Energy recognise that respectful, inclusive, and meaningful engagement is fundamental to the development of wind farm projects, and has prepared a Communications and Stakeholder Engagement Plan (CSEP) for the Proposed Action in line with the NSW Government's Engagement Guidelines. Attachment '23307_Ark_BCWF Stage 2_CSEP_R02_V3_Final', Section 1.0 and Section 3.0 (page 1-2 and 6-15) outlines the objectives, approach and indicative timeline for community engagement throughout the life of the Proposed Action, including from early stages of development through to detailed design, construction and operation.

Engagement with local landholders has predominantly been undertaken by the Ark Energy project team. The key stakeholders identified for the Proposed Action within each stakeholder group include host landholders, neighbouring landholders, community within the social locality, State and Commonwealth Government agencies, local councils, community interest groups and community service groups, local businesses and service providers, and Aboriginal groups.

Ark Energy commenced stakeholder engagement as part of the initial design phase for the Proposed Action. Community engagement activities undertaken to-date include face-to-face meetings, a community drop-in session, community surveys, newsletters and newspaper articles.

The engagement conducted to-date has identified several key community views, including impacts on surroundings, changes to the visual landscape due to the presence of wind turbines, impacts relating to traffic and road conditions, impacts relating to changing land uses, and potential impacts to the value of properties within the community. The key stakeholders also identified positive impacts of the Proposed Action, including the creation of jobs, training and procurement opportunities, the potential to support local tourism, the provision of renewable energy, electricity price stability and affordability, and the sharing of Project benefits within the local community.

Ark Energy will continue to implement the CSEP through the assessment phase for the Proposed Action in accordance with the NSW Government - Planning Secretary's Environmental Assessment Requirements (SEARs). Key consultation mechanisms and activities will include one-on-one meetings and phone calls, email/letter updates and Project newsletters, maintenance of a Project website, community information sessions and community surveys.

SEARs were received for the Stage 2 Project on 15 August 2024. The formal notification process for the Aboriginal Cultural Heritage Assessment will be undertaken in Q3 2024 following which detailed consultation will be undertaken with the Registered Aboriginal Parties (RAPs) for the Project.

1.3.1 Identity: Referring party

Privacy Notice:

Personal information means information or an opinion about an identified individual, or an individual who is reasonably identifiable.

By completing and submitting this form, you consent to the collection of all personal information contained in this form. If you are providing the personal information of other individuals in this form, please ensure you have their consent before doing so.

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Alternatively, email us at privacy@awe.gov.au.

☑ **Confirm that you have read and understand this Privacy Notice ***

1.3.1.1 Is Referring party an organisation or business? *

Yes

Referring party organisation details

ABN/ACN	18059519041
Organisation name	UMWELT (AUSTRALIA) PTY. LTD.
Organisation address	2284 NSW

Referring party details

Name	Nathan Baker
Job title	Principal Environmental Consultant
Phone	0477 713 478
Email	nbaker@umwelt.com.au
Address	Level 11, 213 Miller Street

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	64655242274
Organisation name	BOWMANS CREEK WIND FARM PTY LTD
Organisation address	2000 NSW

Person proposing to take the action details

Name	Rebecca Riggs
Job title	Developer Manager
Phone	0403 852 889
Email	rebecca.riggs@arkenergy.com.au
Address	Level 2/275 George St, Sydney NSW 2000

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 for the Project is 'Bowmans Creek Wind Farm Pty Ltd', wholly owned by Ark Energy Pty Ltd (Ark Energy), a subsidiary of Korea Zinc Co. Ltd (Korea Zinc). Established in January 2021, Ark Energy is a leading Australian renewable energy company specialising in wind, solar and hydrogen. Ark Energy's

mandate is to decarbonise the energy supply of the Korea Zinc group, which involves notoriously difficult-to-abate industry sectors including nonferrous metals refining and heavy haulage transport.

In 2022, Ark Energy completed its friendly acquisition of Australian wind and solar developer Epuron, and now owns a growing portfolio of wind and solar energy projects in Queensland, New South Wales and Tasmania. It is also at the forefront of development of Australia's green hydrogen industry through its 'Sun HQ Hydrogen Hub' in Townsville and the Han-Ho H2 consortium focused on establishing a green energy export corridor from Queensland to South Korea. As part of this acquisition of the Epuron portfolio, Stage 1 was obtained by Ark Energy, who now seeks approval for a subsequent stage of the Bowmans Wind Farm Project (i.e., Stage 2, the Proposed Action).

Ark Energy is a signatory to the Australian Clean Energy Council's Best Practice Charter for Renewable Energy Projects, a voluntary commitment to engage respectfully with communities, be sensitive to environmental and cultural values, and make a positive contribution to the regions in which it operates.

Ark Energy or Bowmans Creek Wind Farm Pty Ltd have not been subject to any past or present proceedings Commonwealth, State or Territory Law for the protection of the environment or the conservation and sustainable use of natural resources.

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

The Environmental Policy of Ark Energy Group (see Attachment 4 'Ark Environmental Policy_2023' of this referral) outlines Ark's commitment to environmentally sustainable development and clean energy projects. The policy emphasises several key points:

- Mission and Scope: Ark Energy Group's mission is to produce electricity and green hydrogen through clean and renewable energy resources, with a strong focus on minimising environmental impact.
- Commitment: Ark Energy Group are committed to being an industry leader in environmental management and integrating environmental considerations into all aspects of their business practices. Ark Energy Group commits to developing clean energy projects that improve the quality of life, comply with relevant legislation, consider broader environmental impacts, and balance commercial and environmental priorities.
- Objectives: Ark Energy Group's objectives include compliance with legal requirements, continuous improvement in environmental performance, careful evaluation to avoid environmental damage, and working with reputable environmental consultants and specialists
- Responsibilities: The executive directors of Ark Energy Group are responsible for allocating resources, while all employees and contractors are responsible for raising environmental issues and complying with the policy and relevant environmental laws.

Overall, the policy demonstrates Ark Energy Group's dedication to sustainable and environmentally responsible business practices throughout project development and in all aspects of business activity.

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	64655242274
Organisation name	BOWMANS CREEK WIND FARM PTY LTD
Organisation address	2000 NSW

Proposed designated proponent details

Name	Rebecca Riggs
Job title	Developer Manager
Phone	0403 852 889
Email	rebecca.riggs@arkenergy.com.au
Address	Level 2/275 George St, Sydney NSW 2000

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	18059519041
Organisation name	UMWELT (AUSTRALIA) PTY. LTD.
Organisation address	2284 NSW
Representative's name	Nathan Baker
Representative's job title	Principal Environmental Consultant
Phone	0477 713 478
Email	nbaker@umwelt.com.au
Address	Level 11, 213 Miller Street

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	64655242274
Organisation name	BOWMANS CREEK WIND FARM PTY LTD
Organisation address	2000 NSW
Representative's name	Rebecca Riggs
Representative's job title	Developer Manager
Phone	0403 852 889
Email	rebecca.riggs@arkenergy.com.au
Address	Level 2/275 George St, Sydney NSW 2000

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? *

No

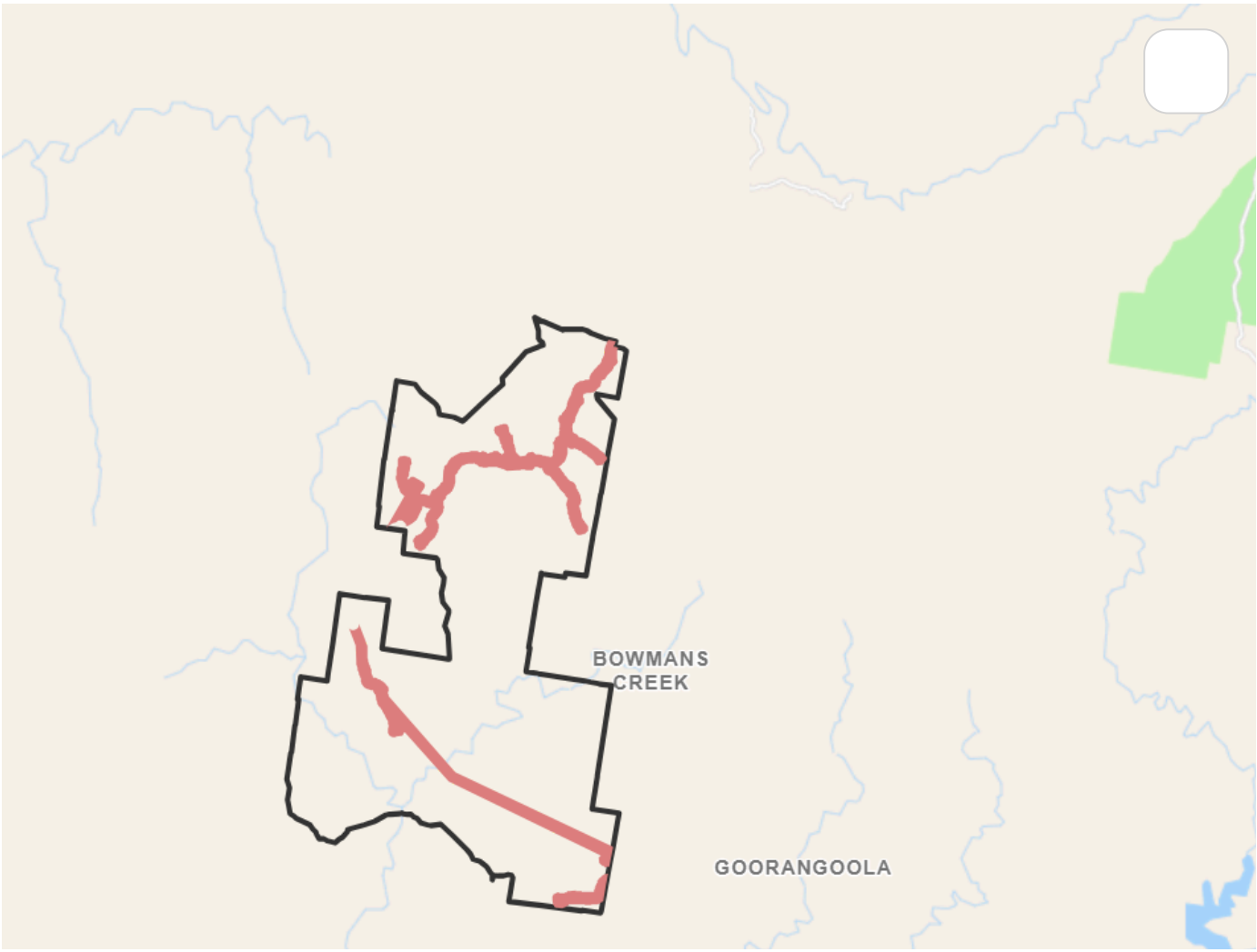
1.4 Payment details: Payment allocation

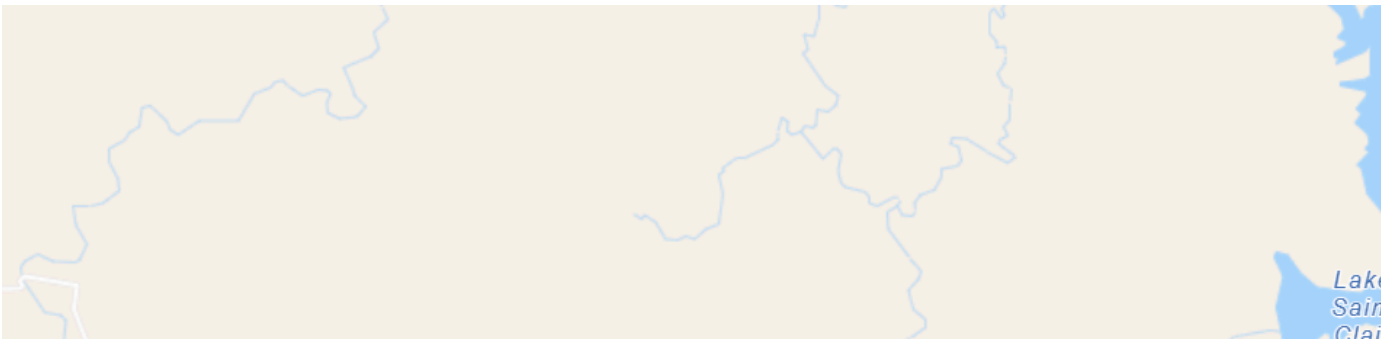
1.4.11 Who would you like to allocate as the entity responsible for payment? *

Person proposing to take the action

2. Location

2.1 Project footprint





- Project area (3565.98 Ha)
- Disturbance footprint (427.86 Ha)

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2.2 Footprint details

2.2.1 What is the address of the proposed action? *

608 Bowmans Creek Road, Bowmans Creek NSW 2330

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? *

Lands within the Project Area are privately owned Freehold land. The project has avoided Non-freehold land (i.e. Crown Land or reserves) but Project infrastructure may interact with some Crown Land roads which traverse portions of the Project Area. There are no current mining and/or exploration titles or title applications within the Project Area.

3. Existing environment

3.1 Physical description

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

The Project Area is situated extends predominantly across two Local Government Areas (LGA) being the Muswellbrook Shire Council and Singleton Shire Council. Muswellbrook is located approximately 10 km west and the Port of Newcastle is located approximately 120 km south west of the Project Boundary. Several small communities are located near the Project Boundary including Bowmans Creek to the east, Davis Creek to the north-east, Goorangoola to the south-east, Greenlands to the south, Hebden to the south west, McCullys Gap to the north west, Muscle Creek to the west and Rouchel Brook to the north.

The Project Area is zoned as RU1 Primary Production within the Muswellbrook Local Environmental Plan (LEP) 2009 and Singleton LEP 2013. Electricity generating works are not permitted within the RU1 zoning in each of these LEPs. Clause 2.36(1)(b) of *State Environmental Planning Policy (Transport and Infrastructure) 2021* (TI SEPP) states that development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed non-residential zone. The project Area is located within a RU1 Zone, which is a prescribed non-residential zone under clause 2.35 of the TI SEPP. Under Clause 2.7(1) of the TI SEPP, the provisions prevail where there are inconsistencies with any other EPIs, including LEPs. Due to the operation of Clause 2.36(1)(b) of the TI SEPP the Project is permissible with development consent in the RU1 zone.

Land directly surrounding the Project Boundary is also RU1 and the dominant agricultural pursuit within 5 km of the Project Boundary is beef cattle grazing. The nearest land use not zoned RU1 is approximately 4 km to the east of the site zoned RU2 under the Singleton LEP 2013. Mount Royal National Park is located approximately 9 km to the north-east of the Project Boundary, zoned C1 National Parks and Nature Reserves under the Singleton LEP 2013.

The Project Area is situated on the foothills and slopes associated with the Mount Royal Range, comprising shales, sandstones, conglomerates, volcanics, and coal measures. Its surroundings are primarily characterized by undulating to rolling hills with narrow valleys transitioning to wide valleys adjoining creeks and rivers to the south of the Project Area. General elevations range from approximately 200 m in the valley flats to 800 m along the ridgelines associated with Mount Royal Range. Undulating to steep foothills and ridgelines associated with the Mount Royal National Park occur to the northeast of the Project Area.

The Project Area and wider locality is comprised of multiple agricultural properties with a series of ridges, valleys, and gullies. The historic land use of the locality has impacted on the presence of fauna corridors within the landscape as extensive land clearing has occurred for agricultural uses as well as development of open cut mines. Vegetation corridors are somewhat fragmented within and surrounding the Project Area,

ranging from dense native vegetation on the steeper slopes of the ranges and lightly wooded areas on spurs and gentle slopes. The extent of wooded areas in the locality varies from property to property depending on the individual land management practices of existing and previous land managers/owners.

Throughout the Project Area, various creeks and unnamed waterways intersect, potentially serving as conduits for birds, microbats, reptiles, and mammals within existing agricultural practices. These include streams that range from 1st order to 6th order streams (as per the Strahler System of ordering watercourses). These tributaries flows into Bowmans Creek which traverses through the south-eastern portion of the Project Area. Lincolns Creek converges with Bowmans Creek near the southern boundary of the Project Area.

Access to the Project Area is proposed via the existing public road network and will follow the preferred route identified by the Stage 1 project, including a newly constructed access point on Scrumlo Road (under Stage 1). Primary access will likely be through the Stage 1 Project Area via Scrumlo Road, Hebden Road (south), the New England Highway, and the Hunter Expressway, which provides connection to the Port of Newcastle. Other existing local roads and access tracks would also provide access to and throughout the proposed Project Area, including Albano Road and Bowmans Creek Road, which travel through the centre of the Project Area.

The preferred transport route of wind turbine components and other Project related materials will be confirmed via port and transport route assessment, to be prepared as part of the EIS. It is expected that upgrades to local roads (secondary access routes) will be required to allow access for heavy vehicles (where considered suitable) prior to any deliveries occurring as part of the construction phase of the Project. There may also be some minor works required along the primary transport route from the selected port to facilitate the path of OSOM vehicles.

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

Agricultural land uses are prevalent within and surrounding the Project Area, including beef cattle grazing which is a notable agricultural activity within and surrounding the Project Area. These areas have historically been subject to land clearing and/or pasture improvement activities.

A crown lot (i.e. Crown Reserve R44773) is also identified within the Project Area as a Category 2 Travelling Stock Reserve (TSR), vested in Local Land Services (LLS). There are no current tenures over the reserve issued by DPHI – Crown Lands Division. The reserve is not intended to be impacted by infrastructure associated with the Project.

The Proposed Action will be compatible with the existing pastoral land uses.

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

There are no conservation areas within Project Area. However, key landscape features identified during community consultation undertaken to support the Project include Mount Royal National Park and the Barrington Tops National Park, which are located outside of the Project Area but are of importance to the local community.

The Mount Royal National Park is located to the north-east of the Project Boundary. The straight line distance between the north-east portion of the Project Boundary and the south-western corner of Mount Royal National Park is approximately 9 km. A vegetation corridor from the north-eastern portion of the Project Area extends

eastward continually toward the Mount Royal National Park and Barrington Tops.

The Barrington Tops National Park is located beyond the Mount Royal National Park to the north-west of the Project Area with a continuous vegetation corridor connecting the National Parks. Bowmans Creek runs in a generally northeast/southeast direction through the centre of the Project Boundary. The headwaters of the creek start at the Mount Royal National Park, eventually flowing into the Hunter River to the south of the Project Boundary.

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

General elevations range from approximately 200 m in the valley flats to 800 m along the ridgelines associated with Mount Royal. Undulating to steep foothills and ridgelines associated with the Mount Royal Range occurring to the northeast of the Project Area.

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.

The proposed Disturbance Area, Development Corridor and wider Project Area are predominantly comprised of farming properties primarily used for livestock grazing. Other land uses within Development Corridor and Project Area comprise public roads.

Native vegetation occurs across the proposed Disturbance Area, Development Corridor and wider Project Area and varies from patches of dry rainforest, open forest and woodland to native-dominated grassland created from the clearing of forest or woodland (known as derived native grassland or DNG). Some areas within the farming properties have been historically subject to pasture improvement, with areas of heavy grazing dominated by exotic pasture species. As documented in Table 3 of Attachment 2 “BOW2 - Matters of National Environmental Significance” (Section 3.2.2, pages 12-13), not classified/non-native vegetation represents approximately 33.08 ha of the Disturbance Area, 224.01 ha of the Development Corridor and 2705.88 ha of the Project Area.

The topography across the proposed Disturbance Area, Development Corridor and wider Project Area varies significantly. The lands associated with public roads occur on relatively flat to gently undulating areas of floodplain while terrain within the farming properties ranges from undulating hills to steep slopes with multiple ridgelines.

Surveys conducted to date (noting these are ongoing since the submission of the referral) have confirmed that the Disturbance Area and Development Corridor generally consist of native grasslands derived from several different woodland communities, as well as substantial area of exotic pasture grasslands and non-native vegetation. Nonetheless, several treed areas are present across the Disturbance Area and Development Corridor, comprising a mix of Grassy Woodlands, Dry Sclerophyll Forests, Wet Sclerophyll Forests with scattered patches of Dry Rainforests and Riparian Forests.

Fauna surveys conducted to date have included Bird and Bat utilisation surveys as well as targeted surveys for threatened species during appropriate survey periods. While some threatened and migratory fauna species have been recorded, this has been limited to 1-2 sightings of a single individual or pair. The majority of the species recorded during surveys to date largely comprised common, widespread species that frequently occur in wooded agricultural landscapes in south-eastern Australia. The birds observed during targeted utilisation surveys were flying moderate to short distances between trees, perching or moving between patches of vegetation. Sightings largely comprised scattered individuals or small groups (<5 individuals) and no large flocks of birds were observed. With the exception of raptors, birds were rarely observed flying directly above or crossing the ridgetops.

The following sections summarise existing threatened flora and fauna identified, and likely to occur, within the Project Area.

The results of the Matters of National Environmental Significance (MNES) Report dated 27 May 2024 determined two threatened ecological communities as occurring within the Disturbance Area, two flora species and four fauna species (three threatened and one migratory) with a high likelihood of occurring within the Disturbance Area due to known occurrences in the proximate Stage 1 development. These include:

Threatened Ecological Communities:

- Central Hunter Valley Eucalypt Forest and Woodland Critically Endangered Ecological Community (CEEC).
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC.

Threatened Flora

- *Eucalyptus glaucina* (Slaty Red Gum)
- *Thesium australe* (Austral Toadflax)

Threatened Fauna

- *Chalinolobus dwyeri* (Large Eared Pied Bat)
- *Calyptorhynchus lathami lathami* (Glossy Black Cockatoo)
- *Climacteris picumnus victoriae* (Brown Treecreeper)

Migratory Species

- *Myiagra cyanoleuca* (Satin Flycatcher)

Additional surveys will be undertaken to target and map EPBC Act listed threatened communities and threatened flora and fauna species. Further information regarding the likelihood of threatened entities and migratory species is provided in Attachment 2 BOW2 - Matters of Environmental Significance (Section 3.2.1, pg 15-21).

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

The native vegetation that occurs across the Project Area varies from patches of dry rainforest, open forest and woodland to derived native grassland (native-dominated grassland created from the clearing of forest or woodland). Some areas within the farming properties have been historically subject to pasture improvement, with areas of heavy grazing dominated by exotic pasture species. The Disturbance Footprint (also referred to

in this referral and attachments as the ‘Development Footprint’ in line with typical SSD project nomenclature in NSW) is predominantly within historically cleared agricultural land. Small amounts of remnant native vegetation are present on steep slopes in the north-eastern and western extent of the Disturbance Footprint.

Desktop assessments of the Eastern NSW State Vegetation Type Map (SVTM) and results of field surveys identified 24 Plant Community Types (PCTs) within the Project Area. The extent of these PCTs within the Project Area, Disturbance Area as well as a Development Corridor (comprising the Disturbance Area and surrounding buffer area) is summarised in Section 3.2.2 of the Attachment 2 BOW2 - Matters of Environmental Significance (refer to Section 3.2.2, Table 3, pg 16-17).

The PCTs mapped in the Project Area include the following:

- 3056 - Central Eastern Ranges Riparian Dry Rainforest
- 3076 - Hunter Valley Whalebone Dry Rainforest
- 3086 - Lower North Hinterland Riparian Dry Rainforest
- 3091 - Lower North Waterhousea-Water Gum Rainforest
- 3114 - Upper Hunter Ranges Moist Gully Forest*
- 3120 - Hunter-Peel Ranges Dry Rainforest*
- 3236 - Hunter Valley Hills Wet Vine Forest
- 3240 - Lower North Escarpment Red Gum Grassy Forest
- 3241 - Lower North White Mahogany-Spotted Gum Moist Forest*
- 3245 - West Mount Royal Slopes Grassy Forest
- 3285 - Lower North Escarpment Blue Gum Grassy Forest
- 3315 - Central Hunter Ironbark-Spotted Gum Forest*
- 3354 - Liverpool Range Box-Silvertop Stringybark Forest*
- 3395 - Northwest Elevated White Box Woodland
- 3396 - Northwest Flats Box-Blakelys Red Gum Forest*
- 3397 - Northwest Flats Yellow Box Woodland
- 3401 - Upper Hunter Sheltered Viney Shrub Forest
- 3431 - Central Hunter Ironbark Grassy Woodland
- 3439 - Hunter Escarpment Grey Gum Sheltered Forest
- 3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
- 3521 - Northwest White Box Woodland
- 3525 - Upper Hunter Box-Blakelys Red Gum Grassy Forest
- 4073 - Lower North Hinterland River Oak Forest*
- 4079 - Northern Hinterland Grassy River Oak Forest

* indicates the PCT was confirmed as present within the Disturbance Area during field surveys.

Of the 24 PCTs present in the Project Boundary and Indicative Disturbance Area, eight (8) are associated with a Threatened Ecological Community (TEC) under the EPBC Act. Two (2) of these TEC were recorded within the Project Disturbance Area during the preliminary biodiversity survey. A summary of the eight PCTs and EPBC Act associations is summarized below, replicated from Table 4 of the Attachment ‘2 BOW2 - Matters of Environmental Significance (refer to Section 3.2.2.1, Table 4, pg 18).

PCT

EPBC Act association of PCT

Recorded (and estimated) extent within Disturbance Area

3076 - Hunter Valley Whalebone Dry Rainforest

CEEC: Lowland Rainforest of Subtropical Australia

No

3120 - Hunter-Peel Ranges Dry Rainforest

EEC: Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions

No

3315 - Central Hunter Ironbark-Spotted Gum Forest

CEEC: Central Hunter Valley Eucalypt Forest and Woodland

Yes - ~3.21ha

3395 – Northwest Elevated White Box Woodland

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

No

3396 - Northwest Flats Box-Blakelys Red Gum Forest

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

Yes - ~2.41 ha as Woodland and ~28.07 ha as Derived Native Grassland (DNG).

3397 - Northwest Flats Yellow Box Woodland

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

No

3431 – Central Hunter Ironbark Grassy Woodland

CEEC: Central Hunter Valley Eucalypt Forest and Woodland

No

3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest

CEEC: Central Hunter Valley Eucalypt Forest and Woodland

No

- EEC = endangered ecological community
- CEEC = critically endangered ecological community

The Project Area is located in the Sydney Basin Bioregion. The geology of the Sydney Basin Bioregion is characterised by Permian and Devonian bedrocks associated with the New England Fold Belt. Faulting has resulted in granite and granodiorite intrusions of the sedimentary rocks. The Project Area generally consists of red podzolic soils which belong to the soil order known as Chromosols. This order is the most widely used soils for agricultural purposes. The soil landscape within the Project Area is predominately Scrumlo (SI5601sc), with areas of Rosevale (SI5601rv) present within the central portion of the Project Area (DPE eSPADE, 2024).

There is no Biophysical Strategic Agricultural Land (BSAL) present within or in the vicinity of the Project Area. Additionally, there are no mapped Class 1-1 soils under the Land and Soil Capability Assessment Scheme (LSC) present within the Project Area. Although, there is Class 2 soils, disturbance to Class 2 soils is limited to overhead reticulation. The remainder of land is mapped as Class 5, Class 6 or Class 7. Existing agricultural activities within the host properties will continue and co-exist with the Project.

There is no Strategic Agricultural Land – Biophysical (BSAL) present within or in the vicinity of the Project Area. Additionally, there are no mapped Class 1-2 soils under the Land and Soil Capability (LSC) Assessment Scheme present within the Project Area. There are Class 3 soils predominantly along the Bowmans Creek watercourse alignment in the southern portion of the Project Area, however disturbance to these areas would be limited to pole foundations and minor earthworks to support the proposed overhead transmission line

network connecting the southern WTGs to the Stage 1 project. The remainder of land within the Project Area is mapped as Class 5, Class 6 or Class 7 LSC. Existing agricultural activities within the host properties will continue and co-exist with the Project.

There are no mapped high-risk areas for acid sulfate soils within the Project Area.

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.

There are no places listed on either the National or Commonwealth heritage lists that are located within the Project Area. There are also no State Heritage Register listed items within, or within 5 km of the Project Area. Beyond the immediate Project Area, a search of the State Heritage Register identified 18 registered heritage items within 25 km of the Project Boundary. None of the registered heritage places or items are anticipated to be impacted by the Proposed Action. No state listed heritage places or items are identified within the Project Area.

There are three historic heritage items listed on local LEPs that are in proximity but external to the Project Area. The ‘Former Roman Catholic Church’ (I56) listed in the Singleton LEP, and ‘Fairview’ (I47) and ‘Hillcrest’ (I48) which are listed in the Muswellbrook LEP.

The ‘Former Roman Catholic Church’ (I156) is located approximately 530 m from the Project Boundary and over 2.6 km to the Disturbance Footprint. The proposed travel path from Newcastle Port is expected to follow Bowmans Creek Road, running parallel to this heritage item. Additional details will be presented in a Historic Heritage Impact Assessment prepared to support the Project EIS.

Further information regarding Commonwealth heritage places is provided in Section 6.2.4 of the Bowmans Creek Wind Farm Stage 2 Scoping Report (page 84-90). A link to this document has been provided in this referral.

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

A Cultural Heritage Scoping Report was conducted by OzArk Environment & Heritage (OzArk) as Appendix G of the Bowmans Creek Wind Farm Stage 2 Scoping Report (Umwelt, 2024). The report is based upon desktop based research of known archeological sites within the region, an aboriginal site predictive model based on environmental zones and post-depositional influences as well as site relevant information identified during previous surveys conducted during the Stage 1 Aboriginal Cultural Heritage Assessment Report (ACHAR).

A search was conducted across various databases, including the Commonwealth Heritage Listings, National Native Title Claims, AHIMS register, and the Local Environmental Plan (LEP). The investigation revealed that there are no sites within the Project Area listed on either the National or Commonwealth heritage lists.

The search of the AHIMS register on 19 July 2023 returned 42 results for Aboriginal sites within a 10 km radius of the Project Boundary. The most frequently recorded site types are isolated finds in the vicinity of the Project Boundary (N=17, 40.48%). Other frequent site types include artefact scatters (n=14, 33.33%) and open camp sites (n=10, 23.81%). A single grinding groove site was also located by the search. The AHIMS search identified no recorded Aboriginal sites within the Project Area.

In 2022, the OzArk ACHAR for the Bowmans Creek Wind Farm Stage 1 project revealed 15 previously undiscovered Aboriginal sites, mostly artefact scatters and isolated artefacts. Six sites were within the Stage 1 project boundary.

Given the known presence of Aboriginal sites within the Study Area, a detailed Aboriginal Cultural Heritage Assessment Report (ACHAR) will be undertaken to assess potential impacts in consultation with the Registered Aboriginal Parties (RAPs) for the Proposed Action.

Further information regarding heritage values is provided in Section 6.2.4 of the Bowmans Creek Wind Farm Stage 2 Scoping Report (page 84-90). A link to this document has been provided in this referral.

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. *

The Project Area is situated in the Hunter River catchment, specifically in the sub-catchments that drain into Bowmans Creek and Sandy Creek. The Hunter River is the primary watercourse in the Hunter Region, and the flows in the Upper Hunter are regulated by Glenbawn Dam and Lake St Clair, also known as "Glennies Creek Dam." Within 10 km of the project, there are three major water storages, including Glenbawn Dam, Lake Liddell, and Lake St Clair.

The majority of the Project Boundary falls within the Bowmans Creek catchment, a sixth-order stream with nearly perennial flow in its higher-order reaches downstream of the Proposed Action. Bowmans Creek originates in the Mount Royal Range, with its upper catchment characterized by steep bedrock terrain. As it progresses downstream, the lower reaches meander through a broad alluvial floodplain and terrace sequence, reaching widths of up to 1 km. To the south of the Proposed Action, Bowmans Creek joins the Hunter River. Named tributaries within the project boundary include Lincolns Creek and Alexander Creek. A small section of the Project Area is situated in the catchment of Sandy Creek, which flows northward and converges with Stringybark Creek.

No flood studies have been undertaken within the Project Area, and it is not currently mapped as flood prone. However, there may be the potential for flows from the Hunter River to be conveyed through the interconnected floodway network in major flood events.

There are a number of watercourse (i.e. creek) crossings that will need to be designed and constructed to facilitate the construction and ongoing operation of the Proposed Action. These will be subject to detailed assessment during the preparation of the EIS in the form of a Water Resources Impact Assessment (WRIA). The WRIA will assess the potential for surface water impacts and to develop appropriate, Project-specific management measures and strategies to avoid, minimise and then manage any residual impacts. The WRIA will consider potential impacts on both surface water and groundwater resources and the catchment, including flooding, erosion and sediment control, water quality, water users, water sourcing, and licensing.

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	Yes	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.

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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. *

The Gondwana Rainforest of Australia World Heritage Area is located within 20 km of the Proposed Action within the Barrington Tops National Park. It is unlikely that the Proposed Action would impact upon any outstanding universal values which gives the Gondwana Rainforest of Australia World Heritage Area its global significance. A review of the DCCEEW Gondwana Rainforest of Australia World Heritage Place profile and brief assessment against each of the relevant criterion has been prepared below:

- *Criterion viii - outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features.* The Gondwana Rainforests provides outstanding examples of significant ongoing geological processes, including increased volcanicity experienced during the Cenozoic Era as the Australian continental plate moved over one of the planet's hot spots. The Tweed Shield erosion caldera, a byproduct of the increased volcanic activity, is located in the QLD portion of the Gondwana Rainforests and is one of the best-preserved erosion caldera globally. Being located in QLD, it will not interact with the Proposed Action.
- *Criterion ix - outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.* The flora and fauna of the Gondwana Rainforests provides outstanding examples of ongoing evolution including plant and animal taxa which show evidence of relatively recent evolution. The Gondwana Rainforests contains an outstanding number of songbird species, including lyrebirds (*Menuridae*), scrub-birds (*Atrichornithidae*), treecreepers (*Climacteridae*) and bowerbirds and catbirds (*Ptilonorhynchidae*), belonging to some of the oldest lineages of passerines that evolved in the Late Cretaceous period. The Brown Treecreeper (*Climacteris picumnus victoriae*) was observed during surveys undertaken within the Bowmans Creek Wind Farm Stage 1 project area and has been conservatively identified as having potential to exist within the Stage 2 Project Area. This species may be associated with the Gondwana Rainforest of Australia World (and/or National) Heritage Area. Results of the Significant Impact Criteria for Vulnerable Species undertaken in Appendix C of the MNES report (Attachment '23065RP2_MNES_20240527', Appendix C, pages A.33-A.36) noted that the Proposed Action would not result in significant impacts to the Brown Treecreeper and other EPBC-listed species with potential to occur within the Project Area. Refer to Section 4.1.4.2 below for additional information.
- *Criterion x - contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.* The ecosystems of the Gondwana Rainforests contain significant and important natural habitats for species of conservation significance, particularly those associated with the rainforests which once covered much of the continent of Australia and are now restricted to archipelagos of small areas of rainforest isolated by sclerophyll vegetation and cleared land. Species continue to be discovered in the property including the re-discovery of two mammal species previously thought to have been extinct, including the Hastings River Mouse (*Pseudomys oralis*) and Parma Wallaby (*Macropus parma*). These species have been conservatively identified as having potential to exist within the Project Area and may be associated with the Gondwana Rainforest of Australia World (and/or National) Heritage Area. However, it is unlikely that these species will occur within the Development Footprint given the lack of records within the Project Area and lack of desirable habitat within the Development Footprint. Additionally, these species were not identified as being impacted as a result of the Stage 1 EPBC Act Referral and subsequent approval.

Any threatened species, communities or migratory species which may be associated with the Gondwana Rainforest of Australia are unlikely to be directly or indirectly impacted by the Proposed Action given the lack of suitable habitat (i.e. rainforest) within the Disturbance Footprint. Nevertheless, surveys targeting relevant listed species will be conducted during preparation of the EIS to determine the presence and extent of any direct and indirect impacts to the species and/or species habitat.

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.

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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. *

The Gondwana Rainforest of Australia National Heritage Place is located within 20 km of the Proposed Action within the Barrington Tops National Park. As discussed in Section 4.1.1, impacts to the any threatened species, communities or migratory species which may be associated with the Gondwana Rainforest of Australia are unlikely to be directly or indirectly impacted by the Proposed Action given the lack of suitable habitat (i.e. rainforest) within the Disturbance Footprint. Nevertheless, surveys targeting relevant listed species will be conducted during preparation of the EIS to determine the presence and extent of any direct and indirect impacts to the species and/or species habitat.

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	Hunter Estuary Wetlands

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. *

The nearest Ramsar Wetland is the Hunter Estuary Wetland approximately 80 km south east of the Proposed Action. No important wetlands listed in the Directory of Important Wetlands in Australia are present in the Project Area and wider locality. The closest important wetland based on the Directory of Important Wetlands in Australia is the Barrington Tops Swamps, located approximately 34 km north-east of the northernmost point of the Disturbance Footprint.

Direct and indirect impacts to these wetlands are not anticipated as a result of the Proposed Action.

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	Androcalva procumbens	
Yes	Yes	Anthochaera phrygia	Regent Honeyeater
Yes	Yes	Aphelocephala leucopsis	Southern Whiteface
No	No	Aprasia parapulchella	Pink-tailed Worm-lizard, Pink-tailed Legless Lizard
No	No	Botaurus poiciloptilus	Australasian Bittern
No	No	Calidris acuminata	Sharp-tailed Sandpiper
Yes	Yes	Calidris ferruginea	Curlew Sandpiper
Yes	Yes	Callocephalon fimbriatum	Gang-gang Cockatoo
Yes	Yes	Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo
Yes	Yes	Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat
Yes	Yes	Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)
Yes	Yes	Cynanchum elegans	White-flowered Wax Plant

Direct impact	Indirect impact	Species	Common name
Yes	Yes	Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)
No	No	Dichanthium setosum	bluegrass
Yes	Yes	Erythrotriorchis radiatus	Red Goshawk
Yes	Yes	Eucalyptus glaucina	Slaty Red Gum
No	No	Euphrasia arguta	
Yes	Yes	Falco hypoleucos	Grey Falcon
No	No	Gallinago hardwickii	Latham's Snipe, Japanese Snipe
Yes	Yes	Grantiella picta	Painted Honeyeater
No	No	Haloragis exalata subsp. velutina	Tall Velvet Sea-berry
Yes	Yes	Hirundapus caudacutus	White-throated Needletail
Yes	Yes	Lathamus discolor	Swift Parrot
No	No	Lepidium aschersonii	Spiny Peppercress
Yes	Yes	Litoria booroolongensis	Booroolong Frog
Yes	Yes	Melanodryas cucullata cucullata	South-eastern Hooded Robin, Hooded Robin (south-eastern)
Yes	Yes	Mixophyes balbus	Stuttering Frog, Southern Barred Frog (in Victoria)
Yes	Yes	Neophema chrysostoma	Blue-winged Parrot
Yes	Yes	Notamacropus parma	Parma Wallaby
Yes	Yes	Petauroides volans	Greater Glider (southern and central)
Yes	Yes	Petaurus australis australis	Yellow-bellied Glider (south-eastern)
No	No	Petrogale penicillata	Brush-tailed Rock-wallaby
Yes	Yes	Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)
No	No	Picris evae	Hawkweed
No	No	Pomaderris brunnea	Rufous Pomaderris, Brown Pomaderris
No	No	Potorous tridactylus tridactylus	Long-nosed Potoroo (northern)

Direct impact	Indirect impact	Species	Common name
Yes	Yes	Pseudomys novaehollandiae	New Holland Mouse, Pookila
Yes	Yes	Pseudomys oralis	Hastings River Mouse, Koontoo
Yes	Yes	Pteropus poliocephalus	Grey-headed Flying-fox
No	No	Pycnoptilus floccosus	Pilotbird
Yes	Yes	Rhizanthella slateri	Eastern Underground Orchid
No	No	Rhodamnia rubescens	Scrub Turpentine, Brown Malletwood
Yes	Yes	Rostratula australis	Australian Painted Snipe
Yes	Yes	Stagonopleura guttata	Diamond Firetail
No	No	Syzygium paniculatum	Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry
Yes	Yes	Thesium australe	Austral Toadflax, Toadflax

Ecological communities

Direct impact	Indirect impact	Ecological community
Yes	Yes	Central Hunter Valley eucalypt forest and woodland
No	No	Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland
No	No	Lowland Rainforest of Subtropical Australia
No	No	Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions
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. *

Threatened Ecological Communities

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

The Proposed Action would likely involve the direct and indirect disturbance of areas of vegetation conforming to the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland listed as a CEEC under the EPBC Act. Desktop assessments and preliminary survey data shows that the PCT's that conform to this TEC have the potential to occur in approximately 30.48 ha of the current Disturbance Footprint.

Central Hunter Valley eucalypt forest and woodland

The Proposed Action would likely involve the direct and indirect disturbance of PCTs that conform to the Central Hunter Valley eucalypt forest and woodland listed as a CEEC under the EPBC Act. Desktop assessments shows that the PCT's that conform to the Central Hunter Valley eucalypt forest and woodland have the potential to occur in approximately 9.63 ha of the current Disturbance Footprint.

As an actual Disturbance Area has not yet been fully determined, actual impacts upon the affected CEECs listed above are expected to be substantially less, subject to further assessment within the EIS and refined during detailed design.

Other TECs

All other TECs listed in Section 4.1.4 of this referral have been assessed as having low likelihood of occurrence within the Project Area and are unlikely to be directly or indirectly impacted by the Proposed Action.

Threatened Species - Recorded Species/ High Likelihood of Occurrence

The following entities have been recorded by Umwelt, have BioNet records within the Project Area, or have a high likelihood of occurring in the Project Area:

- Slaty Red Gum (*Eucalyptus glaucina*) – vulnerable
- Austral Toadflax (*Thesium australe*) - vulnerable
- Large Eared Pied Bat (*Chalinolobus dwyeri*) - vulnerable
- Brown Treecreeper (*Climacteris picumnus victoriae*) - vulnerable
- Glossy Black Cockatoo (*Calyptorhynchus lathami lathami*) - vulnerable

These species were subject to an assessment of significance to determine the extent of potential direct and indirect impacts as a result of the Proposed Action, which is found in Attachment 2 'BOW2 - Matters of National Environmental Significance', Appendix C (pages A.31-A.36).

Slaty Red Gum and Austral Toadflax

Slaty Red Gum (*Eucalyptus glaucina*) and Austral Toadflax (*Thesium australe*) were assessed as having potential to occur within the Disturbance Area, either as there are records of these species within the wider locality and/or given the presence of associated species or vegetation communities within the Project Area and/or Disturbance Footprint.

Large Eared Pied Bat, Brown Tree Creeper and Gloss Black Cockatoo

The Large Eared Pied Bat (*Chalinolobus dwyeri*) and Brown Treecreeper (*Climacteris picumnus victoriae*) were recorded during surveys conducted in proximate parts of the adjacent Bowmans Creek Stage 1 development and are considered to have a high likelihood of occurring within the Disturbance Footprint. A pair of Glossy Black Cockatoos (*Calyptorhynchus lathami lathami*) were also observed foraging during surveys of the Disturbance Footprint. A significant impact assessment was undertaken for these species, which assumed that all mapped woodland areas to date within the indicative Disturbance Area, totalling ~19.98 ha, comprise foraging habitat for these species.

The species discussed above may also be indirectly impacted by the Proposed Action.

Threatened Species – Possible Likelihood of Occurrence

All other species with possible likelihood of occurring within the Project Area are assumed to have some degree of direct and/or indirect impacts as a result of the Proposed Action. These species include:

- White-flowered Wax Plant (*Cynanchum elegans*) - Suitable habitat (i.e. dry rainforest vegetation) is largely absent from the Disturbance Area, however was located within Stage 1 Project. Potential direct and/or indirect impacts to this species (or species habitat) are possible.
- Diamond Firetail (*Stagonopleura guttata*) - Some marginal habitat is present and records of this species have been made within the locality. Potential direct and impacts to this species are unlikely
- Spot-tailed Quoll (*Dasyurus maculatus maculatus*) (SE mainland population) - Several records are present for the locality and the species is relatively mobile with males occupying very large home ranges from 500 to over 4000 hectares. Den sites are limited within the Disturbance Area but species may utilise habitats as part of a wider range. Potential direct and indirect impacts to this species are possible
- Southern Whiteface (*Aphelocephala leucopsis*) - Preferred habitats for this species are largely absent and there are no records for the locality. Potential direct and indirect impact to this species are unlikely
- Booroolong Frog (*Litoria booroolongensis*) - Suitable habitat with appropriate vegetation and structures are absent within the Disturbance Area. Direct and indirect impact to this species are unlikely
- New Holland Mouse (*Pseudomys novaehollandiae*) - Suitable habitat is limited to woodland areas which have limited understorey and there are no records in the locality for the last 10 years. Older records in the locality are largely limited to National Parks areas and other conserved lands. Direct and indirect impacts to this species are unlikely
- Stuttering Frog (*Mixophyes balbus*) - While there are limited records in the locality, suitable habitat is largely absent from the Disturbance Area. Direct and/or indirect impacts to this species are unlikely
- Hastings River Mouse (*Pseudomys oralis*) - Suitable habitat within the Disturbance Area is absent, and there are no records in the locality. Direct and indirect impacts to this species are unlikely
- Parma Wallaby (*Notamacropus parma*) - While records are present in the locality, primary habitat (consisting of thick shrubby understorey/dense understorey) is absent within the Disturbance Area. Direct and indirect impacts to this species are unlikely
- Yellow-bellied Glider (*Petaurus australis australis*) - Some records in the locality. However, suitable habitat within the Disturbance Area is limited and generally degraded. Direct and indirect impacts to this species (or species habitat) are possible
- Koala (*Phascolarctos cinereus*) - Known feed trees are present and recent records are present for the locality. However, the distribution between patches with food trees is fragmented by large grassland areas that limit movement. Direct and indirect impacts to this species (or species habitat) are possible
- Grey Falcon (*Falco hypoleucos*) - Preferred arid habitats are absent from the Disturbance Area. Direct and indirect impacts to this species are unlikely
- Greater Glider (southern and central) (*Petauroides Volans*) - Suitable habitat is absent and there are limited to no records in the locality in the last 10 years. Direct and indirect impacts to this species are unlikely
- South-eastern Hooded Robin (*Melanodryas cucullata cucullata*) - Preferred habitats with complex ground layer are absent within the Disturbance Area. Direct and indirect impacts to this species are unlikely
- Blue-winged Parrot (*Neophema chrysostoma*) - While grassland habitats are present, there are no records in the locality and the Project is located outside of the main population distribution. Direct and indirect impacts to this species are unlikely
- Painted Honeyeater (*Grantiella picta*) - Some habitat present, but vegetation largely lacks the requisite mature trees and mistletoe required to support preferred habitat. Additionally, there are no records in the locality. Direct and indirect impacts to this species are unlikely
- Red Goshawk (*Erythrotriorchis radiatus*) - Preferred habitats for this species are largely absent within the Disturbance Area, and there are no species records within the locality. Direct and indirect impacts to this species are unlikely
- Australian Painted Snipe (*Rostratula australis*) - Suitable habitat for this species is absent from the Disturbance Area. Direct and indirect impacts to this species are unlikely

- Eastern Underground Orchid (*Rhizanthella slateri*) - No records of this species are present in the locality, which is outside of the known areas of occurrence. Direct and indirect impacts to this species are unlikely
- Swift Parrot (*Lathamus discolor*) - Some favoured feed trees present within the Project Area, and there are records in the locality. Occurrence is likely to be limited to fly-throughs as part of a wider migratory range. Direct and indirect impacts to this species (or species habitat) are possible
- White-throated Needletail (*Hirundapus caudacutus*) - Individuals have been recorded in the locality, and the species is highly mobile. Direct and indirect impacts to this species (or species habitat) are possible
- Regent Honeyeater (*Anthochaera phrygia*) - No records in the locality, and the Project Area is outside the main breeding areas. However, species is highly mobile and some key foraging species are present within the Disturbance Area. Direct and indirect impacts to this species (or species habitat) are possible
- Gang-gang Cockatoo (*Callocephalon fimbriatum*) - Records are present for the locality and some suitable habitat is present in close proximity to the Disturbance Area. There is also potential for the species to pass through the area as part of a larger foraging range. Direct and indirect impacts to this species (or species habitat) are possible
- Grey-headed Flying-fox (*Pteropus poliocephalus*) - No known roosting camps are present within daily foraging range for this species, and limited records are present for the locality. Potential to occasionally pass through the Project Area as part of a wider foraging range. Direct and indirect impacts to this species are unlikely

All other threatened species listed in Section 4.1.4 of this referral have been assessed as being unlikely to occur within the Project Area. As such, it is not anticipated that these species will be directly or indirectly impacted.

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. *

At these early stages of design development, it has been conservatively assumed that all vegetation within the survey corridor will be directly impacted through clearing works. These impacts will be further investigated during the EIS and detailed design phases, where the Disturbance Area will be refined and total clearing area reduced. The EIS will include appropriate mitigation measures to avoid, minimise or offset any impacts that are identified in the supporting BDAR.

The TECs and species have been identified on site during the ecological surveys undertaken to date, which confirmed their presence and utilisation of portions of the Project Area. Significant impact assessments for these TECs and threatened species was undertaken as part of the MNES Report, which concluded that the Proposed Action is unlikely to have a significant impact on these TECs and threatened species.

Refer to Attachment 2 BOW2 - Matters of National Environmental Significance, Appendix C (pages A.31-A.36).

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

Yes

4.1.4.8 Please elaborate why you think your proposed action is a controlled action. *

Given the potential impacts to TEC listed under the EPBC Act, it is expected that the Proposed Action would be classified as a controlled action, similar to the Bowmans Creek Wind Farm Stage 1 project (EPBC 2020/8631).

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. *

The key impact avoidance and minimisation strategies implemented by Ark Energy during the early stages of design development included establishing an area (defined by Ark Energy) beyond which Project WTGs and ancillary infrastructure would not occur. It was established based on:

- A comprehensive review all waterbodies within the Project Boundary.
- A 100 m buffer to road reserves, with the exception of access tracks which may intersect road reserves.
- A ~100 m buffer from the Project Boundary to any WTG, with exceptions for residences already involved in Stage 1.
- WTG locations being placed in locations that are compatible with Host residences' existing land uses.

The key strategies implemented by Ark Energy during the Scoping stage to avoid and minimise impacts associated with the Proposed Action ultimately included the reduction of the indicative Project layout, which was undertaken through:

- The completion of a reconnaissance survey to understand ecological constraints and reduce/adjust the Development Corridor accordingly.
- The relocation of WTG and associated ancillary infrastructure to existing areas of cleared land to avoid native vegetation clearing, where possible.
- The reduction of the extent of the Project Area to avoid areas of unfavourable topography.
- The identification of major watering points within the Project Area to inform the siting of Project-related infrastructure.
- Siting of WTGs and other infrastructure (i.e., access tracks) to best utilise the infrastructure of Stage 1, reducing the overall impact of Stage 2 through the sharing of infrastructure.

A Biodiversity Management Plan (BMP) will be developed for the Proposed Action in accordance with the relevant NSW and Commonwealth legislation and/or policies. It is expected that the BMP will detail the following:

- A pre-clearing procedure to be implemented to minimise the potential for impacts on native fauna species (focusing on threatened species, hollow-dependent and other microhabitat-dependent fauna) as a result of the clearing of hollow-bearing trees.
- Staged progressive clearance limits clearly demarcated to prevent unnecessary disturbance.
- Salvage of resources and habitat features (e.g. seed collection, topsoil, timber and native mulch) and translocation to a re-establishment site.

- Placement of habitat features (e.g. hollow logs, tree hollows, fallen timber and rocks/boulders) for quarry rehabilitation.
- Weed management.
- Traffic control measures.
- Pathogen management.
- Pest animal control.
- Fencing and access control.
- Bushfire management.
- Erosion and sedimentation control.
- Employee education and training.
- Providing appropriate environmental management measures as part of the operations to minimise the potential for indirect impacts including:
    - Water management systems that seek to minimise the potential for damage to flora and fauna and their habitats from erosion, sedimentation and unnatural flooding events
    - Noise control systems and dust control measures to minimise noise/dust impacts
    - Lighting controls to minimise night time light impacts, and
    - Blasting controls to minimise blast overpressure and vibration impacts.

The Project layout will be subject to further refinement during the EIS and further design development to minimise impacts on biodiversity, as well as other factors affecting the environment and community. It will be revised as additional biodiversity information is received, constraints are identified, further technical studies and environmental assessments occur and further feedback from stakeholder and community engagement is received.

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

The BDAR will need to include a Biodiversity Offset Strategy (BOS) which complies with relevant requirements under the NSW Biodiversity Offsets Scheme and the *Biodiversity Conservation Act 2016 (NSW)* (BC Act). A comprehensive BOS will be developed for the Proposed Action in accordance with relevant NSW legislation and/or policies, currently being assessed under the Biodiversity Assessment Method (BAM) in accordance with the BC Act. Accordingly, the offset strategy for the Proposed Action will be developed in consultation with DPHI, which will identify and assess the applicability of select offset options (including identifying and securing suitable land for the purpose of a BSA). This is a lengthy and complex process, especially the sourcing and security of biodiversity offsets, and will prioritised so that all offset options can be comprehensively addressed.

All direct impacts associated with the Proposed Action will be offset in accordance with the requirements of the NSW Biodiversity Assessment Method. The BOS is detailed in Attachment 2 BOW2 - Matters of National Environmental Significance, Section 5 (pages 23-24).

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
Yes	Yes	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
Yes	Yes	Hirundapus caudacutus	White-throated Needletail
Yes	Yes	Monarcha melanopsis	Black-faced Monarch
Yes	Yes	Motacilla flava	Yellow Wagtail
Yes	Yes	Myiagra cyanoleuca	Satin Flycatcher
Yes	Yes	Rhipidura rufifrons	Rufous Fantail
Yes	Yes	Symposiachrus trivirgatus	Spectacled Monarch

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

Yes

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

When identifying the potential direct and indirect impacts to migratory species, a precautionary approach has been undertaken to include all potential impacts at this early stage of design. These impacts will be further investigated during the EIS phase and detailed design, where the Development Corridor will be refined and total clearing area reduced. The EIS will include appropriate mitigation measures to avoid, minimize or offset any impacts that are identified in the supporting BDAR and BBUS.

The Project Area is located within a region that has the potential to be used by the Satin Flycatcher (*Myiagra cyanoleuca*). This species was observed during surveys conducted in proximate parts of the adjacent Bowmans Creek Stage 1 development and is considered to have a high likelihood of occurring within the Disturbance Area. Direct and/or indirect impacts to this species is possible as a result of the Proposed Action.

Other migratory species – Possibility of Occurrence

Other migratory species listed in Section 4.1.5, Table ‘Impact details – Migratory species’ of this referral were assessed as possibly occurring or passing through the Project Area:

- Fork-tailed Swift (*Apus pacificus*) - No records in the locality but some potential foraging habitat is present within the Disturbance Area. Direct and/or indirect impacts to this species (or species habitat) are possible, but unlikely.
- Yellow Wagtail (*Motacilla flava*) - Preferred habitat is absent/limited within the Disturbance Area, but the species may pass through the Project Area as part of a wider migratory range. Direct and/or indirect

impacts to this species (or species habitat) are possible, but unlikely.
- Rufous Fantail (*Rhipidura rufifrons*) - Preferred habitat is absent/limited within the Disturbance Area, but the species may pass through the Project Area as part of a wider migratory range. Direct and/or indirect impacts to this species (or species habitat) are possible, but unlikely.
- Spectacled Monarch (*Symposiachrus trivirgatus*) - Preferred habitat is absent/limited within the Disturbance Area, but the species may pass through the Project Area as part of a wider migratory range. Direct and/or indirect impacts to this species (or species habitat) are possible, but unlikely.
- Black-faced Monarch (*Monarcha melanopsis*) - Preferred habitat is absent/limited within the Disturbance Area, but the species may pass through the Project Area as part of a wider migratory range. Direct and/or indirect impacts to this species (or species habitat) are possible, but unlikely.
- White-throated Needletail (*Hirundapus caudacutus*) - Individuals of this species have been recorded in the locality, and the species is highly mobile. Direct and/or indirect impacts to this species (or species habitat) are possible as a result of the Proposed Action.

Other migratory species – Low Likelihood of Occurrence

All other migratory species listed in Section 4.1.5, Table 'Impact details - Migratory species' of this referral have been assessed as having low likelihood of occurrence within the Project Area. As such, it is not anticipated that these species will be directly or indirectly impacted by the construction or operation of the Proposed Action. These species include:

- Sharp-tailed Sandpiper (*Calidris acuminata*)
- Latham's Snipe (*Gallinago hardwickii*)
- Pectoral Sandpiper (*Calidris melanotos*)
- Curlew Sandpiper (*Calidris ferruginea*)
- Common Sandpiper (*Actitis hypoleucos*)

Further details of the impact on migratory species are provided in Attachment 2 'BOW2 - Matters of National Environmental Significance' Section 3.2.5, Appendix B and Appendix C (pages 21, A.21-A.30, A.36)

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

No

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

The Proposed Action will potentially have a direct impact on the identified migratory species due to impacts from habitat clearing and wind turbine strike, as well as indirect impacts to habitat connectivity, impacts to water resources and habitat loss. However, the habitat proposed to be cleared within the Disturbance Area is not considered to be important habitat. Additionally, due to their habitat preferences and limited number of records within the Project Area, none of the identified migratory species are considered likely to be significantly impacted by the Proposed Action.

Further details of the impact on migratory species is provided in Attachment 2 'BOW2 - Matters of National Environmental Significance', Section 3.2.5, Appendix B and Appendix C (pages 21, page A.26, A.36).

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

No

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

The Proposed Action will potentially have a direct impact on the identified migratory species due to impacts from habitat clearing and wind turbine strike, as well as indirect impacts to habitat connectivity, impacts to water resources and habitat loss. However, due to their habitat preferences and number of records within the Project Area, none of the identified migratory species are considered likely to be significantly impacted by the Proposed Action.

Further details of the impact on migratory species is provided in Attachment 2 - 'BOW2 Matters of National Environmental Significance' Section 3.2.5, Appendix B and Appendix C (pages 21, page A.26, A.36).

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

The key impact avoidance and minimisation strategies implemented by Ark Energy during the early stages of design development included establishing an area beyond which Project WTGs and ancillary infrastructure would not occur. It was established based on:

- A comprehensive review all waterbodies within the Project Boundary.
- A 100 m buffer to road reserves, with the exception of access tracks which may intersect road reserves.
- A ~100 m buffer from the Project Boundary to any WTG, with exceptions for Landowners already involved in Stage 1.
- WTG locations being placed in locations that are compatible with Host residences' existing land uses.

The key strategies implemented by Ark Energy during the Scoping stage to avoid and minimise impacts associated with the Proposed Action ultimately included the reduction of the indicative Project layout, which was undertaken through:

- The completion of a reconnaissance survey to understand ecological constraints and reduce/adjust the Development Corridor accordingly.
- The relocation of WTG and associated ancillary infrastructure to existing areas of cleared land to avoid native vegetation clearing, where possible.
- The reduction of the extent of the Project Area to avoid areas of unfavourable topography.
- The identification of major watering points within the Project Area to inform the siting of Project-related infrastructure.
- Siting of WTGs and other infrastructure (i.e., access tracks) to best utilise the infrastructure of Stage 1, reducing the overall impact of Stage 2 through the sharing of infrastructure.

A Biodiversity Management Plan (BMP) will be developed for the Proposed Action in accordance with the relevant NSW and Commonwealth legislation and/or policies. It is expected that the BMP will detail the following:

- A pre-clearing procedure to be implemented to minimise the potential for impacts on native fauna species (focusing on threatened species, hollow-dependent and other microhabitat-dependent fauna) as a result of the clearing of hollow-bearing trees.
- Staged progressive clearance limits clearly demarcated to prevent unnecessary disturbance.

- Salvage of resources and habitat features (e.g. seed collection, topsoil, timber and native mulch) and translocation to a re-establishment site.
- Placement of habitat features (e.g. hollow logs, tree hollows, fallen timber and rocks/boulders) for quarry rehabilitation.
- Weed management.
- Traffic control measures.
- Pathogen management.
- Pest animal control.
- Fencing and access control.
- Bushfire management.
- Erosion and sedimentation control.
- Employee education and training.
- Providing appropriate environmental management measures as part of the operations to minimise the potential for indirect impacts including:
    - Water management systems that seek to minimise the potential for damage to flora and fauna and their habitats from erosion, sedimentation and unnatural flooding events
    - Noise control systems and dust control measures to minimise noise/dust impacts
    - Lighting controls to minimise night time light impacts, and
    - Blasting controls to minimise blast overpressure and vibration impacts.

The Project layout will be subject to further refinement during the EIS and further design development to minimise impacts on biodiversity, as well as other factors affecting the environment and community. It will be revised as biodiversity information is received, constraints are identified, further technical studies and environmental assessments occur and further feedback from stakeholder and community engagement is received.

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

The BDAR will need to include a Biodiversity Offset Strategy (BOS) which complies with relevant requirements under the NSW Biodiversity Offsets Scheme and the Biodiversity Conservation Act 2016 (NSW) (BC Act). A comprehensive BOS will be developed for the Proposed Action in accordance with relevant NSW legislation and/or policies, currently being assessed under the Biodiversity Assessment Method (BAM) in accordance with the BC Act. Accordingly, the offset strategy for the Proposed Action will be developed in consultation with DPHI, which will identify and assess the applicability of select offset options (including identifying and securing suitable land for the purpose of a BSA). This is a lengthy and complex process, especially the sourcing and security of biodiversity offsets, and will prioritised so that all offset options can be comprehensively addressed.

All direct impacts associated with the Proposed Action will be offset in accordance with the requirements of the NSW Biodiversity Assessment Method. The BOS is detailed in Attachment 2 ‘BOW2 Matters of National Environmental Significance’, Section 5 (pages 23-24).

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. *

The Proposed Action is not a nuclear action and will not involve any nuclear activities. As such, there will be no impact as a result of nuclear action.

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.

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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. *

The Project Area is located over 80 km from the nearest coastline. As such, there will be no direct or indirect impacts on Commonwealth Marine Areas as a result of the Proposed Action.

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 Project Area is located over 900 km from the Great Barrier Reef. As such, there will be no direct or indirect impacts on the Great Barrier Reef as a result of the Proposed Action.

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 Proposed Action is not a large coal mining development or coal seam gas development and will not involve any coal mining activities.

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.

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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. *

There are no Commonwealth Lands within the Project Area and as such, no direct or indirect impacts are anticipated as a result of the Proposed Action.

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.

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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. *

The Project Area is located approximately 2,600 km from the closest Overseas Commonwealth Heritage Place (Kokoda Track, Papua New Guinea) and as such will not result in any impacts.

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. *

A number of alternative options to the Proposed Action have been considered to date by Ark Energy, including:

- A 'do nothing' approach. This option does not meet Ark Energy's commercial objectives to develop renewable energy projects in NSW; and does not assist to support the strategic context outlined in Section 2.0 or achieve the Project Objectives outlined in Section 1.2. Accordingly, it has not been considered any further.
- The development of a wind farm of up to 25 WTGs within the Project Boundary. This option was originally proposed at Stage 2 and preliminary investigations were commenced to understand the suitability of this option, including field reconnaissance surveys undertaken by Cumberland Ecology in December 2022 as well as internal civil design undertaken by Ark Energy. Results of the preliminary investigations identified constraints at a number of proposed WTG locations. WTGs were micro-sited to avoid areas of high value biodiversity and/or areas requiring substantial civil engineering or were removed entirely as impacts were considered too substantial. This in turn formed the reduced project design inclusive of 21 WTG's, which forms the basis of Project layout assessed within Bowmans Creek Wind Farm Stage 2 Scoping Report.

The Project Area was selected due to a reliable wind resource, position within the Hunter-Central Coast REZ, proximity to existing electricity transmission infrastructure, the Project being compatible with existing pastoral land uses with minimal impact to current agricultural activities being anticipated during both construction and operation of the Project, proximity to the existing road network, and in consideration of environmental values (i.e. much of the site has been historically cleared).

The indicative layout for the Project Area, informed by discussions with Host landholders and neighbours, has been subject to design iterations to incorporate feedback received during the scoping stage for the Proposed Action. Where landholders did not wish to be involved in the Project, these areas have been removed from the Project Area and a buffer distance applied.

5. Lodgement

5.1 Attachments

1.2.7 Public consultation regarding the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document				

		Attachment 1 BOW2 - Community and Stakeholder Engagement Plan.pdf Outlines the approach and implementation program to inform the Scoping phase of the Social Impact Assessment and broader Environmental Impact Statement for the Project's State Significant Development application, to be lodged with the NSW Department of Planning, Housing and Infrastructure.	14/06/2024	Yes	High
#2.	Document	Attachment 1 BOW2 - Community and Stakeholder Engagement Plan_REDACTED.pdf Outlines the approach and implementation program to inform the Scoping phase of the Social Impact Assessment and broader Environmental Impact Statement for the Project's State Significant Development application, to be lodged with the NSW Department of Planning, Housing and Infrastructure. Sensitive information has been redacted	14/06/2024	No	High

3.1.1 Current condition of the project area's environment

	Type	Name	Date	Sensitivity	Confidence
#1.	Link	Muswellbrook Local Environmental Plan 2009 https://legislation.nsw.gov.au/view/html/inforce..			High
#2.	Link	Singleton Local Environmental Plan 2013 https://legislation.nsw.gov.au/view/html/inforce..			High

3.2.1 Flora and fauna within the affected area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 2 BOW2 - Matters of Environmental Significance.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action.	27/05/2024	Yes	Medium
#2.	Document	Attachment 2 BOW2 - Matters of Environmental Significance_REDACTED.pdf.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action. Sensitive information has been redacted.	27/05/2024	No	Medium

3.2.2 Vegetation within the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 2 BOW2 - Matters of Environmental Significance.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action.	26/05/2024	Yes	Medium
#2.	Document	Attachment 2 BOW2 - Matters of Environmental Significance_REDACTED.pdf.pdf	26/05/2024	No	Medium

		A report prepared to address impacts to known/likely MNES from the Proposed Action. Sensitive information has been redacted.			
#3.	Link	eSPADE v2.2 https://www.environment.nsw.gov.au/eSpade2WebApp			High

3.3.1 Commonwealth heritage places overseas or other places that apply to the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Link	Bowmans Creek Wind Farm Stage 2 Scoping Report https://majorprojects.planningportal.nsw.gov.au/..			Medium

3.3.2 Indigenous heritage values that apply to the project area

	Type	Name	Date	Sensitivity	Confidence
#1.	Link	Bowmans Creek Wind Farm Stage 2 Scoping Report https://majorprojects.planningportal.nsw.gov.au/..			Medium

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	Attachment 2 BOW2 - Matters of Environmental Significance.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action.	26/05/2024	Yes	Medium
#2.	Document	Attachment 2 BOW2 - Matters of Environmental Significance_REDACTED.pdf.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action. Sensitive information has been redacted.	26/05/2024	No	Medium

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	Attachment 2 BOW2 - Matters of Environmental Significance.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action.	26/05/2024	Yes	Medium
#2.	Document	Attachment 2 BOW2 - Matters of Environmental Significance_REDACTED.pdf.pdf A report prepared to address impacts to known/likely MNES	26/05/2024	No	Medium

		from the Proposed Action. Sensitive information has been redacted.			

4.1.4.11 (Threatened Species and Ecological Communities) Proposed offsets relevant to avoidance or mitigation measures

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 2 BOW2 - Matters of Environmental Significance.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action.	26/05/2024	Yes	Medium
#2.	Document	Attachment 2 BOW2 - Matters of Environmental Significance_REDACTED.pdf.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action. Sensitive information has been redacted.	26/05/2024	No	Medium

4.1.5.2 (Migratory Species) Why your action has a direct and/or indirect impact on the identified protected matters

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 2 BOW2 - Matters of Environmental Significance.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action.	26/05/2024	Yes	Medium
#2.	Document	Attachment 2 BOW2 - Matters of Environmental Significance_REDACTED.pdf.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action. Sensitive information has been redacted.	26/05/2024	No	Medium

4.1.5.6 (Migratory Species) Why you do not consider the direct and/or indirect impact to be a Significant Impact

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 2 BOW2 - Matters of Environmental Significance.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action.	26/05/2024	Yes	Medium
#2.	Document	Attachment 2 BOW2 - Matters of Environmental Significance_REDACTED.pdf.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action. Sensitive information has been redacted.	26/05/2024	No	Medium

4.1.5.9 (Migratory Species) Why you do not think your proposed action is a controlled action

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 2 BOW2 - Matters of Environmental Significance.pdf	26/05/2024	Yes	Medium

		A report prepared to address impacts to known/likely MNES from the Proposed Action.			
#2.	Document	Attachment 2 BOW2 - Matters of Environmental Significance_REDACTED.pdf.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action. Sensitive information has been redacted.	26/05/2024	No	Medium

4.1.5.11 (Migratory Species) Proposed offsets relevant to avoidance or mitigation measures

	Type	Name	Date	Sensitivity	Confidence
#1.	Document	Attachment 2 BOW2 - Matters of Environmental Significance.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action.	26/05/2024	Yes	Medium
#2.	Document	Attachment 2 BOW2 - Matters of Environmental Significance_REDACTED.pdf.pdf A report prepared to address impacts to known/likely MNES from the Proposed Action. Sensitive information has been redacted.	26/05/2024	No	Medium

5.2 Declarations

Completed Referring party's declaration

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

ABN/ACN	18059519041
Organisation name	UMWELT (AUSTRALIA) PTY. LTD.
Organisation address	2284 NSW
Representative's name	Nathan Baker
Representative's job title	Principal Environmental Consultant
Phone	0477 713 478
Email	nbaker@umwelt.com.au
Address	Level 11, 213 Miller Street

☑ 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, **Nathan Baker of UMWELT (AUSTRALIA) 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	64655242274
Organisation name	BOWMANS CREEK WIND FARM PTY LTD
Organisation address	2000 NSW
Representative's name	Rebecca Riggs
Representative's job title	Developer Manager
Phone	0403 852 889
Email	rebecca.riggs@arkenergy.com.au
Address	Level 2/275 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. *

☑ I, **Rebecca Riggs of BOWMANS CREEK WIND FARM 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, **Rebecca Riggs of BOWMANS CREEK WIND FARM 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. *